

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

**Incident Investigation Report**

**Report Date:** May 10, 2019

**Incident Number:** E20171020-02

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

**Date and Time of the Incident:** October 8, 2017, 2348 hours

**Location of the Incident:** 1721 Partrick Road  
Napa, CA 94558  
County: Napa

**Fatality / Injury:** 3 fatalities in merged Nuns Fire

**Property Damage:** \$179 million (PG&E restoration costs in Sonoma Division)

**Utility Facilities Involved:** Pueblo 2103, 12 kV Circuit

**Violation:** Yes

**I. Summary**

On October 8, 2017, at approximately 2348 hours, a Coast Live Oak tree fell and contacted overhead conductors of PG&E's Pueblo 2103 12 kV circuit at 1721 Partrick Road in the city of Napa in Napa County. One of the 12 kV conductors fell to the ground and, as a result, the Partrick Fire was ignited. The Partrick Fire burned a total of 8,283 acres and affected 283 parcels.

The Partrick Fire was combined with other fires, which were collectively called the Nuns<sup>1</sup> Fire. The Nuns Fire burned a total of 56,556 acres, destroyed 1,355 buildings, and damaged 172 buildings. Three fatalities occurred as a result of the Nuns Fire, with

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<sup>1</sup> The Nuns Fire included the Nuns, Oakmont/Pythian, Norrbom, Adobe, Pressley and Partrick fires. SED investigated each of these incidents except the Pressley fire, which was a spot fire that ignited from an ember that originated from the Adobe Fire.

one of those fatalities occurring within the perimeter of the Adobe Fire. SED does not know the locations of the other two fatalities.

Based on SED's review, SED found that PG&E violated the Commission's General Order (GO) 95, specifically, GO 95, Rule 31.1 and GO 95, Rule 35:

GO Rule	Violations
GO 95, Rule 31.1	Hazardous tree not identified and abated
GO 95, Rule 35	Vegetation clearance not maintained

#### **A. Rules Violated**

##### **General Order 95, Rule 31.1 – Design, Construction and Maintenance states:**

*“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.*

*A supply or communications company is in compliance with this rule if it designs, constructs, and maintains a facility in accordance with the particulars specified in General Order 95, except that if an intended use or known local conditions require a higher standard than the particulars specified in General Order 95 to enable the furnishing of safe, proper, and adequate service, the company shall follow the higher standard.*

*For all particulars not specified in General Order 95, a supply or communications company is in compliance with this rule if it designs, constructs and maintains a facility in accordance with accepted good practice for the intended use and known local conditions.”*

##### **General Order 95, Rule 35 – Vegetation Management states:**

*“Where overhead conductors traverse trees and vegetation, safety and reliability of service demand that certain vegetation management activities be performed in order to establish necessary and reasonable clearances the minimum clearances set forth in Table 1, Cases 13 and 14, measured between line conductors and vegetation under normal conditions, shall be maintained. (Also see Appendix E for tree trimming guidelines.) These requirements apply to all overhead electrical supply and*

*communication facilities that are covered by this General Order, including facilities on lands owned and maintained by California state and local agencies.*

*When a supply or communication company has actual knowledge, obtained either through normal operating practices or notification to the company, that dead, rotten or diseased trees or dead, rotten or diseased portions of otherwise healthy trees overhang or lean toward and may fall into a span of supply or communication lines, said trees or portions thereof should be removed.*

*Communication and electric supply circuits, energized at 750 volts or less, including their service drops, should be kept clear of vegetation in new construction and when circuits are reconstructed or repaired, whenever practicable. When a supply or communication company has actual knowledge, obtained either through normal operating practices or notification to the company, that its circuit energized at 750 volts or less shows strain or evidences abrasion from vegetation contact, the condition shall be corrected by reducing conductor tension, rearranging or replacing the conductor, pruning the vegetation, or placing mechanical protection on the conductor(s). For the purpose of this rule, abrasion is defined as damage to the insulation resulting from the friction between the vegetation and conductor. Scuffing or polishing of the insulation or covering is not considered abrasion. Strain on a conductor is present when vegetation contact significantly compromises the structural integrity of supply or communication facilities. Contact between vegetation and conductors, in and of itself, does not constitute a nonconformance with the rule."*

## **B. Witnesses**

<b>No.</b>	<b>Name</b>	<b>Title</b>
1	Wilson Tsai	CPUC Investigator
2	Raymond Cho	CPUC Senior Utilities Engineer
3	Brandon Bertolino	CalFIRE Lead Investigator, Fire Chief LNU
4	Jay Singh	PG&E Director
5	[REDACTED]	PG&E Supervisor
6	Maria Deluca	PG&E Claims Investigator
7	[REDACTED]	PG&E Vegetation Management Supervisor

## C. Evidence

No.	Source	Description
1	PG&E	Initial Incident Report 10/20/17
2	PG&E	20-day Incident Report, 11/17/17
3	CPUC	Site Observation Report, 10/17/17
4	CPUC	Field Notes, 10/17/17
5	CPUC	PG&E Evidence Viewing 6/11/18
6	CAL FIRE	Incident Investigation Report and Attachments
7	CPUC	Site Visit Photos
8	CPUC	CAL FIRE Evidence Viewing 11/6/18
9	CAL FIRE	Evaluation of Oak Tree Failure
11	PG&E	Data Request Response #1
12	PG&E	Data Request Response #2
13	PG&E	Data Request Response #3
14	PG&E	Data Request Response #4
15	PG&E	Data Request Response #5
16	PG&E	Data Request Response #6
17	PG&E	Data Request Response #7

## 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 2348 hours, a 50-foot Coast Live Oak tree fell and contacted overhead conductors of PG&E's Pueblo 2103 12 kV circuit located at the Fontanella Family Winery at 1721 Partrick Road in the city of Napa. One of the 12 kV conductors fell to the ground and as a result, a fire known as the "Partrick Fire" started. The Partrick Fire burned a total of 8,283 acres and affected 283 parcels. The Partrick Fire later combined with other fires, which collectively were called the Nuns Fire.



Weather station EW6860, located approximately 4.5 miles southeast from the incident location, recorded a peak wind speed and gust of 9.0 miles per hour (mph) and 22.0 mph, respectively. The ambient condition around the time of ignition was approximately 71 degrees Fahrenheit with a 14% relative humidity.<sup>2</sup>



**Figure 1:** Approximate ignition point/location of the fire via Google Maps (GPS Location: 38.310548, -122.370661).

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<sup>2</sup> Weather conditions per MesoWest ([www.mesowest.utah.edu](http://www.mesowest.utah.edu))



**Figure 2:** Location relative to 1721 Partrick Road, via Google Maps.

On October 20, 2017 at 0941 hours, approximately 12 days after the fire started, PG&E reported the incident to the Safety and Enforcement Division (SED).

### **III. SED Review and Analysis**

#### **A. PG&E's Distribution Facilities Inspection Program**

General Order 165 requires biennial patrol inspections and detailed inspections at five-year 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 business. GO 165 defines a detailed inspection as one where facilities are “carefully examined” to gather and record conditions of overhead facilities.

For the incident, SED reviewed the following PG&E distribution patrol inspection and detailed inspection records:

- 2012 detailed inspection – Resulted in a Map Correction due to cut outs mapped at the wrong location. No other conditions or issues documented.
- 2014 distribution patrol inspection – No conditions or issues documented.
- 2016 distribution patrol inspection – Resulted in two work orders and one Map Correction. The two work orders required vegetation removal from a down guy experiencing abrasion and a primary neutral. Both work orders were assigned as Priority E. The Map Correction involved the addition and/or removal of facilities from the map.
- 2017 detailed inspection – Resulted in 27 work orders. Of the 27, seven were in proximity to the incident area. Five work orders required vegetation trimming above the anchor guy insulator and were assigned as Priority F. One work order required vegetation trimming above the anchor guy insulator and around the pole and was assigned as Priority E. One work order required the removal of a pole butt and was assigned as Priority F.

Priority E work orders require a completion date within 3-12 months. Priority F work orders require a completion date by the next detailed inspection which would be five years after the most recent detailed inspection was conducted.<sup>3</sup>

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<sup>3</sup> PG&E TD-2305M Electric Distribution Preventative Maintenance (EDPM) Manual, April 1, 2016.



## **B. PG&E's Vegetation Management Program**

PG&E performs annual patrols of all primary and secondary distribution lines. PG&E schedules circuits covered by routine patrol to be pruned on an annual basis by the Vegetation Program Manager. PG&E also uses a combination of LiDAR and spectral imagery to allow Vegetation Management to identify hazardous trees in high fire danger areas. Trees identified using these technologies are then inspected from the ground and abated as necessary.

PG&E used two contractors as part of its vegetation management program. Davey Resource Group conducted the vegetation pre-inspection (PI) to identify tree work while a Tree Contractor (TC), in this case The Davey Tree Expert Company (Davey Tree), conducted the vegetation management work that included trimming and removal. Davey Tree is the prime contractor for this area. PG&E defines a prime contractor as:

*"Prime contractors are permitted to engage PG&E-approved subcontractors as necessary to maintain their schedule without advance approval from PG&E. PG&E maintains a system-level list of all tree company subcontractors working for prime contractors, but this is not systematically recorded at the job site level."*

There was no subcontractor recorded for the incident area. 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's pre-inspection contract specification states the following requirements for a CUF:

*"3.2 CONSULTING UTILITY FORESTER I, II, III (CUF-I, II, III), and Post Auditor (PA)*

*3.2.1 Education/ Experience: As a minimum, a PA/CUF shall have at least two years' experience in line clearance tree pruning work or equivalent experience as determined by the PG&E Representative. It is desired that a PA/CUF have an AA Degree in forestry, arboriculture or a related field, although not required. At start of Work under this Contract, the PA/CUF shall be familiar with the Contractor's work practices, proper arboricultural techniques and practices, proper integrated pest management practices, PG&E's [Vegetation Management Database] VMD and handheld computer, PG&E's Tree Pruning Specification, Pre-Inspection Specification and requirements, and all applicable legal and regulatory requirements.*

*3.2.2 Basic Responsibility: A PA/CUF is responsible for patrolling distribution circuits and prescribing work to be performed by PG&E's tree contractor, determining when the next trim is required, notifying property*

*owners of tree pruning and tree/brush removal work to be performed relating to this Specification, mapping circuits using PG&E continuity list, managing EC notifications and cases, performing outage investigations and, when necessary, obtaining permits from public agencies, and documenting Work in the VMD using a hand-held computer. In addition the PA/CUF shall be required to use computers and associated software, enter data into and process data from hand-held computers, and prepare for and become certified as an Arborist through the International Society of Arboriculture. As requested by the SCUF, the PA/CUF shall perform all necessary duties for emergency response in accordance with all safety requirements, laws and regulations, and applicable labor agreements.*

*3.2.3 The PA/CUF shall maintain direct contact with PG&E division personnel, public agencies, and customers as directed by the PG&E Representative.”*

SED reviewed PG&E’s vegetation management records for the incident area from 2013 to 2017. SED focused on reviewing documented inspections and accompanying vegetation work orders. PG&E performed vegetation management activities in 2013, 2014, 2015, 2016, and 2017.

CAL FIRE contracted with Mark Porter, an ISA Certified Arborist, to conduct an analysis of the subject tree that failed. In his report, “Evaluation of Oak Tree Failure” (Attachment 2), Mr. Porter describes the subject tree is a Coast Live Oak with a diameter at breast height (DBH) of approximately 17 inches. The oak is native to the area as part of an oak woodland. The subject tree failed at the trunk. Mr. Porter observed:

*“A margin of callus (woundwood) surrounds a pre-existing trunk injury exposing the wood without protective bark...The wound is at the ground level extending to approximately 6-foot-high on the trunk, 11 inches wide, and at 3-foot decay is more advanced spreading into the north side of the trunk. On the north side of the trunk there are two open cavities.”*

Woundwood is a very tough, woody tissue that grows behind callus and replaces it in that position. Woundwood forms later as the tree cells become lignified or made rigid by the deposition of lignin in the cell walls<sup>4</sup>.

Mr. Porter observed that the subject tree failure is associated with visual decay symptoms or pre-existing wounds and defects.

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<sup>4</sup> Wilson, Phillip. (2018) A Companion to British Arboriculture.  
<http://www.treeterms.co.uk/definitions/wound-wood>

A sample of the failed branch was sent to a wood decay lab for analysis. The lab results identified fungal DNA and both rot and steam decay agents<sup>5</sup>. In conclusion, Mr. Porter states:

*"It is my professional opinion the pre-existing conditions of the subject oak was critical to this failure. My observations and photographic evidence suggest that sound and stable trees have a much better chance of surviving this wind event.*

*The subject tree bent and buckled under load from the wind. The material properties of the remaining holding wood were not strong enough to keep the trunk from snapping off. The previous damage weakened the tree. The open cavities, the decayed and missing wood, the margin of woundwood formation, all confirm a pre-existing condition the contributed to this trunk failure."*

PG&E's Vegetation Management Distribution Patrol Standard (Version 4, revised 9/12/06)<sup>6</sup> describes various factors when patrolling or pre-inspecting trees for vegetation work. Under "Hazard Trees/Facility Protection"<sup>7</sup> 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)."<sup>8</sup>

PG&E's Vegetation Management Hazard Tree Rating and Scoring Procedure<sup>9</sup> (Utility Procedure: VEG-1015P, dated 10/13/2014) indicates a "High" failure potential for the Coast Live Oak species.

