CALIFORNIA PUBLIC UTILITIES COMMISSION Safety and Enforcement Division Electric Safety and Reliability Branch

Incident Investigation Report

Report Date: May 3, 2019

Incident Number: E20171009-02

Utility: Pacific Gas and Electric Company (PG&E)

Date and Time of the Incident: October 8, 2017, 2334 hours

Location of the Incident:	13801 N. Busch Road Potter Valley, CA	9100 Main Street (Hawn Creek Road)
	County: Mendocino	Potter Valley, CA
		County: Mendocino

Fatality / Injury: Nine fatalities

Property Damage: \$21 million in PG&E restoration costs

Utility Facilities Involved: Potter Valley-Mendocino, 60 kV and Potter Valley 1105, 12 kV Circuits

Violations: Yes

I. Summary

On October 8, 2017, at approximately 2334 hours, two Valley Oak trees failed, fell onto PG&E 60 kV overhead transmission and 12 kV overhead distribution conductors, and started the "Potter Fire," which ignited at 13801 N. Busch Road and 9100 Main Street in the city of Potter Valley in Mendocino County. The "Potter Fire" combined with a spot fire found in Redwood Valley and was subsequently called the "Redwood Fire". The "Redwood Fire" burned 36,523 acres, destroyed or damaged 587 structures, and resulted in nine fatalities.

Based on SED's review, SED found one violation of Commission Resolution E-4184 and two violations of Commission General Order (GO) 95, Rule 31.1 as listed below:

GO Rule/ Resolution	Violations
Resolution E-4184	Second fire located at 9100 Main Street, Potter Valley not reported
GO 95, Rule 31.1	Repair records not maintained
GO 95, Rule 31.1	Records of 2016 CEMA inspection not maintained

A. Rules and Commission Orders Violated

Appendix B of Commission Decision (D.) 06-04-055, as amended Resolution E-4184 on August 21, 2008, states in part:

"Within 2 hours of a reportable incident during normal working hours or within 4 hours of a reportable incident outside of normal working hours, the utility shall provide notice to designated CPUC staff of the general nature of the incident, its cause and estimated damage. The notice shall identify the time and date of the incident, the time and date of notice to the Commission, the location of the incident, casualties that resulted from the incident, identification of casualties and property damage, and the name and telephone number of a utility contact person....

2. Reportable incidents are those which: (a) result in fatality or personal injury rising to the level of in-patient hospitalization and attributable or allegedly attributable to utility owned facilities; (b) are the subject of significant public attention or media coverage and are attributable or allegedly attributable to utility facilities; or (c) involve damage to property of the utility or others estimated to exceed \$50,000..."

GO 95, Rule 31.1 Design, Construction and Maintenance states in part:

"Electrical supply and communication systems shall be designed, constructed, and maintained for their intended use, regard being given to the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service.

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of communication or supply lines and equipment."

B. Witnesses

No.	Name	Title
1	Ivan Garcia	CPUC Lead Investigator
2	Rick Tse	CPUC Investigator
3	Chris Lee	CPUC Investigator
4	Charles Filmer	PG&E CPUC Reporting
5		PG&E Supervising Vegetation Program Manager
6	Eric Bettger	CAL FIRE Fire Captain
7	Ryan Smith	CAL FIRE Battalion Chief

C. Evidence

No.	Source	Description
1	PG&E	Initial Online Incident Report 10/10/17
2	PG&E	20-day Incident Report, 11/6/17
3	CPUC	Data Request #1, 11/21/17
4	PG&E	Data Request Response #1, 12/29/17 through 6/29/18
5	CPUC	Field visit, 10/12/17
6	CPUC	PG&E Evidence Inspection, 6/11/18
7	CAL FIRE	Investigation Report and Attachments, 17CAMEU012169
8	CPUC	CAL FIRE Evidence Viewing Photos, 6/29/18
9	CPUC	Data Request #2,7/19/18
10	PG&E	Data Request Response #2, 8/3/18 through 9/21/18
11	CPUC	Data Request #3, 8/16/18
12	PG&E	Data Request Response #3, 8/31/18 through 9/21/18
13	CPUC	CAL FIRE Evidence Viewing Photos, 10/15/18
14	CPUC	Data Request #4, 10/19/18
15	PG&E	Data Request Response #4, 11/15/18 through 12/14/18
16	CPUC	Data Request #5, 1/3/19
17	PG&E	Data Request Response #5, 1/25/19 through 2/6/19
18	CPUC	Data Request #6, 2/8/19
19	PG&E	Data Request Response #6, 2/15/19 through 3/15/19
20	CPUC	Data Request #7, 2/25/19
21	PG&E	Data Request #7 Response, 3/18/19

II. Background

On January 17, 2014, Governor Edmund G. Brown Jr. proclaimed a State of Emergency and directed state officials to take actions to mitigate conditions that could result from the drought and cause a fire. On February 18, 2014, in response to the proclamation, SED issued a letter to PG&E directing PG&E to take all practicable measures to reduce the likelihood of fires caused by utility facilities, including, increasing inspections, taking corrective actions and modifying protective schemes. On June 12, 2014, the California Public Utilities Commission (CPUC) issued Resolution ESRB-4 directing all Investor Owned Electric Utilities (IOU) to take remedial measures to reduce the likelihood of fires started by or threatening utility facilities. On October 30, 2015, Governor Edmund G. Brown Jr. declared a Tree Mortality State of Emergency due to tree mortality caused by the state's prolonged drought and bark beetle infestations.

On October 8, 2017, at approximately 2334 hours, a 19-foot long branch from a 55-foot Valley Oak tree fell and contacted overhead conductors of PG&E's Potter Valley/Mendocino 60 kV transmission circuit located at 13801 N. Busch Road in Potter Valley. (Figure 1)

On October 9, 2017, at approximately 0027 hours, a 45-foot, 8-inch branch from a Valley Oak tree fell and contacted overhead conductors of PG&E's Potter Valley 1105 12 kV distribution circuit located at 9100 Main Street in Potter Valley. (Figure 2)

Another fire was also reported on October 9, 2017, at 0037 hours, in Redwood Valley, but CAL FIRE later determined it to only be a spot fire from embers blown from the high winds. (Figure 3) The three separate fires subsequently merged together and were named the Redwood Incident by CAL FIRE.

On October 9, 2017, at 1707 hours, approximately 18 hours after the fire started, PG&E reported the incident to SED.

During the late evening hours of October 8, 2017 and early morning hours of October 9, 2017, Potter Valley was experiencing very strong winds. CAL FIRE Fire Behavior Analyst Tim Chavez referenced the Beaufort Wind Scale with the wind damage in Potter Valley to be associated with winds in excess of 39 miles per hour (mph). He used data from the nearby Remote Automated Weather Stations (RAWS) and calculated the wind speeds to have reached 67 mph at the ridgelines.



Figure 1. Red marker: approximate ignition point/location (N 39°20.953, W 123°07.882) near 13801 North Busch Road, Potter Valley (Origin #1) (Source: CAL FIRE)



Figure 2. Red marker: approximate ignition point/location (N 39°19.397, W 123°07.877) near 9100 Main Street (Hawn Creek Road), Potter Valley (Origin #2) (Source: CAL FIRE)



Figure 3. Red marker: approximate ignition point/location (39°18.742, -123°13.011) Spot Fire near East Side Road, Redwood Valley (Origin #3) (Source: CAL FIRE)

III. SED Review and Analysis

A. PG&E Transmission Facilities Inspection Program

PG&E performs overhead transmission detailed inspections which consist of a detailed ground, aerial, or climbing inspection of the assets. Inspectors look for abnormalities or circumstances or circumstances that will negatively impact safety, reliability, or asset life. Individual elements and components are examined carefully through visual and/or routine diagnostic tests, and each abnormal condition is graded and/or recorded.

Inspections require viewing all sides of the facilities (including the line equipment). Evaluating line equipment requires a visual inspection of disconnect switches, control cabinets, switch platforms, lightning arrestors, etc. Abnormal conditions that will adversely impact safety, service reliability, or asset life, and are identified by the inspector as requiring maintenance before the next inspection cycle, must be graded based on the inspector's observation and judgement.

An overhead transmission patrol supplements the detailed facility inspection. All overhead facilities are patrolled annually. Patrol schedules are measured in terms of calendar years. A detailed facility inspection may be considered as a patrol, but a patrol cannot be considered as, or substituted for, a detailed inspection.

The inspector's primary responsibility when conducting an overhead electric facility patrol is to observe the electric facilities visually, looking for obvious structural problems or hazards without using measuring devices, tools, or diagnostic tests, and to record that the facilities have been patrolled. Abnormal conditions that, in the opinion of the inspector, warrant maintenance before the next scheduled patrol or inspection, must be identified, assigned a Priority Code, and recorded.

According to PG&E's document TD-1001M, Electric Transmission Preventive Maintenance Manual, May 12, 2016, Rev: 03, Table 13 lists the requirements for overhead transmission detailed inspections for a steel tower at 60 kV. PG&E's requirement is to have a detailed overhead transmission inspection every 5 years.

For the incident area, SED reviewed PG&E's overhead transmission detailed inspection records. The incident tower 000/008 is a lattice steel pole and was inspected on November 19, 2009¹ and November 10, 2014². This meets PG&E's requirement of an inspection every 5 years. In the 2014 inspection, PG&E documented that the incident tower needed high voltage signs. A work order was created, LC109214954, and high voltage signs were installed on the tower.

In addition, SED reviewed PG&E's overhead transmission patrols for the incident area. PG&E performed an overhead air patrol of the incident tower on September 22, 2016³. After the incident, an air patrol was performed on November 6, 2017⁴. Both patrols found no abnormal conditions on the incident tower.

B. PG&E's Distribution Facilities Inspection Program

General Order 165 requires biennial patrol inspections and detailed inspections at fiveyear intervals for rural areas, such as the incident location. Rural areas are defined by GO 165 as "those areas with a population of less than 1,000 persons per square mile".

GO 165 defines a patrol inspection as a "simple visual inspection" meant to identify "obvious" problems and hazards and may be carried out in the course of other company

¹ Bates PGE-CPUC_00009478-00009482

² Bates PGE-CPUC_00009472-00009477

³ Bates PGE-CPUC_00009748-00009753

⁴ Bates PGE-CPUC_00009742-00009747

business. GO 165 defines a detailed inspection as one where facilities are "carefully examined" to gather and record conditions of overhead facilities.

There were two locations where PG&E's distribution facilities were involved; 13801 N. Busch Road and 9100 Main Street (Hawn Creek Road) in Potter Valley. The 13801 N. Busch Road location is an area with "underbuild" distribution circuits. The incident tower 000/008 is a steel lattice tower carrying voltages at 60 kV. Also, on the tower are distribution circuits at 12 kV which are referred to as "underbuild."

13801 N. Busch Road

SED reviewed PG&E's 2017 and 2013 distribution patrol documentation. The patrols were conducted on March 21, 2017⁵ and May 8, 2013⁶. No abnormal conditions were found on the patrols for those two years.

PG&E conducted detailed overhead inspections for this incident area in 2015 and 2010. The inspections were conducted on March 6, 2015⁷ and November 21, 2010⁸. No conditions or issues were documented for the distribution facilities at this location for these two years.

9100 Main Street (Hawn Creek Road)

SED reviewed PG&E's 2016 and 2014 distribution patrol documentation. The patrols were conducted on March 30, 2016⁹ and May 5, 2014¹⁰. No abnormal conditions were found on the patrols for those two years.

PG&E conducted detailed overhead inspections for this incident area in 2015 and 2010. The inspections were conducted on March 23, 2015¹¹ and August 18, 2010¹². No conditions or issues were documented for the distribution facilities at this location for these two years.

C. PG&E's Vegetation Management Program

The GO 95 rules applicable to Vegetation Management (VM) include:

⁵ Bates PGE-CPUC_00009662

⁶ Bates PGE-CPUC_00009533 and PGE-CPUC_00009532

⁷ Bates PGE-CPUC_00009548 and PGE-CPUC_00009652

⁸ Bates PGE-CPUC_00009531

⁹ Bates PGE-CPUC_00009737

¹⁰ Bates PGE-CPUC_00009686 and PGE-CPUC_00009695-00009684)

¹¹ Bates PGE-CPUC_00009693 and PGE-CPUC_00009695

¹² Bates PGE-CPUC_00009682

- a. Rule 31.1 Design, Construction and Maintenance
- b. Rule 35 Vegetation Management
- c. Rule 37 Minimum Clearances of Wires above Railroads, Thoroughfares, Buildings, Etc., Table 1 Cases 13 and 14.

In order to comply with the applicable GO 95 rules, PG&E's Distribution Vegetation Management Standard (DVMS)¹³ outlines the general strategy used to identify:

- 1. Conductor radial clearance issues;
- 2. Trees that will encroach PG&E's minimum distance requirements; and
- 3. Hazard trees that have the potential to strike conductors.

In order to implement its strategy, PG&E's DVMS prescribes annual vegetation patrols and completion of identified tree work for all primary and secondary distribution facilities.

i. Routine VM Inspections

PG&E's VM contractors, specifically Pre-inspection (PI) personnel, work with VM Vegetation Program Managers (VPM) to create an annual plan for routine patrols that lead to vegetation work. Vegetation work prescribed by the PI personnel is completed by Tree Contractor (TC) personnel. PG&E may also use a combination of LiDAR¹⁴ and spectral imagery to allow vegetation management personnel to identify hazardous trees in high fire threat areas. Trees identified using these technologies are then inspected from the ground and addressed as necessary.

LiDAR and spectral imagery were not utilized by PG&E on either of the two incident locations. PG&E has utilized LiDAR on a limited basis on select circuit segments in areas designated as "high", "very high", or "extreme" on CAL FIRE's Fire Resource or Assessment Program (FRAP) fire risk scale. These incident locations were not on one of the select circuit segments.

Pre-inspection is conducted by a Consulting Utility Forester (CUF), a qualified individual who inspects all vegetation that have the potential to grow into or fall into the primary conductors before the next inspection and vegetation that is currently causing strain/abrasion of secondary conductors.

PG&E requires a CUF to have at least two years' experience in line clearance tree pruning work, or equivalent experience as determined by PG&E. PG&E desires that a CUF have an associate's degree in forestry, arboriculture or a related field; however, an associate's degree is not a requirement. The CUF should be "familiar with the Contractor's work practices, proper arboricultural techniques and practices, proper

¹³ Bates PGE-CPUC_00005827_CONFIDENTIAL. Utility Standard TD-7102S, Published on 9/4/15 Rev 1

¹⁴ LiDAR (an acronym of Light Detection And Ranging) is a surveying technology that measures distance by illuminating a target with a laser light. (Source: Wikipedia.)

integrated pest management practices, PG&E's Tree Pruning Specification, PG&E's Pre-Inspection Specification and requirements, and all applicable legal and regulatory requirements.³¹⁵

PG&E used two contractors as part of its vegetation management for both the 13801 N. Busch Road and 9100 Main Street incident areas. Western Environmental Consultants, Inc. (WECI) conducted the PI portion to identify tree work and Family Tree conducted the vegetation management work that included trimming or removal.

13801 N. Busch Road

SED reviewed PG&E's Vegetation Management Records for the area of the incident location from 2012 to 2017. SED focused on documented inspections and resulting vegetation work orders. Pre-inspections of the incident Valley Oak tree were completed on an annual basis from 2012 to 2017.

On February 10, 2014, WECI performed a vegetation management routine patrol. The incident tree was identified for a needed routine trim. On March 27, 2014, Family Tree completed the routine trim of the incident tree.¹⁶

9100 Main Street (Hawn Creek Road)

SED reviewed PG&E's Vegetation Management Records for the area of the incident location from 2013 to 2017. SED focused on documented inspections and resulting vegetation work orders. Pre-inspections of the incident Valley Oak tree were completed on an annual basis from 2013 to 2017. SED could not identify any documented work on the incident tree from these records. According to PG&E's Data Response #2, RedwoodQ11, PG&E states, "Please note that because tree work was not prescribed for the subject tree, it was not scheduled for tree work in the last five years and is therefore not listed in the produced Vegetation Management records."

ii. Enhanced Vegetation Inspections

In addition to routine VM, PG&E contracted WECI to perform enhanced vegetation inspections related to facilities for which a Catastrophic Event Memorandum Account (CEMA) has been opened/authorized.¹⁷

¹⁵ PG&E pre-inspection contract specification. Section 3.2.

