

CAL FIRE



CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION

Mendocino Unit
17501 North Highway 101
Willits, CA. 95490

INVESTIGATION REPORT

CASE NUMBER:	17CAMEU012169
CASE NAME:	Redwood Incident
DATE:	October 8, 2017
INCIDENT TYPE:	Wildland Fire Investigation
INCIDENT INVESTIGATORS:	Eric Bettger Captain – Fire Prevention CAL FIRE Mendocino Unit Ryan Smith Battalion Chief – Fire Prevention CAL FIRE Mendocino Unit

1 **1 - VIOLATIONS:**

2 Not Applicable

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2 - SUMMARY:

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

1 **3 - SUBJECT:**

2 Not Applicable

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4 - VICTIMS & WITNESSES:

Victims - There were multiple victims of the Redwood Fire, including 9 civilian fatalities. 587 structures were damaged or destroyed during the fire. The structures included 7 commercial buildings, 330 residential homes and 250 outbuildings. See the attached damage report for individual property loss.

Witnesses - *Origin #1: North Busch Road, Potter Valley*

W-1

Phone #

DOB:

Note: Witnessed conductors arc and the start of a fire.

W-2

Phone #

DOB

Note: Witnessed fire spread across N. Busch Road.

W-3

Phone #

DOB:

Note: Witnessed conductors arc and the start of a fire.

4 - VICTIMS & WITNESSES (cont.):

W-4

Phone #

DOB:

Note: Witnessed conductors arc and the start of a fire.

W-5

Phone #

DOB:

Note: Visiting RD. Witnessed fires spread.

W-6

Phone #

DOB:

Note: Potter Valley Fire Chief. Witnessed fire behavior and spread.

W-7

Phone #

Note: Witnessed the hay barn catch on fire.

4 - VICTIMS & WITNESSES (cont.):

Witnesses - Origin #2: *Hawn Creek Road, Potter Valley*

W-8 Sean SWEENEY

2690 North State Street

Ukiah, CA. 95482

Phone # (707) 484-5050

Note: CAL FIRE Heavy Fire Equipment Operator. Witnessed first stages of fire.

W-9 [REDACTED]

Phone # [REDACTED]

DOB: [REDACTED]

Note: Witnessed the conductors fall and start of a vegetation fire.

W-10 [REDACTED]

Phone # [REDACTED]

DOB: [REDACTED]

Note: Witnessed weather and fire spread past their property.

W-11 [REDACTED]

Phone # [REDACTED]

DOB: [REDACTED]

Note: Witnessed weather and fire spread past their property.

4 - VICTIMS & WITNESSES (cont.):

Witnesses - *Origin #3: East Road, Redwood Valley*

W-12 [REDACTED]

Phone # [REDACTED]

Note: Redwood Valley Fire Chief.

W-13 Ray TAGLIO

17501 North Hwy 101

Willits, CA. 95490

Phone # (707) 391-6708

Note: CAL FIRE Battalion Chief.

Witnesses – *CAL FIRE and PG&E*

W-14 Dan GREGORY

1300 U Street

Sacramento, CA. 94244

Phone # (916) 324-1644

Note: CAL FIRE LIDAR.

W-15 Dave KAROLY

1300 U Street

Sacramento, CA. 94244

Phone # (916) 323-1044

Note: CAL FIRE LIDAR.

4 - VICTIMS & WITNESSES (cont.):

W-16 Charles MARTIN

17501 North Hwy 101

Willits, CA. 95490

Phone # (707) 459-7440

Note: CAL FIRE Resource Management.

W-17 [REDACTED]

Phone # [REDACTED]

Note: PG&E Transmission Troubleman.

W-18 [REDACTED]

Phone # [REDACTED]

Note: PG&E Lineman.

W-19 [REDACTED]

Phone # [REDACTED]

Note: PG&E Subforeman.