PG&E's Vegetation Management Distribution Patrol Standard and VM Hazard Tree Rating contained criteria that could have been used to identify the Coast Live Oak tree that failed and contacted the overhead conductors. The subject tree had exhibited visual signs of pre-existing decay and wounds.

PG&E's vegetation management activities, such as tree removal, are generally performed by specifically trained contractors who have extensive experience in vegetation related work. As the conditions (decay and wounds) were noted by Mr. Porter to be pre-existing, qualified tree contractors should have identified the Coast Live Oak for removal prior to the incident occurring.

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<sup>5</sup> "Evaluation of Oak Tree Failure" Appendix IV, Page 20, Porter. Date: 10/12/2017

<sup>6</sup> PG&E Vegetation Management Distribution Patrol Standard, Version 4. Revised 9/12/06.

<sup>7</sup> PG&E Vegetation Management Distribution Patrol Standard, Version 4. Revised 9/12/06. Page 3.

<sup>8</sup> PG&E Vegetation Management Distribution Patrol Standard, Version 4. Revised 9/12/06. Page 3.

<sup>9</sup> PG&E Vegetation Management Hazard Tree Rating and Scoring Procedure. Utility Procedure: VEG-1015P. Publication Date: 10/13/2014. Appendix A, Page 11.

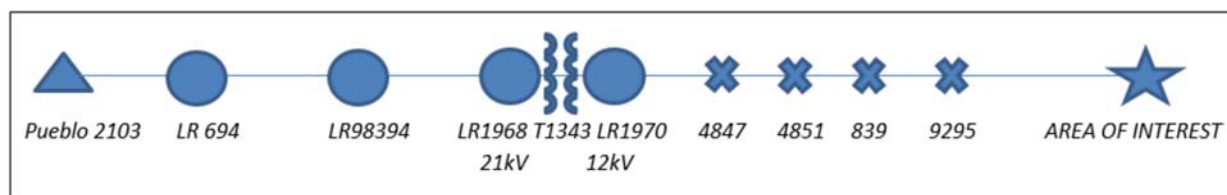
PG&E's VMQA program audits PG&E facilities for any compliance violations, e.g., GO 95 or Public Resource Code (PRC) Section 4293, while PG&E's VMQC program audits PI and TC personnel for any vegetation work that is missed or not performed correctly. VMQA audits are required to be performed by PG&E's VMQA standard, annually at a minimum. PG&E does not require routine VMQC audits and PG&E describes selection of the locations as "computer-generated" and "randomized".

### C. PG&E's Overhead Distribution Facilities' Condition

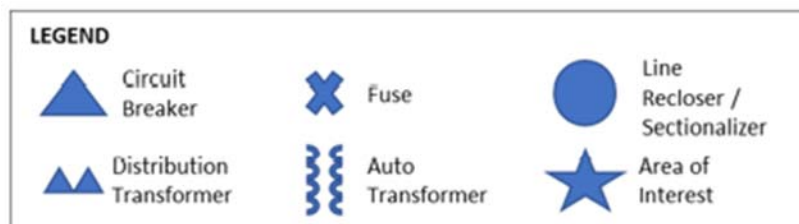
The incident conductors were size #4AR (Aluminum Conductor, Steel Reinforced) and were installed in 1981 as part of PG&E's Pueblo 2103 12 kV circuit. The subject conductors spanned approximately 145 feet. The conductor sag for each subject conductor at the time of the incident is unknown. The ground clearance for each subject conductor at the time of the incident is also unknown but PG&E provided the following response:

*"PG&E has confirmed based on a reasonable search for ground clearance notifications on the subject circuits that no ground clearance issues, at the incident location...were identified from January 1, 2013, to October 8, 2017."*

A visual single-line diagram, Figure 3, provided by PG&E shows all protective devices between Pueblo Substation, which feeds the Pueblo 2103 circuit, and the incident area. The symbols are defined in the legend in Figure 4. The incident span was protected by upstream fuses 9295, 839, 4851, 4847, Line Recloser 1970 (LR 1970), Auto Transformer T1343, Line Recloser 98394 (LR 98394), Line Recloser 694 (LR-694), and finally Pueblo 2103 circuit breaker 2103. The brand and type of each protection device is listed under Table 1. A detailed circuit map identifying the locations of the protection devices and the substation relative to the incident location can be found in Attachment 5.



**Figure 3:** PG&E single-line diagram from the substation to the incident location. The diagram includes all protective devices in-between. Not to scale.



**Figure 4:** Legend for PG&E single-line diagram.

Device ID	Brand	Type
Pueblo 2103 CB	GE, SEL	F60, 351
LR 694	Cooper	Form 6 - PV4
LR 98394	Cooper	Form 6 - PV4
LR 1968	Cooper	Form 6 - PV4
LR 1970	Cooper	Form 6 - PV4
Fuse 4847	Part 44	65T
Fuse 4851	Part 63	40E
Fuse 839	Part 63	25E
Fuse 9295	Part 63	15E

**Table 1:** List of all source side protection devices from the incident location to Pueblo Substation including brand and type.

According to PG&E's records, Pueblo Substation was de-energized on October 9, 2017 at 0154 hours due to an outage on the 115kV transmission line which feeds the substation.

A PG&E Troubleman reported on October 11, 2017 at 1342 hours, that the nearest source side protection device from the incident location, Fuse 9295, had both fuses open.

The peak load on the Pueblo 2103 within a 12-hour timeframe (six hours prior to and after the incident occurred) was 224A. PG&E annually calculates Summer Peak Load forecasts for the subsequent period between April 1 and October 31. The 2017 Summer Peak Load forecasted calculation for the incident circuit was 456.8A.

PG&E identified the following abnormal configurations on the Pueblo 2103 circuit within 24 hours prior to the incident start time:

1. Fuse 4927 open, Fuse 1974 open, and Switch #948 closed.
2. Junction J-0360 toward Fuse 3473, Fuse 3473 open, and Switch 1996 closed.
3. Switch 1702 open, cable placed in isolated standoff between T1213 and Switch 1702 and Fuse 4697 closed.

An abnormal configuration occurs when additional customers are temporarily added to a circuit. In addition, an abnormal circuit configuration can exist within the same circuit, where a loop exists on a circuit and electricity is sourced from a different section of the same circuit to feed that loop from a different location.

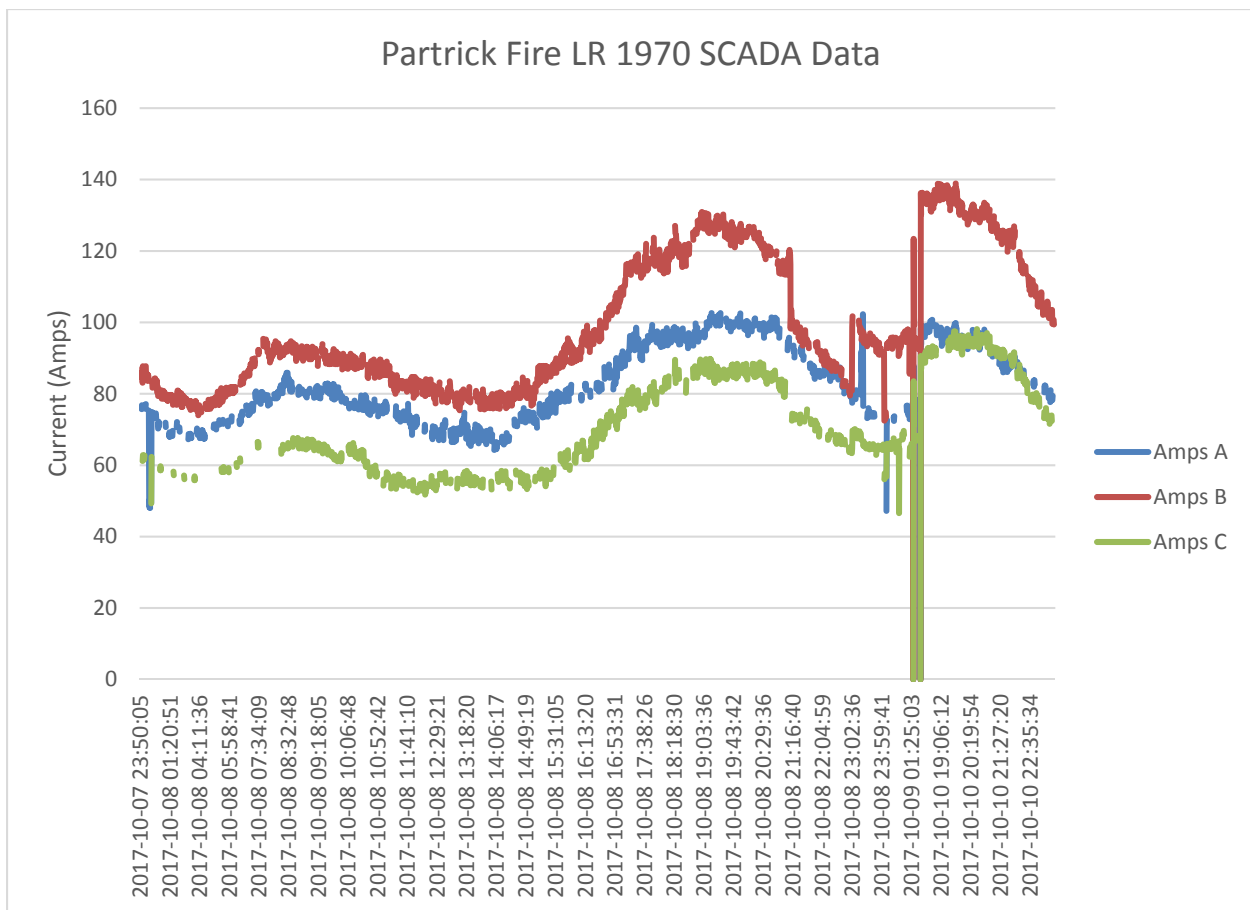


#### D. PG&E's Overhead Distribution Facilities' Operations and Timing

PG&E provided the timed data for the Supervisory Control and Data Acquisition (SCADA) devices upstream of the incident location to the substation circuit breaker. The time range of the data extends from 24 hours prior to and 48 hours after the CAL FIRE designated start time.

SCADA is software that allows for local and remote data collection in real-time and for defined time periods. SCADA is provided in protection devices along circuits to alert personnel as soon as there is a fault or issue on the line. SCADA allows the fault or issue to be isolated quickly and helps mitigate downtime.

The SCADA data for the Partrick Fire is presented in Figure 5.



**Figure 5:** Plot of SCADA data from LR 1970 for each phase from 24 hours prior to and 48 hours after the CAL FIRE designated start time.

LR 1970 is the closest line recloser upstream from the incident location. Beginning at approximately 2100 hours on October 8, 2017, there is a noticeable drop in amperage across all phases. Around the incident start time at 2348 hours, there is a significant drop. On October 9, 2017, at approximately 0154 hours, all phases reported zero amps.

This coincides with Pueblo Substation being deenergized due to an outage on the 115kV transmission side. Data collection resumes on October 10, 2017 at 1720 hours.

#### **i. Event Timeline**

PG&E established a timeline of specific equipment operations and actions of PG&E employees at or near the incident locations during the 12 hours prior to the incident start time until the date 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 occurs last.

1. October 8, 2017 2320 hours – Smart meter at service point 3725037405, on the load side of the incident location, reported a NIC Power Down event.
2. October 8, 2017 2324 hours – 27 smart meters on the load side of Fuse 9295 recorded a series of power off/on events.
3. October 8, 2017 2348 hours – According to CAL FIRE's website, the Partrick fire started.
4. October 9, 2017 0154 hours – Pueblo Substation de-energized.
5. October 10, 2017 1210 hours – Pueblo Substation re-energized.
6. October 10, 2017 1719 hours – Pueblo 2103 Circuit Breaker closed remotely via SCADA and the circuit re-energized.
7. October 11, 2017 1342 hours – Troublemaker reported 2 of 2 fuses open at Fuse 9295.
8. October 14, 2017 0905 hours – First Responders near the incident span to patrol the line.
9. October 16, 2017 1842 hours – Fuse 9295 closed and tested.
10. October 18, 2017 – CAL FIRE released the incident location and PG&E was granted access to the incident location.
11. October 21, 2017 – Both conductors on incident span were replaced.
12. February 1, 2018 – New smart meter was installed and service was restored to customer served by the incident location.