¹⁶ Bates PGE-CPUC_00010350

¹⁷ CEMA is an account used to recover the costs associated with the restoration of service and facilities affected by catastrophic events that have been declared disasters or states of emergency by federal or state authorities. The reasonable balance in the CEMA will be recovered in rates after the CPUC reviews and audits the recorded CEMA balance.

For both incident locations, PI personnel performed an enhanced vegetation inspection on July 20, 2017. PG&E provided a map of this CEMA Patrol¹⁸. PG&E did not produce any worker orders resulting from the inspection for the subject incident area.

PG&E states that after reasonable search of its records, they are unable to locate the maps for the 2016 CEMA patrol for the incident location.¹⁹ GO 95, Rule 31.1 Design, Construction, and Maintenance states in part, "*For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of communication or supply lines and equipment.*" Therefore, PG&E is also in violation of GO 95, Rule 31.1 for not adhering to accepted good maintenance practice of keeping maps records.

PG&E's Vegetation Management Distribution Patrol Standard (Version 4, revised 9/12/06) describes various factors when patrolling or pre-inspecting trees for vegetation work. Under "Hazard Trees/Facility Protection" the document describes trees that should be identified as such. "Trees that are dead, show signs of disease, decay or ground or root disturbance that may fall into or otherwise impact the primary conductor shall be removed or made facility safe (See Facility Protect Procedure)."

PG&E records show there were no Facility Protect (hazard trees) from the incident locations of the Redwood Fire that were identified within the last three years.

iii. PG&E VM Quality Control (VMQC) and VM Quality Assurance (VMQA)

PG&E VMQA

PG&E's VMQA program audits PG&E facilities for any compliance violations, e.g., GO 95 or Public Resource Code (PRC) 4293. VMQA audits are required to be performed by PG&E's VMQA standard²⁰, annually at a minimum.

SED reviewed PG&E's VMQA audit reports from 2013 through 2017. The VMQA audits analyzed PG&E's PI personnel who performed inspections in PG&E's North Coast Division and were conducted by personnel from PG&E, California Forestry & Vegetation Management, or WECI. The North Valley Division encompasses the incident locations. VMQA audits sorts vegetation non-compliances into five categories:

- 1. Contact with conductor.
- 2. Within four feet of conductor.
- 3. Trees that have the potential of being non-compliant within 90 days of auditor observation.

¹⁸ Bates PGE-CPUC_00012647

¹⁹ Bates PGE-CPUC_DR-112117_Common_Q10_part3

²⁰ Bates PGE-CPUC_00006027_CONFIDENTIAL

- 4. Trees that may not hold compliance with GO 95, Rule 35 or PRC §4293 before the next fire season.
- 5. Trees that present a potential threat to the conductors called Facility Protect Trees (FPT).

In PG&E's Audit 7N DL1-17²¹, conducted between January 24, 2017 and February 24, 2017, auditors identified two trees in the Ukiah (Coast/Inland) district that were less than 18 inches from 12 kV conductors. These two trees were missed by an inspector with seventeen months experience.

In PG&E's Audit 7N DS2-17²², conducted in 2017, auditors identified issues in the Ukiah District of PG&E's North Coast Division. Six non-compliant trees were identified as missed by inspectors. Eight trees were identified as having the potential to become non-compliant within 90 days of the VM QA observation. Nineteen dead, dying, and/or decadent trees were observed as a potential threat to the high voltage facilities.

The subject trees in the Redwood Incident were not identified in the 2013-2017 VMQA audits SED reviewed.

PG&E VMQC

PG&E's VMQC program audits PI and TC personnel for any vegetation work that is missed or not performed correctly. PG&E does not require routine VMQC audits and PG&E describes the VMQC audit locations as "computer-generated" and "randomized".²³

There were no VMQC program audits conducted in the incident areas of the Redwood Incident in the last 5 years.

iv. Vegetation Analysis by CAL FIRE

13801 N. Busch Road

In a Supplementary Investigation Report²⁴ prepared by Charles Martin of CAL FIRE, Mr. Martin concluded there were no signs of structural defect, disease, or other pest negatively affecting the branch at the break location. Mr. Martin has over twenty years of experience as a Registered Professional Forester and Arborist. The report states in part, *"I did not observe any indicators of structural problems at the branch break, or on the remainder of the branch, or along the remainder of the main scaffold or the standing*

²¹ Bates PGE-CPUC_00012691 to PGE-CPUC_00012705

²² Bates PGE-CPUC_00012676 to PGE-CPUC_00012690

²³ Bates PGE-CPUC_00005827, Pages 9-10

²⁴ CAL FIRE Supplementary Investigation Report LE 71, Incident Number 17CAMEU012169, 13801 N. Busch Road

tree to the next branch union. The general health of the tree appeared consistent with other white oaks in the area and is consistent with a mature tree of this size."

9100 Main Street (Hawn Creek Road)

Mr. Martin also prepared the report for the 9100 Main Street (Hawn Creek Road) incident location. This is also referenced in the Supplementary Investigation Report.²⁵ Mr. Martin concluded that he did not observe any pests or disease which would negatively impact the structure of the tree branch. The report states in part, *"I did not* observe any signs of any pest or disease damage to the branch end. I probed the wood of the branch end with a knife point and it was solid and did not have any signs of decay. The center of the branch had included bark running the length of the broken end. This occurs when two or more branches grow together at a steep angle and eventually grow together but retain the bark which forms a weak area. The branch had grown together for several years based on counting the rings of the sapwood that tore. Bark inclusions can form a channel for water intrusion into the tree and cause decay. No signs of rot or decay were noted. Further up the branch, a second branch break occurs where a smaller lateral branch failed. This branch scar also has included bark with sound wood surrounding it. No signs of disease, pest, or decay were noted."

PG&E's Distribution Routine Patrol Procedure²⁶ describes various factors when patrolling or pre-inspecting trees for vegetation work. Under section 2.6 "Hazard Trees/Facility Protection Trees"²⁷ the document describes trees that should be identified as such. "(T)rees or portions of trees that are dead, show signs of disease, decay or ground or root disturbance, AND may fall into or otherwise impact primary or secondary conductors, THEN PRESCRIBE work to make tree Facility Safe per Facility Protect and work Difficulty Classification Procedure."²⁸

PG&E's Vegetation Management Hazard Tree Rating and Scoring Procedure²⁹ aids inspectors in prescribing work for potentially hazardous trees. PG&E's Vegetation Management Hazard Tree Rating and Scoring Procedure (Utility Procedure: VEG-1015P, dated 10/13/2014) aids inspectors in prescribing work for potentially hazardous trees.

The procedure indicates a Valley Oak tree as a "Very High" failure potential.

²⁶ PG&E Distribution Patrol Procedure. Utility Procedure TD-7102P-01. Rev: 1. Published 10/27/15.

²⁷ PG&E Distribution Patrol Procedure. Utility Procedure TD-7102P-01. Rev: 1. Published 10/27/15. Page 8.

²⁸ PG&E Distribution Patrol Procedure. Utility Procedure TD-7102P-01. Rev: 1. Published 10/27/15. Page 8.

²⁹ PG&E Vegetation Management Hazard Tree Rating and Scoring Procedure. Utility Procedure: TD-7102P-07. Publication Date: 10/13/2014. Appendix A, Page 11.

²⁵ CAL FIRE Supplementary Investigation Report LE 71, Incident Number 17CAMEU012169, 9100 Main Street

C. PG&E's Infrastructure Conditions

1380 N. Busch Road

The subject conductor was a size #2 copper wire and was part of PG&E's Potter Valley-Mendocino 60 kV transmission circuit. The subject conductor spanned approximately 665 feet between towers and was installed in 1947.

On October 9, 2017, PG&E filed an Electric Safety Incident Report concerning an incident that occurred approximately 500 feet east of 13801 North Busch Road in Potter Valley. At this location, the Potter Valley-Mendocino 60 kV transmission line is mounted on the east side of the steel lattice structures. When PG&E arrived at the incident location, PG&E observed a branch from a green, healthy California White Oak/Valley Oak tree had broken and was lying on the ground beneath. (Figure 4) The tree branch was one foot in diameter and approximately nineteen feet long. (Figure 5) The branch had broken into two different sections. The break at the end of the branch appeared to match the break at the top of the oak tree. The oak tree was approximately six feet in diameter and approximately forty feet tall. The tree was rooted approximately 15 feet from the transmission conductors and had a lean away from the conductors.



Figure 4. Fallen Valley Oak tree branch and break point at 13801 North Busch Road



Figure 5. Broken Valley Oak branch on the ground

PG&E observed the middle conductor of the Potter Valley-Mendocino 60 kV transmission line had broken and was on the ground. (Figure 6) The other two transmission conductors were intact and did not fall to the ground. The "underbuild" of the Potter Valley 1105 12 kV distribution conductors were mounted on the west side of the steel lattice structures. All three of these distribution conductors were also intact.



Figure 6. Broken 60 kV conductor at incident tower (Source: CAL FIRE)

9100 Main Street (Hawn Creek Road)

PG&E did not report the 9100 Main Street (Hawn Creek Road) location as a reportable incident. According to PG&E, a trouble man was the first PG&E responder at this location when he drove down Hawn Creek Road between 0112 and 0132 hours on October 9, 2017. The PG&E trouble man drove south along Hawn Creek Road to look for downed conductors or any in the road that might be hazardous. The trouble man did not recall seeing any damage to PG&E equipment on Hawn Creek Road at that time. He did recall seeing fire activity on the west side of Hawn Creek Road but saw no evidence that the fire burned any area on the east side of this road.

During the daylight hours on October 9, 2017, the same PG&E trouble man drove back down Hawn Creek Road. He recalled seeing one of three phases down between Pole #102176248 and the next pole to the east. The downed conductor was a #6CU (copper) conductor. On October 10, 2017, PG&E crews completed repair work at this location. The crew members observed a limited area of burned vegetation on the property of 9100 Main Street but no burned structures on that property.

SED discovered through a meeting with CAL FIRE on June 29, 2018 that the second location, 9100 Main Street (Hawn Creek Road) was part of the Redwood incident. SED sent data requests about this second location to PG&E after this meeting with CAL FIRE. In Data Response #2, Redwood Location 2, Question 1, PG&E stated, "On November 6, 2017, CAL FIRE notified PG&E that it was requesting data related to three additional sites, one which was the Redwood incident location. To PG&E's knowledge, CAL FIRE did not collect any PG&E facilities as evidence from the Redwood incident location. Based on that fact and examinations from public roads at that time, PG&E was not able to discern any evidence that its facilities had been involved in a reportable event, and therefore did not file an incident report."³⁰

SED concludes that this second Redwood incident location, 9100 Main Street (Hawn Creek Road) should have been reported to the CPUC as a reportable incident event. A reportable incident is defined in Appendix B of Commission Decision (D.) 06-04-055, as amended by Resolution E-4184 on August 21, 2008. The decision states in part, *"Reportable incidents are those which: (a) result in fatality or personal injury rising to the level of in-patient hospitalization and attributable or allegedly attributable to utility owned facilities; (b) are the subject of significant public attention or media coverage and are attributable or allegedly attributable to utility facilities; or (c) involve damage to property of the utility or others estimated to exceed \$50,000..."*

SED concludes that 9100 Main Street (Hawn Creek Road) "Redwood Fire" location in Potter Valley should have been reported to the CPUC as soon as PG&E knew about any fatality involved with the fire and/or when the amount of property damage was clearly going to exceed \$50,000. The "Redwood Fire" contributed to the "Redwood Incident" in which 587 structures were damaged or destroyed and nine fatalities were reported. These two conditions are triggers for PG&E to have reported the incident to the CPUC as defined in Sections 2(a) and 2(c) of Appendix B of Commission Decision (D) 06-04-055, as amended by Resolution E-4184.

In addition, PG&E installed approximately 100 feet of new 12 kV conductor and related splices on the northeast (creek-side) of a single span on October 10, 2017. PG&E has stated it has been unable to locate the work order for the repair.³¹ GO 95, Rule 31.1 Design, Construction, and Maintenance states in part, "*For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance*

³⁰ Bates PGE-CPUC_DR-071918_Redwood_Q01

³¹ Bates PGE-CPUC_DR-071918_Redwood_Q05

with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of communication or supply lines and equipment." Therefore, PG&E is also in violation of GO 95, Rule 31.1 for not adhering to accepted good maintenance practice of keeping maintenance records.

i. Intrusive Pole Tests

1380 N. Busch Road

The incident tower at this address does not require a pole intrusive test because the tower is a lattice steel structure.

9100 Main Street (Hawn Creek Road)

SED did not request a pole intrusive test for this location. It does not appear to SED that a pole failure was involved at this location. CAL FIRE's investigation concluded that an oak tree branch broke, contacted a 12 kV overhead conductor and started a vegetation fire.

ii. Pole Loading Calculations

1380 N. Busch Road

SED did not request pole loading calculations for the incident transmission tower. Based on the field assessment conducted on October 12, 2017, it does not appear to SED that the tower was deteriorating or overloaded.

9100 Main Street (Hawn Creek Road)

SED did not request pole loading calculations for the pole(s) closest to the incident location. It does not appear to SED that a deteriorated or overloaded pole was the cause of this incident based on the reports, photos and data responses given from PG&E and CAL FIRE.

D. PG&E's Equipment Operations

i. Event Timeline

On October 8, 2017, at 2334 hours an emergency 911 call was made to CAL FIRE Howard Forest Emergency Command Center (ECC) reporting a vegetation fire located in a field east o 13801 North Busch Road in Potter Valley.

1380 N. Busch Road

The transmission line at the incident location is the Potter Valley-Mendocino 60 kV transmission line. Circuit Breaker 12 is a protective device north of the incident location and is located at the Potter Valley Powerhouse Substation. Circuit Breaker 62 is a protective device south of the incident location and is located at the Mendocino Substation. (Figure 7)

Mendocino	60kV	Area of Interest	Potter Valley PH
CB 62		×	CB 12

Figure 7. Diagram showing protection devices between incident span/Area of Interest (Source: PG&E)

The following timeline of events were recorded from PG&E records.

October 8, 2017

2233 hours – Circuit Breaker 12 at the Potter Valley Powerhouse Substation operated and locked out.

2233 hours - Circuit Breaker 62 at the Mendocino Substation operated and locked out.

2336 hours – According to CAL FIRE's website, the fire started

October 9, 2017

0300 hours – A PG&E trouble man observed a broken branch lying on the ground below two of three intact transmission conductors. He also observed the middle conductor of the Potter Valley-Mendocino 60 kV transmission line on the ground.

October 10, 2017

1838 hours – CAL FIRE released the incident location site.

October 11, 2017

Repair work completed at the incident location.

1456 hours – PG&E remotely closed Circuit Breaker 12 via SCADA, re-energizing the Potter Valley Powerhouse Substation

1700 hours – Potter Valley Powerhouse Substation remotely de-energized per CAL FIRE request.

October 12, 2017

1526 hours – Potter Valley Powerhouse Substation remotely re-energized, restoring electric transmission service to incident location.

9100 Main Street (Hawn Creek Road)

The distribution line at the incident location is the 12 kV Potter Valley 1105 Circuit. Line Recloser 64118 is the protective device upstream from the 9100 Main Street location. (Figure 8)



Figure 8. Diagram showing protection devices between incident span/Area of Interest (Source: PG&E)

The following timeline of events were recorded from PG&E records.

October 8, 2017

2333 hours – Line Recloser 64118 operated and reclosed, momentarily de-energizing the incident location

October 9, 2017

0000 hours – Line Recloser 64118 operated and reclosed, momentarily de-energizing the Redwood incident location.

0011 hours – Line Recloser 64118 operated and reclosed, momentarily de-energizing the Redwood incident location.

0017 hours to 0033 hours – A majority of smart meters on the entire Potter Valley 1105 circuit recorded a series of power off/on events.

0033 hours to 0034 hours – PG&E remotely opened via SCADA Circuit Breaker 22 at the Potter Valley Powerhouse Substation. Circuit Breaker 52G at the Potter Valley

Powerhouse Substation automatically opened and remained open. When both Circuit Breakers 22 and 52G were opened, the incident location was de-energized.

0112 hours to 0132 hours – A PG&E trouble man was the first PG&E responder at the incident location.

During the daylight hours – The same PG&E trouble man drove back to the incident location and saw on of three phases down between Pole 102176248 and the next pole to the east.

