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

Incident Investigation Report

Report Date: May 10, 2019

Incident Number: E20171021-01

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

Date and Time of the Incident: October 8, 2017, at approximately 0000 hours

Location of the Incident: Ridge Ranch Road and Ridge Oaks Road
Geyserville, CA 95441
County: Sonoma

Fatality / Injury: None reported

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

Utility Facilities Involved: Cloverdale 1102, 12 kV Circuit

Violation: Yes

I. Summary

On October 8, 2017, at approximately 0000 hours, a Valley Oak tree failed and fell onto PG&E's 12 kV overhead conductors near the intersection of Ridge Ranch Road and Ridge Oaks Road in the city of Geyserville, Sonoma County. The tree made contact with PG&E's conductors and caused the ignition of the Pocket Fire, which burned approximately 17,357 acres, destroyed six structures, and damaged two structures.

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

No.	Name	Title
1	Wilson Tsai	CPUC Investigator
2	Raymond Cho	CPUC Senior Utilities Engineer
3	Jeremy Ward	CAL FIRE Lead Investigator, Fire Captain Specialist
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 10/21/17
2	PG&E	20-day Incident Report, 11/13/17
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 Failure
10	CAL FIRE	Forester Observations
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

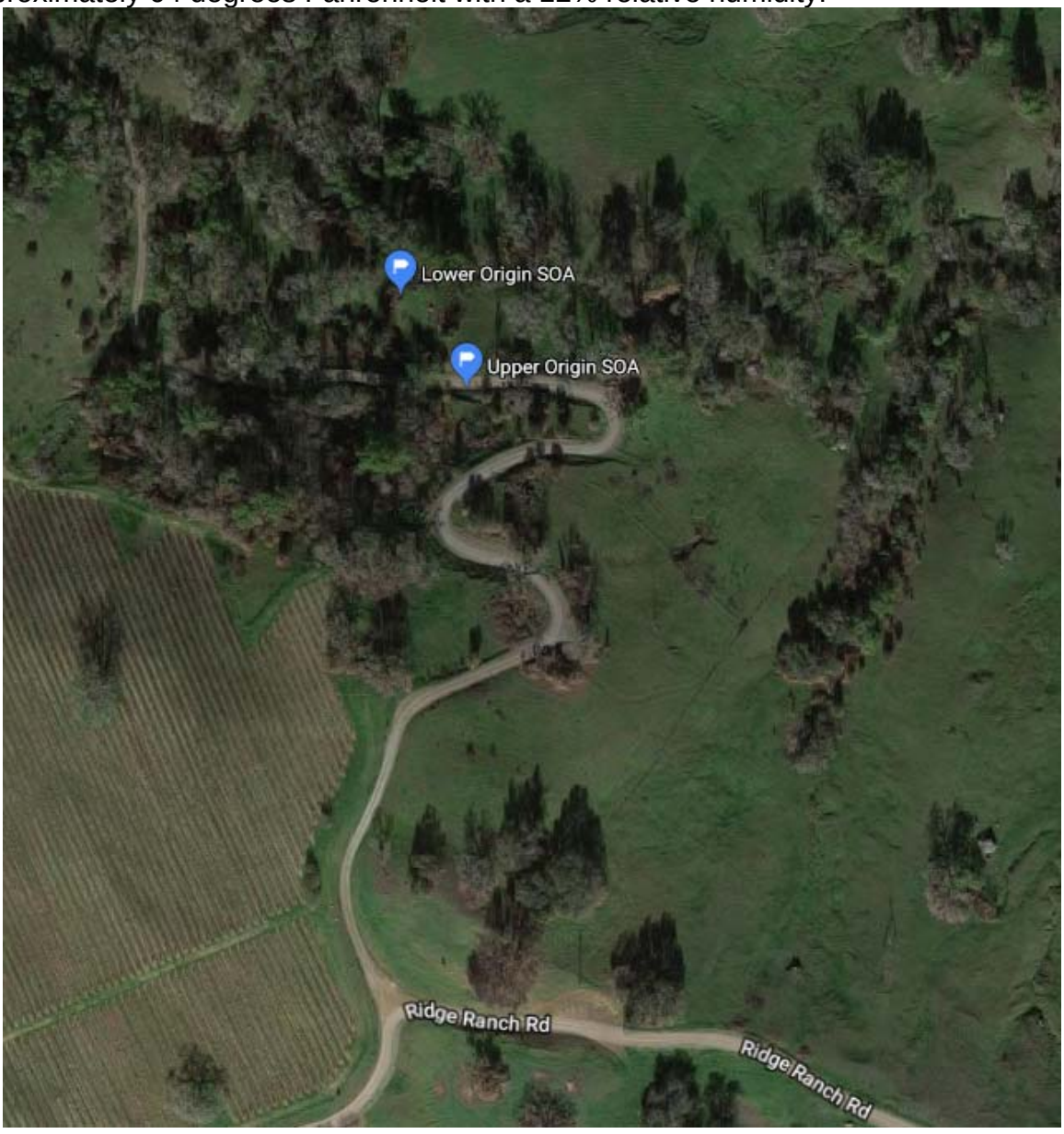
II. Background

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 0000 hours, the branch of an approximately 40-foot mature Valley Oak tree failed, fell, and contacted overhead conductors of PG&E's Cloverdale 1102 12 kV circuit located near the intersection of Ridge Ranch Road and Ridge Oaks Road in Sonoma. One of the 12 kV conductors fell to the ground and ignited the fire. CAL FIRE identified the Specific Origin Area (SOA) for the Pocket Fire as shown

in Figure 1. The SOA is defined as the immediate area surrounding the ignition area[1]. The Upper and Lower Origins establish the boundaries that define the SOA[2].

Weather station HAWKEYE, located approximately 4.35 miles southeast from the incident location, recorded a peak wind speed and gust of 48.0 miles per hour (mph) and 79.0 mph, respectively. The ambient condition around the time of ignition was approximately 64 degrees Fahrenheit with a 12% relative humidity.[3]



[1] Wildlife Origin & Cause Determination Handbook, National Wildlife Coordinating Group. Revised April 2016. (https://www.nwcg.gov/sites/default/files/publications/pms412.pdf)

[2] Pocket Investigation Report, Page 17, Lines 16-22. CAL FIRE. (5/24/18)

[3] Weather conditions per MesoWest (www.mesowest.utah.edu)

Figure 1: CAL FIRE SOA via Google Maps. The Upper and Lower Origins were established by the coordinates CAL FIRE provided.

On October 21, 2017 at 1225 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 and detailed inspection records:

- 2009 detailed inspection – Resulted in eight work orders. Five work orders required pole replacements and were assigned priority P. Two work orders required replacement of decayed primary cross arms and were assigned priority P. One work order required the replacement of a guy anchor and was assigned Priority C.
- 2012 distribution patrol – No conditions or issues documented.
- 2014 detailed inspection – Resulted in 47 work orders.
- 2016 distribution patrol – No conditions or issues documented.

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[4].

For the 2009 detailed inspection, PG&E utilized an older priority system for work orders which consisted of priorities A, C, G and P. The priorities are defined as follows[5]:

- Priority A – Necessary to resolve an unsafe situation and is immediate response work

[4] PG&E TD-2305M Electric Distribution Preventative Maintenance (EDPM) Manual, April 1, 2016.

[5] Adobe Q1, CPUC Data Request Response #2 dated August 31, 2018.

- Priority C – Necessary to restore service and is immediate response work
- Priority G – Necessary to maintain compliance. This work must be completed and cannot be deferred
- Priority P – Necessary for system repair/improvement. Has the following sub-priorities:
    - P1 – Work related to system repair/improvement and has a high probability of impacting safety, reliability, or asset life
    - P2 – Work related to system repair/improvement impacting safety, reliability, or asset life
    - P3 – This is work deemed low priority and can be completed in conjunction with other work
    - P4 – These are idle facility monitor tags and work deemed lowest priority and have no impact on safety, reliability, and asset life

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 or 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 through 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. PG&E conducted the last vegetation inspection of the incident area on March 13, 2017 but did not identify the incident tree.

CAL FIRE contracted with Mark Porter, an ISA Certified Arborist, to conduct an analysis of the subject tree that failed. In Mr. Porter's report, "Evaluation of Oak Failure," (Attachment B), the subject tree is identified as a Valley Oak, species Quercus Lobata, with trunk diameter at breast height (DBH)[6] of approximately 40.5 inches. Mr. Porter observed a trunk cavity approximately two feet five inches wide and two feet nine inches long with woundwood surrounding the cavities.

[6] The standard measurement of tree size in arboriculture. Breast height is 54 inches from ground level.

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.[7]

The subject branch was noted to be approximately 25 feet up the tree and was approximately 11 inches in diameter with decay present and pre-existing.

Regarding the decay on the subject tree,

> *"The decay in the trunk of this oak is advanced. The tree would typically be condemned during an arborist inspection, primarily due to the proximity of powerlines (an immovable target).*
>
> *The amount of visual decay is enough to condemn this tree without the need for advanced risk assessment techniques such as radar, resistance drilling or sonic tomography. The trunk decay has spread vertically toward where the fracture occurred. The higher the tree, the more wind pressure on the part. The force of the wind and the weight of the branch exceeded the elasticity limit of the fractured branch. The decay in the branch does not help matters."*

A sample of the failed branch was sent to a wood decay lab for analysis. The lab results identified fungal DNA.[8]

In conclusion, Mr. Porter states:

> *"Decay is often associated with oak tree failures including valley oak. Tree failure statistics, as well as observations at the site, help confirm:*
>
> *1. decay is familiar to the valley oak*
>
> *2. decay is present in the subject tree*
>
> *3. decay weakens wood and is a significant contributing factor to the failure*
>
> *4. comparable native oak trees in the vicinity survived much better than trees with noticeable decay*
>
> *5. a tree with as much decay as the subject tree should have been condemned during a routine inspection."*

PG&E's Vegetation Management Distribution Patrol Standard (Version 4, revised 9/12/06)[9] describes various factors when patrolling or pre-inspecting trees for vegetation

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[7] Wilson, Phillip. (2018) A Companion to British Arboriculture. http://www.treeterms.co.uk/definitions/wound-wood

[8] "Evaluation of Oak Tree Failure" Appendix IV, Page 20, Porter. Date: 10/12/2017

[9] PG&E Vegetation Management Distribution Patrol Standard, Version 4. Revised 9/12/06.

work. Under "Hazard Trees/Facility Protection"[10] 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)." [11]

PG&E's Vegetation Management Hazard Tree Rating and Scoring Procedure[12] (Utility Procedure: VEG-1015P, dated 10/13/2014) indicates a "Very High" failure potential for the Valley Oak species.

Based on the criteria in PG&E's Vegetation Management Distribution Patrol Standard and VM Hazard Tree Rating, PG&E should have identified the Valley Oak tree that failed and contacted the overhead conductors.

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 decay and rot were noted by Mr. Porter to be pre-existing and visible, the qualified tree contractors should have identified the Valley Oak tree for removal prior to the incident.

Based on Mr. Porter's report, the incident tree showed signs of advanced decay as indicated by the large hole on the trunk. The decay persisted to the subject branch which resulted in the failure. The decay and rot on the tree were visually evident. Under PG&E's Vegetation Management Program, the certified contractors should have identified the tree for removal during the pre-inspection. Records show that from 2014-2017, PG&E did not identify any Facility Protect trees in the incident area.

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

The incident conductors were size 6CU (Copper) and installed in 1946 as part of PG&E's Cloverdale 12 kV circuit. The subject conductors spanned approximately 365 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."*

[10] PG&E Vegetation Management Distribution Patrol Standard, Version 4. Revised 9/12/06. Page 3.

[11] PG&E Vegetation Management Distribution Patrol Standard, Version 4. Revised 9/12/06. Page 3.

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

A visual single-line diagram, Figure 2, provided by PG&E shows all protective devices between Cloverdale Substation, which feeds the Cloverdale 1102 circuit, and the incident area. The symbols are defined in the legend in Figure 3. The incident span was protected upstream by fuses 1381, 12905, 1403, Line Recloser 570 (LR 570), Line Recloser 262 (LR 262) and finally the Cloverdale 1102 circuit breaker. The brand and type of each protection device is listed under Table 2. A detailed circuit map identifying the locations of the protection devices and the substation relative to the incident location can be found in Attachment E.

In addition, while Line Recloser 570 did open as a result of the line to ground fault from the incident, Fuses 1403, 12905, and 1381 did not operate. LR 570 was previously set with a fast time current curve to allow for fuse-saving for the first operation. A time current curve is a graphical representation of the interrupting time of a protective device based on the given current amount. The time current curve dictates the behavior and sensitivity of the protective device on when to operate. LR 570 automatically opened with this configuration and remained open, therefore de-energizing the line without operating the fuses.

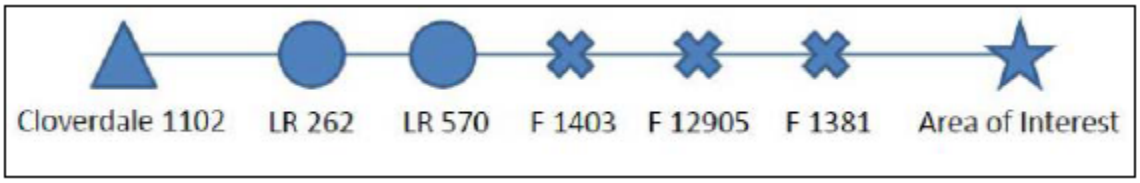

Figure 2: PG&E single-line diagram from the substation to the incident location. The diagram includes all protective devices in-between. Not to scale.

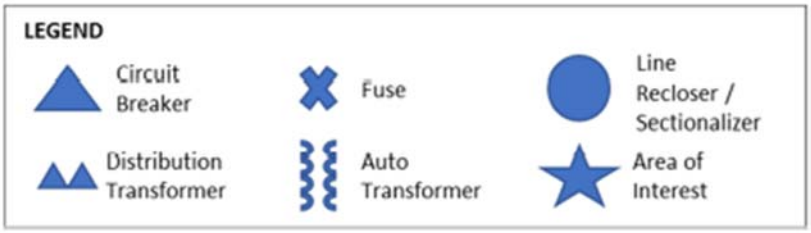

Figure 3: Legend for PG&E single-line diagram.

Device ID	Brand	Type
Cloverdale 1102 CB	GE, SEL	F60, 351
LR 262	Cooper	Form 6 - PV4
LR 570	Cooper	Form 6 - PV4
F 1403	Part 63	40E
F 12905	Part 44	25T
F 1381	Part 44	15T

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

The peak load on the Cloverdale 1102 circuit within a 12-hour timeframe (six hours prior to and after the incident occurred) was 265.0A. 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 504.4A.

PG&E did not identify any abnormal configurations on the Cloverdale 1102 circuit within 24 hours prior to the incident start time. 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 from LR 570 for the Pocket Fire is presented in Figure 4.