#### **E. SED Site Visit and Evidence Viewing**

On October 17, 2017, SED conducted a site visit for the Partrick Fire. The Site Visit Observation Report can be found in Attachment 4. The following observations were made during the site visit by SED:

*“On the pole to the East, attached were 2 phases along with 2 anchors separated by 90 degrees. Another 2 insulators were on the pole but did not have conductors attached to them. I assume the span would attach to*

*this pole and go West toward the second pole. This pole was relatively new and may have replaced a burnt pole. I assume this because I saw a burnt pole stub in close proximity to the newer pole. The field phase was on the ground and the road phase was intact. I noticed 2 trees about 10-15 feet away from the field-side conductor.*

*On the second pole to the West, I noticed a 10 kVA transformer attached and 2 primary conductors dead-ended at about 32 feet high.”*

On June 11, 2018, SED conducted an evidence viewing of evidence PG&E obtained for all October fires. For the Partrick Fire, PG&E collected multiple sections of the Coast Live Oak tree on November 8, 2017. On the same day, PG&E also collected pieces of melted aluminum scraps.



**Figure 6:** Portion of the incident tree PG&E took in possession on November 8, 2017.

On November 6, 2018, SED conducted an evidence viewing of all evidence CAL FIRE took in possession for the Partrick Fire. CAL FIRE collected the primary conductors at the incident location and a section of the Coast Live Oak tree. The entire list of evidence taken by CAL FIRE for the Pocket Fire can be found in Attachment 3.

#### **IV. CAL FIRE’s Investigation**

CAL FIRE’s investigation report (Attachment 1) concludes that the Partrick Fire “was caused when an oak tree contacted a PG&E powerline conductor which ignited portions

of the tree. Embers from contact with the conductor dropped in the fine dead fuels below igniting the wildland.”

Regarding the conductor that fell to the ground: “Additionally, the energized powerline conductor made direct contact with the ground, igniting the dry dead surface fuels.”

CAL FIRE cites Mr. Porter’s report, “Based off the arborist report and lab results, the subject oak tree had obvious signs of rot and decay.”

CAL FIRE found PG&E in violation of California Public Resources Code (PRC) §4292, §4293 and §4421.

**PRC §4292** states in part:

*“Except as otherwise provided in Section 4296, any person that owns, controls, or maintains any electrical transmission or distribution line upon any mountainous land, or forest-covered land, brush-covered land, or grass-covered land shall, during such times and in such areas as are determined to be necessary by the director or the agency which has primary responsibility for fire protection of such areas, maintain around and adjacent to any pole or tower which supports a switch, fuse, transformer, lightning arrester, line junction, or dead end or corner pole, a firebreak which consists of a clearing of not less than 10 feet in each direction from the outer circumference of such pole or tower.”*

**PRC §4293** requires PG&E to maintain a four-foot clearance in all directions between all vegetation and all conductors operating at 2,400 or more volts, but less than 72,000 volts.

**PRC §4421** states:

*“A person shall not set fire or cause fire to be set to any forest, brush, or other flammable material which is on any land that is not his own, or under his legal control, without the permission of the owner, lessee, or agent of the owner or lessee of the land.”*

## **V. Conclusion**

Based on the evidence that SED reviewed, SED’s investigation found the following:

- PG&E violated GO 95, Rule 31.1, by failing to maintain their facilities to allow for safe, proper, and adequate service. PG&E failed to identify a hazardous tree condition despite the tree having visible defects, decay, and rot. PG&E did not take the appropriate steps to prevent the subject tree from falling into the overhead conductors. PG&E did not document the subject tree for trim or removal.

- PG&E violated GO 95, Rule 35, by failing to maintain the clearances required for the hazardous subject tree that fell into the overhead conductors.

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

Attachment B – CAL FIRE Arborist Report by Mark Porter

Attachment C – CAL FIRE Evidence List

Attachment D – CPUC Site Visit Observation Report

Attachment E – PG&E Pueblo 2103 Circuit Map

# **ATTACHMENT A**

## **CAL FIRE Investigation Report**

# ***CAL FIRE***



## **CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION**

### **Sonoma-Lake-Napa Unit**

1199 Big Tree Lane  
St. Helena, CA 94574

## **INVESTIGATION REPORT**

<b>CASE NUMBER:</b>	17CALNU010051
<b>CASE NAME:</b>	Partrick Incident
<b>DATE:</b>	October 8, 2017
<b>INCIDENT TYPE:</b>	Wildland Fire
<b>INCIDENT INVESTIGATORS:</b>	Lead Investigator Brandon BERTOLINO, FC- LNU Vince BERGLAND, BC-CSR



1 **1 - VIOLATIONS:**

2  
3 **Public Resource Code 4421:** A person shall not set fire or cause fire to be set to any  
4 forest, brush, or other flammable material which is on any land that is not his own, or  
5 under his legal control, without the permission of the owner, lessee, or agent of the  
6 owner or lessee of the land.  
7

8 **Public Resource Code 4292:** Except as otherwise provided in Section 4296, any  
9 person that owns, controls, operates, or maintains any electrical transmission or  
10 distribution line upon any mountainous land, or forest-covered land, brush-covered  
11 land, or grass-covered land shall, during such times and in such areas as are  
12 determined to be necessary by the director or the agency which has primary  
13 responsibility for fire protection of such areas, maintain around and adjacent to any pole  
14 or tower which supports a switch, fuse, transformer, lightning arrester, line junction, or  
15 dead end or corner pole, a firebreak which consists of a clearing of not less than 10 feet  
16 in each direction from the outer circumference of such pole or tower. This section does  
17 not, however, apply to any line which is used exclusively as telephone, telegraph,  
18 telephone or telegraph messenger call, fire or alarm line, or other line which is classed  
19 as a communication circuit by the Public Utilities Commission. The director or the  
20 agency which has primary fire protection responsibility for the protection of such areas  
21 may permit exceptions from the requirements of this section which are based upon the  
22 specific circumstances involved.  
23

24 **Public Resource Code 4293:** Except as otherwise provided in Sections 4294 to 4296,  
25 inclusive, any person that owns, controls, operates, or maintains any electrical  
26 transmission or distribution line upon any mountainous land, or in forest-covered land,  
27 brush-covered land, or grass-covered land shall, during such times and in such areas  
28 as are determined to be necessary by the director or the agency which has primary  
29 responsibility for the fire protection of such areas, maintain a clearance of the  
30 respective distances which are specified in this section in all directions between all  
31 vegetation and all conductors which are carrying electric current:



(a) For any line which is operating at 2,400 or more volts, but less than 72,000 volts, four feet.

(b) For any line which is operating at 72,000 or more volts, but less than 110,000 volts, six feet.

(c) For any line which is operating at 110,000 or more volts, 10 feet.

In every case, such distance shall be sufficiently great to furnish the required clearance at any position of the wire, or conductor when the adjacent air temperature is 120 degrees Fahrenheit, or less. Dead trees, old decadent or rotten trees, trees weakened by decay or disease and trees or portions thereof that are leaning toward the line which may contact the line from the side or may fall on the line shall be felled, cut, or trimmed so 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 section which are based upon the specific circumstances involved.



**2 - SUMMARY:**

(All times and distances are approximate)

On Sunday, October 8, 2017, at 11:48 p.m. the Saint Helena Emergency Command Center (ECC) dispatched CAL FIRE and cooperating agency units to a reported vegetation fire at 1721 Partrick Road in Napa, CA. The fire was identified as the Partrick Incident. The Partrick Fire burned together with the Nuns Incident and became a part of the Southern Complex on October 10, 2017. The fire was contained October 31, 2017. The Partrick fire burned 8,283 acres and affected 283 parcels (Attachment # 2).

During the origin and cause investigation I, Brandon BERTOLINO, determined the fire was caused when an oak tree (Evidence Item 3&4) fell over and contacted a Pacific Gas and Electric (PG&E) powerline conductor. The oak tree broke one of the two powerline conductors and brought it to the ground. Embers from this contact with the conductor ignited the fine dead fuels that the powerline conductor and tree had fallen into. Additionally, when the energized conductor contacted the fine dead fuels on the ground it ignited the ground fuels. This resulted in a wildland fire which burned uncontrolled onto numerous properties not owned or controlled by PG&E, resulting in multiple violations (See part 1, Violations).

During the investigation, I determined PG&E and/or its sub-contractors, Davey Tree Expert Company, conducted powerline vegetation management inspections and maintenance in June and September of 2017. PG&E had replaced a power pole that had broken in June 2017 in the same location of my general origin area (GOA). The land owner Jeff FONTANELLA expressed his concern about other trees in the area during the June incident (Attachment #7). PG&E and Davey Tree Expert Company failed to identify hazard trees during the repair in June 2017 as required pursuant to PRC 4293. The failure to identify the hazard oak tree resulted in the tree falling, contacting the powerline conductor operated by PG&E, and igniting the Partrick fire.



**3 - SUBJECTS:**

Pacific Gas & Electric Corporation

77 Beale Street 24<sup>th</sup> Floor

San Francisco, CA 94105

The Davey Tree Expert Company

1500 N. Mantua St.

Kent, OH 44240

**4 – VICTIMS:**

The Partrick incident burned approximately 8,283 acres within Napa and Sonoma counties. The fire affected 283 parcels (Attachment # 2). This summary does not account for all damage to infrastructure, mobile property, miscellaneous property improvements, natural vegetation, livestock, wildlife or other miscellaneous damage.

**WITNESSES:**

W-1 BERGLAND, Vince

CAL FIRE Battalion Chief

(559) 231-1600

*Can testify to assisting in my initial investigation and determination of the cause of the Partrick Incident.*

W-2 ANDERSON, Jarrett

Napa City Fire Dept. Battalion Chief

(707) 695-2066

*Can testify to the fire being at 1721 Partrick Road and to the southwest. Can testify to the fire not involving any property to the northeast of 1721 Partrick Road upon his arrival at 23:35 p.m. October, 8, 2017.*

W-3 FONTANELLA, Jeff

Reporting Party



1 W-4 RAY, Susan

2 Reporting Party

3 [REDACTED]  
4 [REDACTED]  
5 Can testify observing fire on [REDACTED] property headed southwest at 11:30  
6 p.m. on October 8, 2017.

7  
8 W-5 RAY, John

9 [REDACTED]  
10 [REDACTED]  
11 Can testify to calling 911 at 11:40 p.m. on October 8, 2017. Can testify to  
12 observing a fire on [REDACTED] property headed to southwest.

13  
14 W-6 ROSE, Christopher

15 Brothers In Law Security LLC Chief/Owner

16 (707) 321-0389

17 Can testify to providing 24 hour security for Origin at the Partrick incident.

18  
19 W-7 SVT Gruppe Inc

20 (707) 927-2200

21 Can testify to providing security for the origin at the Partrick incident.

22  
23 W-8 LEUZINGER, Peter

24 CAL FIRE Forester II

25 PO Box 839

26 Cobb, CA 95426

27 (707) 928-4378

28 Can testify to examining the subject oak tree.  
29  
30

1 W-9 PORTER, Mark

2 Marks Tree Service and Consulting

3 (951) 354-8733

4 *Can testify to examining the subject oak tree.*

6 W-10 DEGRAFF, Jed

7 CAL FIRE Senior Land Surveyor

8 1300 U Street, Suite 100

9 P.O. Box 944246

10 Sacramento, CA 94244-2460

11 (916) 327-2583

12 *Can testify to conducting LIDAR operation of Partick GOA/SOA.*

14 W-11 GAWRONSKI, Jeff

15 CAL FIRE Survey Party Chief

16 1300 U Street, Suite 100

17 P.O. Box 944246

18 Sacramento, CA 94244-2460

19 (916) 445-4276

20 *Can testify to conducting LIDAR operation of Partick GOA/SOA.*

22 W-12 DE LUCA, Maria

23 PG&E Senior Claims Investigator Law Claims

24 300 Burnell Street

25 Napa, CA 94559

26 (707) 257-5953

27 *Can testify to being present during evidence collection and representing PG&E.*

**5 - EVIDENCE:**

E-1 Game camera

E-2 Game camera SD card

E-3 Part of oak tree stump

E-4 Part of oak tree that was on powerline conductor

E-5 East/Roadside powerline conductor

E-6 West/Uphill powerline conductor from northeast pole

E-6.1 Pieces of West/Uphill powerline conductor

E-6.2 Three-foot section of West/Uphill powerline conductor

E-6.3 West/Uphill powerline conductor from southeast pole equipped with transformer

E-7 Fulgurite from West/Uphill powerline conductor

E-8 USB Flash Drive containing photos from FONTANELLA



**6 – CONDITIONS:****Fuel:**

- Grass, brush, and oak woodland.

**Weather:**

Atlas Peak RAWS on October 8, 2017, at 11:29 p.m.:

- Temperature: 62 degrees Fahrenheit
- Relative Humidity: 16 percent
- Wind: NNE at 13 MPH with gusts of 28 MPH
- Distance to RAWS is approximately 11 miles to the northeast

Santa Rosa RAWS on October 8, 2017, at 11:29 p.m.:

- Temperature: 71 degrees Fahrenheit
- Relative Humidity: 11 percent
- Wind: NE at 14 MPH with gusts of 40 MPH
- Distance to RAWS is approximately 22 miles to the northwest

Game Camera on October 8, 2017, at 11:21 p.m.

- Temperature: 64 degrees Fahrenheit
- Temperature at 11:22 p.m.: 68 degrees Fahrenheit
- Temperature at 11:23 p.m.: 75 degrees Fahrenheit
- Temperature at 11:24 p.m.: 118 degrees Fahrenheit





**7 – EQUIPMENT:**

Pacific Gas & Electric Corporation powerline conductor. Pueblo 2103 Circuit.