October 10, 2017

PG&E crews completed repair work at the incident location.

October 13, 2017

0927 hours – A PG&E trouble man manually closed Line Recloser 64118, restoring distribution service to the Potter Valley 1105 circuit routed through the incident location.

PG&E states in Data Response #6, Potter Q6 states that Line Recloser 64118 is set to lock out after two unsuccessful automatic reclose attempts within a 45 second period. If the device recloses successfully within the 45 second period, it will not lock out, and any outage resulting from its reclose attempts are considered momentary outages. If the recloser locks out, the resulting outage is considered a sustained outage.

SED reviewed the SCADA data and records provided for the Line Recloser 64118. There were three momentary outages on the recloser within a 38-minute period. Since the recloser did not reclose successfully two times within a 45 second period, the recloser operated as it was designed to.

E. Other Field Observations and Review of Physical Evidence

1380 N. Busch Road

On October 12, 2017, SED met at 1100 hours at PG&E's Service Center at 2641 North State Street in Ukiah. SED met Charles Filmer, PG&E, CPUC Reporting and PG&E Supervising Vegetation Program Manager. From there SED followed PG&E to the incident site in Potter Valley. As SED approached the town of Potter Valley, SED was delayed for several minutes by law enforcement, because the area SED was about to enter was evacuated and only police and CAL FIRE were being let in. PG&E talked to law enforcement and they let SED by, but cautioned to be aware that wind conditions could change at any moment and that SED may not be allowed to reach the incident site and may be required to evacuate. SED decided to continue with the investigation but that, if SED were told at another point that it was too dangerous to continue, SED would leave and evacuate. When SED arrived at the incident site, 13801 N. Busch Road, the homeowner told SED that it could drive vehicles through his backyard lot to the area of the incident. SED decided to drive in his backyard but then determined the ground was getting soft, so SED walked about 100 yards to reach the site.

SED observed a Valley Oak tree branch lying on the ground next to the incident tower, PG&E Potter Valley-Mendocino 60 kV circuit, Transmission Steel Tower 000/008. The steel tower had a different type of construction than what SED would normally see. The three transmission phases were on the east side of the tower and the distribution was on the west side of the tower (horizontal). There were also jumpers that were seen on the west side of the tower. The configuration of the transmission tower was different from what SED is used to inspecting. SED normally sees transmission conductors on the very top and distribution just below and this is called, "underbuild". SED approximated the tower was just over 80 feet high based on a visual inspection.

SED saw a branch from the Valley Oak tree lying on the ground which is where CAL FIRE may have found the conductor. According to PG&E's initial report, the conductor was taken by CAL FIRE for evidence. SED saw a fresh cut on the tree at approximately 50-60 feet in height, which may be the location from which the branch fell. SED estimated the transmission conductors were approximately 60 feet away from where the branch broke. SED estimated the base of the transmission tower was approximately 150 feet from the base of the Valley Oak tree.

PG&E got clearance from CAL FIRE the day before, October 11, 2017 to access the incident site. PG&E repaired the broken transmission conductor on October 11, 2017. PG&E provided the work order notification LC#113723033³² to document the repair. (Figure 9)

³² Bates PGE-CPUC_00012211 to PGE-CPUC_00012214



Figure 9. Repaired middle phase 60 kV conductor

On the ground, SED could see evidence of a fire, with vegetation burnt all the way along a barbed wire fence to the next transmission tower heading south of the incident tower. SED saw evidence of a splice on the middle phase of the transmission conductor. Along the burnt trail near the fence, SED noticed another splice on the middle phase heading south. These splices are from the repair PG&E made the day before.

SED spoke to a homeowner who was a witness to the fire. He stated that he was in his backyard when he heard a loud thump and spark behind him. He then observed a flame in the field and believes that is where the fire had started. He stated there was lots of wind and gusts that evening, and they were blowing west. He said it took the fire department about an hour to arrive. The homeowner stated the fire department left the scene with the fire still burning, probably due to other higher priorities in fighting the fire. SED saw evidence the fire had engulfed the home next to his, but his home did not burn down.

Based on the field evidence and the homeowner's statements, SED concluded that high winds brought down the branch of the Valley Oak Tree, which fell onto PG&E's transmission 60 kV conductor. The incident tree more than likely had enough radial clearance from the 60 kV conductor based on SED's visual assessment of the site, an approximation of current conductor and tree branch distances and the fact that the tree was growing away from the 60 kV conductors. GO 95, Rule 37, Table 1 requires a minimum of 48 inches of radial clearance from vegetation and 60 kV conductors.

On June 29, 2018, SED met with CAL FIRE to review evidence collected by CAL FIRE and discuss the Redwood Incident. SED met with CAL FIRE Battalion Chief Ryan Smith and Fire Captain Eric Bettger. Captain Bettger showed SED the evidence he collected at this location. He stated he had asked PG&E to cut two sections of the broken middle phase conductor. He collected a 9-foot, 2-inch section of the 60 kV conductor from the south section of the line and a 6-foot, 6-inch section of the same conductor from the north section. The two sections had burn marks that were related to the tree conductor contact. (Figure 10)



Figure 10. Burn marks found on both sections of conductors from incident tree contact (Source: CAL FIRE)

9100 Main Street (Hawn Creek Road)

SED was unable to visit this second location. SED became aware that this location was part of the Redwood incident during a meeting with CAL FIRE on June 29, 2018. CAL FIRE was able to investigate and provide reports, photos, and evidence of the fire at this location to SED. Captain Bettger stated that he spoke with a firefighter who told

him there was a fire separate from the one that was at 1380 N. Busch Road. He followed the firefighter to the 9100 Main Street incident location where Captain Bettger observed a burned area near the bank of a canal. He investigated further and saw pieces of fulgurite on the ground near the bank. Above the pieces of fulgurite were three distribution conductors. The east conductor appeared to have a newer copper conductor spliced with the existing conductor. Just south of the fire was a tree branch that broke from an oak tree located on the east bank of the irrigation canal. He noticed that there were drag marks from where the tree branch had originally fallen. The branch appeared to match the tree located on the east side of the canal. The branch was approximately 45 feet, 8 inches long and was 14 inches in diameter. (Figure 11) Captain Bettger concluded his investigation by collecting a 4-foot, 6-inch piece of 12 kV conductor with 3-inch splice, 26 pieces of fulgurite, and a 4 ½ inch section of 12 kV conductor with fulgurite for evidence.



Figure 11. Broken branch from incident Valley Oak tree at 9100 Main Street (Hawn Creek Road) (Source: CAL FIRE)

PG&E was unable to retrieve any evidence at this location. PG&E crew members made a repair of the 12 kV conductor on October 10, 2017. Since then, PG&E has been unsuccessful in retrieving any evidence including the fallen tree branch due to the

homeowner's refusal to allow PG&E on to their property. PG&E was able to identify the tree as a California White Oak/Valley Oak approximately 50 to 60 feet tall. The 12 kV conductors were #6CU (copper).

PG&E's response to the possible evidence collection is in Data Response #2, RedwoodQ02. PG&E states, "PG&E does not have any firsthand knowledge as to whether the tree branch that CAL FIRE's Final Report (17CAMEU012169) describes as having been moved on the property of 9100 Main Street was in fact moved or, if it was moved, who moved it. On or about March 15, 2018, one of the property owners of 9100 Main Street told a PG&E employee that he had moved a fallen branch that he found near the canal on the property at some point between October 8, 2018, and March 15, 2018. The property owner also reported that he had cut the branch into pieces. The PG&E employee observed that, as of March 15, 2018, PG&E requested permission from both property owners to collect the branch. On or about March 23, 2018, the property owners notifying them of their obligation to preserve any potentially relevant evidence that may shed light on how the Redwood Fire started, including the branch."

Although PG&E was unable to view and investigate the fallen tree branch, SED concludes that CAL FIRE's analysis by Mr. Martin, a Registered Professional Forester and Arborist for 20 years, provides enough proof that the incident tree was healthy at the time of the failure.

IV. CAL FIRE Investigation

CAL FIRE's investigation report, 17CAMEU012169 states, "After gathering witness statements, receiving fire behavior data and conducting our investigations, I've concluded that the initial fire reported on North Busch Road was ignited when the top section of a valley oak tree broke and fell through the conductor at approximately 11:34 PM. The branch contacted the middle east 60 kV overhead conductor and caused it to break. The conductor caught the blackberry bushes below on fire. The fire advanced west with the northeast wind towards Redwood Valley. A second fire started on the east side of Hawn Creek Road when a branch from an oak tree broke and contacted a 12 kV overhead conductor at approximately 12:27 AM. The conductor fell to the ground starting a vegetation fire in the annual grass east of Hawn Creek Road. The fire grew and spotted across the road and burned into the fire from N. Busch Road. The wind blew embers towards Redwood Valley and started a third fire in a grass field near East Road and Tomki Road at approximately 12:37 AM. The three fires burned together for a total of 36,523 acres."

CAL FIRE's report references Public Resource Code 4293 which states that electrical transmission and distribution lines operating at 2,400 or more volts, but less than 72,000 volts shall maintain a clearance of four feet from vegetation.

The report concludes, "The Valley Oak at Origin #1 N. Busch Road, leaned away from the conductors. The closest part of the Valley Oak was the base of the tree. The

distance from the base of the tree to the closest eastern conductor was 13 feet. The examination of the tree concluded there were no signs of structural defect, disease, or other pest negatively affecting the branch at the break location."

"The Valley Oak at Origin #2 Hawn Creek Road stood predominantly upright and was 36 feet 6 inches away from the closest eastern conductor. The closest part of the Valley Oak was a tree branch that measured 20 feet 8 inches to the closest eastern conductor. The examination of the tree concluded there were no signs of structural defect, disease, or other pest negatively affecting the branch at the break location."

SED's analysis of CAL FIRE's Investigation is consistent with SED's field investigation of the incident location at N. Busch Road. SED concludes that the tree branch that fell from this location was likely at a distance greater than four feet from the 60 kV transmission conductor. Although SED was unable to visit the Hawn Creek Road, it agrees with CAL FIRE's analysis that the distance between the branch and 12 kV distribution conductor at the time of the incident was likely greater than four feet.

For both locations, SED viewed evidence photos taken by CAL FIRE which identify both branches as healthy when they fell onto the conductors.

V. Conclusion

Based on the evidence that SED reviewed, SED's investigation found PG&E in violation of:

- ... Appendix B of Commission Decision (D) 06-04-055, as amended by Resolution E-4184, for not reporting the incident at 9100 Main Street, Potter Valley to the CPUC.
- ... GO 95, Rule 31.1 for not adhering to accepted good maintenance practice of keeping maintenance records. PG&E failed to keep the work order for the repair work performed on October 10, 2017. PG&E notified SED of the lost record on September 21, 2018.
- ... PG&E violated GO 95, Rule 31.1 for failing to maintain VM inspections related to the 2016 CEMA inspection according to best maintenance practice of keeping map records. PG&E could not locate records related to this inspection. PG&E notified SED of the lost record on March 30, 2018.

SED's investigation determined that none of the three violations listed above were the direct cause of the ignition of the subject fire but they nevertheless are violations of Commission regulations and GOs.

If SED becomes aware of additional information that could modify SED's findings in this Incident Investigation Report, SED may re-open the investigation and may modify this report or take further actions as appropriate.

VI. Attachments

Attachment A – CAL FIRE Investigation Report – Case No. 17CAMEU012169

Attachment B – CAL FIRE Supplementary Investigation Report LE 71, Incident Number 17CAMEU012169, 13801 N. Busch Road by Charles Martin, Forester II

Attachment C - CAL FIRE Supplementary Investigation Report LE 71, Incident Number 17CAMEU012169, 9100 Main Street by Charles Martin, Forester II

Attachment D – PG&E Potter Valley Busch Rd. Incident Description & Factual Summary Version 2 – Revised 1/28/2019

Attachment E – PG&E Redwood Location Fact Report

Attachment F – PG&E Data Request #5 Response, Common Question #1, "Circuit Map of Potter Valley-Mendocino, 60 kV"

Attachment G – PG&E Data Request #2 Response, Redwood Question 5. Response dated September 21, 2018.

Attachment H – PG&E Data Request #1 Response, Question 10

ATTACHMENT A

CAL FIRE Investigation Report Case No. 17CAMEU012169







CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION

Mendocino Unit 17501 North Highway 101 Willits, CA. 95490

INVESTIGATION REPORT

CASE NUMBER:

CASE NAME:

DATE:

INCIDENT TYPE:

INCIDENT INVESTIGATORS:

17CAMEU012169

Redwood Incident

October 8, 2017

Wildland Fire Investigation

Eric Bettger Captain – Fire Prevention CAL FIRE Mendocino Unit

Ryan Smith Battalion Chief – Fire Prevention CAL FIRE Mendocino Unit Redwood Incident October 8, 2017

1	1 - VIOLATIONS:
2	Not Applicable
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Redwood Incident

October 8, 2017

1 2 - SUMMARY:

On Sunday, October 8, 2017, Potter Valley experienced wind speeds reaching up to 67 2 miles per hour. The northeast wind caused large tree branches to break and fall onto 3 conductors, communication lines and roadways throughout Potter Valley. At 11:34 PM, the 4 CAL FIRE Howard Forest Emergency Command Center started receiving emergency 911 5 calls reporting vegetation fires in the Potter Valley area. The first fire was reported at 11:34 6 PM in a patch of blackberry bushes east of 13801 North Busch Road. An arc from a 7 8 conductor was witnessed along with the start of a vegetation fire. A second vegetation fire was reported at 12:27 AM by a CAL FIRE Heavy Fire Equipment Operator who was 9 responding to the fire on North Busch Road. The fire was identified as a small spot on the 10 11 east side of Hawn Creek Road on the property of 9100 Main Street. This was thought to be a spot fire from the fire on North Busch Road. After investigation, it was confirmed to be a 12 separate fire from an overhead conductor. The two fires were both located on the valley 13 14 floor approximately 1.7 miles apart and later burned together. A third vegetation fire was 15 reported at 12:37 AM on the south side of the East Road bridge near the Tomki Road intersection in Redwood Valley. This fire was confirmed by the Redwood Valley Fire 16 17 Department who arrived at scene and reported a five acre vegetation fire. After 18 investigation, it was confirmed to be a spot fire from the fires started in Potter Valley. The 19 three fires burned together and were named the Redwood Incident. The Redwood Incident consumed 36,523 acres. The fire burned ten miles from Potter Valley to Reeves Canyon 20 21 Road on the west side of Highway 101 in Redwood Valley. Nine lives were lost and 587 22 structures were damaged or destroyed.