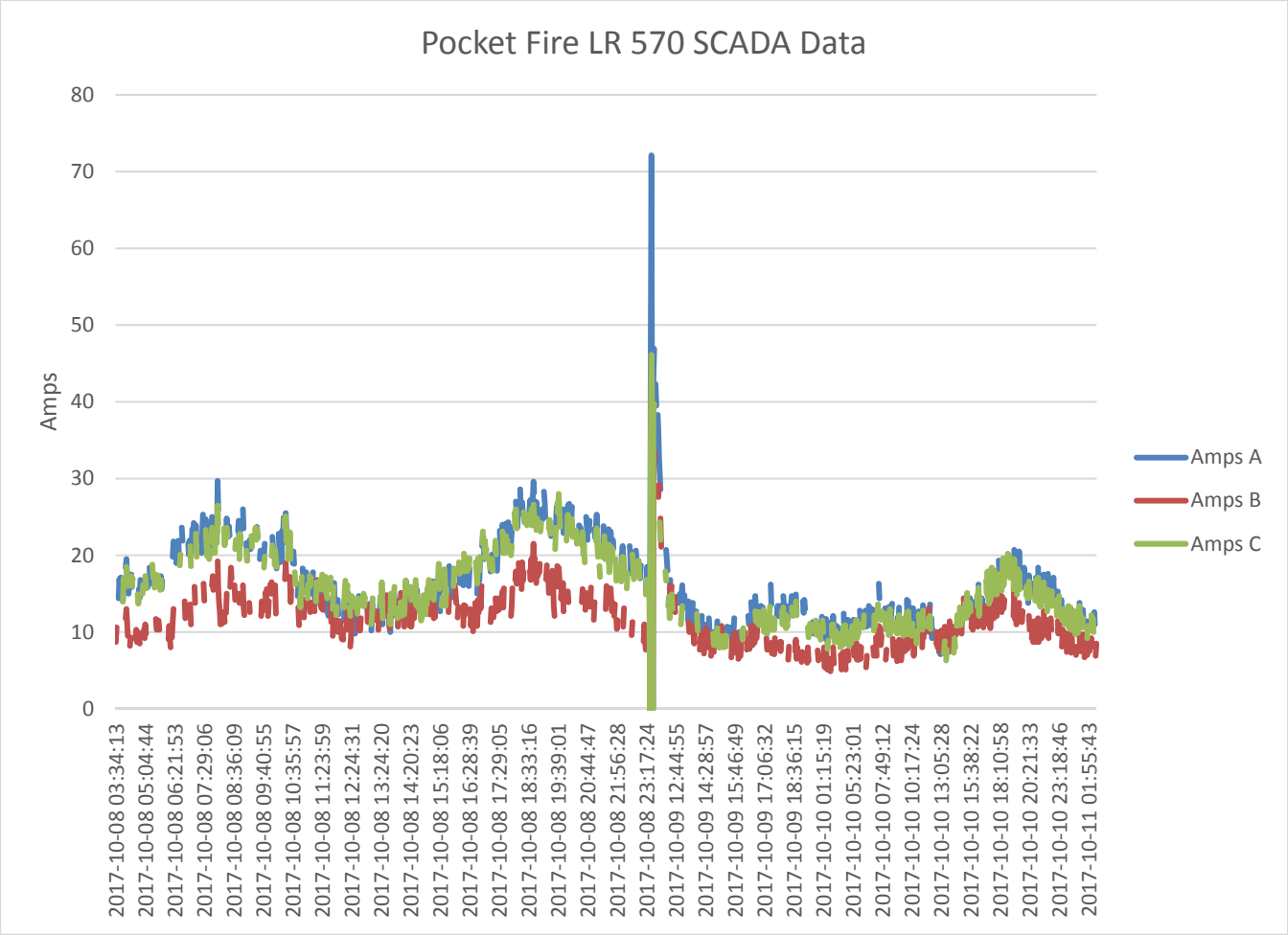

Figure 4: Plot of SCADA data from LR 570 for each phase from 24 hours prior to and 48 hours after the CAL FIRE designated start time.

The load on all three phases is fairly consistent across the entire period, approximately 0-30A. However, there is a spike in amperage around the CAL FIRE designated start time of October 9, 2017 0330 hours. The highest spike occurs on the A phase reaching approximately 72A. Both the B and C phases also experience a spike in current at this point. The spike in current is indicative of a fault downstream as current is back fed to the source side until any of the upstream protection devices trip and isolate the fault.

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 occurred last.

1. October 8, 2017 2324 hours – Based on PG&E records, Line Recloser 570 on the Cloverdale 1102 Circuit automatically opened due to a line to ground

fault and remained open. Fuses downstream of Line Recloser 570 did not open. According to PG&E records, Line Recloser 262 automatically opened due to a line to ground fault, then closed, restoring power and creating a momentary outage for customers between Line Recloser 262 and Line Recloser 570.

2. October 9, 2017 0229 hours – Line Recloser 570 was closed remotely via SCADA, after PG&E linemen patrolled the circuit.
3. October 9, 2017 0230 hours – Line Recloser 570 was opened remotely via SCADA.
4. October 9, 2017 0330 hours – According to CAL FIRE's website, the Pocket fire started at 3:30 AM on October 9, 2017.
5. October 9, 2017 1130 hours – Based on PG&E records, Fuse 1403 was opened manually in the field.
6. October 9, 2017 1147 hours – Line Recloser 570 was closed remotely via SCADA, re-energizing the line up to Fuse 1403 and restoring electricity to 221 customers.
7. October 9, 2017 1250 hours – Per a PG&E lineman, he and another PG&E lineman attempted to patrol to the suspected incident location but were denied access by CAL FIRE. The lineman reported fire activity on the load side of Fuse 1403, beyond the point at which CAL FIRE had turned the linemen away.
8. October 12, 2017 1430 hours – Based on PG&E records, a PG&E lineman patrolled up to Fuse 12905 and manually opened Fuse 12905 on a de-energized line.
9. October 12, 2017 1455 hours – According to PG&E records, a PG&E lineman manually closed Fuse 1403, restoring electricity to nine customers.
10. October 17, 2017 – After CAL FIRE released the site and PG&E was granted access to the incident location, PG&E observed that the top section of a California White Oak/Valley Oak had broken and at least one phase of the Cloverdale 1102 Circuit was on the ground.
11. October 22, 2017 – Repair work was completed downstream of Fuse 12905.
12. October 22, 2017 1810 hours – According to PG&E records, a PG&E troubleman manually closed Fuse 12905 after patrolling the circuit, restoring electricity to 12 customers and energizing the incident location.

E. SED Site Visit and Evidence Viewing

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

> *"The incident span is located on a steep hillside above a series of dirt road switchbacks. The first pole was located at the top of the hill. The incident span ran downhill to a pole located about 200 feet away. The span consisted of two primary conductors and a communications line. The primary conductors were 6/0 copper wire with splices mid-span which may indicate previous vegetation issues. CalFire took possession of both phases as evidence; they had PG&E cut the conductors two feet from each insulator.*
>
> *At approximately mid-span, there is a burned out, hollow, possibly Oak tree approximately 4-5 feet from the lines. On the opposite side, there is a large broken section of branches on the ground. The base of one of the sections had a portion removed by CalFire for evidence. It looked like the fire may have originated from this tree."*

On June 11, 2018, SED conducted an evidence viewing of evidence that PG&E obtained for all October fires. For the Pocket Fire, PG&E collected the remaining sections of the Valley Oak on November 2, 2017.

Figure 5: The trunk of the incident tree.

Figure 6: Hollowed out interior of the incident tree trunk.

Figure 7: Broken top section of the incident tree as seen in Figure 5.

On November 6, 2018, SED conducted an evidence viewing of all evidence CAL FIRE took in possession for the Pocket Fire. CAL FIRE took a section of the Valley Oak tree and sections of both conductor phases. The entire list of evidence taken by CAL FIRE for the Pocket Fire can be found in Attachment C.

IV. CAL FIRE's Investigation

CAL FIRE's investigation report (Attachment A) concluded the origin and cause of the Pocket Fire:

> *"Indications were present prior to the fire the involved tree was weakened and susceptible to damage. Failure to remove all or portions of the weakened oak tree resulted in a portion of the tree falling into and breaking the energized power lines. An energized conductor contacted vegetation and ignited the Pocket Fire, ultimately burning over 17,000 acres of vegetation and destroying multiple structures."*

CAL FIRE cites Mr. Porter's report: "*An arborist's inspection of the tree determined the tree had rot and signs of weakness that should have been outwardly apparent prior to the Pocket Fire."*

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

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 its 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 failed to 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 rule's minimum clearance requirements between the subject 12 kV conductors and the hazardous subject tree.

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 Cloverdale 1102 Circuit Map

ATTACHMENT A

CAL FIRE Investigation Report

CAL FIRE

CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION
Sonoma – Lake – Napa Unit
1199 Big Tree Rd.
St. Helena, CA 94574

INVESTIGATION REPORT

CASE NUMBER:	17CALNU010057
CASE NAME:	POCKET
DATE:	October 9th, 2017
INCIDENT TYPE:	Wildland Fire
INCIDENT INVESTIGATOR(s):	Jeremy Ward Fire Captain Specialist, Humboldt – Del Norte Unit Matt Franklin Fire Captain Specialist, San Bernardino Unit Matt Gilbert Battalion Chief, Tuolumne – Calaveras Unit

1 - VIOLATIONS:

Public Resources Code 4293

Except as otherwise provided in Sections 4294 to 4296 , inclusive, any person that owns, controls, operates, or maintains any electrical transmission or distribution line upon any mountainous land, or in 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 the fire protection of such areas, maintain a clearance of the respective distances which are specified in this section in all directions between all 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.

Public Resources Code 4421

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.

2 - SUMMARY:

On October 9th, 2017, a vegetation fire was reported near Pocket Ranch Road east of the community of Geyserville, California (Attachment 1). The fire, named the Pocket Fire, began during a red flag warning issued by the National Weather Service (Attachment 2). The fire burned approximately 17,357 acres of vegetation in State Responsibility Area over the course of multiple days. The Pocket Fire also destroyed six structures and damaged two others. The fire started around the same time multiple other major fires started in northern California, creating a significant demand for resources.

I, Jeremy WARD, was assigned along with CAL FIRE Captain Specialist Matt FRANKLIN, to conduct the origin and cause investigation for the Pocket Fire. Examination of fire pattern indicators and information provided by witnesses showed the fire originated near an area of downed power lines at Pocket Ranch Road. Through continued investigation, a downed conductor was later determined to be the cause of the Pocket Fire. All other cause classes were excluded. The power lines belong to Pacific Gas and Electric Company (PG&E). The power lines broke and contacted the ground after a portion of the top of an oak tree broke and fell onto the power lines. An arborist's inspection of the tree determined the tree had rot and signs of weakness that should have been outwardly apparent prior to the Pocket Fire.

3 - SUSPECT:

S-1

Pacific Gas and Electric Company
77 Beale Street
San Francisco, CA 94105

Pacific Gas and Electric Company operates the power lines that fell and caused the Pocket Fire.

4 - VICTIMS & WITNESSES:

VICTIMS

The Pocket Fire burned approximately 17,357 acres of vegetation and destroyed three residential structures and three outbuildings across numerous parcels in Sonoma County. The fire also damaged one residence and one outbuilding. Other damage to real and personal properties occurred. Such values damaged includes but is not limited to: vineyards, natural vegetation, infrastructure, vehicles, and property improvements.

WITNESSES

W-1

Bob TODESCHINI
Fire Captain, CAL FIRE
1199 Big Tree Road
Saint Helena, CA 94574
707-967-1400 (main)
Can testify to briefing me on fire on October 10th, 2017.

W-2

Preston ADDISON
Resident
DOB: [redacted]
[redacted]
Can testify to providing information about a possible witness.

W-3

James NAVE

Resident

DOB: [redacted]

[redacted]

[redacted] (home)

[redacted] (cell)

Can testify to wind conditions and fire location on October 9th, 2017.

W-4

Greg ESTRADA

General Manager, Alden Park Vineyards

DOB: [redacted]

[redacted]

[redacted] (cell)

Can testify to fire location on October 9th and introducing WILLIAMS to me.

W-5

Steven Kelly WILLIAMS

Resident, husband of W-6

DOB: [redacted]

AZ DL: [redacted]

[redacted]

[redacted] (cell)

Can testify to wind conditions and fire location on October 9th, 2017.

W-6

Candace Larue WILLIAMS
Resident, wife of W-5
DOB: [redacted]
CA DL: [redacted]
[redacted]
[redacted] (cell)
Can testify to wind conditions, fire location, and photos from October 9th, 2017.

W-7

James Michael TOVANI
Fire Captain, Geyserville Fire Protection District
20975 Geyserville Avenue
Geyserville, CA 95441
707-857-4373 (main)
Can testify to report of fire and fire conditions on October 9th, 2017.

W-8

Matt FRANKLIN
Fire Captain Specialist, CAL FIRE
3800 N. Sierra Way
San Bernardino, CA 92405
909-881-6900 (main)
Can testify to origin and cause investigation.

W-9

Matt GILBERT
Battalion Chief, CAL FIRE
785 Mountain Ranch Road
San Andreas, CA 95249
209-754-3831 (main)
Can testify to assisting with investigation on October 12th – 14th, 2017.

W-10

Shawn ZIMMERMAKER
Division Chief, CAL FIRE
6105 Airport Road
Redding, CA 96002
530-224-2490 (main)
Can testify to case management and investigation support.

W-11

Michael J. JONES
Employee, PG&E
77 Beale Street
San Francisco, CA 94105
707-382-6904
Can testify to checking power lines for energy on October 11th, 2017.

W-12

Erik ANESON
Volunteer Fire Fighter, Napa County Fire
Station 10 – Carneros
1598 Milton Road
Napa, CA 94559
707-252-6097
Can testify to scene security the night of October 11th, 2017.

W-13

Andrew WHEELER
Volunteer Fire Fighter, Napa County Fire
Station 13 – Soda Canyon
2368 Soda Canyon Road
Napa, CA 94558
707-253-7087
Can testify to scene security the night of October 11th, 2017.

W-14

Peter LEUZINGER
Forester II, CAL FIRE
1199 Big Tree Road
Saint Helena, CA 94574
707-967-1400 (main)
Can testify to his observations of involved tree and tree top.

W-15

Mark PORTER
Consulting Arborist
[redacted]
Can testify to his observations of involved tree and tree top.

W-16

Dave KAROLY
Survey Party Chief, CAL FIRE
P.O. Box 944246
1300 U Street
Sacramento, CA 94244-2460
916-323-1044 (office)
Can testify to LIDAR survey.

W-17

Dan GREGORY
Geomatics Engineer, CAL FIRE
P.O. Box 944246
1300 U Street
Sacramento, CA 94244-2460
916-324-1644 (main)
Can testify to LIDAR survey.

W-18

Crystal NAULT
Dispatch/Scheduling Manager, SVT Gruppe Inc.
P.O. Box 270
Napa, CA 94559
707-927-2200 (office)
Can testify to providing security staff for scene.

W-19

Aaron James (A.J.) RAYFIELD
Security Guard, SVT Gruppe Inc.
P.O. Box 270
Napa, CA 94559
707-927-2200 (office)
Can testify to securing scene.

W-20

Benvindo DEL SANTOS
Security Guard, SVT Gruppe, Inc.
P.O. Box 270
Napa, CA 94559
707-927-2200 (office)
Can testify to securing scene.

W-21

Sam ARREGUIN
Security Guard, SVT Gruppe Inc.
Napa, CA 94559
707-927-2200 (office)
Can testify to securing scene.

W-22

Michael GINN
Fire Investigator, Fire Cause Analysis
[redacted]
Can testify to representing PG&E as a fire investigator.

W-23

Russ WEST
Fire Captain Specialist, CAL FIRE
1199 Big Tree Road
Saint Helena, CA 94574
707-967-1400 (main)
Can testify to transfer of evidence.

W-24

Gary UBOLDI
Fire Captain Specialist, CAL FIRE
1199 Big Tree Road
Saint Helena, CA 94574
707-967-1400 (main)
Can testify to entering evidence into electronic database.

W-25

Jim NOLT

Consulting Electrical Engineer

[redacted]

Can testify to viewing items of evidence including conductors and fulgurite.

W-26

Joe BALDWIN

Battalion Chief, CAL FIRE

1199 Big Tree Road

Saint Helena, CA 94574

707-967-1400 (main)

Can testify to collecting LEUZINGER's photos and statement as evidence.

W-27

Raymond CHO

Senior Utilities Engineer, California Public Utilities Commission (CPUC)

505 Van Ness Avenue

San Francisco, CA 94102

415-703-2236

Can testify to assisting with PG&E data. Responded to Pocket Fire.

W-28

Wilson TSAI

Utilities Engineer, CPUC

505 Van Ness Avenue

San Francisco, CA 94102

415-703-1359

Responded to Pocket Fire.

5 - EVIDENCE:

Item 1A

Approximately five-foot long portion of oak tree cut from remainder of tree top, split along most of its length to near saw-cut end, with apparent rot near middle area of split. Item 1A separated from 1B during collection.

Item 1B

Approximately three-foot long portion of oak tree cut from remainder of tree top, split along most of its length to near saw-cut end. Item 1B separated from Item 1A during collection.