**8 - PROPERTY:**

The Partrick Incident originated on the following property:

APN: 050-010-018

Address: 1721, 1717 Partrick Road, Napa, CA 94559

Owner: [REDACTED]

County: Napa

**Global Positioning System (GPS) Datum WGS 84**

Latitude: 38 18.622

Longitude: -122 22.225

The Partrick Fire burned approximately 8,283 acres within Napa and Sonoma counties.

Damaged property can be found in (Attachment #2).

**9 - NARRATIVE:**

(All times and distances are approximate)

On Sunday, October 8, 2017, at 11:41 p.m., the Saint Helena ECC dispatched CAL FIRE and cooperating agency units to a reported vegetation fire at 1721 Partrick Road in Napa, CA (Attachment # 1). The fire burned 8,283 acres and merged with the Nuns fire on October 10, 2017. The fire affected 283 parcels (Attachment # 2).

On Monday, October 9, 2017 at 7:00 a.m., CAL FIRE Battalion Chief Mike THOMPSON assigned me to the Partrick Incident. I responded in uniform in my CAL FIRE assigned vehicle from the CAL FIRE station in Yountville, CA. While responding, I observed the smoke column from the Partrick fire and could see the fire and smoke heading in a southwest direction as the wind was coming out of the north/northeast. I arrived at Partrick Road, near 1721 Partrick Road at 8:30 a.m. The fire appeared to be several thousand acres from my vantage point near the top of Partrick Road. I was stopped near 1733 Partrick Road by a CAL FIRE inmate crew Captain. The Captain told me he believed the fire had started at a burned down structure at 1733 Partrick Road. I drove to the burned down structure at 1733 Partrick Road at 9:00 a.m. I investigated the area around the structure, and the indicators I observed helped me determine that the location was not the origin. All the indicators I found represented advancing and lateral movement. I could exclude the area around the structure as being the GOA.

I drove to [REDACTED] Partrick Road and contacted a reporting party, Jeff FONTANELLA at 10:15 a.m. FONTANELLA told me that around 11:20 p.m. the night before, the lights in his house started flickering. FONTANELLA told me that he then went outside to investigate why the lights were flickering. FONTANELLA told me when he went outside he could see fire to the southeast and was describing it near the powerlines that were visible from his back porch by the pool. FONTANELLA told me the fire was moving fast and appeared to be at the top of the hill within three minutes. FONTANELLA called 911 at 11:28 p.m. to report the vegetation fire. FONTANELLA told me he had left his



1 residence within 30 minutes after making the call.

2  
3 At 10:45 a.m. I made access to the area identified by FONTANELLA through a locked  
4 gate. The gate had both a PG&E and homeowner lock securing it. FONTANELLA gave  
5 me the combination for his lock which I used to make entry. I started my investigation  
6 in the area near the powerlines that FONTANELLA showed me from his porch. I walked  
7 down the dirt road looking at foliage freeze, grass stem fall and angle of char. I found a  
8 location that had some heavy downed fuels with foliage freeze that was going in  
9 opposing directions. I flagged off this area to further investigate. At 11:00 a.m. I started  
10 my investigation. I walked around the area twice in opposing directions. I identified fire  
11 spread indicators representing advancing (head), lateral, and backing fire spread using  
12 the grass stem fall and protection on downed heavy fuels. I entered the area from the  
13 advancing indicators and walked in a serpentine pattern identifying advancing and  
14 lateral (flank) fire spread indicators. At 2:45 p.m., CAL FIRE Battalion Chief Vince  
15 BERGLAND, Badge #2156 arrived at my location. I briefed BERGLAND on what I had  
16 found and he assisted me in my investigation. BERGLAND and I looked for indicators  
17 and placed flags indicating direction of fire (Attachment # 3). I observed a tree limb  
18 suspended from a tree that appeared to have two burn marks which could have been  
19 from contacting the conductors above. I took 14 photos of the location (IMG\_0075 to  
20 IMG\_0088). My camera was not reset back to zero for image log. Photographs for the  
21 Partrick Incident start at IMG\_0075. At 7:00 p.m. it was too dark to continue  
22 investigating the area.

23  
24 At 7:00 p.m. I contacted Christopher ROSE, Chief and owner of Brothers in Law  
25 Security, who was at my location. I told ROSE to not let anybody in past the gate.  
26 ROSE understood and agreed to keep the area secure and to not let anybody enter.  
27 ROSE told me he would be providing 24-hour security at my scene, and security was  
28 also provided by SVT (Attachment #4). I left the scene at 7:30 p.m.

29  
30 On October 10, 2017 at 7:00 a.m., I arrived at the scene I had security protecting.

1 Security told me nobody had made entry. At 9:00 a.m. BERGLAND and I continued  
2 investigating the area. At 9:30 a.m. BERGLAND and I were coming up inconclusive  
3 with evidence to support this area as being the GOA. BERGLAND and I decided to  
4 keep walking southwest down the powerlines, observing macro indicators. I walked in a  
5 serpentine pattern from the road down to the bottom of the drainage. We followed  
6 macro indicators such as foliage freeze, angle of char, and grass stem fall. The  
7 indicators were leading us to the drainage that was to the south of our original location.

8 At 10:00 a.m. BERGLAND and I found a location with a large oak tree that had fallen  
9 over bringing down the powerline conductor. [At 10:30 a.m. I found a game camera in  
10 the later to be identified GOA (Evidence #1).] I took a photo of the game camera at  
11 11:29 a.m. (IMG\_0089-IMG\_0090).

12  
13 BERGLAND and I left the initial area we were investigating to contact other possible  
14 reporting parties in the area. At 12:40 p.m., I contacted John and Sue RAY at [REDACTED]  
15 [REDACTED] John RAY told me he was watching a football game around 11:20 p.m.  
16 the night of October 8. John RAY told me at 11:30 p.m. his wife Sue RAY came out of  
17 the bedroom and told him she could see a fire on the hill. View from Sue RAY's window  
18 (IMG\_0232-IMG\_0234). John and Sue RAY told me that the power was flickering on  
19 and off during the time they discovered the fire and were evacuating but were not clear  
20 on exactly when. John RAY called 911 at 11:40 p.m. and reported a vegetation fire.  
21 John and Sue RAY showed me where the fire was from their residence (IMG\_0091-  
22 IMG\_0093). The fire was to the south of their residence. [The information provided by  
23 John and Sue RAY supported the new location BERGLAND and I discovered, the  
24 downed oak tree on the powerline conductor.]

25  
26 At 1:40 p.m. I arrived at the downed oak tree. BERGLAND flagged off a fifty by fifty-foot  
27 area around the downed oak tree. I observed indicators of angle of char, protection,  
28 grass stem fall, and foliage freeze that supported the area to be a GOA.

29  
30 At 2:45 p.m., I contacted FONTANELLA. I asked FONTANELLA more questions to try



1 and get a better description of where the fire was before he called 911. FONTANELLA  
2 told me he took a video with his cell phone before he had evacuated. I watched the  
3 video FONTANELLA took (Attachment #11). The video supported the location we  
4 flagged off as the GOA. The video showed the fire coming out of the top of the drainage  
5 from the GOA.

6  
7 At 3:00 p.m. BERGLAND and I continued with our investigation. I walked around the  
8 GOA twice in opposing directions. I identified fire spread indicators representing  
9 advancing (head), lateral, and backing fire spread using the grass stem fall and  
10 protection on downed heavy fuels. I entered the GOA from the advancing indicators  
11 and walked in a serpentine pattern identifying advancing and lateral (flank) fire spread  
12 indicators. The indicators I identified led me to a five by five-foot area where the  
13 conductor was under a tree branch to be the specific area of origin SOA #1. The  
14 conductor in SOA #1 was melted to a fulgurite (IMG\_0143). The broken powerline  
15 conductor that was connected to the southeast power pole had another SOA #2 based  
16 on the spread indicators.

17  
18 At 3:45 p.m. I removed the game camera from the tree. I secured the game camera in  
19 my vehicle to be stored as evidence. At 5:22 p.m., the powerline conductors that were  
20 on the ground started buzzing and were apparently being energized (Attachment #24).  
21 The oak tree limb that the conductor was in contact with ignited, I captured a photo of  
22 the tree limb on fire while maintaining a safe distance (IMG\_0149-IMG\_0151). I  
23 contacted the Division Group Supervisor (DIVS), using my portable radio, on the tactical  
24 frequency that was assigned to the division I was located in. I told the DIVS that the  
25 downed powerline conductor behind 1721 Partrick Road was being energized. The  
26 DIVS told me that PG&E was trying to restore power to some of the residents on  
27 Partrick Road. I told the DIVS to contact PG&E and to not restore power. The DIVS  
28 responded back several minutes later and told me that he had contacted PG&E and  
29 that the power would not be restored. The fire on the branch I observed stopped  
30 burning once the powerline conductor was de-energized. At 8:00 p.m., I left the scene.

1 I confirmed that security was in place before leaving. I met with FONTANELLA on my  
2 way off his property. I asked FONTANELLA if he was aware of a game camera on his  
3 property. FONTANELLA told me he had placed a game camera down by the spring on  
4 his property. I told FONTANELLA I had removed the camera and asked his permission  
5 to try and obtain any footage from the SD card. FONTANELLA told me I could keep the  
6 camera and do whatever I would like with it.

7  
8 On October 11, 2017 at 8:00 a.m. I met with CAL FIRE Forester II Peter LEUZINGER,  
9 at 1721 Partrick Road. I confirmed with security that nobody had entered the scene  
10 while I was gone. LEUZINGER examined the oak tree that fell on the powerline  
11 conductor (Attachment # 5). [At 9:40 a.m. BERGLAND investigated SOA #2 and  
12 placed indicator flags (See Attachment # 3).] I started taking photos at 10:00 a.m. At  
13 11:00 a.m. BERGLAND and I used a metal detector in SOA #1 and SOA #2. The metal  
14 detector alerted at three areas, but we were unable to find anything. BERGLAND was  
15 released from the incident at 12:00 p.m.

16  
17 I investigated the circuit breaker box located ninety feet to the northwest of SOA #2. I  
18 placed indicator flags in the area. The indicators I discovered all represented advancing  
19 fire, and therefore I excluded the area as being an additional area of origin (IMG\_0237-  
20 IMG\_0252).

21  
22 At 2:42 p.m., I spoke with FONTANELLA by cell phone. FONTANELLA told me that  
23 there was a power pole down by the spring on his property that had been replaced.  
24 FONTANELLA told me a tree had come down and broke the power pole around June  
25 11, 2017(Attachment #10, Page 4). I asked FONTANELLA if it started a fire.  
26 FONTANELLA told me it did not start a fire because it had just rained the day before  
27 and the fuels were still green. I observed that the northwest pole in my GOA had been  
28 replaced recently and could determine this was the same location as FONTANELLA  
29 described to me on the phone call. I left the scene at 7:00 p.m. I confirmed that  
30 security was in place before leaving for the evening.





1 On October 12, 2017 at 8:30 a.m. I arrived at the scene. I confirmed with security that  
2 nobody had entered the scene while I was not present. I continued investigating SOA  
3 #1, placing indicator flags.

4  
5 At 9:30 a.m. I removed the game camera from my vehicle to try and extract the SD  
6 card. I successfully extracted the SD card. At 12:55 p.m. I transferred the SD files to  
7 my department issued laptop (Attachment #12). I stored the SD card in my locked gun  
8 vault (Evidence #3). I reviewed the files from the game camera. I found another  
9 possible SOA #3 after reviewing the SD card. I discovered a photo and video of a fire in  
10 its incipient stage. The time and date indicated on the data indicated October 8, 2017 at  
11 11:21 p.m. The data also included the temperature of 64 degrees Fahrenheit. The last  
12 photo I observed from the data appears to be of the camera lens melting, taken at  
13 11:24 p.m., with a temperature of 118 degrees Fahrenheit. I also found evidence that  
14 Davey Tree had been in the GOA on 6/11, 6/14 and 6/16 of 2017 after reviewing the  
15 data off the game camera. I also found evidence that PG&E had been in the GOA on  
16 9/18/17 after review of the game camera data (Attachment #12).

17  
18 At 3:30 p.m., arborist Mark PORTER arrived at my location. PORTER examined the  
19 area and oak tree that fell onto the conductor (Attachment # 22).