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Redwood Incident

October 8, 2017

1 3 - SUBJECT:

- 2 Not Applicable

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Redwood Incident

4 - VICTIMS & WITNESSES:

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October 8, 2017



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Potter Redwood 036


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Officer Initials 288



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1	4 - VICTIMS & WITNESSES (cont.):
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3	Witnesses - Origin #3: East Road, Redwood Valley
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5	W-12
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8	Phone #
9	Note: Redwood Valley Fire Chief.
10	-
11	W-13 Ray TAGLIO
12	17501 North Hwy 101
13	Willits, CA. 95490
14	Phone # (707) 391-6708
15	Note: CAL FIRE Battalion Chief.
16	
17	Witnesses – CAL FIRE and PG&E
18	
19	W-14 Dan GREGORY
20	1300 U Street
21	Sacramento, CA. 94244
22	Phone # (916) 324-1644
23	Note: CAL FIRE LIDAR.
24	
25	W-15 Dave KAROLY
26	1.300 U Street
27	Sacramento, CA. 94244
28	Phone # (916) 323-1044
29	Note: CAL FIRE LIDAR.
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Potter Redwood 041

- 1 **5 EVIDENCE**:
- 2 Origin #1: North Busch Road
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- 4 Evidence #1
- 5 Item: 17MEU012169 Item Number 1
- 6 Description: 60kV Overhead Conductor
- 7 Collected By: Officer Eric BETTGER Badge # 4703 on October 9, 2017 at 4:05 AM
- 8 Stored: CAL FIRE Howard Forest Prevention Office Evidence Locker
- 9 Address: 17501 North Highway 101 Willits, CA. 95490
- 10 Note: South section 9 feet 2 inches long 1/2 in. diameter
- 11
- 12 Evidence #2
- 13 Item: 17MEU012169 Item Number 2
- 14 Description: 60kV Overhead Conductor
- 15 Collected By: Officer Eric BETTGER Badge # 4703 on October 9, 2017 at 4:15 AM

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- 16 Stored: CAL FIRE Howard Forest Prevention Office Evidence Locker
- 17 Address: 17501 North Highway 101 Willits, CA. 95490
- 18 Note: North section 6 feet 6 inches long 1/2 in. diameter
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- 1 **5 EVIDENCE (cont.):**
- 2 Origin #2: Hawn Creek Road
- 3
- 4 Evidence #1
- 5 Item: 17MEU012169 Item Number 3
- 6 Description: 12kV Overhead Conductor with Splice
- 7 Collected By: Officer Ryan SMITH Badge # 2722 on October 12, 2017 at 1:32 PM
- 8 Stored: CAL FIRE Howard Forest Prevention Office Evidence Locker
- 9 Address: 17501 North Highway 101 Willits, CA. 95490
- 10 Note: Approx. 4 ft. 6 in. Conductor with 3 in. Splice
- 11
- 12 Evidence #2
- 13 Item: 17MEU012169 Item Number 4
- 14 Description: Fulgurite
- 15 Collected By: Officer Ryan SMITH Badge # 2722 on October 12, 2017 at 1:32 PM
- 16 Stored: CAL FIRE Howard Forest Prevention Office Evidence Locker
- 17 Address: 17501 North Highway 101 Willits, CA. 95490
- 18 Note: 26 pieces 1/4 inch to 2 inches in size
- 19
- 20 Evidence #3
- 21 Item: 17MEU012169 Item Number 5
- 22 Description: Fulgurite with conductor
- 23 Collected By: Officer Ryan SMITH Badge # 2722 on October 12, 2017 at 1:32 PM
- 24 Stored: CAL FIRE Howard Forest Prevention Office Evidence Locker
- 25 Address: 17501 North Highway 101 Willits, CA. 95490
- 26 Note: Approx. 4½ in. Conductor with Fulgurite
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Officer Initials 666

October 8, 2017

1 6 - CONDITIONS:

Potter Valley was experiencing strong winds at the time of the Redwood Fire. CAL FIRE 2 Fire Behavior Analysist Tim CHAVEZ referenced the Beaufort Wind Scale with the wind 3 damage in Potter Valley to be associated with winds in excess of 39 miles per hour. 4 CHAVEZ used data from the nearby Remote Automated Weather Stations (RAWS) and 5 calculated the wind speeds to have reached 67 miles per hour at the ridgelines. See the 6 attached Fire Behavior Analyst Report. The weather at the Lyons Valley Remote 7 Automated Weather Station located on Cow Mountain 11 miles east-southeast of Potter 8 Valley at 11:34 PM was as follows: 9

- 10
- 11 Lyons Valley RAWS
- 12 Temperature: 58 Degrees Fahrenheit
- 13 Relative Humidity: 12 Percent
- 14 Wind Direction: Northeast
- 15 Wind Speed: 25 MPH with gusts to 35 MPH
- 16 Location: Cow Mountain Ukiah, CA.
- 17 Time: October 8, 2017 at 11:30 PM
- 18 Elevation: 3355 Feet
- 19
- 20 Kestrel Digital Weather Reading
- 21 Temperature: 68.9 Degrees Fahrenheit
- 22 Relative Humidity: 12.2 Percent
- 23 Wind Direction: Northeast
- 24 Wind Speed: 17 MPH with gusts to 20 MPH
- 25 Location: Gibson Lane and Busch Lane in Potter Valley, CA.
- 26 Time: October 9, 2017 at 1:37 AM
- 27 Elevation: 1019 Feet
- 28 Taken By: Eric BETTGER
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1	7 – EQUIPMENT:		
2	The equipment associated with t	e Redwood Fire is a	owned by PG&E. The conductor that
3	broke at Origin 1 on the property	f 13801 N. Busch R	oad is a 60kV conductor according to
4	PG&E Transmission Troublema	. т	his is one of six conductors that run
5	from the PG&E substation locate	d on Powerhouse R	oad south towards Highway 20 near
6	Lake Mendocino. The break c	curred between tv	wo transmission towers which are
7	referenced below with the follow	ng Datum WGS 84	GPS coordinates.
8			
9	Origin #1: North Busch Road		
10			
11	North Transmission Tower	South Transmiss	ion Tower
12	N 39°20.953	N 39°20.8	41
13	W 123°07.882	W 123°07.	880
14			
15	The conductor that broke at Ori	in 2 on the propert	y of 9100 Main Street east of Hawn
16	Creek Road is a 12kV conductor	according to PG&E	Subforeman
17	This conductor is one of three th	at run northwest to s	southeast from Hawn Creek Road to
18	Main Street. The break occurred	between two powe	r poles which are referenced below
19	with the following Datum WGS 8	4 GPS coordinates.	
20			
21	Origin #2: Hawn Creek Road		
22			
23	Northwest Power Pole	Southeast Pow	ver Pole
24	N 39°19.397	N 39°19.3	80
25	W 123°07.877	W 123°07.	.847
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October 8, 2017

1 8 - PROPERTY:

The Redwood Fire burned approximately 36,523 acres. 587 structures were damaged or destroyed during the fire. See the attached damage report for the individual property loss. The three separate fires started in the Local Responsibility Area and spread to the State Responsibility Area. The Specific Origin Areas of the two fires located in Potter Valley and the spot fire in Redwood Valley can be located with the following Datum WGS 84 GPS coordinates.

8	
9	Origin #1: North Busch Rd. Potter Valley
10	North 39°20.929
11	West 123°07.88
12	
13	Origin #2: Hawn Creek Rd. Potter Valley
14	North 39°19.392
15	West 123°07.867
16	
17	Origin #3: East Side Rd. Redwood Valley
18	North 39°18.742
19	West 123°13.011
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October 8, 2017

1 9 - NARRATIVE:

On Sunday October 8, 2017 at 11:34 PM an emergency 911 call was made to the 2 3 California Department of Forestry and Fire Protection (CAL FIRE) Howard Forest 4 Emergency Command Center (ECC) reporting a vegetation fire located in a field east of 13801 North Busch Road in Potter Valley, California. The reporting party told the Howard 5 6 Forest ECC the fire was located in the blackberry bushes on the backside of their property. 7 At 11:36 PM Howard Forest ECC dispatched the Potter Valley Fire Department and CAL 8 FIRE resources to the fire. The first report on conditions was from the Potter Valley Fire 9 Department reporting a 20 acre vegetation fire with a critical rate of spread and one 10 structure fully involved.

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At 11:56 PM, I responded to Potter Valley from a fire in Laytonville. While driving to Potter Valley, I heard the Howard Forest ECC alerting incoming fire resources that conductors were down and the possibility of three separate fires in the Potter Valley area. I heard the Potter Valley Fire Department tell the Howard Forest ECC tree branches throughout the valley were falling across the roads blocking access to the fire on North Busch Road. The Potter Valley Fire Department also reported 40 mile per hour winds blowing across the valley floor with gusts of 60 miles per hour.

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I drove into Potter Valley from Highway 20 at approximately 1:00 AM. At the intersection of 20 21 County Road 240 and Westside Road I saw a bright orange glow towards the north. I continued driving on East Potter Valley Road and observed a strong wind from the 22 23 northeast. I saw a well-developed fire on the west side of the valley floor heading southwest at a critical rate of spread. The fire was wind driven and aligned with the 24 topography on the eastern facing slope. The smoke column was aligned horizontal with the 25 26 slope and moving southwest with the wind. I estimated the fire to be 200 acres in size from 27 this location. I continued driving to the established staging area located at Gibson Lane and Busch Lane. I drove on the opposite side of the road multiple times to get around broken 28 29 tree branches blocking the roadway. I arrived at the designated staging area and saw the 30 fire had already burned through this area.

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1 At the staging area, I spoke with CAL FIRE Battalion Chief Jake SERRANO, who had established unified command with Potter Valley Fire Chief Bill PAULI. I wanted to confirm 2 3 the initial report given by the Howard Forest ECC of three separate fires. SERRANO 4 believed there were at least two separate fires, but possibly more with the spotting 5 potential. I then spoke with PAULI, who was one of the first resources to arrive at scene. I 6 asked him where the fire was when he first saw it. He pointed northeast towards N. Busch 7 Road from our location. PAULI showed me a map he had sketched of the surrounding 8 roads where he saw the fire initially burning. He told me the fire originated between N. Busch Road and Powerhouse Road. At the staging area, I took weather on level ground 9 with a digital device at 1:37 AM. I observed a clear sky with a wind from the northeast at 17 10 mph and gusts of 20 mph, a temperature of 68.9 degrees Fahrenheit and a relative 11 12 humidity of 12.2 percent.

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I drove east on Busch Lane along the edge of the fire with the smoldering grass field to the 14 15 north. I turned left on N. Busch Road and drove a short distance before I was blocked by a 16 large tree branch across the road. I turned around and headed towards Powerhouse Road 17 to find a different access point. At the intersection of Busch Lane and Powerhouse Road 18 was a tree branch suspended by communication lines and conductors. A short distance 19 past this branch was a tree across the road completely blocking Powerhouse Road. I 20 turned around and headed back towards N. Busch Road. I bypassed the tree branch on N. 21 Busch Road through a grass field to the west. While driving through the field, I observed 22 three structures burning to the east. I observed a vegetation fire burning in a field 23 approximately a guarter mile to the east of the burning structures. At 2:15 AM, I drove 24 through an opened gate onto the property of 13851 N. Busch Road to gain access to the fire. At this residence, I was met by the home owners and his wife 25 26 I asked them if I could access the fire from their property. They told me I could 27 drive a short distance and walk the rest of the way. I spoke with them for a short period of

- time and found they had witnessed the start of the fire and had called 911 to report it.
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told me he was in his bathroom preparing for bed when he saw a huge arc

LE80 (Rev. 7/2011)

16

Officer Initials

towards the east. He said he saw a tree illuminate when the conductors arced. He told me 1 he had lost power 15 minutes prior to witnessing the arc. He said he saw the fire start on 2 the neighbor's property on the south side of the creek under the conductors. He described 3 the initial size of the fire as a 5-yard burn pile. I asked if the would show me the 4 location of where he saw the fire start. I walked with him towards the southeast corner of 5 his property. He showed me where the conductors were and where he saw them arc. On 6 the southeast corner of his property was a transmission tower with six overhead conductors 7 running north and south. The middle east conductor was broken and suspended on the 8 bottom conductor. This conductor was not in contact with the ground. 9 pointed to the area on the neighbor's property where he saw the fire start. He pointed to the northeast 10 corner of his neighbor's property, owned by at 13801 N. Busch Road. I asked 11 how fast he thought the wind was blowing when he saw the conductors arc. He 12 13 said it was well over 45 mph from the northeast. He told me there was a wind event two years ago when the wind reached nearly 100 mph. He didn't think it was that fast, but did 14 say the wind almost knocked him over while he was walking outside. I walked back with 15 to his home and asked him and his wife to fill out a witness 16 statement form describing the events they saw (see witness statements attachment 12). 17

18

At 2:50 AM, I walked onto the property owned by The fire was actively burning in 19 a patch of blackberry bushes. The fire had lost momentum as the vegetation transitioned 20 21 into the green grass of the pasture. I looked to the south and noticed the fire was burning in 22 the same fashion to the west along two other fence lines separating the properties. Each property line was separated by approximately 100 yards of green fields. I saw oak trees 23 within the perimeter of the fire actively burning and casting embers with the wind in a 24 southwest direction. I saw the fire had burned on both sides of the creek and was now 25 smoldering as it reached the edges of the blackberry bushes. I looked east and saw a slow 26 moving backing fire burning towards Powerhouse Road. The backing fire was in the creek 27 drainage slowly burning against the northeast wind. I looked south and saw the fire had 28 29 burned underneath the conductors between the two transmission towers. The fire 30 appeared to be isolated from the main fire.

LE80 (Rev. 7/2011)

17

Officer Initials 288

1 I walked towards the south transmission tower to find the other end of the separated 2 conductor. The south tower is located on the property of at 13751 N. Busch Road. At the transmission tower, I saw six conductors running north and south. The 3 4 middle east conductor had lost its tension. It dropped down from the tower to a small tree 5 where it was suspended. It then dropped down to the ground for a short distance and over the fence dividing and and property. I found the conductor coiled up on 6 7 the ground approximately 60 feet north of the fence line. It was directly under the remaining 8 five overhead conductors.

9

10 I wanted to confirm the conductors were deenergized and safe to work around. The 11 assigned radio channels were congested with radio traffic. The channels were being used 12 for life safety and firefighting operations. Therefore, a face to face conversation with the 13 Incident Commander was more appropriate at the time. Potter Valley Fire Engine 6361 14 stayed at this location. At 3:40 AM, I drove to the staging area to talk with CAL FIRE Incident Commander SERRANO. SERRANO told me the power was being shut off by 15 PG&E but wasn't positive it was completely safe in the area I was at. While talking to 16 SERRANO, I saw a PG&E utility truck drive by and I spoke with the driver, who identified 17 himself as PG&E Lineman . I asked if he would secure the power near N. 18 19 Busch Road. He followed me in his truck and we arrived back at 3:54 AM. I showed the conductor on the ground and asked him to cut a five-foot section off the 20 21 end. We then walked to the north transmission tower to cut the other end of the broken 22 conductor. The end of the conductor was hanging approximately twenty feet from the couldn't reach this end with his extension pole so he cut the lower 23 around. 24 hanging section in the middle to get the conductor down. He then cut a five-foot section off 25 the broken end. I took the two cut sections back to my truck. I coiled both conductors and 26 taped them with red evidence tape. I placed them into two separate brown paper evidence 27 bags and labeled them north and south and locked them in the cab of my truck.

28

I waited to further investigate this area until the fire stopped burning and the wind died down. There was still the possibility of more branches falling from the swaying trees. I tried

LE80 (Rev. 7/2011)

October 8, 2017

1 to call the Howard Forest ECC, but did not have cell phone service at my current location. I 2 later found out the cell towers in the area were damaged during the fire and reception was 3 poor. At 5:10 AM, I went to obtain more information on the other fires and find reception to 4 place a phone call to request additional investigators. Potter Valley Engine 6361 stayed at this location. I drove south on Hawn Creek Road towards Spring Valley Road to confirm a 5 reported second fire. I saw that the fire had already burned through this area. I continued 6 7 south onto Spring Valley Road until I reached fire equipment along the fires edge. I spoke 8 to a resident at the end of the dirt road and asked if a fire had started in this area. They 9 said no and thought this was all one fire.

10

11 I drove to Eastside Road where I received a cell phone reception and placed a phone call to the Howard Forest ECC. I spoke with Howard Forest ECC communications operator 12 13 Sean FARRELLE and asked if there was any updated information on the other reported 14 fires. From the information he had received, he now thought there might be one fire in Potter Valley and another fire in Redwood Valley. I asked him who the Incident 15 Commander was on the fire in Redwood Valley and was told it was CAL FIRE Battalion 16 Chief Ray TAGLIO. I called TAGLIO to see where the fire was with the intention of having 17 the origin secured. I asked him if the fire in Redwood Valley was a separate fire from the 18 one in Potter Valley. He told me he now thought it was all part of the same fire. At that 19 time. Deputy Chief Kyle PINSON drove up to my location on Eastside Road. He also 20 thought it was all the same fire. With the information I gathered, I drove back to 13801 N. 21 Busch Road to start an origin and cause investigation. 22

23

At 5:50 AM, I returned to 13801 N. Busch Road. I was met by **Sector** who opened a gate for me to access the back of their property. **Sector** told me she had reported the fire by calling 911. She described the event as though lightning had struck near the northeast side of their field. She said a fire then started in the blackberry bushes. told me no one else had accessed their property besides the Potter Valley Fire Engines. I spoke with the firefighters on the Potter Valley Engine 6361 and was told no one had entered the area. I waited for sunrise to start my investigation. I used the time to transfer

LE80 (Rev. 7/2011)

1 my field notes onto my computer and to prepare for the investigation.

2

3 Origin #1: North Busch Road October 9, 2017

4

5 At 7:10 AM. I started my origin and cause investigation by walking counter clockwise around the perimeter of the fire on property. I made the same observations I 6 7 saw earlier in the morning when the fire was actively burning. The primary fuel of the fire 8 was the blackberry bushes. The fire self-extinguished when it reached the higher fuel 9 moisture of the green irrigated pasture. The fire was isolated in the pasture approximately a guarter of a mile east of N. Busch Road. The fire was located on flat terrain and was 10 11 approximately 4.15 acres in size. The blackberry bushes that grew between the two 12 transmission towers were approximately six to ten feet tall and approximately thirty feet 13 wide.