Item 2

Approximately eight-foot long portion of oak tree collected near Items 1A and 1B, split along entire length, with apparent rot near middle of its length.

Item 3

Fulgurite found on Pocket Ranch Road near downed conductor (documented as power line during collection), approximately 2 inches by 1 ¼ inches in size.

Item 4

Conductor collected from east side of pole "7", cut approximately 24 inches from center of insulator, with broken end marked, "C". Documented as power line during collection.

Item 5

Conductor collected from west side of pole "7", cut approximately 24 inches from center of insulator, with broken end marked, "A". Documented as power line during collection.

Item 6

Conductor collected from east side of pole "6", cut approximately 24 inches from center of insulator, with broken end marked, "B". Documented as power line during collection.

Item 7

Conductor collected from west side of pole "6", cut approximately 22 inches from center of insulator due to splice, with broken end marked, "A". Documented as power line during collection.

Item 8

Conductor collected from ground along east side span, between Items 4 and 6, with broken ends marked "B" at the northern end, and "C" at the southern end. Documented as power line during collection.

Item 9

DVD containing photographs related to the Pocket Incident using FCS FRANKLIN's assigned camera. Contains Photos 0001 through 0168.

Item 10

DVD containing photographs related to the Pocket Incident using my assigned camera. Contains Photos 1058 through 1330. These files were renamed as 0169 through 0441 on a working disk to be sequential to the numbered photos in Item 9. Item 10 also contains photos provided by W-3 C. WILLIAMS and photos taken in the field of chain of custody logs.

Item 11

USB drive containing Forester LEUZINGER's photographs and report.

6 – CONDITIONS:

The Pocket Fire started on land consisting of open grass and oak woodland vegetation with Little Sulphur Creek east of the fire's origin. Elevations in the initial areas of the fire are approximately 800 to 1600 feet. The topography along Pocket Ranch Road is mostly rolling hills, with few narrow or steep drainages. The area is rural, with unpaved roads maintained through a landowner's association. Vineyards of varying sizes are scattered across areas of Pocket Ranch Road and Ridge Oaks Road. Large ranches are also found in the area. Many residences are large, custom structures. This area is classified as State Responsibility Area, with the land falling under the protection of CAL FIRE. Electrical service provided via above-ground power lines can be found in the area. The power lines in the area belong to PG&E, except for two locations where sections of power lines to properties were reported privately owned and maintained. These properties were outside the origin area. These locations are shown on Attachment 3

WEATHER (Attachment 4):

Date:	Sunday, October 8th, 2017
Time:	11:56 PM
Temperature:	64 degrees Fahrenheit
Relative Humidity:	12 percent
Wind Speed:	48 miles per hour
Wind Gust:	79 miles per hour
Wind Direction:	North-northeast
Source:	Hawkeye RAWS, ID: HWKC1
GPS Coordinates:	38.735086,
	-122.837058
Elevation:	2024 feet above sea level
Description:	Remote Automated Weather Station located approximately 4.4 miles southeast of origin, near Ridge Ranch Road approximately ¼ mile west of Geysers Road.

7 –EQUIPMENT:

The equipment involved in the Pocket Fire included power lines owned by PG&E. These power lines were part of the Cloverdale 1102 Circuit, within the Sonoma Division (in other documentation provided by PG&E, Sonoma is designated as a district). The power lines were reported by PG&E employees to be 12 KV and made from #6 copper wire. The power lines involved one span between two wooden poles and crossed Pocket Ranch Road twice near a switchback in the road. The poles at the ends of this span were marked with painted numbers "6" at the northern, downhill pole, and "7" at the southern, uphill pole. Handheld GPS showed the poles to be found at the following locations:

Pole "6" at N 38° 46.235', W 122° 54.324'
Pole "7" at N 38° 46.189', W 122° 54.278'

All coordinates recorded in the field by me during this investigation were made using a Garmin Model 64s handheld GPS using WGS84 datum.

In this report, I use the term power line(s) to describe electrical components that are inclusive of more than the conductor(s). For example, power line(s) may be used to describe an area including: poles, conductors, insulators, hardware, etc. I use the term conductor(s) to describe the wire(s) used to carry electrical energy.

Pole "6" used a wooden cross-arm to support the power lines, while pole "7" used metal brackets attached to the sides of the pole. There were two electrical conductors on this set of power lines (one on the western side of the poles and one on the eastern side). These conductors were collected as evidence as five separate pieces. Four pieces remained attached to the two poles following the breaks in the conductors. The fifth piece was found as a separate portion of the eastern span. It was found on the ground, near the broken end of the conductor attached to the east side of pole "6".

8 - PROPERTY:

The Pocket Fire burned approximately 17,357 acres. During the fire, six structures were destroyed. Two structures were damaged by the fire. Assessment of fire damage was completed for all habitable structures and outbuildings having a footprint greater than 10 feet by 12 feet. The Damage Inspection Report for the Pocket Fire (Attachment 5) provides further details regarding the assessment.

Two Specific Origin Areas (SOA) were identified for the Pocket Fire. Both were near a portion of Pocket Ranch Road. This portion of the road is not accurately depicted on most maps; however, it is visible on satellite imagery. Local landowners identified the road as Pocket Ranch Road, and a nearby address marker at a gate identified the road as the access to 22000 Pocket Ranch Road.

The coordinates for the SOAs are:

Upper Origin
North 38° 46.204'
West 122° 54.298'

Lower Origin
North 38° 46.224'
West 122° 54.316'

Based on Sonoma County GIS data available online, I concluded the fire originated on Sonoma County parcel, APN 141-140-033.

9 - NARRATIVE:

On October 9th, 2017, at approximately 2:44 AM, the Geyserville Fire Protection District received a report of a fire west of Geyserville. The firefighters were just about to respond when a male drove to the district's Station 1 and reported a fire to the east. The male pointed in that direction. The firefighters looked and immediately saw a glow along the ridge to the east and responded with a fire engine. The fire was burning on State Responsibility Area land within CAL FIRE's Sonoma – Lake – Napa (LNU) Unit. This incident was given the name Pocket due to its location near Pocket Ranch Road, east of the community of Geyserville. The CAL FIRE LNU Emergency Command Center (ECC) recorded the dispatch time as 3:30 AM (Attachment 1). This was after the Geyserville Fire engine responded. This dispatch time was reported by CAL FIRE as the start time of the incident, and is not the estimated start time of the fire.

The fire would eventually consume approximately 17,357 acres of vegetation and destroy six structures. It would take more than two weeks to fully control the Pocket Fire. The Pocket Fire occurred around the same time as multiple other major fires began in counties across northern California, creating a large demand for resources. CAL FIRE requested investigators from across the state to conduct origin and cause investigations of the fires. I was assigned investigation of the Pocket Fire, along with CAL FIRE Fire Captain Specialist (FCS), Matt FRANKLIN. I responded to multiple fires in my home Unit on October 8th, including one to which I was committed through the afternoon of October 9th. Following that commitment, I slept for several hours and departed early October 10th for Sonoma County.

<u>October 10th, 2017:</u>

After arriving in Sonoma County, I phoned the CAL FIRE LNU ECC and asked for directions to the Pocket Fire. I was told the report they received for the fire was at the intersection of Pocket Ranch Road and Ridge Oaks Road in Geyserville. I checked for the area on a map and found these two roads intersected twice. I drove to Ridge Oaks Road and followed it to the southern intersection with Pocket Ranch Road. I saw

two water tenders, but no fire. I then continued north on Pocket Ranch Road. At approximately 7:30 AM, I met with CAL FIRE Fire Captain Bob TODESCHINI at a structure near the fire's southern edge along Pocket Ranch Road. He estimated the fire was 1,000 acres or more in size and said there were very few resources on the fire. He said he thought the first-in resources were local government engines from Geyserville Fire. I asked him if he had any idea where the origin was. He said he didn't know, but pointed up the road toward the north and said he'd guessed somewhere that way.

The fire did not appear to be actively burning that I could see. A strong inversion was settled in over the area, keeping the smoke from dispersing. While this temporarily kept the fire activity low, it made visibility poor. As I continued driving along Pocket Ranch Road, I found it difficult to see beyond several hundred feet in some areas to tell if an area had burned or not. While driving north toward the northern intersection of Pocket Ranch Road and Ridge Oaks Road, I could see areas along the road which showed heavy consumption and scorching of fuels indicative of advancing fire. Based on fire weather forecasts, radio weather reports, and firefighting experience, I expected to see indications of fire spread from the north and east to the south and west. I saw macroscale fire pattern indicators visible from the road that demonstrated the fire generally moved from the north and northeast, aside from a few areas where it appeared topography had greatest influence. Indicators included, angle of char on trees and brush, foliage freeze on trees and brush, and a clean burn in open grass areas where grass stems were consumed by fire. One area of the topographic influence was found near a fork in the road with a sign indicating Alden Vineyards was to my left. A narrow drainage paralleled the road for several hundred feet. Foliage freeze within parts of this drainage showed winds and possibly fire moving up the drainage from the south. Driving further north, the drainage appeared to be below a ridge and likely sheltered from any prevailing winds. After passing a damaged gate on Pocket Ranch Road marked "22000", I continued north and started downhill. Fuels were heavily consumed near the top of the hill, with signs of angle of char and foliage

freeze indicating the fire had come up to the top of the hill from the north to northeast. I continued and arrived at an area of switchbacks in the road. In this area, I found power lines that were obviously damaged as a conductor had fallen on the downhill side of the road. I continued past this conductor by driving under it along the uphill side of the road. After driving through the next switchback, I found additional conductors down in the road. I stopped here and could see a general appearance of more consumption and scorching of fuels on the uphill side compared to the downhill side. There was what appeared to be one area of advancing fire pattern indicators along the downhill side of the road, beyond the conductors. These indicators of angle of char and foliage freeze showed fire spread to be uphill, crossing the road. Not wanting to drive over the downed conductors, I continued attempting to access other parts of the fire to the north to look for fire pattern indicators.

I met a male in a van driving through Alden Vineyards. He identified himself as Preston ADDISON (Attachment 6). He told me a vineyard worker named Armando was there the first night of the fire and could provide more information. He provided me a phone number and address for Armando, but I did not have cell service and could not find the address. I continued driving in the area.

I later met with FRANKLIN on Pocket Ranch Road. We worked together exploring the fire and looking for possible witnesses. We also placed yellow barrier tape across Pocket Ranch Road to identify the conductors as a safety risk and keep people out of the area. We met a male on another road in the area. The male identified himself as James NAVE and explained the road led to his house at [redacted] FRANKLIN and I discovered maps of this area, such as Google Maps, did not accurately represent all the portions of the roads. Google Maps shows the road where we met NAVE being Ridge Ranch Road, however his address was on Pocket Ranch Road. NAVE drew a map of the area for us (Attachment 7). NAVE told us he was home the night the fire started. He said the wind speeds were about 25 to 30 miles per hour from the northeast at about 9:00 PM on October 8th. NAVE said the

winds increased through the night. He told us he noticed smoke in the air about 10:00 PM that night. When he called to report it, he said he was told there were numerous fires burning. He told us he did not believe the smoke he noticed at 10:00 PM was from this fire and he did not see any fire at the time. NAVE said later that night, about 3:00 to 3:30 AM on October 9th, he woke to the sound of roof tiles blowing off his roof. He told us that was when he went outside and saw fire on the hillside west of his residence. NAVE said he could see the glow of the fire over the ridge to the west. NAVE said he called a neighbor to the southwest, Mark HARRIS, who told NAVE his house was already threatened by the fire.

FRANKLIN and I met a male near Alden Park Vineyards. The male identified himself as Greg ESTRADA. ESTRADA was the General Manager for Alden Park Vineyards. He said he was not in the area the night the fire started, but returned on October 9th. ESTRADA did not witness the fire during its early hours, but did provide information on some areas where the fire had and had not burned on the day of October 9th. I asked ESTRADA if he could put us in contact with Armando, who ADDISON said I should talk to about the night of the fire. ESTRADA also said Armando was there the night of the fire. ESTRADA also said Armando told him that all the tractors from the vineyard had burned in the fire that night. ESTRADA said no tractors burned and they were all parked near the entrance to the vineyard. I had seen the tractors where ESTRADA mentioned. This reported misperception of events led FRANKLIN and I to believe that Armando might not be a reliable witness. We decided to pursue other witnesses and return to search for Armando if we did not find other information to aid us.

ESTRADA directed us to local resident Kelly WILLIAMS, who we were told was at home at the Pocket Ranch when the fire started. We were guided to WILLIAMS's residence at [redacted] using an alternate route shown to us by ESTRADA. The alternate route ran near the bottom of a drainage between Alden Vineyards and Little Sulphur Creek. This route avoided the section of downed power

lines in the road. We met an adult male who identified himself as Steven (Kelly) WILLIAMS who arrived at the residence by UTV (Utility Task/Terrain Vehicle) about the same time. WILLIAMS told us he had just come the other way (through the area of the power lines). WILLIAMS said he tore down the yellow tape since he and neighbors had already driven over the power lines multiple times and was not concerned about them being energized. I told WILLIAMS not to drive that area anymore and not to bypass any more taped-off areas. We asked WILLIAMS about events the night of the fire. He said he went to bed on Sunday night (October 8th) at about 10:00 to 10:30 PM. He said the strong winds kept waking him up through the night. WILLIAMS told us he went outside to the deck about 3:30 AM (October 9th) and saw fire on the hill to the southeast burning toward an A-frame house (satellite imagery shows the A-frame more south than southeast). WILLIAMS's wife, Candace, showed me photos of the fire she had taken on her cell phone. The photos show the fire moved from near the ridge south of their residence downhill toward Little Sulphur Creek. Candace WILLIAMS forwarded me seven of her photos (CW1 through CW7). All show a progression of the fire backing down toward the creek. The first photo, CW1, shows the fire near the ridge with a glow above it, indicating more fire beyond the ridge. WILLIAMS told us the power went out that night and estimated it happened between 10:00 PM and 2:00 AM. WILLIAMS said the road to the residence became blocked by fire and he and his wife were evacuated by helicopter around 8:00 AM. WILLIAMS and ESTRADA attempted to lead us to another vantage point by circling around the fire to the south. The attempt was unsuccessful due to Ridge Oaks Road being blocked by fire. Fire activity increased after the lifting of the inversion layer, and FRANKLIN and I were diverted to protect a structure in the area until suppression resources arrived.

The trip to and from WILLIAMS's residence along the alternate route provided us with additional knowledge of the fire's behavior. The alternate route and Pocket Ranch Road from the area of the downed power lines to WILLIAMS's residence form a rough "T" shape. The vertical and top right sections of the "T" represent Pocket Ranch Road. The top left section would represent the alternate route, with Alden Vineyards at the far

left. The top of the "T" is north, and runs in an east-west direction in a drainage roughly perpendicular to Little Sulphur Creek. As we drove the top of the "T", we saw that the fire intensity on the south (uphill) side of the road had been low. Consumption of fuels was limited to grasses and leaf litter. The leaves on low tree branches and on brush had little damage. This indicated the fire had backed down the hill, from south to north. Fire had also burned on the opposite side of the east-west drainage, up toward a house at the top of the hill. Fire retardant on that side of the hill indicated that side had not burned until after daylight when air tankers could operate over the fire. ESTRADA confirmed the fire had not reached the bottom of the drainage at the alternate route when he first saw it. Photos CW4, CW5 and CW7 also appear to show the fire had not reached the bottom of the drainage perpendicular to Little Sulphur Creek nor had it crossed to the other side.

The information provided by NAVE, ESTRADA, WILLIAMS, and C. WILLIAMS was consistent (Attachment 8). NAVE saw fire on the hillside to the west. WILLIAMS described the fire was to his southeast, burning toward the A-frame house (west of NAVE's residence). Attachment 9 shows an overview of the area. NAVE also described a glow from fire beyond the ridge. Photo CW1 shows a glow beyond the ridge. The witness observations, along with expected fire behavior based on the weather conditions, fuels and topography, and observations made by FRANKLIN and I, of both the fire's location and of fire pattern indicators, led us to an area we believed was nearing the heel of the fire. The advancing side of this area was near the top of the switchbacks past the damaged gate to [redacted] Pocket Ranch Road. As we earlier drove the alternate route to the WILLIAMS's residence, we observed that route showed signs of low intensity backing fire. This was downhill from the switchbacks, and demonstrated fire originated between the top of the switchbacks and the alternate route.