20  
21 I flagged off SOA #3 and conducted my investigation. I walked around SOA #3 twice  
22 in opposing directions. I identified fire spread indicators representing advancing (head),  
23 lateral, and backing fire spread using the grass stem fall and protection on downed  
24 fuels. I entered SOA #3 from the advancing indicators and walked in a serpentine  
25 pattern identifying advancing and lateral (flank) fire spread indicators. I narrowed SOA  
26 #3 down to three by three foot. I used a magnet in the area to try and obtain any  
27 evidence. I was unable to locate any pieces of metal in SOA #3. Some powerline  
28 conductors are made of aluminum and are not detected by a metal detector. I ran the  
29 metal detector over the down powerline conductor that was lying in the GOA, the metal  
30 detector did not alert. Using the NWCG FI-210 guidelines for fire cause classes, I could



1 exclude all cause classes except electrical power in SOA #3. At 4:57 p.m. I took  
2 photographs of SOA #3 (IMG\_0204-IMG\_0220). I left the scene at 7:30 p.m. I  
3 confirmed security was in place before leaving for the evening.  
4

5 On October 13, 2017 at 8:00 a.m., I arrived at the scene. I confirmed with security that  
6 nobody had entered the scene. At 9:00 a.m., the Light Detection and Ranging (LIDAR)  
7 team arrived at the origin. The LIDAR team consisted of CAL FIRE Survey Party Chief,  
8 Jeff GAWRONSKI and CAL FIRE Senior Land Surveyor, Jed DEGRAFF. I explained to  
9 the LIDAR team what I had found and expressed key points of interest I wanted them to  
10 capture. I told them that I wanted them to capture the entire GOA, which I described,  
11 and the key points I expressed were location of indicator flags, the subject oak tree, the  
12 three SOA's, the powerline conductor, and the game camera (Attachment #6).  
13

14 I left at 12:30 p.m., to obtain a written witness statement from Sue RAY (Attachment #  
15 7). Security was still in place while I was gone.  
16

17 At 1:15 p.m. I went to [REDACTED] Partrick Road to see if I could obtain more information. I  
18 contacted the homeowner at [REDACTED] Partrick Road, Steven TAYLOR. TAYLOR told me  
19 that around 11:30 p.m. his wife had got out of bed to use the restroom. TAYLOR told  
20 me when his wife turned on the bathroom light it was very dim so she woke him up to  
21 investigate. TAYLOR told me he got out of bed and his wife saw a glow outside the  
22 window. TAYLOR said when they looked outside that they both could see a fire.  
23 TAYLOR told me that the fire was on the hill behind the FONTANELLA winery.  
24

25 At 5:00 p.m., LIDAR left for the evening. The LIDAR team said they would have to  
26 complete their work the following day. I left the scene at 6:00 p.m. I confirmed security  
27 was in place before leaving.  
28

29 On October 14, 2017 at 7:45 a.m. I arrived at the scene. I confirmed with security  
30 nobody had entered the scene. LIDAR arrived at 8:00 a.m. and continued their work.

1 At 9:15 a.m., two PG&E workers attempted to access my location. I spoke with the two  
2 PG&E workers and informed them that I was conducting an investigation and they could  
3 not make access near my origin. The PG&E workers understood and cooperated.

4  
5 LIDAR completed their assignment at 10:30 a.m. and were released (Attachment # 6).

6  
7 At 12:15 CAL FIRE firefighters Nicholas EVANS and Erik JOHNSON arrived at the  
8 scene to assist me in collecting a part of the tree for evidence. I had them cut a section  
9 of the oak tree stump and a section of the oak tree with a chainsaw. At 12:46 p.m., we  
10 loaded the evidence into a stake side utility truck. I followed the stake side truck to  
11 Middletown, CA to secure the evidence in one of our secured evidence Conex boxes. I  
12 confirmed security was in place before leaving the scene. I arrived in Middletown, CA  
13 at 2:30 p.m. and secured Evidence #3 and #4 into our secured evidence Conex box. I  
14 drove back to the scene to let security know that I would be gone for the evening.

15  
16 On October 15, 2017 at 8:00 a.m., I arrived at the scene. Security confirmed nobody  
17 had entered the scene while I was gone. I worked on follow up interviews with  
18 witnesses. I left the scene for the evening at 6:00 p.m. Security was in place before I  
19 left.

20  
21 On October 16, 2017 at 8:35 a.m. I arrived at the scene. Security confirmed nobody  
22 had entered the scene while I was gone. At 11:30 a.m. PG&E and Sacramento  
23 Municipal Utility District (SMUD) entered the 1721 Partrick Road property to restore  
24 power to the winery and residence. I escorted the workers and identified the area in  
25 which they could be in. The workers were cooperative and did not interfere with my  
26 investigation. At 3:00 p.m., I took photos of the indicator flags that I had placed  
27 excluding the circuit breaker box and the well pump as viable sources of ignition  
28 (IMG\_0237-IMG\_0252). I left the scene at 6:00 p.m. I confirmed security was in place  
29 before leaving.



1 On October 17, 2017 at 9:00 a.m. I arrived at the scene. Security confirmed nobody  
2 had entered the scene while I was gone. I continued working on follow up interviews  
3 with witnesses. At 3:30 p.m., FONTANELLA gave me a written witness statement  
4 (Attachment # 7). FONTANELLA showed me photos he took of the location where the  
5 power pole had broken in June. The power pole was the northeast pole in my GOA. I  
6 asked FONTANELLA if he could put the photos together and email them to me.  
7 FONTANELLA told me he would figure out a way to get me the photos. I left the scene  
8 at 7:00 p.m. I confirmed security was in place before leaving.

9  
10 On October 18, 2017 at 7:35 a.m., I arrived at the scene. Security confirmed nobody  
11 had entered the scene while I was gone. I met with PG&E at 8:00 a.m. at the front gate  
12 of 1721 Partrick Road. I contacted PG&E Senior Claims Investigator, Maria DE LUCA.  
13 I told DE LUCA no investigators were allowed at the origins until I had concluded my  
14 investigation. I told DE LUCA only PG&E workers who were assisting in retrieving my  
15 evidence were allowed on site. DE LUCA told me she understood. The seven PG&E  
16 workers began retrieving my evidence at 8:37 a.m. DE LUCA asked if she could take  
17 photos. I told DE LUCA she could not take any photos until I had concluded my  
18 investigation, DE LUCA told me she understood. At 8:48 a.m., the powerline  
19 conductors were cut from the poles. At 8:50 a.m., I started collecting and numbering  
20 the remaining pieces of evidence. At 8:57 a.m., I collected Evidence #5, East/Roadside  
21 conductor. At 9:03 a.m., I collected Evidence #6, West/Uphill conductor. At 9:10 a.m. I  
22 collected Evidence #6.1, pieces of West/Uphill conductor. At 9:10 a.m., I collected  
23 Evidence #6.2, 3-foot section of West/Uphill conductor. At 9:10 a.m., I collected  
24 Evidence #6.3, West/Uphill conductor from transformer side. At 9:15 a.m., I collected  
25 Evidence #7, fulgurite from West/Uphill conductor. At 9:30 a.m., I secured all the  
26 evidence obtained in my vehicle (See Attachment #18). I released the scene at 9:30  
27 a.m. At 10:34 a.m., FONTANELLA gave me a USB flash drive containing the photos  
28 from June 2017 and the photos he took on October 8, 2017 (Evidence #8). I left the  
29 scene at 11:00 a.m. At 12:30 p.m., I secured Evidence #1,2,5,6,6.1,6.2,6.3,7, and 8 into  
30 the secured evidence shed in Santa Rosa, CA. At 2:25 p.m., I transferred the photos

1 from the USB flash drive I obtained from FONTANELLA to my department issued  
2 laptop. The photos provided evidence that a tree fell on June 11, 2017, breaking a  
3 power pole in the same location as the origin of the Partrick Incident (Attachment #10,  
4 Pages 2-4). At 3:00 p.m., I secured the USB flash drive (Evidence #8) into the secured  
5 evidence shed in Santa Rosa, CA.

6  
7 On October 19, 2017 at 12:50 p.m., I contacted Napa City Battalion Chief Jarrett  
8 ANDERSON by cell phone. ANDERSON's radio identifier for the Partrick Incident was  
9 Battalion 1. ANDERSON was the Incident Commander for the Partrick Incident on  
10 October 8, 2017. ANDERSON told me he had arrived at the Partrick Incident at 11:35  
11 p.m. ANDERSON told me the fire was at 1721 Partrick Road and was headed to the  
12 south/southwest. ANDERSON told me there was nothing on fire at any locations to the  
13 north or northeast of 1721 Partrick Road upon his arrival.

14  
15 On October 20, 2017 at 9:58 a.m., I transferred all photos I took using my department  
16 issued camera (IMG\_0075-IMG\_0252) of the Partrick Incident, onto a compact disc. I  
17 labeled the disc with the Incident name, Incident number, my name, and badge  
18 number. I did not alter any of the photos that were transferred to the compact disc  
19 (Attachment #9).

20  
21 On October 28, 2017 at 11:30 a.m. I reviewed the information obtained from the CAL  
22 FIRE fire behavior analyst (Attachment # 20). The information for the fuels on the  
23 Partrick were as follows: very high load, dry climate shrub (S) (147), rate of spread  
24 (ROS) at 107.2 chains an hour. Mixed with moderate load, dry climate grass (D) (147),  
25 ROS at 292.1 chains an hour. The data supports the fire progressing at approximately  
26 200 chains an hour. There is 66 feet in a chain, the calculated ROS is 13,200 feet per  
27 hour. I examined the video that FONTANELLA took at 11:39 p.m. I measured the  
28 distance from the area of origin to the area displayed on FONTANELLA's video  
29 (Attachment #10). The distance measures 1216.42 feet which does not account for  
30 terrain, as it is a straight line (Attachment #8). Using the calculations mentioned and



1 determining the fire originating at 11:21 p.m. based on the evidence gathered. The  
2 time between ignition and FONTANELLA's video is 18 minutes. This would indicate the  
3 fire spread approximately 3960 feet from SOA #1 to the area on FONTANELLA's video.  
4

5 On Thursday, November 2, 2017 at 8:00 a.m., I went to the fire origin at 1721 Partrick  
6 Road. I wanted to accurately GPS the distance between SOA #1 and the area shown  
7 on FONTANELLA's video. I started at SOA #1 (N 38 18.622 W -122 22.225) and  
8 ended at (N 38 18.551 W -122 22.480) (Attachment # 8). The distance measured 0.8  
9 mile (4224 feet). This distance accounts for the terrain between the two points. This  
10 data information gathered from the fire behavior analyst and the evidence collected for  
11 ignition time and place of origin supports the origin of the fire at the downed oak tree on  
12 the powerline conductor. I also observed an additional violation of PRC 4292 for  
13 clearance around the southeast pole. I took four photos with my department assigned  
14 digital camera (IMG\_0012-0015). The photographs show vegetation growing around  
15 the power pole with no clearance. The power pole is a dead-end pole equipped with a  
16 transformer.  
17

18 On Friday, November 24, 2017 at 10:40 a.m., I obtained a piece of oak tree off  
19 evidence item #4. I collected it and placed into an evidence bag which I sealed. I  
20 secured the piece of evidence item #4 in my vehicle. I released the piece of evidence  
21 item #4 to UBOLDI on December 12, 2017 at 11:48 a.m. (Attachment #16). The  
22 evidence was sent to a lab for testing.  
23

24 On Friday, December 8, 2017 I reviewed ECC transcripts from October 8, 2017. There  
25 was a report of a possible vegetation fire on October 8 during the same time of the  
26 Partrick Fire, in the Carneros area. The fire was named "Henry". CAL FIRE/Napa  
27 County Fire Engine 12 was to assume Incident Command at the Henry Incident. On  
28 October 8, 2017 at 12:20 a.m. the ECC confirmed that the Henry Fire is part of the  
29 Partrick Incident. Fire Apparatus Engineer David PENA was assigned to Engine 12 on  
30 October 8, 2017. I contacted PENA by phone on December 8, 2017. PENA told me

1 the fire on Henry Road was not a new start and was advancing fire from the Partrick  
2 Incident. PENA told me he told Napa City Fire Battalion 2, Charlie RHOADS that  
3 information.

4  
5 On Thursday, March 8, 2018, I was reviewing the PG&E Vegetation Management Work  
6 Requests I obtained from ZIMMERMAKER. I discovered a work request dated May 4,  
7 2016. The work request form is issued for 1717 Partrick Rd (Attachment #14). The  
8 work request form identifies a tree at latitude/longitude of 38.310323/-122.370502. The  
9 comments on the work request form state "Root Rot/Open Hole at Base". I inputted this  
10 latitude/longitude into Google Earth. The latitude/longitude was in the location of the  
11 oak tree I discovered on the powerline conductor on October 10, 2017. The oak tree  
12 that fell onto the powerline conductor had an open hole at its base.

13  
14 On Friday, March 9, 2018, I spoke with FONTANELLA to obtain a copy of his PG&E bill  
15 for October 8, 2017. On Friday, March 16, 2018 FONTANELLA told me he called PG&E  
16 and they would not give him any of his billing information for October 8, 2017.  
17 (Attachment #3)

18  
19 On Friday, May 4, 2018 at 12:00 p.m. I met with Mike COLE. COLE is a Private  
20 Investigator representing Subro. We met at 1172 National Drive in Sacramento, CA, at  
21 Unified Investigations & Sciences, Inc. COLE wanted me to view the evidence that he  
22 had collected from the Partrick Fire. During the viewing, I observed an oak tree branch  
23 with burn marks, fragments of metal, and several fulgurites. I did not exchange any  
24 information regarding my investigation with COLE.