14

I looked at the fire's direction of travel by identifying the macro and micro burn indicators. I 15 observed burn indicators underneath the conductors midway between the two transmission 16 towers, such as cupping on the blackberry stems and protection on the wooden fence 17 posts, showing the fire traveling north to south. To the east of the north transmission tower 18 19 I saw burn indicators, such as staining on glass bottles, protection on animal bones and stem fall, showing the fire traveling east towards Powerhouse Road. To the west of the 20 north transmission tower I saw burn indicators such as, cupping on the blackberry stems, 21 22 foliage freeze on the smaller oak trees and angle of char on their trunks, showing the fire traveling west towards N. Busch Road. With the burn indicators and the fire spread I 23 24 observed earlier that morning, I was able to establish a General Origin Area (GOA). The 25 GOA I established was an approximate 200 square foot in size. I walked the perimeter of 26 the GOA in a counter clockwise direction identifying macro and micro burn indicators. I observed micro burn indicators, such as charring on the wooden posts supporting a barbed 27 28 wire fence and cupping on blackberry stems. I finished walking counter clockwise and retraced my path in a clockwise direction. I marked the fire's direction of travel with colored 29 flags along the GOA perimeter. I marked advancing burn indicators with red flags, lateral 30

LE80 (Rev. 7/2011)

Officer Initials 288

October 8, 2017

burn indicators with yellow flags and backing burn indicators with blue flags. I went to 1 where I saw advancing indicators and entered the GOA. I continued my systematic 2 approach by walking back and forth until I saw lateral burn indicators showing a transitional 3 zone. I continued this approach until I came across backing indicators. I identified the fire's 4 initial run by the advancing burn indicators. Cupping on the remaining six to twelve-inch 5 blackberry stems showed the advancing run of the fire coming from an oak tree located 6 near the transmission lines. The advancing vector headed southwest from the oak tree, 7 8 which aligned with the northeast wind at the time of the fire.

9

At 11:19 AM, CAL FIRE Mendocino Bureau Chief Ryan SMITH arrived at the incident. 10 SMITH told me we were the only CAL FIRE investigators on the Redwood Incident due to 11 the high fire activity in Northern California. SMITH informed me he had requested a CAL 12 FIRE Survey LIDAR team from Sacramento to take measurements and map the origin. I 13 briefed SMITH on the events leading up to his arrival and the status of the investigation. 14 Together we walked the fire and retraced the steps I made earlier. SMITH and I continued 15 identifying burn indicators and marking them with colored flags. We used a systematic 16 17 approach until we located the Specific Origin Area (SOA), which we identified as a 32-foot by 25-foot section. The SOA we identified was located on the northeast corner of 18 property under the conductors. Located in the SOA was a branch that appeared to 19 be the top section of an oak tree ten feet away. The tree branch was one foot in diameter 20 21 and approximately nineteen feet long. The branch had broken into two different sections. 22 The break at the end of the branch appeared to match the break at the top of the oak tree. 23 The oak tree was approximately six feet in diameter and approximately forty feet tall. The 24 oak tree had a lean away from the conductors.

25

SMITH and I visually searched the SOA without moving the tree branch. We waited to further examine the SOA until the LIDAR team had taken their measurements and mapped the area. CAL FIRE LIDAR Surveyors Dan GREGORY and Dave KAROLY arrived at the incident at approximately 1:25 PM. They were briefed on the investigation and started setting up their equipment. SMITH and I measured the distance from the SOA to the

LE80 (Rev. 7/2011)

October 8, 2017

transmission towers for future reference. The transmission tower to the north of the SOA 1 was 111 feet 4 inches away and the transmission tower to the south was 546 feet 8 inches 2 away. SMITH and I measured the distance from base of the oak tree to the eastern 3 overhead conductors and received a measurement of 13 feet. The oak tree leaned away 4 from the overhead conductors, which made the trunk the closest part of the tree to the 5 conductors. 6 7 At 4:45 PM CAL FIRE Firefighter Jeremy WHITAKER arrived at the incident to secure the 8 SOA overnight. WHITAKER was instructed not to let anyone into the SOA or disturb the 9 investigation. He was left with a marked CAL FIRE vehicle and a portable radio to notify us 10 if any issues arose. At 6:30 PM, SMITH and I left the incident for the night. 11

12

13 Origin #1: North Busch Road October 10, 2017

14

On Tuesday October 10, 2017, I met SMITH at the Redwood Incident Base located in 15 Ukiah. SMITH put in a request for an arborist to examine the condition of the oak tree. After 16 obtaining information on the fire and attending the morning briefing, I drove back to Potter 17 Valley to continue the investigation. At 10:15 AM, I arrived back at the incident. SMITH was 18 already there and told me he had requested CAL FIRE Forester II Charles MARTIN to 19 examine the oak tree. MARTIN has over twenty years of experience as a Registered 20 Professional Forester and Arborist. MARTIN arrived at the incident at 11:27 AM to examine 21 the oak tree for health and structural defects. MARTIN concluded there were no signs of 22 structural defect, disease, or other pest negatively affecting the branch at the break 23 location. MARTIN identified the tree as a Valley Oak (see arborist report attachment 10). 24 25

The CAL FIRE LIDAR team was already at the incident taking measurements of the SOA. Walking in front of the LIDAR equipment will disrupt the measurements, so I used this time to examine how the fire progressed from the SOA towards N. Busch Road. I walked the two fields southwest of the SOA and saw multiple spot fires. I observed a few spot fires on property, but he majority of them were located on property.

LE80 (Rev. 7/2011)

1 two homes were fully consumed during the initial stages of the fire. Next to their homes was a 20 by 40-foot metal hay barn that had also burned. There were five spot 2 fires near the hay barn and two homes. I walked the surrounding properties and did not 3 observe any additional spot fires. LIDAR Surveyor GREGORY and I then walked the two 4 fields using a GPS to record their locations. We marked 146 spot fires from the SOA to N. 5 Busch Road. They ranged in size from approximately six by six inches to twenty by twenty 6 , the son of the son who was there the 7 feet. I later spoke with told me the stacked hay within the barn caught on fire from 8 night of the fire. the windblown embers. The hay barn cast more embers igniting the two homes on fire. 9 was visiting friends at 13901 N. Busch Road the night of the fire. In his 10 witness statement, he said the sparks from the fire ignited the homes and ranch buildings. 11 He said the sparks then caught the field to west of N. Busch Road on fire (see witness 12 13 statements attachment 12).

14

After the LIDAR team was done surveying the area, SMITH and I tried to locate the Ignition 15 Area within the SOA. SMITH and I examined the tree branch in the SOA and were unable 16 to find any evidence on it, such as marks from the overhead conductors. SMITH used a 17 chain saw to cut the small limbs and debris from around the tree branch to try to locate 18 more burn indicators and an Ignition Area. I ran a magnet over the SOA and was not able 19 to find any magnetic material except an old section of metal fence that was no longer in 20 use. The fence line stopped near the south edge of the SOA. It was not continuous and 21 was no longer maintained. Rusted remains of an electrical wire were near the metal fence. 22 The wiring was in sections and partially buried in the ground. 23 hadn't been used or energized for over ten years. The blackberry bushes acted as a fence 24 to keep the cattle on the property. After examining the burned area within the SOA, we 25 26 were unable to locate the Ignition Area.

27

After talking with witnesses and investigating the fire, SMITH and I determined the middle east conductor started the fire when the top section of the oak tree broke through it. The fire advanced west with the wind along the property line and creek until it reached irrigated

LE80 (Rev. 7/2011)

Officer Initials _ 228

October 8, 2017

pasture and self-extinguished. The fire burned laterally from the origin south along the property line and underneath the conductors. The burning oak trees and blackberry bushes, with the wind, cast embers in a southwest direction towards the barn and two homes. The hay in the barn caught fire along with their two homes. The fire crossed N. Busch Road and continued to burn towards Redwood Valley. SMITH and I completed our investigation at 6:38 PM, on Tuesday October 10, 2017 and released the scene.

8

9 Origin #2: Hawn Creek Road October 12, 2017

10

11 On Thursday October 12, 2017, I drove to Potter Valley to interview witnesses who were there the night of the fire. I went to the Potter Valley Fire Station to speak with Chief PAULI 12 13 and the firefighters who were part of the initial response. I was met by Warren FOSTER, 14 who is a CAL FIRE firefighter with the Lassen Modoc Unit and a former Potter Valley 15 firefighter. He told me there was a separate fire from the initial fire on N. Busch Road. I asked FOSTER if he would show me it's location. I followed him in my vehicle to the 16 17 intersection of Main Street and Hawn Creek Road. We then walked north towards the 18 driveway of 12300 Hawn Creek Road. I looked to the east and saw a burned area on the 19 property of 9100 Main Street. I estimated the burned area to be approximately an acre and 20 a half in size. I walked to the fires edge and saw it had burned along an irrigation canal in 21 short annual grass. I saw pieces of fulgurite on the ground near the bank of the canal. 22 Above the pieces of fulgurite were three distribution conductors. All but three pieces of 23 fulgurite were in the burn. Two of the three pieces had a small burned area around them 24 approximately 3 inch by 3-inch in size. To the south of the fire appeared to be a scaffold 25 (main) tree branch that broke from an oak tree located on the east bank of the irrigation 26 canal. The tree branch had been moved to the west from where it had fallen. I saw drag 27 marks in the dirt and grass from where the branch had landed to where it was currently 28 located. I called SMITH and told him there was a separate fire from the one we investigated on N. Busch Road. SMITH told me he was on his way from Willits. 29 30

Officer Initials

SMITH arrived at the scene at 9:20 AM and we began an origin and cause investigation. I 1 showed SMITH the location of the broken tree branch. I showed him a black mark on the 2 branch I thought was from the conductors, but after a closer observation it appeared to be 3 from equipment grabbing onto the branch and moving it away from the canal. SMITH and I 4 found a depression on the west side of the canal bank where the branch had hit. To the 5 south of the depression was a conductor and splice laying on the ground. The conductor 6 was approximately 5 feet in size. Directly above were three overhead conductors running 7 parallel with the irrigation canal. The east conductor appeared to have a newer copper 8 conductor spliced into an older existing conductor. The newer conductor was shinier in 9 appearance compared to the dull darker existing one. SMITH and I looked at the fulgurite 10 on the ground and saw they were in line, spread out over approximately 95 feet. One of the 11 pieces of fulgurite had an approximately 4 ½ inch bare copper wire imbedded in it. 12

13

SMITH and I continued our investigation by determining the fire's direction of travel by 14 identifying the macro and micro burn indicators. We started walking counter clockwise 15 along the north edge of the fire. We crossed into the field to the west of Hawn Creek Road 16 and saw macro burn indicators such as angle of char in the tree crowns and on their 17 trunks. These macro burn indicators showed the fire traveling west from Hawn Creek 18 Road. SMITH marked the macro and micro burn indicators with red flags identifying 19 advancing fire. The angle of char on the trees along the west side of Hawn Creek Road 20 showed advancing fire. We walked across the road and identified advancing burn 21 indicators along the east side of Hawn Creek Road. We observed fire burn indicators such 22 as staining and ash deposits on a mail box post, angle of char on a small tree stump and 23 protection on the metal fence posts. SMITH and I determined the GOA to be approximately 24 an acre and a half on the east side of Hawn Creek Road. We followed the perimeter of the 25 GOA by walking both counter clockwise and clockwise and entered from the advancing 26 side. We identified the SOA as a 6-foot by 60-foot area located next to the irrigation canal. 27 We continued identifying advancing burn indicators until we reached the apex of the burn. 28 At the apex of the burn was a piece of fulgurite, which SMITH and I identified as our 29 primary point of ignition. From the Ignition Area, the fire burned in a V pattern towards 30

LE80 (Rev. 7/2011)

Officer Initials 288

Hawn Creek Road. SMITH and I determined the fire had started on the east side of Hawn
Creek Road and spotted across the road with the wind.

3

SMITH and I then placed white flags next to the items we were going to collect as 4 evidence. We placed a white flag next to the conductor found on the ground and marked it 5 Item 1. We placed white flags next to the pieces of fulgurite along the irrigation canal. We 6 marked individual pieces of fulgurites as one piece of evidence and numbered them as 7 Item 2. The last item we marked was approximately a 4 1/2 -inch long copper conductor 8 fused to a piece of fulgurite and numbered it Item 3. SMITH and I took measurements of 9 the primary point of ignition for future reference. We triangulated it by taking two 10 measurements from Hawn Creek Road. We used two 3-inch vertical culvert posts used as 11 part of the construction of the irrigation canal running underneath Hawn Creek Road. The 12 measurement from the north post to the primary point of ignition was 92 feet 3 ¾ inches. 13 The measurement from the south post to the primary point of ignition was 88 feet 2 1/2 14 15 inches.

16

SMITH and I examined the tree branch that was moved approximately 30 feet to the west 17 from the irrigation canal and approximately 30 feet to the south of the SOA. We observed a 18 broken section on the branch that appeared to match the tree located on the east side of 19 the canal. The branch was approximately 45 feet 8 inches long and was 14-inches in 20 diameter. SMITH and I measured the distance from the trunk of the tree to the closest 21 eastern conductor and received a measurement of 36 feet 6 inches. We measured the 22 distance of the closest tree branch to the closest east conductor and received a 23 measurement of 20 feet 8 inches. SMITH and I concluded our investigation at 1:44 PM. 24 25

To support our investigation at Hawn Creek Road, a recording from the Howard Forest ECC has a radio transmission from CAL FIRE Heavy Fire Equipment Operator Sean SWEENY telling the Incident Commander of a new vegetation fire at Hawn Creek Road and Main Street. The radio transmission was recorded at 12:27 AM. I later spoke with SWEENY, who told me he was driving to the staging area the night of the fire. He turned

LE80 (Rev. 7/2011)

staging area the night of the fire. He turned right from Main Street onto Hawn Creek Road 1 and drove a tenth of a mile and saw a fire on the east side of the road. He said the fire was 2 10-foot by 10-foot in size located southwest of the irrigation canal. SWEENY told me by the 3 time he turned his dozer transport around the fire had already crossed Hawn Creek Road. 4 He said in a matter of a few minutes the fire had crossed the road and was already burning 5 5 to 10 acres on the west side of Hawn Creek Road. The fire SWEENY described was 6 what I saw approximately 30 minutes later when I arrived in Potter Valley the night of the 7 fire. I estimated this fire as 200 acres in size when I first saw it from Eastside Road. 8

9

SMITH requested CAL FIRE LIDAR Surveyors GREGORY and KAROLY to map the SOA 10 at Hawn Creek Road. Due to the high fire activity in Northern California and other 11 assignments they weren't able to come to Potter Valley until October 19, 2017. SMITH also 12 requested CAL FIRE Forester II MARTIN to examine the tree for health and structural 13 defects. On October 19, 2017, I met with both the LIDAR Surveyors and MARTIN in Potter 14 Valley to show them the fire's SOA and the tree to be examined. I showed MARTIN the 15 tree branch and the oak tree east of the irrigation canal. MARTIN concluded the branch 16 was solid and did not have any signs of decay where the break occurred. He saw no signs 17 of structural defect, disease, or other pest negatively affecting the branch at the break 18 location. MARTIN identified the tree as a Valley Oak (see arborist report attachment 10). 19 Shortly after MARTIN examined the oak tree, CAL FIRE LIDAR Surveyors GREGORY and 20 KAROLY arrived at the incident to take measurements and map the SOA. 21

Before showing MARTIN the oak tree, I was approached by **Section**, who said he saw the fire start on Hawn Creek Road. **Section** told me he was assisting his neighbors evacuate the night of the fire. He said he was driving south on Hawn Creek Road when he saw a flash to the east and saw the conductors come down. He said the conductors sparked and started a fire about 50 feet east of Hawn Creek Road. He said the fire crossed the road within seconds. **Section** filled out a witness statement form describing the events he saw (see witness statements attachment 12).