FRANKLIN and I returned to this area after being relieved by a fire engine at the structure we stopped to protect. We had learned the alternate route to WILLIAMS's

residence at the Pocket Ranch was only suitable for pickup trucks and smaller vehicles. As I was driving back to this area, I contacted the Division Supervisor for that part of the fire. I told him of the downed power lines and to only let fire engines through the area if they were needed for structure protection at the Pocket Ranch because there was no other access. I told him smaller vehicles could use the alternate route and described it.

Within the overall area near the switchbacks were the downed power lines. When FRANKLIN and I put up the yellow barrier tape, we saw multiple fulgurites in the road. Nearly all the fulgurites were found close to an area of sooting and discoloration of one conductor. These fulgurites would have been created when the conductor was energized. Because Pocket Ranch Road was going to be the only access for fire engines to the structures at the Pocket Ranch, FRANKLIN and I decided to photograph the power lines and fulgurites before any other vehicle traffic passed. I did not observe any noticeable changes to the conductors compared to when FRANKLIN and I placed the barrier tape in the morning. We placed four orange cones, two on each side of the downed conductors, to guide any fire engines through a portion of the road that would avoid contact with the broken end of a conductor and some of the fulgurites. There were several times during the investigation FRANKLIN and I had to let fire apparatus pass through to get to the Pocket Ranch. During these times, we ensured only necessary equipment passed, directed drivers where to pass, and told them to keep straight and not turn while passing through the cones.

During the investigation, both mine and FRANKLIN's department-issued cameras were used. Because the cameras started with differing file numbers, photographs from my issued camera were renumbered to coincide sequentially with those from FRANKLIN's. Attachment 10 shows the renumbering of the photographs. The Photographic Log (Attachment 11) provides the date and times the photographs were taken. Attachment 12, Photographs, includes those taken that evening (0169 – 0240) showing overview of the power line and road areas, positioning of the conductors in and near the road, areas of discoloration or bending of conductors, and fulgurites. I

also sketched the position of the conductors in the road (Attachment 13). Because of the fading daylight, we were unable to continue assessing indicators. We had observed some indicators over a large area from the road, but had not yet seen enough to determine a manageable area to secure. The large area we were assessing was accessible by road from three sides and would require guards posted at each location. Due to the large area and a lack of available resources caused by the demand from other fires, we decided to not post security guards for the night. Security for the night consisted of the verbal instruction given to the Division Supervisor and to WILLIAMS.

October 11th, 2017

FRANKLIN and I arrived back at the switchbacks on Pocket Ranch Road at approximately 8:00 AM. We estimated the directions to the residences of NAVE and WILLIAMS from the switchbacks. We found the switchbacks to fit within the areas those witnesses described seeing the fire. We began to assess macroscale indicators in the overall area. We again discussed indicators of angle of char and foliage freeze visible from the road as we drove in. These indicators near the top of the hill and where we met NAVE the day before, showed advancing spread to the south and some more to the southwest, angling toward the east side of a vineyard.

FRANKLIN and I began walking the area we determined the previous night to possibly be the overall fire area (or heel of the fire). We covered a large area, approximately ten acres in size (Attachment 14). Doing so, we determined this was the overall fire area, and we began to narrow down the General Origin Area (GOA) through continued assessment of macroscale indicators. Visible around the road, near the top of the hill were indications of advancing spread including angle of char/scorch, overall V pattern of more consumed fuels, and foliage freeze. Working around to the east side, we identified a transition to lateral and then backing fire as we progressed down the slope toward Little Sulphur Creek. Indicators here included grass stems, which transitioned from consumed near the top, to stem-fall in lateral and backing areas farther downhill. Angle of char/scorch in these areas became parallel to the slope, and

lower branches of trees and brush were only scorched or unburned. White ash deposits and some foliage freeze showed unsheltered areas of the east-facing slope were exposed to east, upslope winds. Continuing our perimeter search to the north, the slope turned from east-facing to north-facing. Fire pattern indicators showed backing fire spread down this slope as well. Indicators of protection, grass stem, white ash, and foliage freeze showed the fire backed downslope against north to northeast, upslope winds. Moving back up the western side of the area showed a transition to higher intensity fire farther uphill. As we reached areas along the vineyard which were less sheltered from trees, we again saw signs of foliage freeze where winds had blown from the northeast and east. We also found a lesser drainage aligned with the general northeast wind conditions where the fire advanced toward the vineyard in wind and slope alignment.

Photos 0428, 0429, and 0441, aerial photographs taken during a helicopter flight on October 24th, 2017, show the overall topography of this area. The backing fire indicators we saw on the east side of the area were consistent with the photos taken by C. WILLIAMS and of the description of the fire by the residents who saw the fire around 3:30 AM. NAVE's description of the fire he saw west of his house also was consistent with the backing fire indicators. Observations FRANKLIN and I made in this overall fire area led us to two areas to begin investigating as possible GOAs.

From the area where the conductors were found lying in the road, there looked to be one origin above the road and one below. We considered the possibility the one above the road started from a spot fire from the possible origin below. The advancing vectors of these two areas however were not in-line, where spot fires would most likely occur. The advancing vector from below the road continued across Pocket Ranch Road where it burned in the lesser drainage with the wind-slope alignment toward the vineyard. The apparently separate advancing fire vector above the road was east of the one in the lesser drainage. We saw these to be separate runs above the road because an area of heavier brush and small trees between the two areas was less

consumed, with lateral fire spread indicators on each side. These indicators included white ash deposits and/or sooting on exposed sides of indicators, protection on unexposed sides of rocks and vegetation, and foliage freeze found at an angle to advancing spread. Seeing there were two areas to examine, we used the term, "upper", for the uphill (southern) origin, and "lower" for the one downhill (northern) from the portion of Pocket Ranch Road running between them. While examining fire pattern indicators in the overall fire area below the road, it became apparent a portion of a tree was on the ground by the downed conductors. I did not notice the tree portion on October 10th, when I walked below the road approximately 25 feet to photograph the lower power pole and a suspended portion of a conductor. The portion of tree appeared at least partially burned, indicating it did not fall after the fire passed. We observed it was on top of one conductor. A forester and an arborist had been requested to assist CAL FIRE investigators if needed at any of the fires. We requested they respond when available to examine the tree portion and the related tree.

The advancing area of the upper GOA began at Pocket Ranch Road, west of a power pole marked with a painted "7" near the base. The upper GOA we determined to be between Pocket Ranch Road on the north and south sides, along the area of thicker, less consumed brush and trees on the west, and approximately 75 feet west of the road switchback on the east side. We began moving through this area from the uphill side, working laterally east and west in an "S" pattern while placing fire pattern indicator flags. These indicator flags are visual markers used to demonstrate fire progression and aid with scene documentation. We found indicators and clusters of indicators of advancing fire, including: protection, grass stem, freezing, angle of char, sooting, staining, white ash, and an overall V pattern of the area of more-consumed fuels. Red fire pattern indicator flags were used to identify advancing fire pattern indicators.

As we moved to the east and west edges of the GOA, we saw transition zones showing decreases in fire intensity. On the west side, fire transitioned from advancing to lateral where it began to burn side-slope into an area of heavier fuels. Fuel

consumption was comparatively less than in the advancing area. Indicators of protection, freezing, angle of char, sooting, staining, and white ash showed this transition. On the east side, another transition zone was identified. This zone transitioned from advancing fire spreading uphill toward the south-southwest, to lateral spread side-slope and uphill to the southeast, and then transitioned to backing fire on the east side approaching the switchback. It was evident by areas of protection, grass stem, staining, and freeze where the fire was exposed to the east winds in this less sheltered area. This was the same fire behavior seen in larger scale when we walked the east side of the overall fire area earlier in the day. Yellow fire pattern indicator flags were used to identify lateral fire pattern indicators.

FRANKLIN and I continued working back and forth down the hill until the indicators were becoming less obvious in an area where the burned grass fuels were intermixed with bare dirt. The remaining daylight did allow us to work around this area where we saw signs of backing fire close to the portion of Pocket Ranch Road that ran between the origins. We observed indicators of protection, grass stem, sooting, and staining showing backing fire spread. Blue fire pattern indicator flags were used to identify backing fire pattern indicators.

FRANKLIN and I concluded that day's examination of the scene at approximately 7:00 PM. At approximately 7:35 PM, a Pacific Gas and Electric (PG&E) employee arrived in the area. The employee, Michael JONES, tested the power lines near pole "7" and in the road, confirming they were deenergized. He said they were not grounded and could still be dangerous. JONES left two orange cones at the conductor crossing the road still attached to pole "7" and departed. Having confirmed this was the overall fire area and identified a manageable area to protect, we had requested security to maintain control of the scene. There was a shortage of private security personnel from the demand caused by the multiple major fires. Two firefighters from Napa County Fire were assigned to keep the scene secure that night. Erik ANESON and Andrew WHEELER arrived around midnight, and were briefed on the situation. They were

instructed to only let through any fire engines needing to get to or from the Pocket Ranch and advised of the alternate route. We briefed them on safety considerations including the ungrounded power lines and the uncontrolled fire. They were also instructed not to discuss the scene with others. FRANKLIN and I departed.

October 12th, 2017

FRANKLIN and I arrived back at scene at approximately 9:35 AM and relieved the Napa County firefighters. ANESON said that no vehicles had passed through the site during their shift. That morning I photographed pole "7" due to concerns an oak tree (visible in background of Photo 0241), burned at its base, might fall into the pole. I observed no noticeable changes in the condition of the pole or its attached conductors from the times I saw it on October 10th, 2017. These photographs document the pole and its attached conductors in Photos 0241through 0245.

I then began working with FRANKLIN in the lower (northern) GOA. The south side of the lower GOA we determined to be at Pocket Ranch Road where it ran between the two origin areas. The north side we determined to be several yards below the power pole marked with a painted "6". The west side was in a flat open area of grass leading uphill into heavier vegetation toward Pocket Ranch Road. The east side was determined east of the spur ridge and a line of oak trees roughly in-line with the power line path.

Photo 0106 shows where the advancing fire vector of the lower origin was identified below Pocket Ranch Road. We examined this origin area in the same manner as the upper one. We used red, yellow, and blue fire pattern indicator flags to mark advancing, lateral, and backing fire pattern indicators, respectively. We started working our way downhill from the road, moving east and west in an "S" pattern. We identified advancing fire spread indicators between lateral transition zones on the east and west sides. The advancing vector was identified by indicators of: protection, grass stem, freezing, angle of char, sooting, staining, white ash, and again an overall V

pattern of more highly consumed fuels. The base, or point, of the V was near the fallen portion of tree lying on the conductor.

The east and west edges of this lower advancing vector showed signs similar to those seen at the upper origin area. Fire intensity was relatively lower in these areas of transition, shown by more remaining grass stems and lower levels of scorching and charring of foliage. On the west side, a tree had fallen which appeared only burned near its base. Its green leaves and unburned branches showed it fell after the fire had passed. A flat, open area was west of this fallen tree. Grass stem and protection indicators showed the fire moved laterally to the west through the area. On the north side of the flat, the topography changed to the overall north-facing slope, and the fire transitioned to a backing vector. On the east side of the fallen tree were more lateral indicators west of the advancing vector. This included an area of lesser consumption of fuels. Photo 0125 shows some of this area as well as the flat area in the top-left corner. Patterns of protection, freezing, angle of char, sooting, staining, and white ash were found along the lateral zone. The east side lateral area identified was similar to the one seen at the upper origin area. This area showed a southeast lateral vector where the fire moved side-slope and uphill at an angle to Pocket Ranch Road. Downhill from this area, closer to the fallen tree top, the lateral fire spread was more to the east where it burned a short distance up to the spur ridge along the power line path. East of the spur ridge, evidence of the east winds again became apparent in the more open, less sheltered areas. Considerably more grass stems remained in this area showing the fire backed into the wind as it moved east. Indicators of grass stem, protection, sooting, staining, and white ash were present at the east side lateral area.

Moving downhill through the advancing area between the lateral areas east and west showed these areas coming together close to the downed tree top lying on the conductor. FRANKLIN and I continued around this area that we knew to be nearing the Specific Area of Origin (SOA). We began to work the area we knew showed backing fire spread to continue to establish the SOA. We started assessing indicators below

power pole "6". Fuels north (downslope) of pole "6" showed lower intensity burning, with little damage to low hanging leaves of trees and brush. Many more grass stems remained and tree leaves were less consumed than in areas under the trees in the advancing and lateral zones. Other indications of backing fire included: protection, freezing, angle of char/scorch, and sooting.

At approximately 11:00 AM, CAL FIRE Forester Peter LEUZINGER and CAL FIRE Battalion Chief Matt GILBERT arrived at scene. We led LEUZINGER to the area where the downed piece of tree top was lying on the conductor, instructing him to be careful of our indicator flags and the conductor. LEUZINGER said he would provide us a written statement regarding his observations of the portion of tree top and the related tree (Attachment 15). LEUZINGER identified an area of rot that was also evident to FRANKLIN and me. The rot was evident in a split on the portion of tree top on the ground as well as in a similar-shaped split on a nearby oak tree. LEUZINGER departed while GILBERT remained at scene. LEUZINGER also included Photos PL_165 through PL_171 with his statement of observations (Attachment 12).

GILBERT assisted FRANKLIN and I with further flagging of indicators. Together, we completed flagging of the lower origin. We used lime green flags to show the smallest area we could identify as the lower SOA (Photo 0003). This SOA was approximately 5 feet by 14 feet in size. We then returned to the upper origin area where we continued flagging. GILBERT assisted us for a short while prior to leaving. Our progress was slow in this area due to the sparser fuels and intermixed bare dirt.

That afternoon two PG&E employees approached the scene. At approximately 1:35 PM, an employee arrived who was inspecting all the power lines and poles in the area before the company would attempt to restore power. We discussed getting this portion of downed power lines grounded. He said the power lines could be made safe without disturbing the area where we were working. He told us they would work on getting that done. We allowed the inspector into the upper portion of the lower GOA so

he could determine if there was any other damage to the poles or power lines to the north and note the work that needed to be done. At approximately 3:35 PM another PG&E employee arrived. We also discussed grounding of the power lines with him. He told us he would get to a location of cell service and make some calls to see about getting that done. He told us if we did not see him in about 15 minutes, it was unlikely the grounding would happen that day. He did not return and no grounding occurred.

Scene security was now going to be provided by SVT Gruppe Incorporated whenever FRANKLIN and I were not at scene. One security guard was assigned per shift. Each night before we would depart, FRANKLIN and/or I would brief the assigned security guard. The security guards were each briefed on the situation and our expectations. These briefings included the same instructions given to Firefighters ANESON and WHEELER. Debriefings also occurred when we would return to the scene in the mornings. During the debriefings, there were two reports by the SVT guards of vehicles passing to get to and from the Pocket Ranch. These involved one truck during the shift beginning October 14th, and one engine during the shift beginning October 15th. FRANKLIN and I departed at approximately 7:05 PM.