25  
26 On Monday, May 21, 2018 I received a PG&E Partrick Incident description & factual  
27 summary document from ZIMMERMAKER (Attachment #24). The summary states at  
28 11:20 p.m. on October 8, 2017, a smart meter that was located downstream from the  
29 SOA reported a power down event. The information PG&E provided stated that four  
30 minutes later, 27 smart meters on the load side of Fuse 9295 recorded a series of



power off/on events. Fuse 9295 is the nearest fuse downstream from the SOA. The game camera data's initial photograph of the Partrick Fire was at 11:21 p.m., one minute after the reported power down event. The facts provided by PG&E support my investigation findings and conclusion.

#### Opinion and Conclusion:

I believe based on my training, education, experience, observations, evidence, reports and witness statements the wildland fire (Partrick Incident) was caused when an oak tree (Evidence Item #4) contacted a PG&E powerline conductor which ignited portions of the tree. Embers from contact with the conductor dropped in the fine dead fuels below igniting the wildland. Additionally, the energized powerline conductor made direct contact with the ground, igniting the dry dead surface fuels. Based off the arborist report and lab results, the subject oak tree had obvious signs of rot and decay.

I reserve the right to re-examine this investigation if additional information is discovered or provided to me that could amend or reinforce my opinions or conclusion.

END OF REPORT

 5/22/18

Signature

Date

Brandon Bertolino, Badge #2756

Fire Captain Specialist, CAL FIRE



**10 - ATTACHMENTS:**

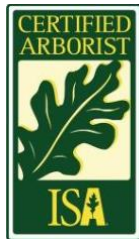
1. FC-34 Report
2. Damage Inspection Report
3. LE-71 Reports
4. Security Log
5. Forester Report
6. LIDAR Map
7. Witness Statements (LE-78)
8. Google Map
9. Original Photographs (Disc)
10. FONTANELLA Photographs/Video's
11. 4292 Violation Photographs
12. Game Camera Data
13. CHP Video
14. PG&E Data/Maintenance Records
15. PUC Report
16. Chain of custody (Piece of Item #4)
17. Damage Inspection Report (Nuns Incident)
18. Evidence Log
19. RAWs Data
20. Fire Behavior Analyst Data
21. ECC transcript
22. Arborist Report
23. Fire origin flight photographs (Disc)
24. PG&E Partrick Incident Description & Facts Summary



# **ATTACHMENT B**

## **CAL FIRE Arborist Report by Mark Porter**

**Mark Porter, Mark's Tree Service and Consulting**  
**ISA Certified Arborist # WE465**  
**markstree@iCloud.com**



member  
*asca* AMERICAN SOCIETY *of*  
CONSULTING ARBORISTS

**Evaluation of Oak Tree Failure**  
**1721 Partrick Road**  
**Napa, CA**

**Prepared for Cal Fire Investigator Brandon Bertolino**

**October 12, 2017**

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## **Summary**

An oak tree collapsed near 1721 Partrick Road on October 8, 2017. The failure occurred on a small slope above a dirt road near the Fontanella Winery in Napa, California. A wildfire referred to as the Partrick Fire or Central LNU Complex occurred in the area near the tree failure.

I was asked to visit the site, inspect and assist in the investigation of the tree failure, document conditions I observed, and provide a written report. On October 12, 2017, I met Cal Fire Investigating Officer Brandon Bertolino on the site. I took some photographs, notes and completed my site inspection.

I observed pre-existing wounds including damage to the trunk of the subject tree. Open cavities, old trunk wounds, were found along with decayed wood. It is my understanding a wind event occurred in the area on or leading to the date of the failure. A large part of the tree had snapped off at the trunk and was lying on the ground. The remaining broken trunk showed several defects including decay and had played a role in the weakness of the tree. A wood sample was sent to a wood decay lab. The lab confirmed both rot and stem decay agents (see-Appendix IV).

Several trees close to the subject tree are either broken or have broken parts or lying on the ground. Most all of the broken tree parts I observed were decayed and defective. Trees in the immediate vicinity that are sound, solid and free of decay fared much better with little or no observable defects.

This report explains in detail the species, the types of failures reported with this species of oak, my observations, what they mean, and my conclusion. It is my professional opinion the pre-existing conditions of the subject tree was vital to this failure.

## **Introduction**

### **Background**

October 8, 2017, a wildfire occurred near Fontanella Winery at 1721 Partrick Road in Napa, CA. A fallen oak tree was found adjacent and to the south of the winery (see-Appendix II Site Overview). Native trees and vegetation surround the fallen oak tree and are near power poles and energized distribution lines.

On October 12, 2017, I visited the site with Cal Fire Investigating Officer Brandon Bertolino to assist with the tree failure investigation. The area near the subject tree had burned in a wildfire. I observed down wires near the tree and charred vegetation.

Cal Fire referred to this incident as the Partrick Fire or Central LNU Complex (see Appendix I for specific and final reported Cal Fire Incident information).



## Assignment

I was asked to:

1. Visit the site where the tree failed.
2. Provide my professional opinion of the circumstances or conditions that led to the failure of a oak tree on this site
3. Document my observations in a report.

## Limits of Assignment

The cause of the fire, damage to any structures or surrounding property is not included in this report. This report focuses on the subject tree and the circumstances that lead to failure.

## Purpose and Use of Report

To assist Cal Fire with the tree failure investigation.

## Observations

I visited the site on October 12, 2017. The subject tree is a Coast Live Oak (*Quercus agrifolia*). **DBH**<sup>1</sup> is approximately 17 inches. The oak is native to the area, part of an oak woodland below the Fontanella Winery operations. The tree failure occurred on a slight slope above a dirt road (See Photos 1, 2, and 4).

A wind event occurred in the area October 8, 2017. On October 12, 2017, during my site inspection, I noticed that structurally sound trees survived this particular wind event. Trees with multiple branch and trunk failures lay about the hillside. The failures I observed (mostly all of them) are associated with visual decay symptoms or pre-existing wounds and defects including the subject tree.

The subject oak tree snapped off at the trunk (see- Photos 1 & 2). A margin of callus (woundwood) surrounds a pre-existing trunk injury exposing the wood without protective bark. Symptoms of the top of the tree torn out and fracture are visible in Photo 2. No **sporophores** or **saprophytes** are present<sup>2</sup>. The broken stump remaining has a pre-existing wound. The wound is at the ground level extending to approximately 6-foot-high on the trunk, 11 inches wide, and at

---

<sup>1</sup>Unfamiliar words in **bold** can be found in the Glossary (with the exception of section headings in bold print).

<sup>2</sup> Possibly consumed by the fire; possibly not present due to the warm season.

3-foot decay is more advanced spreading into the north side of the trunk (see - Photo 1). On the north side of the trunk there are two open cavities (see - Photo 7).

## Discussion

It appears clear to me there is a correlation between defective tree parts and failures. The observation seems accurate in the immediate area, as well as the entire Napa area, and surrounding counties, not just this site. The immediate area refers to the area enclosed by yellow police tape close to Cal Fire Investigating Officer Brandon Bertolino truck (see -Photos 1, 3, 4 and 5).

Sporophores and saprophytes are not always present on tree parts. When they are present, they help in identification. Many only grow in colder weather and at certain times of the year. Researchers study decay fungi and share information with arborist. Fungi typically appear as fruiting bodies in the form of mushrooms. They may be present in the soil above the roots, at the base of the tree or on trunks and branches. They are most commonly seen in fall and sometimes in late spring. Extensive decay may occur without their appearance.

Sporophores are sometimes called conks, brackets, basidiocarps or mushrooms. Wood decay in trees is a concern for both tree health and safety (Hickman and Perry). Although decay is not always visible, it may require **advanced assessment** techniques or tools to identify it, many times; decay can be easily seen just by inspecting the wood visually. More so with an open cavity.

Factors contributing to decay in oaks are variable with age, species, health, wounding, and environmental conditions. Older trees with large wounds are likely to have more decay than younger trees. Wood decay diminishes the cell wall materials reducing the load bearing capacity of the wood. Two primary types of decay are white and brown rots. White rot fungi destroy **cellulose, hemicellulose, and lignin**, producing a moist stinky, or spongy decay that becomes lighter in color than sound wood. Brown rot fungi consume cellulose and hemicellulose, leaving lignin mostly unaffected. Wood becomes brown, dry, and crumbly with both longitudinal and transverse cracks.

Following a fire, classification of white, brown and a third type of rot (canker rots) become more difficult to identify visually. Cankers have a necrotic lesion with a defined border. Most canker pathogens can live in both bark and wood (Shigo). Some are more serious than others. Visually, missing material and open wounds are the easiest way to spot decay. When not visible, poking, probing for soft punky wood, sounding with a hammer, are sometimes used to find decay before advanced decay assessment methods and tools are applied.

Researcher study tree biomechanics to better understand the forces on living trees. A well-known researcher named Mattheck compares engineering concepts and provides a scientific

basis to understand tree defects and describe tree failure comparisons to structures and natural forms. E.g.: *Fiber buckling occurs when wood fibers collapse on the compression side (bending zone), and trunk fibers tear on the tension side. Fibers buckle far more readily than a tear so that initially a kink develops in that group of fibers on the compression side and then quickly runs inward until the bending increases enough to tensile failure on the other side of the stem leading to complete fracture.*

A bent banana serves as a useful model of compressive failure on the inside, and the back-side is tearing in tension. The banana example is more straightforward to understand, explain and compare to what is happening to a tree trunk failure under load.

The weight of the tree is one load, the wind another. The wind is not static such as in a steady, measured pull. The wind is dynamic, causing twisting, bending and testing material properties to the rupture limits before fracture. Trees are capable of putting on wood to compensate for stress on certain parts, yet, when wood is missing, defective, decayed, etc. failure limits happen much sooner.

### **Basic Species Information<sup>3</sup>**

#### Coast Live Oak (*Quercus agrifolia*)

- Evergreen foliage.
- Height: 20 - 70 feet.
- Width: 20 - 70 feet.
- Growth Rate: 24 Inches per Year.
- Longevity Greater than 150 years.
- Branch Strength Rated as Strong.

There are nine species of tree oaks in California found from the Oregon Border to Baja California. Oaks occupy along the coast, foothills, valleys and high mountains. Depending on various ecological factors tree oaks contribute to three structural types of natural vegetation: forests, savanna, and woodlands (Pavik et al.). Oaks also occur in riparian and desert plant communities, chaparral, and conifer-dominated forest ecosystems (USDA GTR-197).

The Coast Live Oak has a long history in California. Evergreen with a low branching canopy and dense crown. The trunk divides into erect limbs or more crooked broad spacing limbs. Many can exceed 250 years old. It can grow near the coast and inland up to 5000 feet elevation. Groves spread along valleys, hillsides, rocky canyons, along streams and watercourses.

From Mendocino to northern Baja, coast live oak is the most characteristic tree of the state's coastal plain, valleys, and foothills (Costello et al.). The oak trees are a desired tree in built

---

<sup>3</sup> Urban Forestry Ecosystem Institute\_ <https://selectree.calpoly.edu/tree-detail/quercus-agrifolia>

communities, frequently preserved and cultivated, yet vulnerable to construction pressure. A host to many pathogens and insects including acorn feeders, foliage feeders, gall formers, sap feeders, twig borers, bark and wood boring insects, diseases affecting acorns, leaves, twigs, branches, trunks and root diseases.

Structural failures are classified and reported into three general types: *trunk, branch, or root* failures. The type at this site is a trunk failure.

In the **California Tree Failure Database** (CTFD) root failures constitute 36% of all reports for oaks, while 35% are trunk failures and 29% are branch failures. For each of these failures, breaks can occur at different locations (e.g., base or midsection of the trunk); causal factors differ, and general risk varies.

In July of 2010, there were 526 tree failure reports for *Quercus agrifolia*. By 2014, 619. For all oak trunk failures, 37% occurred between the ground line and 5 feet. The remainder (30%) occurred above 5 feet. Trunk diameter ranged from 13-36 inches (72%) while less than 12% of all cases (less than 12 inches in diameter), larger diameter (>36 DBH) were 16%.

Most oak tree failures reported occurred with wind speeds from 0 to 5 mph 43%, 5 to 25 mph 29%, over 25 mph 28%.

Costello and Jones report in *Western Arborist* (2014) 619 failure reports for coast live oak is in the CTFD including 226 trunk failures.

Of the 1063 failure reports in the CTFD (2010), 74% identified decay as a primary factor contributing to failure (Costello et al.). For the different failure types, decay was reported as a primary factor in 80% of all trunk failures, 75% of all root failures, and 65% of branch failures. By 2014 decay remained the primary factor in 80% of all trunk failures. Costello, Hagen, and Jones emphasize: “*To reduce the potential for structural failures in oaks, it is important to be able to recognize key defects (e.g., decay) and be aware of contributing factors*”. Decay is a significant defect that contributes to branch, trunk, and roots failures of oaks.

Table 7. Cross-sectional area of trunk with decay and failure occurrence	
Cross-sectional area with decay	Frequency of occurrence
< 25%	19%
26-50%	24%
51-76%	21%
> 76%	36%

Western Arborist Summer 2014

### Summary of key findings of the 2014 study



- Root failure was the most common type of failure for coast live oak, followed by trunk and branch failure.
- Decay was the most commonly reported defect associated with root, trunk, and branch failure.
- Sporophores were not found in the majority of failures associated with decay.
- Many failures occur during dry and calm conditions.
- Decay was associated with 80% of trunk failures. Over 40% of these failures occurred when less than half of the cross-sectional area was decayed.
- Multiple trunks/codominant stems are defects associated with trunk failure.