30

22

LE80 (Rev. 7/2011)

1 Origin #3: East Road October 12, 2017

2

On October 12, 2017 at 2:45 PM, SMITH and I went to Redwood Valley to investigate another fire reported to the Howard Forest ECC the morning of October 9, 2017 at 12:23 AM. We drove to the Redwood Valley Fire Department located at 8481 East Road. SMITH and I spoke to Fire Chief who told us he was responding to Potter Valley when he heard about a new fire in Redwood Valley. He drove to the intersection of East Road, West Road and Tomki Road and saw a vegetation fire. He said the fire was approximately 5 acres in size when he first saw it.

10

SMITH and I investigated the field where had seen the fire. The field was located 11 next to dry river bed of the Russian River and East Road. We accessed the field through a 12 gated fence and started looking at the macro and micro burn indicators. We started walking 13 clockwise towards the dry river bed. We observed burn indicators, such as protection and 14 staining on a white irrigation pipe, rock staining and protection on brush stems, showing the 15 fires direction coming from East Road. We walked in a circular path until we reached a 16 fence along East Road. We saw the burn indicators change direction indicating a 17 transitional zone. We marked these with yellow flags showing lateral fire. We then walked 18 counter clockwise reading advancing burn indicators until we reached the opposite 19 transitional zone. We located the transitional zone and marked the lateral burn indicators 20 with yellow flags. SMITH and I established the GOA as 5 acres in size between the river 21 bed and East Road. SMITH and I entered the GOA where we identified the advancing burn 22 indicators. We marked advancing indicators with red flags. We walked back and forth in a 23 systematic approach between the transitional zones reading the advancing indicators. The 24 distance between these zones became narrower and eventually we reached an area where 25 the burn indicators showed a backing fire. SMITH and I identified the SOA as a ten-foot by 26 ten-foot area. In the SOA, we observed short annual grass that wasn't fully consumed by 27 the fire. SMITH and I continued to identify micro burn indicators until we identified an 28 ignition area approximately 1-foot by 1-foot in size. I ran a magnet over this area and didn't 29 find any ferrous metal fragments or particles. We were unable to find any physical 30

LE80 (Rev. 7/2011)

evidence in this area. SMITH and I found the cause of this fire to be a spot fire from the
 fires in Potter Valley. These three fires burned together creating the Redwood Incident (see
 SMITH's investigative report attachment 1).

4

5 During the first couple of days of the Redwood Incident, SMITH requested the fire spread 6 and spotting potential for the first two hours of Origin #1 and Origin #2 located in Potter 7 Valley. The map created by CAL FIRE Fire Behavior Analysist Tim CHAVEZ shows the fire 8 from Potter Valley headed directly towards the area we identified as the SOA in Redwood 9 Valley. CHAVEZ's map shows the fire had potential to spot a half mile in front of the fire. 10 CHAVEZ said the results of the data are an underestimate of the fires spread and spotting 11 distances (see fire behavior analyst report attachment 13).

12

Through the investigation, SMITH and I established three separate Specific Origin Areas
on the Redwood Incident. Within these three SOA, I conducted the following fire cause
exclusion analysis.

16

Lightning - The sky was clear with no thunderhead or cloud build-up observed. The lightning detection data shows there were no lightning strikes in Potter Valley or Redwood Valley at the time of the fires (see lightning activity attachment 14). The reporting party said it looked like lightning had stuck during the 911 call while reporting the fire east of 13801 N. Busch Road. This was later clarified as the light and noise coming from the conductor breaking. Based on these facts, I eliminated lightning as a cause of these fires.

23

Campfire – There were no signs of a campfire observed at any of the SOA. There were no designated campgrounds, tents or shelters in these areas. There were no rock rings, ash pits or cooking stoves. There were no piles of stacked wood associated with camp fires at any of the three fires. Based on these facts, I eliminated a campfire as the cause of these fires.

29

30 Smoking - There were no discarded cigarettes or other smoking material within the SOA of

LE80 (Rev. 7/2011)

any of the three fires. The three fires were all located behind gated fences on private 1 2 property away from public access. Based on these facts, I eliminated smoking as a cause 3 of these fires. 4 5 Debris Burning - All burning was suspended in Mendocino County at the time of the 6 Redwood Incident. There was no evidence of debris burning on any of the three properties. 7 I saw no burn piles or burn barrels at or near the SOA. Based on these facts, I eliminated 8 debris burning as the cause of these fires. 9 Incendiary - There were no types of incendiary devices observed in the SOA of any of the 10 three fires. There was no evidence of any arson devices such as matches or cigarettes. 11 Access to each SOA involves passing through gated fences onto private land. Based on 12 13 these facts. I eliminated arson as the cause of these fires. 14 Equipment Use - There was no equipment use seen by witnesses at the time of any of the 15 three fires. There was no evidence of equipment use at Origin #1 and Origin #3. It 16 appeared that some type of equipment was used to move a fallen oak branch from 17 underneath the conductors south of Origin #2 after the fire had started. However, there 18 was no evidence of equipment use in the SOA, such as tire marks, carbon particles or rock 19 strikes. Based on these facts, I eliminated the use of equipment as the cause of these 20 21 fires. 22 Railroad - There are no railroads located near the SOA of any of the three fires. There are 23 no railroads in Potter Valley. The closest railroad in Redwood Valley to the SOA is more 24 than two and a half miles to the south. Based on these facts, I eliminated a railroad as a 25 cause of these fires. 26 27 Children - There was no indication of children being in or near the SOA of any of the three 28 fires. There were no toys left behind. The fires were located away from playgrounds, 29 schools and campsites. The falling tree branches from the strong wind made it unsafe to 30

LE80 (Rev. 7/2011)

be around these areas. The time of night and location of these fires are unlikely to have
 children present. Based on these facts, I eliminated playing with fire as a cause of these
 fires.

4

Fireworks - The use of fireworks are illegal in Mendocino County. There was no evidence
of fireworks in or near the SOA of any of the three fires. While walking the perimeter of
GOA I did not observe any remnants of fireworks. Based on these facts, I eliminated
fireworks as a cause of these fires.

9

10 Vehicles - The SOA of each of the three fires were located behind gated fences on private 11 property away from paved roads. Each SOA was in a remote area on the properties with 12 no dirt roads or easy access to them. Based on these facts, I eliminated a vehicle as a 13 cause of these fires.

14

Glass Refraction - The only glass capable of refracting sunlight were glass bottles located in the burn at N. Busch Road. The glass bottles were located approximately 60 feet from the SOA and were used as a burn indicator showing a backing fire. All three fires occurred at night with the first fire starting at approximately 11:34 PM. Sunset on October 8, 2017 was at approximately 6:43 PM. Based on these facts, I eliminated glass refraction as a cause of these fires.

21

Electrical Power - Conductors were damaged due to falling tree branches. Evidence at N. 22 Busch Road and Hawn Creek Road show that conductors broke and contacted the ground. 23 Witnesses at N. Busch Road saw the conductors arc and a fire start immediately after. 24 Witnesses saw a fire start on the eastside of Hawn Creek Road on the property of 9100 25 Main Street. Fulgurite pieces and copper wire were found during the investigation of this 26 fire. There was no electrical power in or near the SOA in Redwood Valley. Based on these 27 facts, I included electrical power as a cause of the fires at N. Busch Road and Hawn Creek 28 29 Road.

30

After gathering witness statements, receiving fire behavior data and conducting our 1 2 investigations. I've concluded that the initial fire reported on North Busch Road was ignited when the top section of a valley oak tree broke and fell through the conductor at 3 approximately 11:34 PM. The branch contacted the middle east 60kV overhead conductor 4 and caused it to break. The conductor caught the blackberry bushes below on fire. The fire 5 advanced west with the northeast wind towards Redwood Valley. A second fire started on 6 the east side of Hawn Creek Road when a branch from an oak tree broke and contacted a 7 8 12kV overhead conductor at approximately 12:27 AM. The conductor fell to the ground 9 starting a vegetation fire in the annual grass east of Hawn Creek Road. The fire grew and spotted across the road and burned into the fire from N. Busch Road. The wind blew 10 embers towards Redwood Valley and started a third fire in a grass field near East Road 11 and Tomki Road at approximately 12:37 AM. The three fires burned together for a total of 12 13 36,523 acres.

14

The conductors at Origin #1 - N. Busch Road, is a 60kV overhead conductor. The 15 conductor at Origin #2 - Hawn Creek Road, is a 12kV overhead conductor. Per California 16 Public Resource Code 4293, except as otherwise provided in Sections 4294 to 4296, 17 inclusive, any person that owns, controls, operates, or maintains any electrical transmission 18 or distribution line upon any mountainous land, or in forest-covered land, brush-covered 19 land, or grass-covered land shall, during such times and in such areas as are determined 20 to be necessary by the director or the agency which has primary responsibility for the fire 21 protection of such areas, maintain a clearance of the respective distances which are 22 specified in this section in all directions between all vegetation and all conductors which are 23 carrying electric current: (a) For any line which is operating at 2,400 or more volts, but less 24 than 72,000 volts, four feet. (b) For any line which is operating at 72,000 or more volts, but 25 less than 110,000 volts, six feet. (c) For any line which is operating at 110,000 or more 26 volts, 10 feet. In every case, such distance shall be sufficiently great to furnish the required 27 clearance at any position of the wire, or conductor when the adjacent air temperature is 28 120 degrees Fahrenheit, or less. Dead trees, old decadent or rotten trees, trees weakened 29 by decay or disease and trees or portions thereof that are leaning toward the line which 30

LE80 (Rev. 7/2011)

1 may contact the line from the side or may fall on the line shall be felled, cut, or trimmed so 2 as to remove such hazard. The director or the agency which has primary responsibility for the fire protection of such areas may permit exceptions from the requirements of this 3 4 section which are based upon the specific circumstances involved. 5 The Valley Oak at Origin #1 N. Busch Road, leaned away from the conductors. The closest 6 7 part of the Valley Oak was the base of the tree. The distance from the base of the tree to 8 the closest eastern conductor was 13 feet. The examination of the tree concluded there 9 were no signs of structural defect, disease, or other pest negatively affecting the branch at 10 the break location. 11 The Valley Oak at Origin #2 Hawn Creek Road, stood predominantly upright and was 36 12 13 feet 6 inches away from the closest eastern conductor. The closest part of the Valley Oak was a tree branch that measured 20 feet 8 inches to the closest eastern conductor. The 14 examination of the tree concluded there were no signs of structural defect, disease, or 15 other pest negatively affecting the branch at the break location. 16 17 18 19 20 21 22 23 24 25 26 642018 27 28 Signature Date 29 Eric Bettger, #4703 **Fire Captain Specialist** 30

LE80 (Rev. 7/2011)

10 - ATTACHMENTS:

- 1. SMITH's Investigative Report
- 2. Photographs Origin #1 Potter Valley
- 3. Photographs Origin #2 Potter Valley
- 4. Photographs Origin #3 Redwood Valley
- 5. Photographs and Dispatch Recordings
- 6. Scene Entry Log
- 7. Evidence Log
- 8. Chain of Custody
- 9. Fire Report LE-66
- 10. Arborist Reports
- 11. LIDAR Reports
- 12. Witness Statements
- 13. Fire Behavior Analyst Report
- 14. Lightning Activity
- 15. Remote Automated Weather Stations Data
- 16. Incident and Fire Progression Map
- 17. Damage Assessment Report
- 18. Incident Status Summary ICS 209
- 19. PG&E Electrical Data
- 20. FC-34

LE80 (Rev. 7/2011)

ATTACHMENT B

CAL FIRE Supplementary Investigation Report LE 71, Incident Number 17CAMEU012169, 13801 N. Busch Road by Charles Martin, Forester II

	SUPPL	EMENT	ARY INVE	INCIDENT NUMBER 17CAMEU012169 CASE NAME REDWOOD			
CAL FIRE BINCE 1995	STATE OF DEPARTM LE 71 (REV	CALIFORNIA ENT OF FORE /. 7/2011)					
DAY	MONTH	DATE	YEAR	COUNTY	REGION	UNIT	CASE NUMBER
SUN	ОСТ	8	2017	MENDOCINO	CNR	MEU	12169

On October 10, 2017, CAL FIRE Battalion Chief, Ryan SMITH, requested I evaluate a tree at 13801
N. Busch Road, Potter Valley, CA. SMITH showed me one tree and a broken branch to evaluate. I
evaluated the tree and broken branch for signs of poor health or structural defects which could result
in branch or tree failure. I did not take measurements since a full survey of the site was conducted
as part of the investigation.

6

The tree is a valley oak, *Quercus lobata*, growing in a row of solitary trees along an irrigation canal.
Comparing the tree to others in the area, the tree is larger in diameter and average height. Multiple
trees in the immediate area had broken branches and the Potter Valley area in general had
numerous toppled trees and trees with broken branches and leaders. Tree failure in the area was
observed across all tree species.

12

13 I observed an upper scaffold branch broken above the intersection with the next main scaffold 14 branch. The branch lay at the bottom of the tree under the broken branch stub. I observed the end 15 of the broken branch. I did not observe any signs of any pest or disease damage to the branch end. 16 I probed the wood of the branch end a knife point and it was solid and did not have any signs of 17 decay. Ash clung to the sapwood around the break (Picture #2) which is an indication the sapwood 18 was moist at the time of the break, thus conducting water and nutrients. There were no signs of 19 structural defect, disease, or other pest negatively affecting the branch at the break location.

20

The upper break began at a branch union with a smaller lateral branch (Picture #1). This branch union appeared sound with no signs of structural defect, disease or other pest. An intact branchbark ridge indicates the branch attachment was normal and structurally sound.

24

I did not observe any indicators of structural problems at the branch break, or on the remainder of
the branch, or along the remainder of the main scaffold of the standing tree to the next branch union.
The general health of the tree appeared consistent with other white oaks in the area and is
consistent with a mature tree of this size.



1 2

3

4



5 Picture #2: Closeup of end of scaffold branch showing ash clinging to sapwood.

Potter Redwood 068

1	EXPERIENCE:
2	B.S. in Forestry, UC Berkeley, 1986
3	Registered Professional Forester, #2406, 1990 to current
4	Licensed Pest Control Advisor, insect and disease, #AA07243, from 1992 to 2013
5	Certified Arborist, Western Chapter of the International Society of Arboriculture, WE-0953A, from
6	1992 to 2013
7	
8	Work experience from 1987 to 1992 with the CAL FIRE Forest Pest Management Program including;
9	tree care, pest and disease surveying. I trained and advised homeowners, local government
10	workers, private tree care professionals on pest detection, treatment and general tree care. I
11	conducted hazard tree evaluations and reported tree failures through the California Tree Failure
12	Report program run by the University of California, Cooperative Extension.
13	
14	From 1992 to present I have worked as a CAL FIRE Forester I and Forester II reviewing and
15	inspecting timber harvesting operations for compliance with the California Forest Practice Rules
16	which include measures to detect and minimize the spread of forest pests and pathogens.
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	PRINTED NAME SIGNATURE BADGE NUMBER DATE
	Charles Martin // 1491 11/14/17

Potter Redwood 069

ATTACHMENT C

CAL FIRE Supplementary Investigation Report LE 71, Incident Number 17CAMEU012169, 9100 Main Street by Charles Martin, Forester II

	SUPPL	EMENT		INCIDENT NUMBER 17CAMEU012169 CASE NAME REDWOOD			
	STATE OF DEPARTM LE 71 (RE ^V	CALIFORNI/ ENT OF FOR V. 7/2011)	A RESTRY AND FIF				
DAY	MONTH	DATE	YEAR	COUNTY	REGION	UNIT	CASE NUMBER
SUN	OCT	8	2017	MENDOCINO	CNR	MEU	12169

On October 19, 2017, CAL FIRE Battalion Chief, Ryan SMITH, requested I evaluate a tree at 9100 Main Street, Potter Valley, CA in the Redwood-Lake Complex Fire. Fire Captain, Eric BETTGER showed me one tree and a broken branch to evaluate. The tree and broken branch were evaluated for signs of poor health or structural defects which could result in branch or tree failure. I did not take measurements since a full survey of the site, including the tree, was conducted as part of the investigation.

7

8 The tree is a valley oak, *Quercus lobata*, growing in a row of solitary trees along an irrigation canal. 9 Comparing the tree to others in the area, the tree is average diameter and height. Multiple trees in 10 the immediate area had broken branches and the Potter Valley area in general had numerous 11 toppled trees and trees with broken branches and leaders. Tree failure in the area was observed 12 across all tree species.