October 13th, 2017

FRANKLIN and I arrived back at the scene at approximately 7:50 AM. After relieving the SVT security guard, we continued placing indicator flags in the upper origin area working toward a SOA. The consulting arborist, Mark PORTER arrived midmorning, along with GILBERT. We escorted PORTER to the area of the tree top and showed him the involved tree. PORTER identified areas of rot in the tree top and tree. He also described areas on the tree having visible signs of "woundwood". PORTER showed us an area of the tree where removal of a large portion of the tree had occurred years earlier. PORTER said these areas would allow pathogens to enter the tree past the protective bark. He said these signs of weakness should have been apparent to those inspecting the vegetation surrounding the power lines. In the following days, I took photographs representing some of the observations PORTER

discussed. Photo 0071 shows an overview looking towards the east of the tree top portions and the tree. Photo 0073 shows the break on the tree. Photo 0076 shows the orientation of the break in relation to the powerline path. An example of the "woundwood" PORTER described can be seen in Photo 0091, shown as a thick buildup of wood around the opening. Photos 0092 through 0096 show the area where a portion of the tree was previously removed. Photo 0093 shows how the area formed a flat plane, indicative of that portion being removed. PORTER made notes and took measurements and told us he would provide a report of his observations of the tree top and tree (Attachment 16). PORTER described what portion of the tree top should be collected for evidence based on the visible rot. These portions were later collected as Items 1A, 1B, and 2 (Attachment 17). PORTER discussed having wood samples from the items we would collect sent to a laboratory for testing. Further information on the testing is included in his report.

FRANKLIN and I returned to flagging indicators at the upper origin area. At approximately 3:30 PM, FRANKLIN began photographing fire pattern indicators in the lower GOA using his assigned camera (Photos 0001 through 0037). He also photographed an area of discoloration on the conductor near a portion of the broken tree top that we had observed while assessing indicators at the lower origin (Photos 0008 through 0010). I continued assessing fire pattern indicators at the upper origin. The upper SOA was determined to be above the cut-bank on the uphill side of Pocket Ranch Road where the road ran between the two origin areas. The upper SOA was approximately 4.5 feet by 10 feet in size, in the shape of a rectangle.

Two different search techniques were used for the two SOAs. A parallel lane technique was chosen for the lower SOA. This technique uses a series of marked lanes laid parallel to the advancing fire vector. The lanes systematically break the SOA into manageable search areas. This technique was chosen for the lower SOA primarily because of the orientation of the trunk portion of the tree top within the SOA. A perpendicular technique would have placed a large obstacle within each lane, causing

the need to place separate lanes on each side of the trunk. I placed lanes at the lower SOA as shown in Photos 0246 through 0255. I began the search on the downslope side to avoid causing materials to roll down onto unsearched lanes. I conducted a visual search of each lane using a straightedge to maintain a systematic search. I also used a magnifying glass when necessary. The straightedge was longer than the width of the lanes. This allowed me to use the entire length of the straightedge to guide the visual search into an overlapping area of the adjacent lanes to ensure an area was not overlooked. I looked for any indications of ignition, both from the conductor and from other causes. I found no further signs of ignition. There were no other obvious fulgurites, and I did not see evidence of any other ignition source. After completing the visual search of each lane, I used a magnet to search that lane before moving to the next. The magnet search yielded only small specks of dirt, likely containing iron. I did not magnet search the portions of the lanes at the conductor since it still was not grounded. The only source of ignition I found in the lower SOA was the conductor that was under and along portions of the broken tree top. The area of conductor discoloration shown in Photos 0008 through 0010 was found in search lane 3 (Photo 0251). Photo 0010 also shows a bulged area near the discoloration on the conductor. This discoloration appeared similar to the areas of discoloration on the same conductor where it was on the road and close to the fulgurites.

FRANKLIN and I completed examination of the scene that day and departed at approximately 7:10 PM. Scene security was again being provided by an SVT Gruppe Inc. security guard.

October 14th, 2017

I arrived the following morning at approximately 7:45 AM and relieved the SVT security guard. FRANKLIN began the morning by visiting NAVE's residence, to see the area from NAVE's reported vantage point when he first saw the fire. When FRANKLIN returned to the origin scene, he told me NAVE described seeing fire in the area where my department vehicle (visible from NAVE's residence) was parked at the east

switchback. While FRANKLIN followed up with the witness, I photographed the area of the upper SOA (Photos 0256 through 0262). The area is identified by green flags in the photos. While not visible in the photos, the lower SOA would be in the direction of the top left of Photo 0262. Then I began a search of the upper SOA.

For this SOA, I chose to use a perpendicular lane technique. This technique was chosen so that I could work from the downslope side where I would not cause materials to roll into unsearched areas. These lanes were arranged perpendicular to the advancing vector of the fire. The lanes were placed as shown in Photos 0263 through 0272. The same methods of visual and magnet searching were used at this SOA as were used at the lower SOA. The visual search revealed no indications of ignition. Unlike the lower SOA, no conductor was laying in this SOA. This allowed the magnet search to be conducted throughout this SOA. Again, the only items identified by the magnet were small specks of dirt. The only probable sources of ignition were either a spot fire from below the road or contact of the power lines with the ground as they were brought down by the tree top.

As I was completing the search of the upper SOA, Dave KAROLY and Dan GREGORY, surveyors with CAL FIRE, arrived to perform a LIDAR survey of the scene. LIDAR (Light Detection and Ranging or Light Imaging, Detection, and Ranging) can create an accurate digital image, or model, of the objects surveyed (Attachment 18). An electronic copy of data from the LIDAR surveys done by the CAL FIRE survey team for multiple fires, including the Pocket Fire, will be stored at the CAL FIRE LNU Santa Rosa evidence locker.

When the surveyors had completed their operations, FRANKLIN and I prepared to collect portions of the tree top as evidence. I photographed the overall area, the items to be collected, the involved tree, and the conductor running under the tree top. I also photographed the tree top showing the removal cuts made to collect Items 1A and 1B. Photos 0038 through 0083 show these areas described. These photos were taken

by me using FRANKLIN's department-issued camera, as it already contained photographs he had taken of indicators in the lower GOA. Using a chainsaw, I cut the tree top where PORTER had said to cut it. PORTER said the cuts would allow us to collect what was needed to represent the rot and break. This required two cuts as PORTER said to remove it just past a fork in the trunk of the tree top. Photo 0081 shows the cuts made. A crack at the fork had caused too much damage to hold the forked area together. The weight of one side of the fork could no longer be fully supported by the remaining wood at the crack once removed from the supporting tree top. When the upper cut was made, the top portion of the fork sagged toward the lower portion (compare angle of cuts in Photos 0081 and 0083). After making the lower cut and bringing both portions of the fork to the ground, we realized we would not be able to move the pieces without them separating. There was almost no wood connecting the two pieces together. Item 1 was then collected as two separate pieces, Items 1A and 1B. The larger of the two pieces was identified as Item 1A. Photos 0082 and 0083 show the area of separation of the two items. The portion of the trunk found separated from the nearby tree top was collected as Item 2. It is shown in Photos 0062 and 0063. GILBERT arrived around the time the surveyors were finishing and helped FRANKLIN and I move the evidence items up to the road. GILBERT took custody of Items 1A, 1B, and 2 and transported them to a CAL FIRE evidence locker in Middletown.

That afternoon it was determined FRANKLIN would be assigned to assist on another fire the following day. Since I would be the only investigator at scene and did not have cell service at the origin, we requested SVT provide site security 24 hours per day. FRANKLIN and I departed at approximately 7:35 PM, with an SVT guard on site.

October 15th, 2017

I arrived at scene at approximately 7:30 AM. SVT security remained in the area as requested in case I needed to leave the scene. I began the day taking additional photographs of the involved tree (0084 through 0096). Again, I was using FRANKLIN's camera. I also took several photos (0097 through 0100) to show the canopies of other

standing trees in the area so they could be compared to the canopy of the involved tree. Photo 0084 shows the overall canopy of the involved tree to have less dense foliage than some of the surrounding trees. Photo 0099 shows the involved tree at the right edge of the photo and a tree at the center having a greener appearance of the foliage than the involved tree. Photos 0101 through 0104 show other trees fallen over and near the conductor. The green leaves and unburned tops show these trees fell after the fire had burned through the area. I concluded use of FRANKLIN's camera by photographing some of the flagged indicators in the lower origin area (Photos 0105 through 0168).

Later, I collected a fulgurite from the portion of the road between the two origin areas as an example of the general characteristics of the fulgurites observed on Pocket Ranch Road. The location the fulgurite (Item 3) was found is shown in Photos 0273 through 0275. Photos 0276 and 0277 show its approximate size. A hole, or tubular formation, was visible at one edge of the fulgurite (Photo 0277). I used the metal rod from an indicator flag to gauge the depth of the hole. Using a piece of tape to mark the depth, I found the rod went into the ground over two and one-half inches (Photos 0278 and 0279). The fulgurite was found several inches from an area of discoloration on the nearby conductor (Photo 0280). The discoloration had the appearance of being caused by heat. The center of the discoloration appeared as a copper color. The edges were black and sooty, and surrounding this was a green copper patina (Photos 0281 and 0282). Photo 0283 shows the tube formation after collecting the larger fulgurite pieces. Photo 0284 shows what remained after collection.

The rest of the day I spent continuing to document the scene with photographs, field sketches, measurements, and notes. I photographed a sampling of the flagged indicators from the upper origin, as I had done in the lower origin. I generally took overall, mid-range, and close-up photographs of the indicators to show their location and orientation to the fire's spread (Photos 0285 through 0368).

The next series of photos (0369 through 0408) show both power poles and areas of the power lines between them. The series starts at pole "7", works down the conductor from the western side of the span to pole "6", then along the conductor from the eastern span back to pole "7". I used a series of letters to identify the broken ends of the conductors. Break "A" was on the western span. Breaks "B" and "C" were on the eastern span. Break "A" occurred close to pole "7". This left most of the conductor from the western span still attached to pole "6". PG&E confirmed the power came from that side. This would account for the fulgurites found in the road near the conductor that was attached to pole "6", but not on the conductor that was broken from pole "6" and laying across the same section of road. The western span would later be collected as Items 5 and 7, with break "A" separating them. Item 7 was the longer piece. From pole "6", Item 7 ran under the tree top of the involved tree, and on the ground almost to the road. Near the north edge of the road, the conductor was suspended in brush and tree limbs. Beyond this suspended area, the conductor went back to laying on the ground next to and on the road. Here it laid in a twisted mass. Photos 0379 and 0380 show the overall area of the "A" end of item 7. Photo 0381 is a close-up of the "A" end.

Photos of pole "6" show how the pole appeared to have shifted. In Photo 0387, a gap is visible between the dirt and the uphill (southern) side of the pole. I believe this gap was likely created due to the loss of tension from the power lines going to pole "7" when they broke. The power lines continued downhill on the north side of pole "6". This would act as a force pulling the top of the pole in that direction.

The eastern span would later be collected in three pieces. Item 6 would come from pole "6". Item 4 would come from pole "7". Item 8 would be collected from the ground, nearer to Item 6. Following the east span from north to south, the order would be: pole "6" – Item 6 – break "B" – Item 8 – break "C" – Item 4 – pole "7". A simplified drawing of the conductors, breaks, and poles is shown as Attachment 19. Photos 0392 through 0398 show the overall area and the ends of the conductors (Items 6 and 8) at break "B". Photos 0399 through 0401 show break "C" on Item 8. Photos 0402 through

0406 show break "C" on Item 4.

I took measurements from the scene from several fixed points. Some of these points were preexisting, including: pole "6", pole "7", the involved tree, and a power pole providing service to a water well. Much more precise measurements could be provided by the LIDAR scan. Reference Point 1 (RP1) was a control point placed by the LIDAR survey team. It was made using a large nail placed in the ground. Photos 0409 through 0414 show RP1. Reference Point 2 (RP2) was also made using a large nail. This one I placed near ground level on the east side of an oak tree along the road. Photos 0415 through 0418 show RP2. The west side of the power pole servicing the water well was used as Reference Point 3 (RP3). Photos 0419 through 0421 show RP3. Photos 0422 and 0423 were taken from RP3 to show the orientation to RP2. I used a method of triangulation to measure the locations of the approximate centers of both SOAs and the approximate areas where the tree top portions and fulgurite were collected. This method used a set of three measurements, each from a different fixed point, to locate the area. I also used the handheld GPS to find the approximate locations of these areas. The surveyors would also have collected some of this information with much more accurate instruments. I also collected approximate measurements of the involved tree, its top, and the approximate center of the power line path. I estimated the center of the power line path by standing under what appeared to be a communications line which was still suspended between poles "6" and "7". Based on my experience on multiple emergency incidents involving above-ground utility lines, I have been told multiple times by utility company employees that such lines can include phone, cable, or fiber optic lines. In my experience, these lines are usually attached directly to power poles below the level of electrical conductors. I found the involved tree to be approximately 15 feet perpendicular from the center of the power line path. The center of the power line path perpendicular to the saw cuts made on the tree top to collect evidence was approximately 14 feet. From the involved tree to the saw cuts was approximately 35 feet (line was not perpendicular to the power line path). The measurements I took that day are documented in Attachment 20.

I left the scene at approximately 7:15 PM. SVT was still maintaining security over the site, and I ensured a new guard was briefed before leaving.

October 16th, 2017

I arrived back at scene the following day at approximately 10:40 AM. I was notified by the security guard his company was running short on personnel. He said the scene had not gone uncovered, but if he were able to leave now, he could return for the night shift. I agreed and told him I would maintain control of the scene that day. I removed the indicator flags, then cleaned and organized equipment. There were noticeably more vehicles in the area that day. I saw more fire department vehicles and utility company vehicles than on any other day, but none had to travel over the conductors in the road. Another PG&E employee, working with a Southern California Edison employee, arrived and were inspecting for areas of damage to poles or power lines. I escorted the two employees to pole "6" where they would be able to observe the gap between the dirt and the pole's base and poles and power lines to the north. The SVT security guard returned at approximately 8:45 PM, and I departed.

October 17th, 2017

On this day, FRANKLIN returned to the POCKET Fire to assist me with evidence collection. FRANKLIN and I met at the staging area for the Pocket Fire at Highway 128 and River Road near Geyserville at approximately 12:30 PM. I had received instruction to meet representatives from PG&E at the intersection at 1:00 PM who would assist with collection of the conductors from the poles. While we waited, I saw a white Ford Explorer marked with PG&E's logo along with an unmarked white Ford Explorer turn onto River Road from eastbound Highway 128. The vehicles did not stop, and I did not believe they were the ones we were waiting for because no bucket truck was with them that could perform the work. While FRANKLIN and I waited, I spoke on the phone with CAL FIRE Division Chief Shawn ZIMMERMAKER, who was coordinating the multiple fire investigations. ZIMMERMAKER instructed me to only allow the PG&E personnel

into the scene who were needed to remove the lines and to not release the scene until FRANKLIN and I were done. After 1:15 PM, a United States Forest Service employee who I had recognized as a line supervisor on the Pocket Fire from the day before, drove to where FRANKLIN and I were parked. He told us a group of PG&E trucks was on Pocket Ranch Road headed toward the origin. No PG&E representatives ever met us at the designated location.

FRANKLIN and I immediately drove from the staging area toward the origin. At Pocket Ranch Road, just south of Alden Vineyards, we came to a group of several passenger vehicles stopped in the road. I stopped and noticed yellow barrier tape had been placed across Pocket Ranch Road ahead of the vehicles. I did not know who placed the barrier tape. I was approached by multiple individuals; a female identified herself as a PG&E representative, another I recognized as Michael GINN, who I knew to be a private fire investigator and instructor of California State Fire Marshal fire investigation classes. GINN told me he was the investigator representing PG&E. I informed the group we would only be allowing the line removal crew into the scene and when FRANKLIN and I finished the evidence collection, we would release the scene completely. GINN and PG&E personnel objected. I removed the barrier tape and asked the group to move their vehicles to the area of the vineyard entrance where we could speak without blocking the road. GINN and PG&E employees continued to protest not being allowed into the scene. I explained I was given clear instruction on the matter and that this was being investigated as a crime scene.

I was informed the PG&E crew who would assist with the removal of conductors was delayed while they drove a different route to our location. While we waited, I met with the SVT security guard and ensured he understood not to allow anyone into the scene until FRANKLIN or I directed. FRANKLIN then met me on the road to the origin and informed me the PG&E crew arrived and he was taking some of them to assess what trucks or equipment they needed to do the work. The crew retrieved the necessary equipment and we began collection of the conductors at pole "7".