## Conclusion

It is my professional opinion the pre-existing conditions of the subject oak was critical to this failure. My observations and photographic evidence suggest that sound and stable trees have a much better chance of surviving this wind event.

A wood sample was sent to a wood decay lab. The lab confirmed both rot and stem decay agents (see-Appendix IV).

The subject tree bent and buckled under load from the wind. The material properties of the remaining holding wood were not strong enough to keep the trunk from snapping off. The previous damage weakened the tree. The open cavities, the decayed and missing wood, the margin of woundwood formation, all confirm a pre-existing condition that contributed to this trunk failure.

## Appendix I Cal Fire Incident Information –

[CA.gov](#) | [FAQs](#) | [Contact Us](#) | [Site Map](#) | [Translate](#)

This Site California

[HOME](#) | [ABOUT US](#) | [PROGRAMS](#) | [NEWSROOM](#) | [CAREERS](#) | [RESOURCES](#)

### Incident Information


Last modified on Feb 09, 2018

**NUNS / ADOBE / NORRBOM/ PRESSLEY / PARTRICK FIRES / OAKMONT (CENTRAL LNU COMPLEX)**

Nuns / Adobe / Norrbom/ Pressley / Partrick Fires / Oakmont (Central LNU Complex) Incident Information:		
<b>Last Updated:</b>	February 9, 2018 9:30 am	<b>FINAL</b>
<b>Date/Time Started:</b>	October 8, 2017 10:00 pm	
<b>Administrative Unit:</b>	CAL FIRE Sonoma-Lake-Napa Unit	
<b>County:</b>	Napa County, Sonoma County	
<b>Location:</b>	Hwy 12, north of Glen Ellen	
<b>Acres Burned - Containment:</b>	56,556 acres - 100% contained	
<b>Structures Destroyed:</b>	1,355 destroyed / 172 damaged	
<b>Evacuations:</b>	See the latest <a href="#">Incident Update</a> for more information on this fire.	
<b>Long/Lat:</b>	-122.5209/38.4041	
<b>Conditions:</b>	<a href="#">State's Post Fire Watershed Emergency Response Report</a> See the latest <a href="#">Incident Update</a> for more information on this fire. <a href="#">Central LNU Complex Evacuation Map</a> <b>Resources:</b> <ul style="list-style-type: none"> <li>• <a href="#">Sonoma County Fire Information</a></li> <li>• <a href="#">Sonoma County Website</a></li> <li>• <a href="#">CAL FIRE Structure Status Map</a> Please note that damage assessment is still on-going. If a structure point does not appear on the map it may still have been impacted by the fires.</li> </ul>	
<b>Phone Numbers</b>	(707) 967-4207 (Fire Information Line)	

### California Statewide Fire Map

2018 Stat...



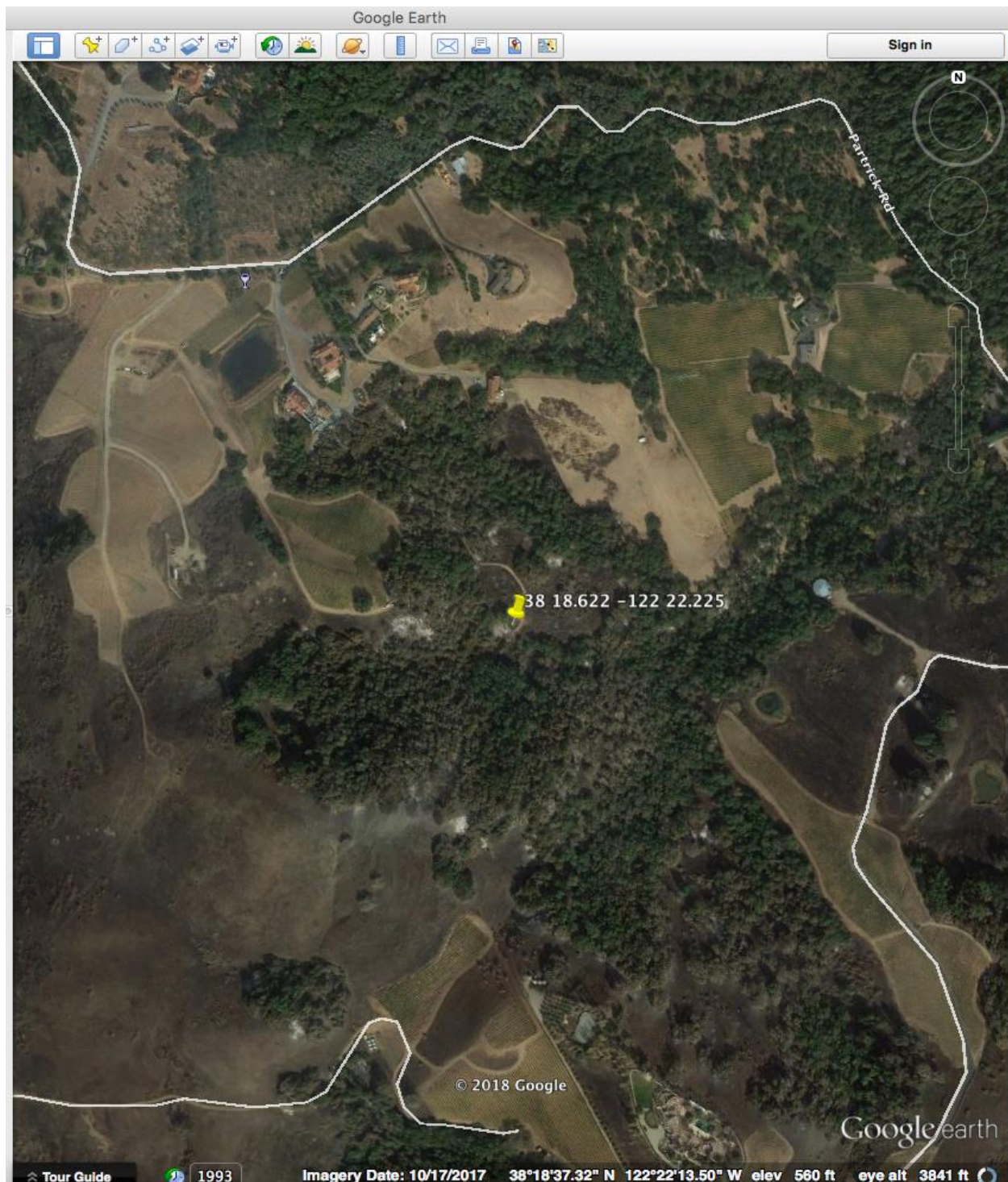
Map data ©2018 Google, INEGI Terms 100 mi

[View California Fire Map in a larger map](#)

**NUNS / ADOBE / NORRBOM/ PRESSLEY / PARTRICK FIRES / OAKMONT (CENTRAL LNU COMPLEX) MORE INFO**

- Nuns / Adobe / Norrbom/ Pressley / Partrick Fires / Oakmont (Central LNU Complex) Information
- Incident Maps
- Photos
- News Releases
- Weather Information
- Telephone Numbers
- Special Notices
- Related Links

## Appendix II Site Overview





## Appendix III Photos

### Photo 1

- Failure site and subject tree (blue arrow)
- The yellow arrow points to another oak tree with decayed heartwood (hollow) downslope seen in Photo 3.

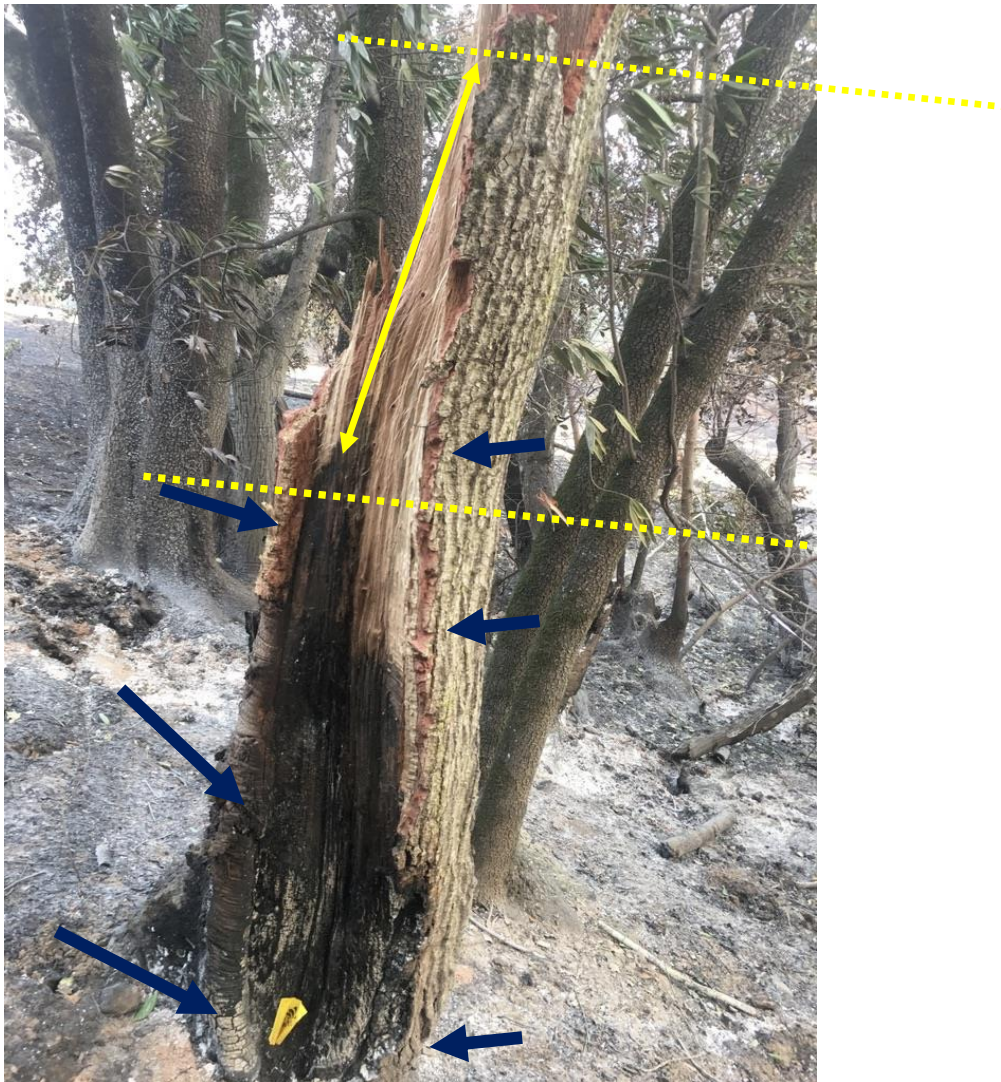




## Photo 2

### Subject tree

- Existing wound and margins of wound wood (blue arrows). The wood resisted fracture in this area.
- The oak tree was wounded several years ago. Note surrounding trees with superior wood quality remain un-fractured.
- The broken trunk lying next to the blue arrow is visible in Photos 1, 8, & 9 (top of the fractured trunk left standing).
- A significant point of weakness from bending stress. The wood fibers tore entirely to failure in this general area along the trunk (between yellow dotted line).
- See Photo 8 for broken trunk and canopy part and Photo 9 for the direction of fall.





**Photo 3**

- Decayed trees fail first and do not resist wind as well as structurally sound trees.
- Multiple areas of structural defects associated with decay and failed tree parts (blue arrows).

Note the solid stem comparable to the hollow decayed stem that failed in the wind (inside red circle).

- The union between the two stems is defective and weak with a vertical bark inclusion (yellow arrow).
- The pre-existing decay (failed hollow stem on the left solid trunk).
- The decayed trunk was a greater factor of weakness during the failure event.



**Photo 4**

- Area of tree failure (red circle)
- Power pole (blue arrow)





**Photo 5**

- Neighboring oak trees sound and solid with no visible decay and no evidence of failure.
- Even with the multiple leaders arising at one point.
- Comparing to surrounding trees with decay, the trees with sound wood withstood the wind load much better.
- Pre-existing conditions such as decay was a factor leading to failure at this site.



**Photo 6**

- Decay, defects, and tree failures





**Photo 7**

- Subject tree. Open cavities on north side of trunk





**Photo 8**

- Subject tree failure once connected to Photo 2





**Photo 9**

- Direction of failure to the southwest (yellow arrow).
- Fibers crush in compression (where the arrow points) and tear off in tension.
- Weight distribution influenced by sunlight and open space.