13

14 I observed an upper scaffold branch broken at the intersection with two other main scaffold branches 15 (Picture #1). I observed the end of the broken branch. I did not observe any signs of any pest or disease damage to the branch end. I probed the wood of the branch end with a knife point and it 16 17 was solid and did not have any signs of decay. The center of the branch had included bark running 18 the length of the broken end (Picture #2). This occurs when two or more branches grow together at 19 a steep angle and eventually grow together but retain the bark which forms a weak area. The 20 branch had grown together for several years based on counting the rings of the sapwood that tore. 21 Bark inclusions can form a channel for water intrusion into the tree and cause decay. No signs of rot 22 or decay were noted. Further up the branch, a second branch break occurs where a smaller lateral 23 branch failed (Picture #3). This branch scar also has included bark with sound wood surrounding it. 24 No signs of disease, pest, or decay were noted.

25

1 did not observe any pests or disease which would negatively impact the structure of the tree
branch. There appeared to be other branch scars from broken branches that had grown over.

28

- 1 Pruning scars appeared to be the result of proper pruning methods and were growing over the cut
- 2 face. The tree otherwise appeared healthy and typical of white oaks in the same area.
- Multiple branches intersecting at a steep angle is an indicator of possible weak branch attachments.
 The included bark forms a weak area inside of the branch where the wood from the two branches
- 5 remains separate. However, several years of growth surround the included bark on both branches.
- 6 Prior to the branch failure, It would likely take a very detailed, up-close evaluation of the branches to
- 7 determine any weakness and would likely not be noticeable from a ground observation. Since the
- 8 branches were moved prior to my examination, I could not orient the branches as to how they fell. I
- 9 could not tell if the smaller lateral branch failed first or if the large scaffold branch fell with the lateral
 10 branch still attached.
- 11



12

13 Picture #1: Showing branch scar at intersection of two lateral branches.




- Picture #2: Branch end of main scaffold branch showing included bark.



Picture #3: Branch scar of lateral branch showing included bark.



1	EXPERIENCE:			
2	B.S. in Forestry, UC Berkeley, 1986			
3	Registered Professional Forester, #2406, 1990 to current			
4	Licensed Pest Control Advisor, inse	ect and disease, #AA07243, from	m 1992 to 2013	
5	Certified Arborist, Western Chapter of the International Society of Arboriculture, WE-0953A, from)953A, from
6	1992 to 2013			
7				
8	Work experience from 1987 to 199	2 with the CAL FIRE Forest Pes	t Management Pro	gram including;
9	tree care, pest and disease survey	ing. Training and advising home	owners, local gove	rnment
10	workers, private tree care profession	onals on pest detection, treatme	nt and general tree	ecare. I
11	conducted hazard tree evaluations and reported tree failures through the California Tree Failure			ree Failure
12	Report program administered by the University of California, Cooperative Extension.			
13				
14	From 1992 to present I have worked as a CAL FIRE Forester I and Forester II reviewing and			
15	inspecting timber harvesting operations for compliance with the California Forest Practice Rules.			ctice Rules.
16	This work includes measures to detect and minimize the spread of forest pests and pathogens.			
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	PRINTED NAME	SIGNATURE	BADGE NUMBER	DATE
	Charles Martin	Chullt	1491	11/14/17

ATTACHMENT D

PG&E Potter Valley Busch Rd. Incident Description & Factual Summary Version 2 – Revised 1/28/2019

POTTER VALLEY BUSCH RD. INCIDENT DESCRIPTION & FACTUAL SUMMARY Version 2 – Revised 1/28/2019

For completeness, this incident description and factual summary should be read in conjunction with the contemporaneously submitted response to Question 62.

Background:

On October 9, 2017, PG&E filed an Electric Safety Incident Report (Incident No. 171009-8553) concerning an incident that occurred approximately 500 feet East of 13801 North Busch Road, Potter Valley, Mendocino County (the "incident location" as defined by the CPUC's December 7, 2017, letter). At the incident location the Potter Valley-Mendocino 60 kV transmission line is mounted on the east side of the steel lattice structures. When PG&E arrived at the incident location, PG&E observed that a branch from a green, healthy California White Oak/Valley Oak tree had broken and was laying on the ground below 2 of 3 intact transmission conductors. PG&E also observed the middle conductor of the Potter Valley-Mendocino 60 kV transmission line had broken and was on the ground. Three of three distribution conductors of the Potter Valley 1105 circuit, mounted on the west side of the steel lattice structures, were intact. The California White Oak/Valley Oak tree was rooted approximately 15 feet from the transmission conductors.

According to CAL FIRE's website, CAL FIRE has not identified a fire starting in Potter Valley. CAL FIRE has collected evidence at the incident location.

CAL FIRE has identified the Redwood Valley fire as occurring North of Highway 20, west of Mendocino National Forest, and south of Black Bart. According to CAL FIRE's website, the Redwood Valley fire started at 11:36 PM on October 8, 2017.

Incident Overview:

Menducing	50kV	Area of Interess	Postern Valley P
	1403	X	
CV 62			CB 12

The transmission line at the incident location is the Potter Valley-Mendocino 60 kV transmission line. Circuit Breaker 12 is a protective device north of the incident location, and is located at the Potter Valley Powerhouse Substation. Circuit Breaker 62 is a protective device south of the incident location, and it is located at the Mendocino Substation.

According to PG&E records, on October 8, 2017, Circuit Breaker 12 and Circuit Breaker 62 operated and locked out at approximately 11:33 PM. Per PG&E records, once Circuit Breakers 12 and 62 had automatically opened, the transmission conductors at the incident location were de-energized. Per PG&E records, the distribution conductors of the Potter Valley 1105 circuit

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routed through the incident location experienced a momentary outage at approximately the same time because Line Recloser 64118 operated and reclosed. Apart from this momentary outage, the distribution conductors of the Potter Valley 1105 circuit routed through the incident location otherwise remained energized at this time because the Potter Valley Powerhouse Substation remained energized by the Potter Valley-Willits transmission line.

According to PG&E records, on October 9, 2017 at approximately 12:00 AM, the distribution conductors of the Potter Valley 1105 circuit routed through the incident location experienced momentary outages because Line Recloser 64118 operated and reclosed.¹ Later, at approximately 12:11 AM, the distribution conductors of the Potter Valley 1105 circuit routed through the incident location experienced additional momentary outages because Line Recloser 64118 operated and reclosed. 64118 operated and reclosed because Line Recloser 64118 operated and reclosed because Line Recloser 64118 operated and reclosed.

According to PG&E records, a troubleman was the first PG&E responder at the incident location. Per the PG&E troubleman, at 12:26 AM on October 9, 2017, he called the PG&E Distribution Control Center in Rocklin to request that the Potter Valley Powerhouse Substation be deenergized due to fire in the area.

According to PG&E records, on October 9, 2017, at approximately 12:33 AM, the Grid Control Center ("GCC") remotely opened via SCADA Circuit Breaker 22 at the Potter Valley Powerhouse Substation. Circuit Breaker 22 is the protective device for the Potter Valley-Willits transmission line located at the Potter Valley Powerhouse Substation. Then, at approximately 12:34 AM, Circuit Breaker 52G at Potter Valley Powerhouse Substation automatically opened and remained open, de-energizing the Potter Valley Powerhouse. Opening both Circuit Breaker 22 and 52G de-energized the distribution conductors at the incident location.

According to the PG&E troubleman, after the Potter Valley Powerhouse Substation was deenergized, CAL FIRE enlisted the troubleman to assist in cutting a downed conductor at the incident location. When he arrived at the Potter Valley incident location, the troubleman observed one conductor of the transmission line had come down near steel lattice structure number 0/8. The troubleman estimated about 100 yards of the transmission conductor to the south of the break point was laying on the ground, and the conductor span to the north of the break point was dangling above the ground. The troubleman also observed that a branch of a nearby tree had broken and was on the ground below the transmission line. Per the troubleman, he cut sections from both ends of the downed transmission conductor and provided them to CAL FIRE at CAL FIRE's request. The troubleman also observed charred vegetation in the area.

PG&E accessed the incident location again during daylight hours on October 11, 2017.² At that time, PG&E identified that the tree was a California White Oak/Valley Oak tree and that it was

² After submitting the Potter Valley Busch Road Incident Description and Factual Summary, CAL FIRE reported that it did not release the incident location until October 10, 2017, rather than October 9, 2017, as PG&E originally believed. Upon learning this, PG&E reviewed additional data and determined that after CAL FIRE restricted access to the incident location, it accessed areas adjacent to the incident location on October 9, 2017, but did not access the incident location again until October 11, 2017.

rooted approximately 15 feet from the transmission line. The transmission conductor was #3/0CU (copper) installed prior to 1931.

By October 11, 2017, PG&E crews completed repair work at the incident location. On October 11, 2017 at around 2:56 PM, Circuit Breaker 12 was remotely closed via SCADA, re-energizing the Potter Valley Powerhouse Substation. This re-energized the transmission circuit at the incident location. On October 11, 2017 at around 5:00 PM, the Potter Valley Powerhouse Substation was again remotely de-energized via SCADA per CAL FIRE's request. This de-energized the transmission circuit at the incident location. On October 12, 2017 at 3:26 PM, the transmission line to the Potter Valley Powerhouse Substation was remotely re-energized via SCADA. This re-energized the transmission circuit at the incident location.

On October 13, 2017 at 9:27 AM, per PG&E records, a troubleman manually closed Line Recloser 64118, restoring distribution service to the Potter Valley 1105 circuit routed through the incident location.

Evidence Collection:

CAL FIRE collected sections of both ends of the downed transmission conductor. CAL FIRE also collected parts of a tree branch or branches from the incident location. PG&E does not know whether CAL FIRE collected additional evidence from the incident location.

On February 27, 2018, PG&E collected a branch and a section from a California White Oak/Valley Oak tree.

<u>Po</u>	<u>otter</u>	
Event	<u>CPUC Bates Number</u> <u>Reference</u>	<u>CAL FIRE Bates</u> Number Reference
October 8, 2017, 11:33 PM: Per PG&E		
records, Circuit Breaker 12 at the Potter		
Valley Powerhouse Substation operated and		
locked out.		
October 8, 2017, 11:33 PM: Per PG&E		PGE-CF_00140302
records, Circuit Breaker 62 at the Mendocino		
Substation operated and locked out.		
October 8, 2017, approximately 11:33 PM:		PGE-CF_00135210
Per PG&E records, Line Recloser 64118		
operated and reclosed causing a momentary		
outage on the Potter Valley 1105 circuit		
routed through the incident location.		
October 8, 2017, 11:36 PM: According to		
CAL FIRE's website, the Redwood Valley		
fire started.		
October 9, 2017, approximately 12:00 AM:		PGE-CF_00135210
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Per PG&E records, Line Recloser 64118 operated and reclosed causing momentary outages on the Potter Valley 1105 circuit		
routed through the incident location. ³		
October 9, 2017, approximately 12:11 AM:		PGE-CF_00135210
Per PG&E records, Line Recloser 64118		
operated and reclosed causing momentary		
outages on the Potter Valley 1105 circuit		
routed through the incident location. ⁴		
October 9, 2017, approximately 12:33-12:34	PGE-CPUC_00015127	PGE-CF_00136317
<u>AM</u> : The GCC remotely opened Circuit		
Breaker 22 via SCADA at the Potter Valley		
Powerhouse Substation. Per PG&E records,		
Circuit Breaker 52G at Potter Valley		
Powernouse Substation automatically opened		
and remained open. Opening Circuit Breakers		
22 and 520 de-energized the Potter Valley		
conductors at the incident location		
October 9, 2017, approximately 3AM:		
According to a troubleman, he observed a		
broken branch laving on the ground below 2		
of 3 intact transmission conductors. He also		
observed the middle conductor of the Potter		
Valley-Mendocino 60kV transmission line on		
the ground.		
October 10 2017 6.38 PM CAL FIRE		
released the incident location site.		
October 11, 2017: Per PG&E records, repair		
work completed at incident location.		
October 11, 2017, 2:56 PM: Per PG&E	PGE-CPUC 00015127	PGE-CF 00136317
records, Circuit Breaker 12 remotely closed	_	—
via SCADA, re-energizing the Potter Valley		
Powerhouse Substation.		
October 11, 2017, 5:00 PM: Per PG&E	PGE-CPUC 00015127	PGE-CF 00136317
records, Potter Valley Powerhouse Substation	_	_
remotely de-energized per CAL FIRE request.		
<u>October 12, 2017, 3:26PM</u> : Per PG&E	PGE-CPUC_00015127	PGE-CF_00136317

records, Potter Valley Powerhouse Substation		
remotely re-energized, restoring electric		
transmission service to incident location.		
October 13, 2017, 9:27 AM: Per PG&E	PGE-CPUC_00015127	PGE-CF_00136317
records, a troubleman manually closed Line		
Recloser 64118, restoring distribution service		
to the Potter Valley 1105 circuit routed		
through the incident location.		

Source List:

Source	Brief Description
PGE-CPUC_00012216	Log of Evidence Collected by CAL FIRE (amended response)
PGE-CPUC_00015127	ILIS Outage Report 17-0085311
Redwood Electric Safety	10/9/2017 Electric Safety Incident Report
Incident Report	http://cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Saf
	ety/USRB_FW_%20Electric%20Safety%20Incident%20Reported-
	%20PGE%20Incident%20No_%20%20171009-8553.pdf
PGE-CPUC_00015140	Transmission Line Outage Report
Response to Question 35	12/29/17 Response to CPUC's October 2017 Wildfire Data Request
Response to Question 36	12/29/17 Response to CPUC's October 2017 Wildfire Data Request
PGE-CPUC_00015808	LC Tags
PGE-CPUC_00017161	Log of Evidence PG&E Collected (amended response)
Redwood Electric Safety	20 Day Electric Safety Incident Report (EI171008A)
Incident Report	
CAL FIRE Website	"Redwood Valley Fire (Mendocino Lake Complex) Incident
	Information"
	http://cdfdata.fire.ca.gov/incidents/incidents_details_info?incident_id
	=1874
CAL FIRE Report	Cal Fire Investigation Report, Redwood Incident, Case
	17CAMEU012169
PGE-CPUC_00001203	Single Line Diagram
PGE-CF_00140302	Potter Valley Mendocino Line Operation 10/08/2017 Events
PGE-CF_00135234	SCADA Data
PGE-CF_00135210	Line Recloser Download from LR 64118
Response to Potter Q3	Response to CPUC's October 2017 Wildfire Data
PGE-CPUC_00016939	Photo to be produced to CPUC
Circuit Breaker 12 Relay	Circuit Breaker 12 Relay Data
Data	
Circuit Breaker 62 Relay	Circuit Breaker 62 Relay Data
Data	
Power Generation	Power Generation SCADA Alarms
SCADA Alarms	
Transmission Outage	Transmission Outage Tracking and Logging Tool (TOTL)
Tracking and Logging	Interruption Report
Tool (TOTL)	
Interruption Report	
10/9/2017 GCC Office	10/9/2017 GCC Office Items Report
Items Report	

Factual Report Guidance:

PG&E is providing Incident Description and Factual Summaries (the "Reports") for each incident location, as defined by the CPUC's December 7, 2017, letter. In addition to Question 62, these Reports provide a complete response to Question 1. These Reports also provide a partial response to Question 54. Documents and attachments responsive to Question 54 are being produced with that response.

PG&E's review and collection of records are ongoing, and these Reports are based on information that PG&E believes may be relevant to the incident location, as defined by the CPUC's December 7, 2017, letter, based on information currently known. In preparing these Reports, PG&E has not included data or information that may not be relevant to the incident location, as defined by the CPUC's December 7, 2017, based on information currently known, for example:

- Transmission-level outages, which because of their wide-spread impact, may have caused an outage at the incident location, unless the source of the outage appears to have been related to the incident location or the transmission-level outage de-energized the incident location; or
- Certain minor alarms sent by protection devices that did not result in a sustained outage at the incident location.

Raw data has, however, been provided in response to other questions.

PG&E has not reviewed potentially relevant information that is in the possession of CAL FIRE or any other entity. The causes of the incidents are still under investigation and it is premature to draw conclusions about whether the "fire locations" or "incident locations" addressed by these Reports are points of origin.

Moreover, PG&E has relied on some publicly available information provided by third parties, such as CAL FIRE. For example, PG&E has relied on the start times designated by CAL FIRE as indicated in PG&E's response to Question 25, submitted to the CPUC on January 31, 2018, in generating these Reports. PG&E is not presently able to validate this information.