A crewmember asked what components we wanted. I explained we wanted both conductors from the span between the two poles and did not need any other hardware from the poles. We agreed they would cut the lines 24 inches from the centers of the insulators. This avoided removal of line taps that went to the transformer on pole "7", which showed no indication of involvement in the fire cause. It also provided a consistent method of removal. When asked to mark the power lines to indicate which direction was positioned up, a crewmember offered to mark them as they had already done at other fires. They wrapped white tape around each conductor and marked a line with a felt pen on the top before removal. I similarly used orange tape to mark the top sides of other areas of conductors where they were on the ground. Orange tape was also used to identify the evidence item numbers and broken ends of the conductors. Evidence tags were later added for further description of the items. The ends cut by PG&E were not marked with tape and were left exposed.

The conductor pieces were assigned evidence item numbers in the order they were removed by PG&E. FRANKLIN took photos 0424 through 0427 during the collection process. Item 8 was not cut from a pole by PG&E since it was already a separate portion of the eastern span, broken at both ends. A sketch of the items collected and markings used to identify the breaks is included in Attachment 21.

Items 4 and 5 were collected from pole "7". Item 4 was taken from the eastern side of the pole. Item 5 was removed from the western side of pole "7". Items 6 and 7 were collected from pole "6". Item 6 was cut from the eastern side of the pole. Item 7 was removed from the western side and had to be cut 22 inches from the insulator because of the location of a connector, commonly called a line splice. Item 8 was not cut from a pole by PG&E since it was found on the ground broken from the other two portions of the eastern span. Refer to Attachment 19 for the simplified drawing.

Once PG&E had finished removing the conductors from the poles, they were

released. FRANKLIN and I continued work we had started to protect portions of the conductors including, the broken ends of the conductors and areas that showed heavy discoloration beyond sooting from smoke. These discolored areas appeared to have resulted from high heat, and were a brighter copper color. We used bubble wrap, tape, and plastic sheeting to protect the areas. Not including Item 5, which was short in length, the conductors were coiled and secured with duct tape. After FRANKLIN and I completed packaging the evidence, we released the scene to PG&E and other investigators at approximately 6:15 PM.

October 24th, 2017

After a flight in a helicopter to take aerial photographs (0428 through 0441), I met with two witnesses this day to collect follow-up information. First I met with C. WILLIAMS, who had provided me with photos CW1 through CW7. C. WILLIAMS provided me the dates and times she said were recorded by the phone for the photos. She described the approximate directions she had taken the photos from by her home. She also further described events as she recalled them the night and morning of the start of the fire (Attachment 22).

Next I met with James TOVANI, a Fire Captain with Geyserville Fire Protection District (FPD). I had contacted Geyserville FPD directly because the LNU ECC did not have an accurate record of what resources were first at scene. When I had phoned Geyserville FPD, TOVANI explained he was one of the first at scene and agreed to meet with me. A summary of my meeting with TOVANI is included in Attachment 23. TOVANI explained he learned of the fire when a man drove to their station as they were about to respond to a different reported fire. He said the man asked if they were going to the fire and pointed east. TOVANI said he looked that way and could see a glow at the ridge near Pocket Ranch Road. TOVANI provided me a dispatch report for the other reported call (Attachment 24). This gave a time close to when he responded to the Pocket Fire. TOVANI showed me approximate locations they found active fire when they responded using satellite imagery. The advancing areas he described were

consistent with conditions and observations described by NAVE, WILLIAMS, and C. WILLIAMS. TOVANI said they could not initially estimate the fire's size due to darkness and terrain. Later, based on where they had encountered active fire, he said they estimated the fire was 200 acres. He said the fire seemed to be pushed from the north, but they also experienced swirling winds. TOVANI described wind shifts later in the morning, as C. WILLIAMS had also noted. Data from the Hawkeye RAWS shows a period in the morning of October 9th when winds decreased considerably as well as some varying wind directions (Attachment 4).

Based on the investigation of the Pocket Fire, the following cause class was included:

Electrical Power

Two GOAs were identified at the Pocket Fire. Downed electrical conductors ran through both GOAs. In the lower origin, one conductor ran through the SOA. The two GOAs were on opposite sides of Pocket Ranch Road.

The lower SOA was found approximately 100 feet below (north) of Pocket Ranch Road. This SOA contained a portion of the broken tree top lying on top of a conductor still connected to the western side of pole "6". This portion of conductor (Item 7) showed evidence it had been energized when it contacted the ground. This was demonstrated by the fulgurites found in the road. The fulgurites were mostly found near areas of damage to the conductor. This damage included discoloration where the conductor was a brighter copper color, and in some cases, sharper bends in the conductor. PG&E employees confirmed the electricity flowed in the direction from pole "6" to pole "7". A grid search of the lower SOA yielded no other sources of ignition. The only competent ignition source found within this SOA was the conductor that was under the portion of tree top. The electricity from this energized conductor would have been sufficient to ignite dry vegetation under or around the broken tree top.

The upper SOA was located closer to, and above Pocket Ranch Road in comparison to the lower SOA. The conductor connected to the eastern side of pole "7" (Item 4) was found in contact with the ground near the upper SOA, but not running through it. Because the electricity flowed from pole "6" toward pole "7", this conductor was likely not energized when it contacted the ground. No fulgurites were found along this conductor. Item 4 did not appear to be a competent ignition source. No physical sign of ignition was found within the upper SOA following a grid search.

Based on the totality of circumstances, FRANKLIN and I considered two probable causes for ignition of the upper origin. One cause would have been from an ember blown across Pocket Ranch Road, landing in the dry fuels, and igniting the vegetation as a spot fire. This, or direct flame contact from wind-driven flames caused the Pocket Fire to cross multiple roads, trails, and other barriers. The advancing vector from the lower origin extended across Pocket Ranch Road in a more southwest direction, where macroscale indicators showed the fire burned up through the lesser drainage. This was not in-line with the upper origin, where a spot fire would have been most likely. The other probable cause of ignition for the upper origin was from the same conductor that caused the fulgurites in the road (Item 7). When this conductor broke from close to pole "7", gravity caused it to be pulled downhill toward pole "6". A large section of this conductor fell into the road in a haphazard arrangement. This is where the fulgurites were located. The upper SOA was in-line between the haphazard arrangement of conductor and pole "7". Based on the slope, alignment, and similar location of ground contact of the downed eastern conductor (Item 4), it is likely the energized conductor (Item 7) contacted the vegetation above the road before coming to rest on the road. The upper SOA was in an area where this contact could have occurred.

The only ignition source found in the general area of both origins was the downed power lines. These power lines were brought down by the tree top which broke from a nearby oak tree, fell across the power lines, and ultimately came to rest on top of

a portion of the western conductor. The broken tree top was burnt. Other nearby tree tops of fallen trees were not burnt. This indicates the fire burned in the lower origin area while the broken tree top was on the ground. It did not fall after the fire passed through the area. Backing fire pattern indicators to the north (downhill) show the fire did not burn upslope to the broken tree top from somewhere downhill.

PG&E outage data (Attachment 25) shows an outage at approximately 11:28 PM on October 8th, 2017 on the Cloverdale 1102 Circuit, within the Sonoma Division. The data provided by PG&E shows an operating device, Fuse 1381, was involved at that time. The address described for this device is shown as, "22000 POCKET RANCH RD 1/2 MILE BEYOND GATE". This description is close to the fire's origin. The GPS coordinates included show this location at the switchbacks. Additional documentation provided by PG&E shows event data for related equipment on this circuit. These documents include data identified by PG&E as Supervisory Control and Data Acquisition (SCADA) data. SCADA data shows other equipment on the circuit recorded information apparently related to the outage beginning at 11:23 PM on October 8th, 2017, and over the next several minutes. Some of the PG&E data included as attachments was formatted and converted to .pdf files to make the information more readable. None of the contents of spreadsheet cells were changed in this process. Other outage records (Attachment 26) were also provided by PG&E which are individual equipment records. These records included those for Line Reclosers 262 and 570, and Fuse 1381. Each of these records describe the equipment as open on October 8th, 2017 at 11:24 PM. They each describe the equipment condition as: Conductor, Overhead, Broken, wire on ground. The line recloser records describe the cause as: Equipment Failure/Involved, Overhead, and the fault type as: Line to Ground. The record for Fuse 1381 describe the cause as: Environmental/External, Fire, Forest/Grass, and the fault type as: Open Circuit.

PG&E reported an electric incident in the area to the California Public Utilities Commission (CPUC) (Attachment 27). In an email to the CPUC dated October 21st,

2017, PG&E reports an electrical incident (PG&E incident number 171021-8592) occurred near the intersection of Ridge Ranch Road and Ridge Oaks Road. The location described is correct per Google Maps, however, as described earlier, residents and their addresses show that naming of roads in the area is not accurate on multiple maps. The email further describes a broken tree limb and wire down on Cloverdale 1102. This email says PG&E identified the broken tree limb and wire down on October 18th, 2017, however it was October 17th, 2017 that a PG&E crew and PG&E representatives were at the area to assist with collection of the conductors. The incident is further documented in a 20 Day Report PG&E also submitted to the CPUC. Both the email and the 20 Day Report show the incident date as October 9th, 2017. The email shows the incident time as 3:30 AM, while the 20 Day Report lists the time of incident as unknown. This is likely based on the date and time CAL FIRE reported on its website as the start time. PG&E provided no other incident reports for electrical incidents in the area.

On March 8th, 2018, I met with consulting electrical engineer, Jim NOLT, to review some of the evidence collected from the Pocket Fire. I showed NOLT photographs of the overall scene, the conductors, and the fulgurites. I described to NOLT how the conductors and breaks were identified, and there being two origins. NOLT and I also discussed some of the SCADA data provided by PG&E. Based on the description of the scene I related to NOLT, he said there would likely be SCADA data identifying a phase-to-ground fault. The individual equipment outage records I received after this meeting described line to ground faults on the line recloser records. We then reviewed some of the SCADA data, however, full explanations or definitions were not provided for the abbreviated data. A request was later placed through ZIMMERMAKER for clarification of some of the data. ZIMMERMAKER said he would request the information from PG&E. NOLT told me the "rule-of-thumb" when multiple origins are involved is the one farthest from the electrical source is first chronologically, but this was not always the case. I explained I could not determine whether the lower or upper origin ignited first, but suspect they started at nearly the same time. NOLT and I then

examined items of evidence (Attachment 28). We looked at each of the conductor ends at breaks, "A", "B", and "C". NOLT reviewed the ends of Items 5 and 7, at break "A". He described the ends as showing strong signs of a tension-caused break. He described the break having a tapering portion of the end of the conductor with a jagged or crystalline tip from the conductor being stretched until it snapped. According to NOLT, break "B" (between Items 6 and 8) showed signs of tension as well as beading from heat. NOLT said the cause of break "C" was unclear (between Items 8 and 4).

On Wednesday, May 2nd and Thursday May 3rd, 2018, I met with California Public Utilities Commission (CPUC) employees, including Raymond CHO and Wilson TSAI, who had been to the Pocket Fire. I asked CHO for assistance with understanding some of the data provided by PG&E. I could not determine the exact time of the outage because the data provided by PG&E showed outage information from approximately 11:23 PM to 11:28 PM on October 8th, 2017. The outage records included in Attachment 26, all appear to show an outage at 11:24 PM. I showed CHO information related to the operation of equipment. CHO looked at some of the PG&E data and records attached to this report. He said the way the information was formatted made it hard to understand, and it appeared it did not contain enough information to completely identify all equipment operations. The request I had placed for clarification of the data after speaking with NOLT had not yet been fulfilled. The CPUC will be completing their own report for the incident.

On Thursday, May 17th, 2018, I received additional PG&E data from ZIMMERMAKER. This data included definitions of terms from my request for clarification of other PG&E data (Attachment 29). Based on my understanding of the definitions, the information appeared to be related to the Cloverdale 1102 circuit breaker. None of the information provided by PG&E indicated to me the circuit breaker operated around the time of the outage on October 8th, 2017. This data also included PG&E's Pocket Incident Description and Factual Summary (Attachment 30). The Incident Description provided an overview of the incident. It describes a line-to ground

fault on the Cloverdale 1102 Circuit at 11:24 PM on October 8th, 2017. ZIMMERMAKER later provided a supplemental report providing a timeline for his requests to PG&E for information and PG&E's responses (Attachment 31). His report also describes where the response information for multiple fires is stored on an external hard drive. Due to the large volume of data provided by PG&E, only select documents, or portions thereof, were included in this report. All data provided to ZIMMERMAKER by PG&E regarding the Pocket Fire is stored on the external hard drive.

Conclusion

Based on my training and experience, examination and analysis of the origin scene, evaluation by subject matter experts, and other supporting documentation, the Pocket Fire was determined to be caused by an energized conductor contacting vegetation after a portion of an oak tree top fell onto power lines. Based on PG&E documentation, this occurred at approximately 11:24 PM on October 8th, 2017. The rot-effected oak tree, caused the portion of the tree top to break and fall into the power lines.

When the portion of oak tree top broke and fell into the power lines between poles "6" and "7", both conductors broke and contacted vegetation on the ground. The conductor from the western side of pole "6" (Item 7), was found with the tree top laying on top of it. Arcing from this energized conductor ignited the dry vegetation, including grass and leaf litter, at the lower origin. I believe the upper origin could have resulted from a spot fire, but was most likely ignited by a portion of the same conductor (Item 7). While no conductor was found directly in the upper SOA, the conductor likely arced while in contact with the ground as it fell and was pulled downhill toward the road. During this movement, the conductor likely contacted vegetation above that portion of the road. I believe this was the cause of the upper origin for several reasons: the SOA was in-line with pole "7" and the concentration of conductor from item 7 found in the road, the amount of conductor found in the road compared to the distance from the actual break, and because the two advancing vectors were not in alignment. All other

cause classes were excluded from involvement in the Pocket Fire.

PG&E also provided documents related to their vegetation management program, including work requests (Attachment 32) and compliance audits. A work request dated April 4th, 2017 shows an inspection occurred on March 13th, 2017 involving the span between poles "6" and "7". Further descriptions of the location include 22000 Pocket Ranch Road and indicate end of the span crosses the road twice. The involved span crossed Pocket Ranch Road twice near a switchback close to pole "7". This request indicates vegetation in the area was inspected for trimming or other work. A Madrone tree is listed on the work request. The involved oak tree did not appear to be identified in this inspection. GPS coordinates for the listed tree demonstrate the location was near the involved oak tree. The location of the coordinates is shown by a screen capture image with the attached April 4th, 2017 work request. Other provided work requests show the exact same span was included in inspections in 2012 and 2015.

Compliance audit documents (Attachment 33) provided display a recurring trend in the Sonoma District (Sonoma is referred to also as a division in some documents provided by PG&E) in audit reports dated from 2013 through 2017. Multiple reports document issues with the pre-inspection process where trees requiring work were not identified, even though internal compliance levels were met. Several reports identify lack of experience of those performing the pre-inspections as a contributing factor. In multiple reports over the course of multiple years, PG&E's vegetation management audits document awareness of the continuing issues of the pre-inspection process. The recurring theme of pre-inspections missing vegetation in need of treatment shows how the involved tree might have not been identified as a risk. However, the consulting arborist, PORTER, identified signs the tree was susceptible to disease he said should have been apparent to inspectors.

Attachment 34 is a screenshot from October 25th, 2017, of a satellite image of

the area prior to the Pocket Fire. Leaves on the suspect tree are visible as browner in color compared to the green leaves in many surrounding trees.

Indications were present prior to the fire the involved tree was weakened and susceptible to damage. Failure to remove all or portions of the weakened oak tree resulted in a portion of the tree falling into and breaking the energized power lines. An energized conductor contacted vegetation and ignited the Pocket Fire, ultimately burning over 17,000 acres of vegetation and destroying multiple structures.