## Appendix IV Wood Decay Lab Results

### Forest Pathology and Mycology Laboratory UC Berkeley Wood Decay Diagnostic Results

ID Code: Marks Tree 7  
 Submitted by: Mark Porter  
 Collection Date:  
 Received Date: 12/14/2017  
 Tree Species: Quercus agrifolia  
 Location:  
 Reason For Submission:

Targets	Results
1. Fungal DNA	x
2. <i>Armillaria</i> spp.	x
3. <i>Fomitiporia</i> ( <i>P. punctatus</i> , <i>P. robustus</i> )	
4. <i>Fuscoporia</i> ( <i>P. contiguus</i> , <i>P. gilvus</i> , <i>P.</i>	
5. <i>Ganoderma</i> spp.	
6. <i>Ganoderma adspersum</i>	
7. <i>Ganoderma applanatum</i>	
8. <i>Ganoderma lucidum</i> (Eu)	
9. <i>Ganoderma resinaceum</i>	
10. <i>Hericius</i> spp.	
11. <i>Inocutis</i> ( <i>I. dryophilus</i> )	
12. <i>Kretzschmaria deusta</i>	
13. <i>Inonotus dryadeus</i>	
14. <i>Inonotus</i> s.s. ( <i>I. andersonii</i> , <i>I. hispidus</i> )	
15. <i>Inonotus/Phellinus</i> spp.	
16. <i>Laetiporus</i> spp.	weak
17. <i>Perenniporia fraxinea</i>	
18. <i>Phellinus</i> s.s. ( <i>P. igniarius</i> , <i>P. lundellii</i> , 19. <i>Pleurotus</i> spp.	x
20. <i>Schizophyllum</i> spp.	
21. <i>Stereum</i> spp.	
22. <i>Trametes</i> spp.	

Sample Positive for: Armillaria, Laetiporus (weak), Pleurotus

#### Notes:

Both root and stem decay agents detected.

## Glossary

**Advanced Assessment:** an assessment performed to provide detailed information about specific tree parts, defects, targets, or site conditions. Specialized equipment, data collection, and analysis, and expertise are usually required.

**Branch Failure:** One of three failure modes. E.g. of branch failure reasons - excessive end weight, cracks, cavities, poor taper, weak wood, excess load from wind, rain, snow, fruit, etc.

**Buckling:** Mode characteristic of collapsing under compressive stress.

**Cellulose:** complex carbohydrate found in the cellular walls of the majority of plants, algae, and certain fungi.

**DBH:** trunk diameter at breast height (54 inches from ground level). The standard measurement of tree size in arboriculture.

**Hemicellulose:** any group of complex carbohydrates that, with other carbohydrates (e.g., pectins), surround the cellulose fibers of plant cells.

**Lignin:** an organic substance that impregnates certain cell walls to thicken and strengthen the cell to reduce susceptibility to the decay and pest damage.

**Root Failure:** one of three failure modes where tip over occurs.

**Sporophores:** spore-bearing structure of a fungus

**Saprophyte:** a plant, fungus, or microorganism that lives on dead or decaying organic matter.

**Trunk Failure:** A tree failure that occurs somewhere along the trunk. Often associated with decay or poor structure. One of three failure modes.

## Bibliography

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## **Assumptions and Limiting Conditions**

1. Any legal description provided to the consultant/appraiser is assumed correct. Any titles and ownerships to any property are assumed good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.
2. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other governmental regulations.
3. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.
4. The consultant shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.
5. Loss or alteration of any part of this part of this report invalidates the entire report.
6. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior express written or verbal consent of the consultant/appraiser.
7. Neither all nor any part of the contents of this report, nor copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without my prior expressed written or verbal consent.
8. This report and any values expressed herein represent my objective and independent opinion. My fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.
9. Sketches, diagrams, graphs, or photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.
10. Unless expressed otherwise: information contained in this report covers only those items that were examined and reflects the condition of those items at the time of photographic inspection.

## **Certificate of Performance**

I certify that the statements made in this report to be true and correct to the best of my knowledge. The opinions expressed are my personal, unbiased professional opinions and conclusions, and I have no present or prospective interest in the vegetation that is the subject of this report. I have no personal interest or biases with respect to the parties involved and have based my assessment on the situation as I have seen it.

My compensation is not contingent on the reporting or a predetermined outcome or direction that favors the cause of the client, the attainment of a stipulated result, or the occurrence of a subsequent event.

My opinions and conclusions were developed, and this report prepared in conformity with standard arboricultural practices, my expertise, and experience. If further documentation or evidence is reviewed, these opinions could be changed, altered, or maybe strengthened.

I further certify that I made a personal inspection of the property, and no one provided any significant professional assistance to this report.

A handwritten signature in cursive script, appearing to read "Mark Porter".

Mark Porter, Consulting Arborist

# **ATTACHMENT C**

## **CAL FIRE Evidence List**

# EVIDENCE LOG



STATE OF CALIFORNIA  
DEPARTMENT OF FORESTRY AND FIRE PROTECTION  
LE 75e (REV. 7/2011)

<b>INCIDENT NUMBER</b>	
17CALNU010051	
<b>CASE NAME</b>	
PARTRICK	

<b>DAY</b>	<b>MONTH</b>	<b>DATE</b>	<b>YEAR</b>	<b>COUNTY</b>	<b>REGION</b>	<b>UNIT</b>	<b>CASE NUMBER</b>
SUN	10	08	2017	NAPA	CNR	LNU	

ITEM NO	DATE COLLECTED	TIME COLLECTED	COLLECTED BY	ITEM DESCRIPTION	LOCATION
1	10/10	3:45 p.m.	B. BERTOLINO	Game Camera	GOA
2	10/12	9:30 a.m.	B. BERTOLINO	Game Camera SD Card	GOA
3	10/14	12:15 p.m.	B. BERTOLINO	Stump of Oak Tree that was part of tree on conductor	GOA
4	10/14	12:15 p.m.	B. BERTOLINO	Section of oak tree that was on Conductor wire/stump match	GOA
5	10/18	8:57 a.m.	B. BERTOLINO	East/ Roadside conductor	GOA
6	10/18	9:03 a.m.	B. BERTOLINO	West/ Uphill Conductor	GOA/SOA
6.1	10/18	9:10 a.m.	B. BERTOLINO	Pieces of West/Uphill Conductor	SOA
6.2	10/18	9:10 a.m.	B. BERTOLINO	3-foot section of West/Uphill Conductor	SOA
6.3	10/18	9:10 a.m.	B. BERTOLINO	West/Uphill Conductor wire from Transformer Side	GOA/SOA
7	10/18	9:15 a.m.	B. BERTOLINO	Fulgurite from West/Uphill Side of Conductor	SOA
8	10/18	10:34 a.m.	B. BERTOLINO	USB Flash Drive given to me by Jeff FONTANELLA with photos.	1721 Partrick Rd.



PRINTED NAME	SIGNATURE	BADGE NUMBER	DATE
BRANDON BERTOLINO		2756	10/25/17

Partrick 072

# **ATTACHMENT D**

## **CPUC Site Visit Observation Report**

## ESRB Site Visit Observation Report

**Date:** 10/17/2017

**Time:** 0900 hours

**Incident ID:** E20171020-02

**Utility Involved:** Pacific Gas and Electric (PG&E)

**Investigator:** Raymond Cho

**Date and Time of Incident:** 10/9/2017, 0000 hours

**Location of Incident:** 1721 Partrick Rd., Napa, Napa County

### **Summary of Initial Report:**

PG&E noted that on October 18, 2017, they identified a 25-inch diameter Live Oak, approximately 70 feet tall that struck and took down one phase of the Pueblo-2103 circuit near the above address. The tree was rooted uphill, approximately 44 feet from the distribution conductors.

### **Reason for Reporting:**

The incident was reported due to the damage in excess of \$50,000 caused by the incident.

### **Field Findings:**

When I arrived at the incident site, I met Brandon Bertolino, the lead CAL FIRE investigator for the Partrick Fire. He had already directed PG&E to remove 2 subject spans for evidence retention prior to my arrival. When I asked to review the conductors, he stated that he preferred if I reviewed them during a formal evidence review. Brandon also stated that he had requested to retain a portion of a tree as evidence.

On the pole to the East, attached were 2 phases along with 2 anchors separated by 90 degrees. Another 2 insulators were on the pole but did not have conductors attached to them. I assume the span would attach to this pole and go West toward the second pole. This pole was relatively new and may have replaced a burnt pole. I assume this because I saw a burnt pole stub in close proximity to the newer pole. The field phase was on the ground and the road phase was intact. I noticed 2 trees about 10-15 feet away from the field-side conductor.

On the second pole to the West, I noticed a 10 kVA transformer attached and 2 primary conductors dead-ended at about 32 feet high. Wilson Tsai helped me take the measurement with the range finder.

I could not determine if the trees were hazardous prior to the fire.

**Witnesses/Person(s) Involved:**

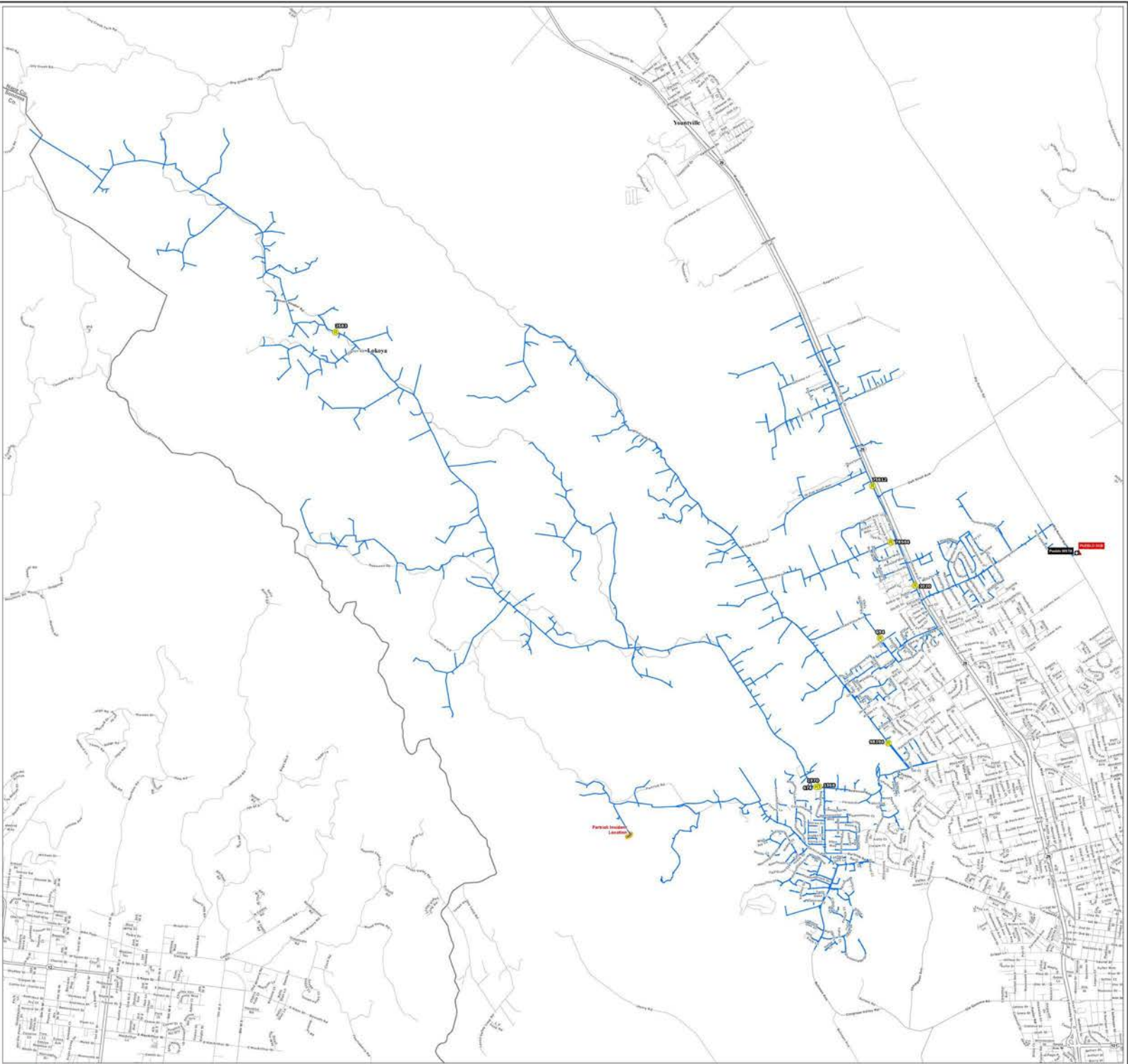
<b>Name</b>	<b>Title</b>	<b>Phone Number</b>	<b>Email</b>
Wilson Tsai	CPUC Utilities Engineer	415-703-1359	wilson.tsai@cpuc.ca.gov
Brandon Bertolino	Cal Fire Investigator	707-339-6618	
Jay Singh	PG&E Regulatory Director	415-990-1530	J112@pge.com
	PG&E Supervisor		
	PG&E Vegetation Management Supervisor		

**Drawing/Photos:** Attached photos and drawings.  
Please see "Photos" folder.



# **ATTACHMENT E**

## **PG&E Pueblo 2103 Circuit Map**



**MAP 12**  
**PUEBLO 2103**  
**Partrick**

 Incident Location    Substation    Incident Distribution Circuit  
 Weather Station    Recloser

 0 0.5 1 Miles

While every effort has been made to ensure accuracy, there is no guarantee that the information on this map is correct or that it will be updated. The user assumes all responsibility for the use of this map.