For these reasons, among others, the facts described in the Reports may or may not be relevant to questions of causation or origin with respect to any incidents, and there may also be other facts not in the Reports that are relevant to questions of causation or origin of any incidents.

In addition, please find a list of additional explanations related to particular points.

Single Line Diagrams

For ease of reference, PG&E has included reproductions of the single line diagrams produced in response to Question 28, submitted to the CPUC on December 29, 2017. Any reference to "area of interest" in the single line diagrams refers to the incident location, as defined by the CPUC's December 7, 2017, letter. The single line diagrams show the incident location and the location of all protection devices upstream of the incident location back to the distribution circuit breaker at the substation. Smart Meters, switches, and any devices downstream of incident locations are not shown on the single line diagrams, although they may be referenced in the Reports. CONFIDENTIAL

Below please find a legend that explains the symbols used in the diagrams.



First Responders

As indicated above, in response to Question 54, PG&E has included in its Reports an account of the first PG&E employee who attempted to access the incident location before the CPUC's site visit with PG&E to the incident location, as defined by the CPUC's December 7, 2017, letter.

Repair and/or Restoration Work

PG&E has included information related to when repair and/or restoration work was completed. PG&E has not attempted to include all dates on which repair crews were present at or near incident locations, as defined by the CPUC's December 7, 2017, letter, either in the incident overview or the timeline.

Timeline

As indicated above, in response to Question 1, PG&E has included a timeline of certain equipment operations and actions of PG&E employees at or near the incident locations, including during the period 12 hours prior to CAL FIRE's designated start time, as indicated in PG&E's response to Question 25, until the date (if known) when CAL FIRE obtained PG&E facilities for evidence, CAL FIRE released the incident scene, or repair and/or restoration work was completed, whichever event came last. PG&E has not included every possible data point during the timeline time period. Rather, as indicated above, the timelines include information that PG&E believes may be relevant to the incident location, as defined by the CPUC's December 7, 2017, letter, based on information currently known. Where records have been produced, PG&E provided the Bates number. Within a single row, some information may be based on records that have been produced.

Operational Data

PG&E has relied on certain operational data sets (*e.g.*, SCADA, AMI) in preparing these Reports. There may be data discrepancies between different operational data sources. For example, timestamps of a common event across different operational data sources may differ. In these Reports, PG&E has documented to the best of its ability the most accurate occurrence time based on its current understanding.

SCADA Data

SCADA (Supervisory Control And Data Acquisition) data includes alarm and event data remotely collected in real time from data-collection capable devices on PG&E's electric distribution and transmission circuits. Reclosers and circuit breakers are examples of devices that may report SCADA data. Fuses do not have SCADA connectivity and, therefore, do not report SCADA data. SCADA alarms and events memorialize electrical events on a circuit. However, they are associated with the device that collected them and do not include information on the specific cause or precise origin location of the electrical event that they memorialize.

As noted above, PG&E has not included all SCADA events in the Incident Overview or the Timeline. For example, Minimum To Trip ("MTT") alarms have not been included. MTT alarms are generated when a SCADA-enabled device identifies a circuit load that exceeds a maximum threshold load but for less than a certain amount of time. MTT alarms can be frequent and do not include information on the specific cause or origin location of the event that triggered them. A record of all SCADA events and alarms that occurred during the requested time periods has been previously produced in response to Question 25, submitted to the CPUC on January 31, 2018, in the Bates range PGE-CPUC_00007875-7911.

AMI Data

Smart Meters are electric meters designed to record customer electricity usage, primarily for billing purposes. They can record and transmit electrical data including usage, voltage and event data ("Smart Meter" or "AMI" data). In certain situations, data collected by these meters may be helpful to determine information about outages. For example, a Smart Meter's "last gasp" is an event that may show the time at which a specific Smart Meter lost power. In conjunction with data from other Smart Meters, "last gasp" data might indicate when a certain location on the electric grid lost power or some other secondary problem. A "NIC power down" is a recorded log event when a Smart Meter initiates a shut down. A "zero volt reading" occurs when a meter is partially energized (between 25% and 75%) at the time of a reading. Each of these readings will only occur if the communication from the Smart Meter is successfully received (or subsequently retrieved and downloaded if the Smart Meter is still accessible).

As noted above, PG&E has not included all AMI events in the Incident Overview or the Timeline. For example, sag or swell events have not been included. Smart Meters record these events when they detect a decrease (sag) or increase (swell) in voltage above or below a certain threshold for more than a certain period of time. Sag and swell events do not have specific timestamps; the data indicates only that they occurred during a certain time interval. Sag and swell events may indicate unusual activity; however, they do not indicate the location of that unusual activity. Smart Meter data was not requested in the November 21, 2017, Data Requests and has not been produced in response to those Data Requests.

Reclosing Device Operations

PG&E is providing certain times at which reclosing devices "operated" (opened or closed), which could include multiple operations depending on the device's settings before the device ultimately stayed closed or stayed open.

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Outage Records

PG&E has relied on certain information from its Integrated Logging Information System Operations Database ("ILIS") in preparing these Reports. As explained in response to Question 27, submitted to the CPUC on March 30, 2018, ILIS is PG&E's system of record for distribution transformer-level and above outages. ILIS is the application used by the distribution system operators to document information pertinent to the operation of the electric system. Due to the nature of how information is documented in the application, there may be discrepancies in outage start times and other information between ILIS and other data sources. For example, ILIS does not record single-customer or service-level outages, in accordance with CPUC Decision 96-09-045 and Advice Letter 3812-E on outage reporting requirements. Data from these ILIS records should be reviewed and considered together and in conjunction with those other data sources.

Outage cause information in ILIS is preliminary and is based on the best available information at the time, from initial field intelligence and through spot check quality reviews.

Smart Meter Service Point ID Numbers

Some PG&E records identify Smart Meters by their associated Service Point ID number ("SP_ID"), while other records identify Smart Meters by their associated "Badge" numbers. For consistency, all Reports use SP_ID to identify Smart Meters. PG&E will provide a translation between SP_ID and Badge numbers upon request.

Source List

At the end of each Report, PG&E has included a list of records on which it relied in drafting each Report. When PG&E indicates in a Report that information is per PG&E records, PG&E is referring to the records identified at the end of the Report. Where records have been produced, PG&E provided the Bates number. In addition to the items on the source list, PG&E relied on a variety of internal databases to make an assessment of location information regarding devices and individuals (*e.g.*, GIS, GPS) and observations made by PG&E employees including the first PG&E employee who attempted to access the incident location before the CPUC's site visit with PG&E to the incident location.

Revision History

Page	Change
2	Change "PG&E was granted access to the incident location again during the
	daylight hours on October 9, 2017" to "PG&E accessed the incident location again
	during daylight hours on October 11, 2017"
3	Change "The transmission conductor was #2CU (copper) installed in 1947" to "The
	transmission conductor was #3/0CU (copper) installed prior to 1931"
4	Change "October 9, 2017: CAL FIRE released the incident location site" to
	"October 10, 2017, 6:38 PM: CAL FIRE released the incident location site"
6	Add "Cal Fire Investigation Report, Redwood Incident, Case 17CAMEU012169"
	to source list.

ATTACHMENT E

PG&E Redwood Location Fact Report

REDWOOD LOCATION FACT REPORT

The Redwood incident location is the location on the PG&E system closest to the latitude and longitude coordinates (39°19.392, -123°07.867) which were provided in the April 20, 2018 communication from CAL FIRE to PG&E (the "Redwood incident location"). The electrical circuit that serves the Redwood incident location is the Potter Valley 1105 circuit.

Incident Overview



Per CAL FIRE, the Redwood incident location was first observed in the early morning hours of October 9, 2017. At the time of the incident, the Redwood Incident Location was on the 12kV Potter Valley 1105 Circuit.

The Redwood incident location is the location on the PG&E system closest to the latitude and longitude coordinates (39°19.392, -123°07.867) which were provided in the April 20, 2018 communication from CAL FIRE to PG&E (the "Redwood Incident Location"). The electrical circuit that serves the Redwood Incident Location is the Potter Valley 1105 circuit.

Line Recloser 64118 is a protective device upstream from the Redwood Incident Location on the Potter Valley 1105 circuit. According to PG&E records, on October 8, 2017 at approximately 11:33 PM, Line Recloser 64118 operated and reclosed, momentarily de-energizing the Redwood incident location. According to the CAL FIRE Investigation Report for the Redwood Incident, CAL FIRE started receiving reports of a vegetation fire in Potter Valley at 11:34 PM. Per PG&E records, on October 9, 2017 at approximately 12:00 AM, Line Recloser 64118 operated and reclosed, momentarily deenergizing the Redwood incident location. Per PG&E records, on October 9, 2017 at approximately 12:11 AM, Line Recloser 64118 operated and reclosed, momentarily deenergizing the Redwood incident location. Per PG&E records, on October 9, 2017 at approximately 12:11 AM, Line Recloser 64118 operated and reclosed, momentarily deenergizing the Redwood incident location. Per PG&E records, on October 9, 2017 from 12:17 AM to 12:33 AM, a majority of smart meters on the Potter Valley 1105 circuit recorded a series of power off/on events. According to the CAL FIRE Investigation Report for the Redwood Incident, a CAL FIRE employee reported a small vegetation fire on the east side of Hawn Creek Road at 12:27 AM.

According to PG&E records, on October 9, 2017, at approximately 12:33 AM, the GCC remotely opened via SCADA Circuit Breaker 22 at the Potter Valley Powerhouse Substation. Then, at approximately 12:34 AM, Circuit Breaker 52G at Potter Valley Powerhouse Substation automatically opened and remained open, deenergizing the Potter Valley Powerhouse. Per PG&E records, when both Circuit Breakers 22 and 52G were opened, the Redwood incident location was de-energized.

According to PG&E records, a PG&E troubleman was the first PG&E responder at the Redwood incident location when he drove down Hawn Creek Road around 1:12-1:32 AM on October 9, 2017. The PG&E troubleman drove south along Hawn Creek Road to look for downed wires or anything in the road that might be hazardous. The PG&E troubleman did not recall seeing any damage to PG&E equipment on Hawn Creek Road at that time. He did recall seeing fire activity on the west side of Hawn Creek Road, but saw no evidence that the fire burned any area on the east side of Hawn Creek Road.

Sometime later on October 9, 2017, during day light hours, the same PG&E troubleman recalled that he drove back down Hawn Creek Road. The PG&E troubleman recalled seeing one of three phases down between Pole 102176248 and the pole to the east. On October 10, 2017, PG&E crews completed repair work at the Redwood incident location.

Redwood Incident Location

The Redwood incident location is the location on the PG&E system closest to the latitude and longitude coordinates (39°19.392, -123°07.867), which were provided in the April 20, 2018 communication from CALFIRE to PG&E (the "Redwood incident location").

The timeline below includes a three hour window on either side of the start time designated by CAL FIRE in the April 20, 2018 communication, which was October 8, 2017, 11:30 PM.

<u>Timeline</u>

Redwood	
Event	CAL FIRE Bates Number
	<u>Reference</u>
October 8, 2017, approximately 11:33 PM: Per	PGE-CF_00135210
PG&E records, Line Recloser 64118 operated and	
reclosed, momentarily de-energizing the Redwood	
incident location.	
October 9, 2017, approximately 12:00 AM: Per	PGE-CF_00135210
PG&E	
records, Line Recloser 64118 operated and	
reclosed, momentarily de-energizing the Redwood	
incident location.	

Redwood	
Event	CAL FIRE Bates Number
	<u>Reference</u>
October 9, 2017, approximately 12:11 AM: Per	PGE-CF_00135210
PG&E	
records, Line Recloser 64118 operated and	
reclosed, momentarily de-energizing the Redwood	
incident location.	
October 9, 2017, 12:17 AM-12:33 AM: Per PG&E	PGE-CF_00000055
records, a majority of smart meters on the entire	
Potter Valley 1105 circuit recorded a series of	
power off/on events.	
October 9, 2017, approximately 12:33-12:34 AM:	PGE-CF_00136317
Per	
PG&E records, the PG&E GCC remotely opened	
via SCADA Circuit Breaker 22 at the Potter	
Valley Powerhouse Substation. Per PG&E records,	
Circuit Breaker 52G at Potter Valley Powerhouse	
Substation automatically opened and remained	
open. Per PG&E records, when both Circuit	
Breakers 22 and 52G were opened, the Redwood	
incident location was de-energized.	

Source List

Source	Brief Description
PGE-CF_00135210	Equipment Event Info – LR 64118
PGE-CF_00000055	AMI SmartMeter Data – PV 1105
PGE-CF_00136317	ILIS Outage Report 17-0085311
PGE-CF_00136317	ILIS Outage Report 17-0085311
Power Generation	Power Generation SCADA Alarms
SCADA Alarms	
GCC Office Items	GCC Office Items Report
Report	
AMI SmartMeter Data	AMI SmartMeter Data

ATTACHMENT F

PG&E Data Request #5 Response, Common Question #1, "Circuit Map of Potter Valley-Mendocino, 60 kV"



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Potter Redwood 092 PGE-CPUC_00023048

ATTACHMENT G

PG&E Data Request #2 Response, Redwood Question 5. Response dated September 21, 2018

PACIFIC GAS AND ELECTRIC COMPANY October 2017 Wildfires CPUC Data Request – Redwood Location 2

Requesters: Leslie L. Palmer and Nicholas Sher Request Date: July 19, 2018 Response Date: September 21, 2018

Question 5:

Was the conductor spliced and repaired or replaced during October 2017? If so, what length of conductor was repaired or replaced? If not, when was it replaced prior to the subject fire. Please explain and provide the work order for the repair or replacement.

Response to Question 5:

PG&E installed approximately 100 feet of new conductor and related splices on the northeast (creek-side) conductor of a single span of the PG&E system closest to the latitude and longitude coordinates of 39°19.392, -123°07.867 (the "Redwood incident location" as defined by the April 20, 2018 communication from CAL FIRE to PG&E) on or about October 10, 2017. PG&E has not been able to locate the work order for the repair.

Response provided by:

Principal Project Manager, Electric Asset Management Excellence 245 Market St., San Francisco, CA 94105

ATTACHMENT H

PG&E Data Request #1 Response, Question 10

PACIFIC GAS AND ELECTRIC COMPANY October 2017 Wildfires CPUC Data Request – Common

Requesters: Leslie L. Palmer and Nicholas Sher Request Date: November 21, 2017

Question 10 – Part 3:

Please provide all Vegetation Management records (Records for request 7 & 8) for subject circuit(s) for the past five (5) years.

Response to Question 10 – Part 3:

PG&E's initial response to this question was sent on February 28, 2018 and included copies of PG&E's Vegetation Management (VM) inspection records, work requests, and vegetation control inspection records for the incident locations, as defined by the CPUC's December 7, 2017, letter completed between October 8, 2012 and October 8, 2017. The response also stated that PG&E was continuing to compile hard copy inspection maps associated with the increased VM inspection activities, also known as enhanced ground patrols, for the incident locations in the last five years.

PG&E is now producing the hard copy inspection maps associated with the drought-related, increased VM inspection activities (enhanced ground patrols) for the incident locations in the Bates number range PGE-CPUC_00012586 – PGE-CPUC_00012651. Please note that, as requested, PG&E is only producing the map pages that include information about the incident locations. In all cases, the produced map covers patrol areas beyond the incident locations. Also note that records pertaining to LiDAR and/or spectral imagery data collected at incident locations are provided in response to Question 14.

In addition to the enhanced ground patrols documented in these hard copy inspection maps, PG&E's Project Management Database (PMD) indicates that the following drought response patrols were also completed on the subject circuits in the last five years. After a reasonable search of its records, PG&E is unable to locate the maps for these patrols. As such, PG&E cannot definitively determine whether the precise incident locations were included in these patrols. PG&E's VM records at these incident locations, produced with its initial response to this question on February 28, 2018, indicate that no work was prescribed during these enhanced ground patrols.

- Adobe (Incident No. 171010-8558): 2015 CEMA WUI Patrol
- Lobo (Incident No. 171012-8565): 2014 CEMA Patrol
- Potter Valley (Incident No. 171009-8553): 2016 CEMA WUI Patrol
- Sulphur (Incident No. 171011-8562): 2016 CEMA WUI Patrol

Response provided by:

Principal, Vegetation Management, 245 Market Street, San Francisco, CA

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