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

5-24-2018

Signature Date

Jeremy Ward, #4005

Fire Captain Specialist

10 - ATTACHMENTS:

1. FC-34 Interagency Report of Incident and Dispatch Action – 6 pages
2. Fire Weather Summary and Definitions – 6 pages
3. Electric Circuit Map – 1 page
4. RAWS Weather Data – 2 pages
5. Damage Inspection Report – 25 pages
6. Supplementary Investigation Report (ADDISON) – 1 page
7. Witness NAVE's Map – 1 page
8. Supplementary Investigation Report (multiple witnesses) – 5 pages
9. Area Overview Map – 1 page
10. Renumbering of Photographs – 3 pages
11. Photographic Log – 22 pages
12. Photos – 3 DVD/CD Discs and Binders 2, 3, and 4 – 457 pages
13. Sketch of Conductors in Road – 1 page
14. Satellite Image of Overall Fire Area – 1 page
15. Forester Observations – 4 pages
16. Arborist Report – 22 pages
17. Evidence Log – 1 page
18. LIDAR Survey – 4 pages and 1 DVD Disc
19. Simplified Drawing of Power Lines – 1 page
20. Measurements – 1 page
21. Sketch of Location of Evidence Items – 1 page
22. Supplementary Investigation Report (C. WILLIAMS) – 2 pages
23. Supplementary Investigation Report (TOVANI) – 2 pages
24. Geyserville Fire Department Report – 1 page
25. PG&E Outage and Equipment Data – 6 pages
26. PG&E Outage Records – 3 pages
27. PG&E Electric Incident Reports to CPUC – 4 pages
28. Supplementary Investigation Report (Evidence Viewing) – 2 pages

29. PG&E Definitions of Terms – 2 pages
30. PG&E Pocket Incident Description & Factual Summary – 9 pages
31. Supplementary Investigation Report (ZIMMERMAKER) – 2 pages
32. PG&E Vegetation Work Requests and Screen Capture – 5 pages
33. PG&E Vegetation Compliance Audits – 12 pages
34. Satellite Image of Brown Leaves on Tree – 1 page
35. Origin and Cause Report and Origin Sketches – 6 pages

ATTACHMENT B

CAL FIRE Arborist Report by Mark Porter

Mark Porter, Mark's Tree Service and Consulting
ISA Certified Arborist # WE465
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member

Evaluation of Oak Failure
Pocket Ranch Rd.
Geyserville, CA

Prepared for Cal Fire Investigator Jeremy Ward

October 13, 2017

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Summary

October 9, 2017, a wildfire occurred on Pocket Ranch Road and Ridge Ranch Road in Geyserville, CA. I was asked to look at a mature oak tree below the road, near high voltage utility lines and determine why a branch fracture occurred.

I inspected the site of the tree failure accompanied by Cal Fire Officers Matt Gilbert, Jeremy Ward, and Matt Franklin. I observed a large diameter mature valley oak tree with visible defects. An extensive open cavity spreads all the way through the trunk. The tree is in poor health thus compromising the ability of the tree to resist decay.

A sample of the tree was sent to a wood decay lab. The lab results for the valley oak report fungal DNA present.

The trunk decay alone is far too advanced to retain this large oak tree within striking range of an object where the consequences of impact are severe. If the broken tree were along a hillside or any rural location where nothing could be harmed if a failure occurred, then the risk of harm would be nonexistent. The consequences of impact would be negligible.

I took measurements, notes, and photographs. I completed my site inspection October 13, 2017. A tree with as much decay as the subject tree, near a non-movable target should have been condemned during a routine inspection.

Background

October 9, 2017, a wildfire occurred on Pocket Ranch Road and Ridge Ranch Road in Geyserville, CA. Cal Fire Incident report calls this the Pocket Fire (Central LNU Complex). See Appendix I, for specific information.

October 13, 2017, Cal Fire Officer Matt Gilbert escorted me to the site in question along Pocket Ranch Road. We met with Cal Fire Officers Jeremy Ward and Matt Franklin. I observed a significant portion an oak tree was rotten and collapsed. The rot spread from a hollow cavity in the trunk to the upper branches where the failure occurred (see – Photos 1).

The failed branch is from a mature valley oak tree (*Quercus lobata*).
I was asked to look at the tree and help describe why it fell.

I was asked to assist Cal Fire Investigator Jeremy Ward to investigate the cause of the oak tree failure. I took some photographs, notes and completed my site inspection October 13, 2017.

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 the 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

The subject tree is a valley oak (Quercus lobata). Trunk **DBH**[1] is approximately 40.5 inches. A trunk cavity as seen in Photo 1 is approximately two feet five inches wide x two feet nine inches long. There is a margin of woundwood surrounding the cavities. At approximately 25 feet up the tree, a branch approximately 11 inches in diameter fractured (see Photos 1, 4, 6, & 7). Photo 4 shows the fractured branch on the ground and Photo 5 shows a closeup of the decay at the **fracture point.**

I observed wildfire damage surrounding the tree, including the surrounding hills. A wildfire was still burning in the area, and a water-dropping helicopter could be seen in the distance fighting the fire.

Species Information

Valley oak *(Quercus lobata)* grows from 90 feet or more and typically live 250- 500 years. A deciduous tree and native to California. The valley oak is the world's tallest and most massive oak (Costello et al.). Distribution is from Shasta County to Los Angeles County, Sacramento Valley, the east side of the San Joaquin Valley hills and valleys surrounding the central valley;

[1] Words in bold may be unfamiliar to the reader. Refer to the Glossary for definitions.

coast ranges; Santa Cruz and Santa Catalina Islands. Usually found below 2,200 feet in Northern California but is most common out about 500 to 800 feet. In Southern California it ranges up to about 5,600 feet.

Valley oak hybridizes with nine other species, so it can look like or be confused as blue oak, Oregon white oak, bur oak and English oak. The bark can also look like black oak, and both leaves are lobed, yet the valley oak leaf is not pointed.

Not vigorous on dry sites. Prefers deep, fertile, well drained, but relatively moist soils.

California Tree Failure Database

The California Tree Failure Report Program (CTFRP) was established in 1987 to collect quantitative information on the mechanical failure of urban trees (trunk breaks, branch breaks, and uprootings). This information is used to develop "failure profiles" for genera and species to more accurately assess failure probability in standing trees and thereby reduce failure potential in urban forests (http://ucanr.edu/sites/treefail/).

Patterns of Failure – valley oak (Quercus lobata)[2]

In 2013 there were 6680 failures in the California Tree Failure Report Program database. Of all those, 251 reports were for valley oak failures. In California, trained cooperators send in reports to the database.

For valley oak, there are failure statistics for root failures (82 reports), trunk failures (62 reports), and **branch failures** (107 reports). Most branch failures occur between May to October (81). Warm months are most often associated with branch failures.

Decay was a factor in 61% of reported branch failures. In 95% of the cases **included bark** was not a factor in branch failures. Most branch failures occur when the branch is still alive. There were no signs of decay observed from ground inspection. That does not mean there is no decay at the junction.

Heavy lateral lambs is a significant factor of branch failure in valley oak. Over 75% or three times (3-1) as many branch failures are associated with heavy lateral limbs. This branch stuck in the tree was long and judged to be heavy. It is reported that 46% of the time the defect is visible before the failure occurred. A dense crown is not a factor in branch failures of valley oak.

Discussion

Sporophores are sometimes called conks, brackets, basidiocarps or mushrooms. They often appear in colder parts of the year and offer visual clues there is something wrong. Also known

[2] Western Arborist Magazine 1-29-2014.

as fruiting bodies and are many times not visible during warmer parts of the year. 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.

The decay in the trunk of this oak is advanced. The tree would typically be condemned during an arborist inspection, primarily due to the proximity of powerlines (an immovable target). The trunk is the main structural column connecting roots to the canopy and serves as the attachment and support point for all branches (Dunster). Generally speaking, trees develop enough wood to compensate for applied forces (reaction wood). The growth patterns are the 'Body Language' described by Mattheck and Breloer (1994).

Trees in general can tolerate a central column of decay as long as this does not exceed the minimum shell wall thickness of around 33%. This number has been used similarly by the US Forest Service described as a minimum threshold of one inch of shell thickness for every six inches of diameter. Both figures are debated globally by researchers. Some still use it as a general guideline not an absolute rule.

The woundwood surrounding the cavity is very strong and survived this wind event. The problem lies with the compartmentalization (CODIT) potential of the tree. After wounding, trees form physical as well as chemical boundaries in an attempt to stop decay. CODIT is an acronym for compartmentalization of decay in trees. Aggressive decay breaks down CODIT barriers. The CODIT potential is low, due to multiple factors including the age of the tree, the health, the recent drought conditions as well as the aggressive spread of decay consuming wood faster than the tree can produce more. Compartmentalization is more efficient in a horizontal direction than it is vertically. The compartments developed as a response to wounding with the purpose of slowing decay are weakest in the water-conducting vessels (xylem cells).

The amount of visual decay is enough to condemn this tree without the need for advanced risk assessment techniques such as radar, resistance drilling or sonic tomography. The trunk decay has spread vertically toward where the fracture occurred. The higher the tree, the more wind pressure on the part. The force of the wind and the weight of the branch exceeded the elasticity limit of the fractured branch. The decay in the branch does not help matters.

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 stringy, 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. The decay at the fracture point of the fallen branch is pre-existing (see- Photo 5).

Following fire damage, it is not easy to visually identify what specific type of decay is involved. When the load exceeds material properties of wood, fracture occurs at times without any evidence of defect. Wood color can appear normal in fractures or appear different such as darkening, suggesting decay is progressing. When the wood is missing, decay is at an advanced stage.

Two natural forces that exert loads on trees are gravity and wind (Smiley et al.). Gravity acts as a constant pull on the mass of a tree generating load from self-weight and the weight of water (condensation, rain, snow, or ice) on leaves and branches. Energy from winds adds dynamic forces. Bending forces result in stress and strain on tree parts. Decay adds to the problem by reducing the strength and flexibility of wood contributing to fiber rupture hence, branch failure.

Decay is a recognized structural defect that affects the likelihood of failure. Missing wood is a long-term process of wood degradation by microorganisms (Smiley et al.). Open cavities are positive indicators of decay as opposed to potential indicators (old wounds, swelling, ridges, cracks, seams, oozing, dead or loose bark, sunken areas or termites). Decay is a positive defect indicator frequently associated with tree failure.

*"A **cavitated** tree may have to be thinned to reduce the weight and wind resistance of the top"* Filling a cavity does nothing to promote the health and longevity of the tree. A tree with a cavity is best served if everything possible is done to improve tree vigor, so the new wood and bark grow faster than decay advances within the compartmentalization barrier. (Harris. 1992.).

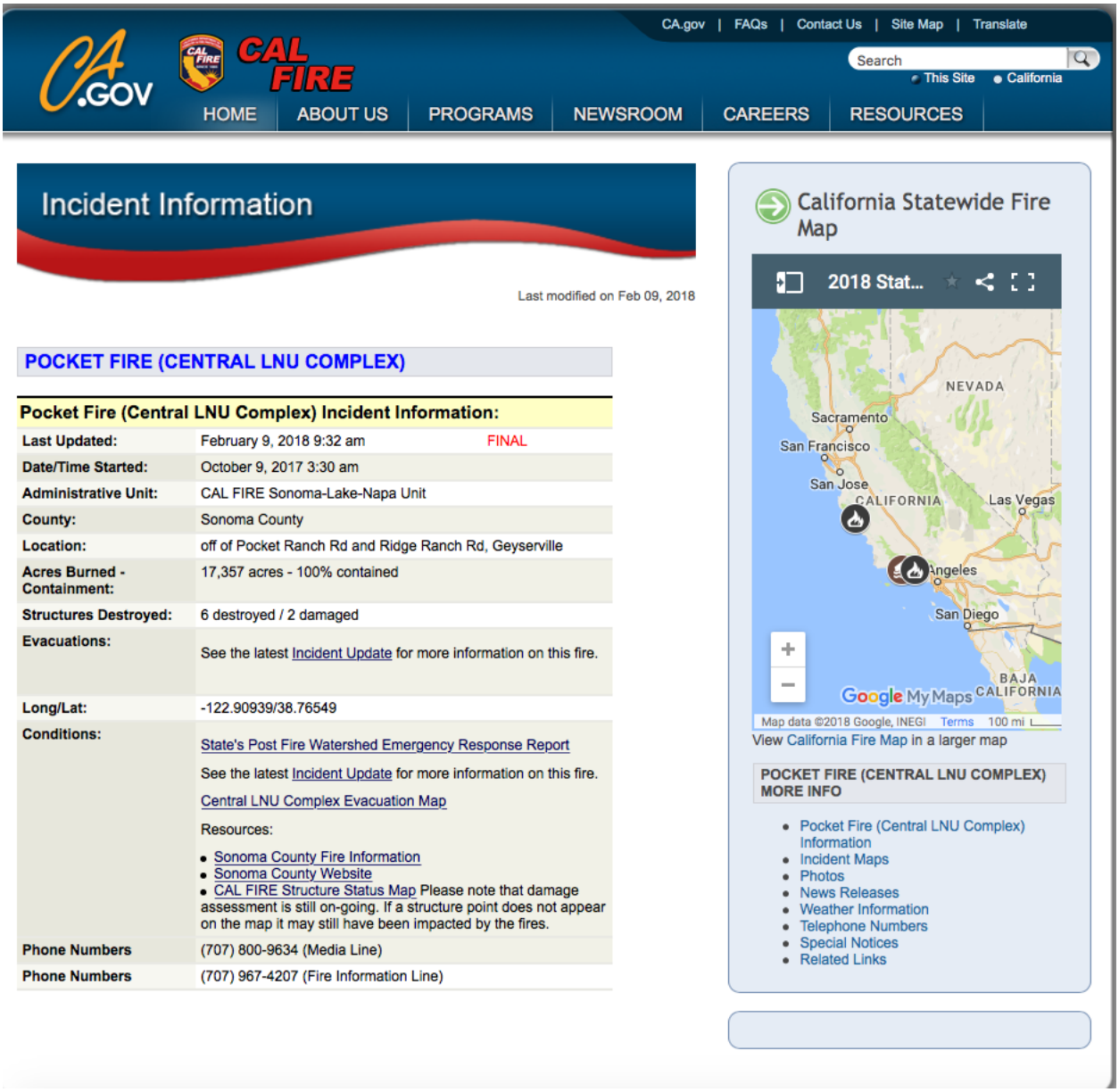
Conclusion

Decay is often associated with oak tree failures including valley oak. Tree failure statistics, as well as observations at the site, help confirm:

1. decay is familiar to the valley oak
2. decay is present in the subject tree
3. decay weakens wood and is a significant contributing factor to the failure
4. comparable native oak trees in the vicinity survived much better than trees with noticeable decay
5. a tree with as much decay as the subject tree should have been condemned during a routine inspection.

A sample of the tree was sent to a wood decay lab. The lab results for the valley oak report fungal DNA present (see – Appendix IV). The fire and heat are believed to destroy tissues that may contain decay markers or chemicals interfering with the amplification of DNA. Lab tests are not necessary to see decay has compromised this tree beyond a reasonable level. The photographic evidence shows it. Regardless if more wood in the hollow trunk were available to test more target fungi would be found.

Appendix I Cal Fire Incident Information –



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Incident Information

Last modified on Feb 09, 2018

POCKET FIRE (CENTRAL LNU COMPLEX)

Pocket Fire (Central LNU Complex) Incident Information:	
Last Updated:	February 9, 2018 9:32 am FINAL
Date/Time Started:	October 9, 2017 3:30 am
Administrative Unit:	CAL FIRE Sonoma-Lake-Napa Unit
County:	Sonoma County
Location:	off of Pocket Ranch Rd and Ridge Ranch Rd, Geyserville
Acres Burned - Containment:	17,357 acres - 100% contained
Structures Destroyed:	6 destroyed / 2 damaged
Evacuations:	See the latest Incident Update for more information on this fire.
Long/Lat:	-122.90939/38.76549
Conditions:	State's Post Fire Watershed Emergency Response Report See the latest Incident Update for more information on this fire. Central LNU Complex Evacuation Map Resources: • Sonoma County Fire Information • Sonoma County Website • CAL FIRE Structure Status Map 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.
Phone Numbers	(707) 800-9634 (Media Line)
Phone Numbers	(707) 967-4207 (Fire Information Line)

California Statewide Fire Map

View California Fire Map in a larger map

POCKET FIRE (CENTRAL LNU COMPLEX) MORE INFO

- Pocket Fire (Central LNU Complex) Information
- Incident Maps
- Photos
- News Releases
- Weather Information
- Telephone Numbers
- Special Notices
- Related Links

Appendix II Site Overview (pin drop close to tree failure site).

Appendix III Photos

Photo 1

Subject Tree fracture point (horizontal arrow). Breakdown of compartmentalization barriers allowing decay to move (smaller arrows). Trees that are healthy can resist decay better than trees that are stressed or in a state of decline.

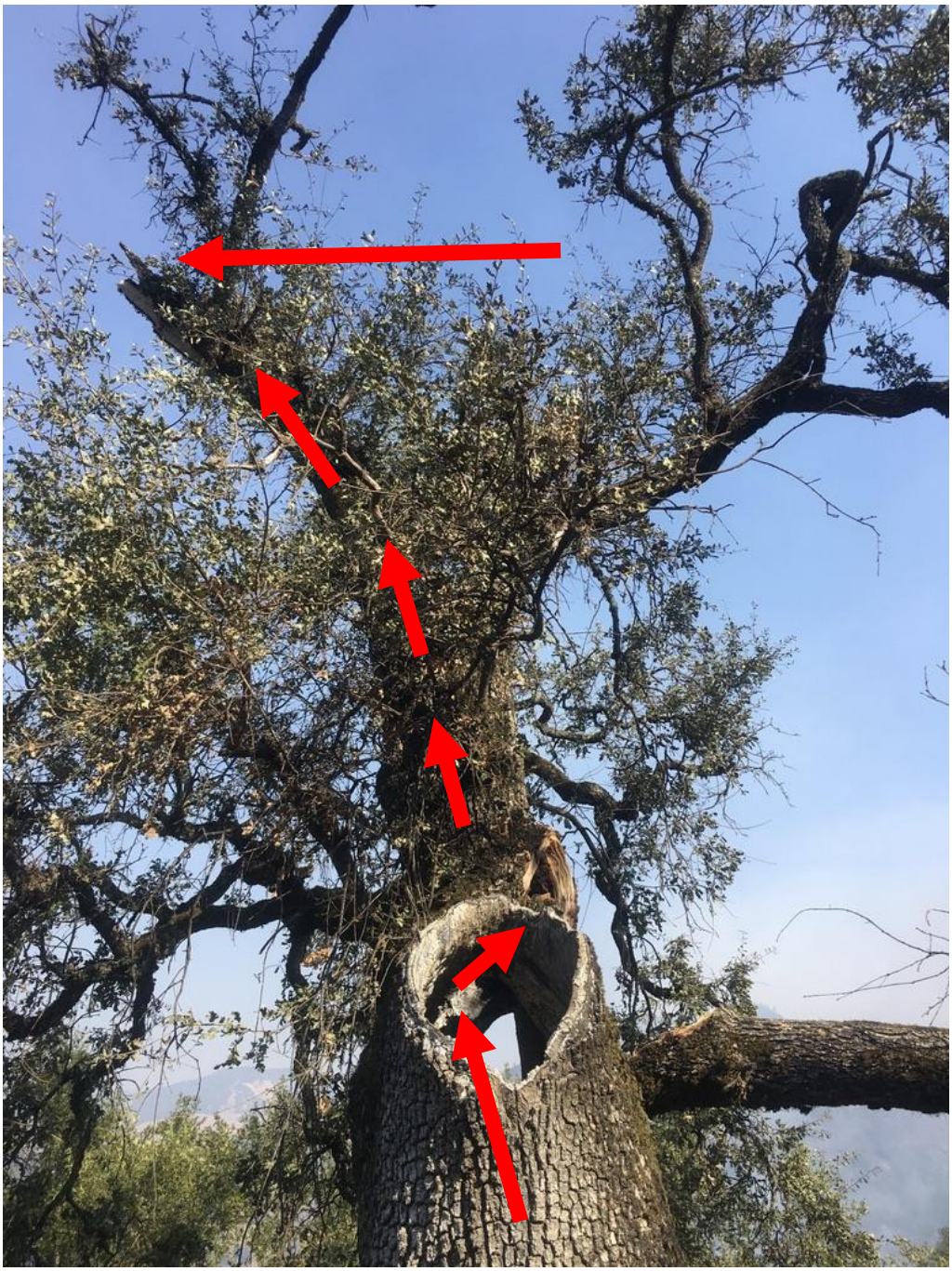

Photo 2

Subject tree trunk – decay at cavity extends through the tree and up the trunk

Photo 3

Subject Tree – hollow cavity extends through the tree opposite side of trunk as shown in Photo 2

Photo 4

Subject Tree -Fractured branch. Note the trees in the background are free of visible decay and survived the wind event without significant branch fractures.

Photo 5

Subject Tree
Decay at fracture point of the fallen branch. Note: the appearance of rot

Photo 6
Subject Tree – fracture point

Photo 7

Subject Tree - decay from the open cavity (red arrows) in trunk spread to fractured branch (yellow arrow). Regardless of the trunk surviving the wind event, under normal conditions, the amount of decay is too much to retain a tree of this size with a target nearby. The tree is under stress, shown by the limited amount of foliage and under-sized leaves, thereby reducing the CODIT potential. Decay can consume wood faster than the tree can produce more wood. The **mass to energy ratio** (photosynthate production) is not in balance.

Photo 8

Rural site is adjacent to and below tree failure. Typically, native trees in rural areas survive wind events better than those trees with decay.

Appendix IV Wood Decay Lab Result

Forest Pathology and Mycology Laboratory UC Berkeley
Wood Decay Diagnostic Results

ID Code:	Marks Tree 9
Submitted by:	Mark Porter
Collection Date:	
Received Date:	12/14/2017
Tree Species:	Quercus lobata
Location:	
Reason For Submission:	

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

Sample Negative for all targets but positive for fungal DNA control
(decay caused by non-target fungi.)
Notes:

Glossary

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

Cavitated: A tree with an advanced state of decay where one or more cavities are present.

Compartmentalization: a dynamic tree defense process that forms boundaries that resist spread of pathogens. Trees are highly compartmented plants. A compartment is the subdivision of a space. The subdivision is a room, chamber, cell, or any space set off by borders or boundaries.

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

Fracture: Referring to the breakage of a branch, trunk, or root.

Fracture point: The location where the branch, trunk, or root snapped, splinted, or simply broke. 1. A point of fracture or fracture location. 2. In this report, a point of failure or failure point.

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

Included bark: bark that becomes embedded in the crotch (union) between branch and trunk or between codominant stems. Causes a week structure.

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

Mass to Energy Ratio: a term introduced by US Forest Service chief scientist Dr. Alex Shigo. A large mature tree with a large mass or dynamic mass requires efficient photosynthate production from an adequate supply of leaves. Stress and over-pruning can create a deficit of energy producing leaves, and a mature tree starts a decline spiral and starts to break apart.

Sporophores: spore-bearing structure of a fungus

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

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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.

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)

INCIDENT NUMBER
17CALNU010057
CASE NAME
POCKET

DAY	MONTH	DATE	YEAR	COUNTY	REGION	UNIT	CASE NUMBER
MON	OCT	9	2017	SONOMA	CNR	LNU	

ITEM NO	DATE COLLECTED	TIME COLLECTED	COLLECTED BY	ITEM DESCRIPTION	LOCATION
1A	10/14/2017	5:47 PM	Jeremy Ward	Approximate five-foot portion of oak tree cut from treetop.	Middletown
1B	10/14/2017	5:50 PM	Jeremy Ward	Approximate three-foot portion of oak tree cut from treetop.	Middletown
2	10/14/2017	5:52 PM	Jeremy Ward	Approximate eight-foot portion of oak treetop.	Middletown
3	10/15/2017	10:21 AM	Jeremy Ward	Fulgurite approximately 2 inches by 1 ¼ inches.	Santa Rosa
4	10/17/2017	3:25 PM	Jeremy Ward	Conductor cut approximately 24" from center of insulator on east side of pole "7" by PG&E.	Santa Rosa
5	10/17/2017	3:30 PM	Jeremy Ward	Conductor cut approximately 24" from center of insulator on west side of pole "7" by PG&E.	Santa Rosa
6	10/17/2017	4:40 PM	Jeremy Ward	Conductor cut approximately 24" from center of insulator on east side of pole "6" by PG&E.	Santa Rosa
7	10/17/2017	4:40 PM	Jeremy Ward	Conductor cut approximately 22" from center of insulator on west side of pole "6" by PG&E.	Santa Rosa
8	10/17/2017	4:42 PM	Jeremy Ward	Conductor collected from near uncut end of item 6. Found on ground between powerline items 6 and 8.	Santa Rosa
9	10/27/2017	9:00 AM	Jeremy Ward	DVD containing photos taken at Pocket fire using camera assigned to FCS Franklin, 0001 – 0168.	Santa Rosa
10	10/27/2017	9:30 AM	Jeremy Ward	DVD containing photos taken at Pocket fire using camera assigned to FCS Ward and photos from W-3, C. WILLIAMS.	Santa Rosa
11	04/09/2018	5:27 PM	Joe Baldwin	USB drive containing Forester LEUZINGER's photos and report.	Santa Rosa

PRINTED NAME	SIGNATURE	BADGE NUMBER	DATE
Jeremy Ward		4005	4-28-2018

OFFICER INITIALS

ATTACHMENT D

CPUC Site Visit Observation Report

ESRB Site Visit Observation Report

Date: October 17, 2017

Time: 1500 hours

Incident ID: N/A

Utility Involved: PG&E

Investigator: Wilson Tsai

Date and Time of Incident: October 8, 2017, 0000 hours

Location of Incident: Ridge Ranch Road & Ridge Oaks Road, Geyserville, 95441, Sonoma County

Summary of Initial Report:

On Wednesday, October 18, 2017, near the City of Geyserville, Sonoma County, PG&E identified a broken tree limb and wire down on the Cloverdale 1102 (12 kV) near the intersection of Ridge Ranch Road and Ridge Oaks Road. The White Oak was rooted approximately 15 feet away from the lines. PG&E's meteorology department determined that there were wind gusts in the area up to 65 m.p.h. prior to the event. CalFire has taken possession of a section of the tree limb and the primary conductors. This information is preliminary and PG&E is fully cooperating with Cal Fire.

Reason for Reporting: The incident was reported under the Property Damage criterion.

Field Findings:

On Tuesday, October 17, 2017, I met with Jeremy Ward from CalFire and Jay Singh from PG&E at Ridge Ranch Road & Ridge Oaks Road in the city of Geyserville. Due to security issues from other locations, CalFire would not let anyone on site until they released the scene. They allowed PG&E's crews to enter to remove the conductors for evidence collection. Around 1800 hours, CalFire concluded their evidence collection and released the scene.

The incident span is located on a steep hillside above a series of dirt road switchbacks. The first pole was located at the top of the hill. The incident span ran downhill to a pole located about 200 feet away. The span consisted of two primary conductors and a communications line. The primary conductors were 6/0 copper wire with spliecs mid-span which may indicate previous vegetation issues. CalFire took possession of both phases as evidence; they had PG&E cut the conductors two feet from each insulator.

At approximately mid-span, there is a burned out, hollow, possibly Oak tree approximately 4-5 feet from the lines. On the opposite side, there is a large broken section of branches on the ground. The base of one of the sections had a portion removed by CalFire for evidence. It looked like the fire may have originated from this tree.

Witnesses/Person(s) Involved:

Name	Title	Phone Number	Email
Wilson Tsai	Utilities Engineer	(415) 703-1359	wt1@cpuc.ca.gov
Raymond Cho	Sr. Utilities Engineer	(415) 703-2236	rc7@cpuc.ca.gov
Jay Singh	PG&E Compliance Director	(415) 990-1530	j112@pge.com
[redacted]	PG&E Vegetation Management Supervisor		
Jeremy Ward	CalFire Investigator	(707) 726-1221	Jeremy.Ward@fire.ca.gov

Drawing/Photos:

Figure 1: The first incident pole located uphill. CalFire had already removed and taken the incident span as evidence.

Figure 2: The broken section of tree on the ground by the incident span.

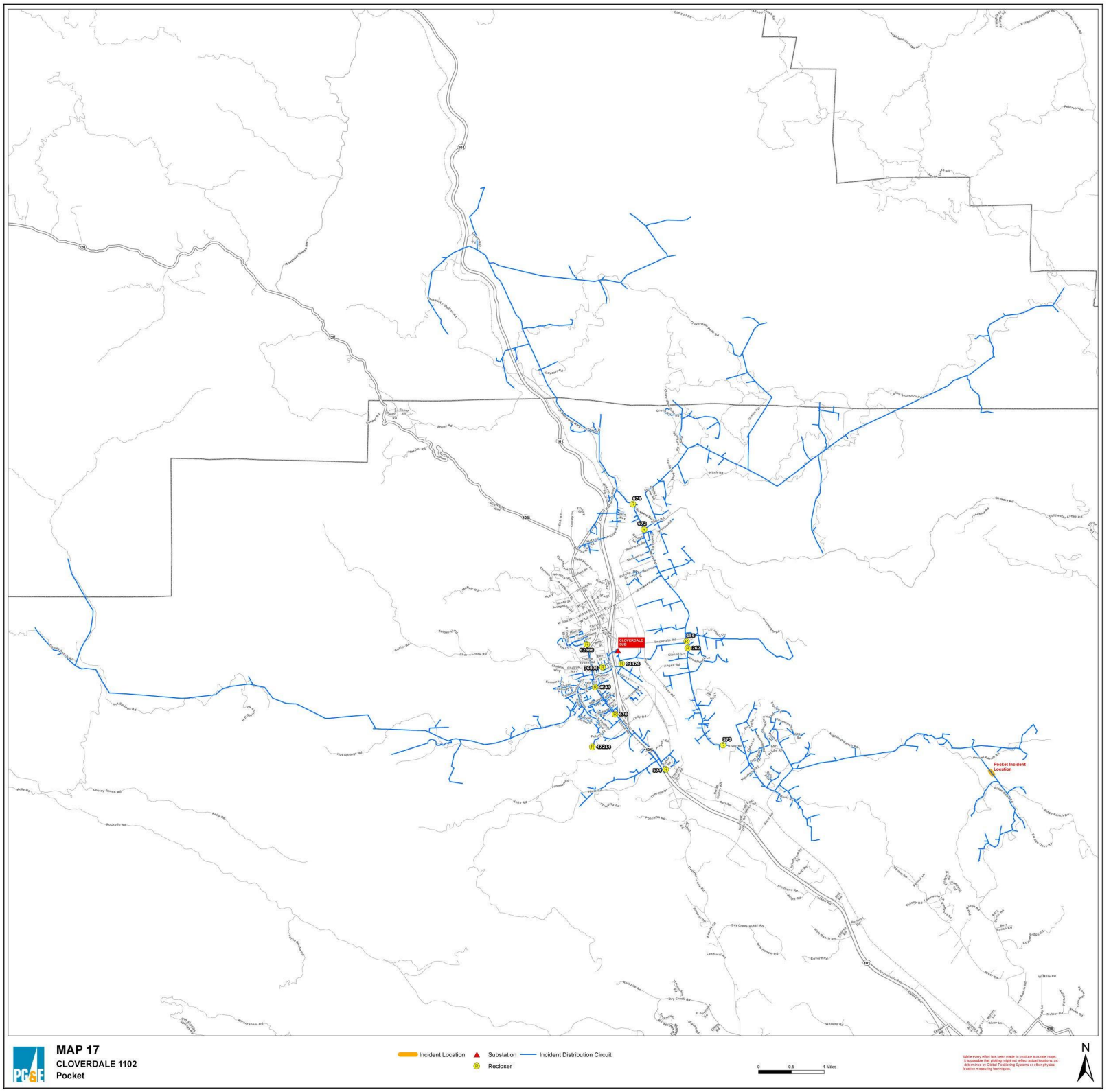
Figure 3: Part of the broken section that was removed by CalFire for evidence.

Figure 4: Photo of the burned out hollow tree that may have been the origin of the fire.

ATTACHMENT E

PG&E Cloverdale 1102 Circuit Map

Pocket 103



Pocket 104

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