1 **5 - EVIDENCE:**

2 Origin #1: North Busch Road

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4 Evidence #1

5 Item: 17MEU012169 Item Number 1

6 Description: 60kV Overhead Conductor

7 Collected By: Officer Eric BETTGER Badge # 4703 on October 9, 2017 at 4:05 AM

8 Stored: CAL FIRE Howard Forest Prevention Office Evidence Locker

9 Address: 17501 North Highway 101 Willits, CA. 95490

10 *Note: South section - 9 feet 2 inches long - ½ in. diameter*

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12 Evidence #2

13 Item: 17MEU012169 Item Number 2

14 Description: 60kV Overhead Conductor

15 Collected By: Officer Eric BETTGER Badge # 4703 on October 9, 2017 at 4:15 AM

16 Stored: CAL FIRE Howard Forest Prevention Office Evidence Locker

17 Address: 17501 North Highway 101 Willits, CA. 95490

18 *Note: North section - 6 feet 6 inches long - ½ in. diameter*

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1 **5 – EVIDENCE (cont.):**

2 Origin #2: Hawn Creek Road

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4 Evidence #1

5 Item: 17MEU012169 Item Number 3

6 Description: 12kV Overhead Conductor with Splice

7 Collected By: Officer Ryan SMITH Badge # 2722 on October 12, 2017 at 1:32 PM

8 Stored: CAL FIRE Howard Forest Prevention Office Evidence Locker

9 Address: 17501 North Highway 101 Willits, CA. 95490

10 Note: Approx. 4 ft. 6 in. Conductor with 3 in. Splice

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12 Evidence #2

13 Item: 17MEU012169 Item Number 4

14 Description: Fulgurite

15 Collected By: Officer Ryan SMITH Badge # 2722 on October 12, 2017 at 1:32 PM

16 Stored: CAL FIRE Howard Forest Prevention Office Evidence Locker

17 Address: 17501 North Highway 101 Willits, CA. 95490

18 Note: 26 pieces - ¼ inch to 2 inches in size

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20 Evidence #3

21 Item: 17MEU012169 Item Number 5

22 Description: Fulgurite with conductor

23 Collected By: Officer Ryan SMITH Badge # 2722 on October 12, 2017 at 1:32 PM

24 Stored: CAL FIRE Howard Forest Prevention Office Evidence Locker

25 Address: 17501 North Highway 101 Willits, CA. 95490

26 Note: Approx. 4½ in. Conductor with Fulgurite

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6 – CONDITIONS:

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

Lyons Valley RAWS

Temperature: 58 Degrees Fahrenheit

Relative Humidity: 12 Percent

Wind Direction: Northeast

Wind Speed: 25 MPH with gusts to 35 MPH

Location: Cow Mountain Ukiah, CA.

Time: October 8, 2017 at 11:30 PM

Elevation: 3355 Feet

Kestrel Digital Weather Reading

Temperature: 68.9 Degrees Fahrenheit

Relative Humidity: 12.2 Percent

Wind Direction: Northeast

Wind Speed: 17 MPH with gusts to 20 MPH

Location: Gibson Lane and Busch Lane in Potter Valley, CA.

Time: October 9, 2017 at 1:37 AM

Elevation: 1019 Feet

Taken By: Eric BETTGER

7 – EQUIPMENT:

The equipment associated with the Redwood Fire is owned by PG&E. The conductor that broke at Origin 1 on the property of 13801 N. Busch Road is a 60kV conductor according to PG&E Transmission Troubleman [REDACTED]. This is one of six conductors that run from the PG&E substation located on Powerhouse Road south towards Highway 20 near Lake Mendocino. The break occurred between two transmission towers which are referenced below with the following Datum WGS 84 GPS coordinates.

Origin #1: North Busch Road

North Transmission Tower	South Transmission Tower
N 39°20.953	N 39°20.841
W 123°07.882	W 123°07.880

The conductor that broke at Origin 2 on the property of 9100 Main Street east of Hawn Creek Road is a 12kV conductor according to PG&E Subforeman [REDACTED]. This conductor is one of three that run northwest to southeast from Hawn Creek Road to Main Street. The break occurred between two power poles which are referenced below with the following Datum WGS 84 GPS coordinates.

Origin #2: Hawn Creek Road

Northwest Power Pole	Southeast Power Pole
N 39°19.397	N 39°19.380
W 123°07.877	W 123°07.847

8 - PROPERTY:

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

Origin #1: North Busch Rd. Potter Valley

North 39°20.929

West 123°07.88

Origin #2: Hawn Creek Rd. Potter Valley

North 39°19.392

West 123°07.867

Origin #3: East Side Rd. Redwood Valley

North 39°18.742

West 123°13.011

9 - NARRATIVE:

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

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

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

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

13
14 I drove east on Busch Lane along the edge of the fire with the smoldering grass field to the
15 north. I turned left on N. Busch Road and drove a short distance before I was blocked by a
16 large tree branch across the road. I turned around and headed towards Powerhouse Road
17 to find a different access point. At the intersection of Busch Lane and Powerhouse Road
18 was a tree branch suspended by communication lines and conductors. A short distance
19 past this branch was a tree across the road completely blocking Powerhouse Road. I
20 turned around and headed back towards N. Busch Road. I bypassed the tree branch on N.
21 Busch Road through a grass field to the west. While driving through the field, I observed
22 three structures burning to the east. I observed a vegetation fire burning in a field
23 approximately a quarter mile to the east of the burning structures. At 2:15 AM, I drove
24 through an opened gate onto the property of 13851 N. Busch Road to gain access to the
25 fire. At this residence, I was met by the home owners [REDACTED] and his wife [REDACTED]
26 [REDACTED]. I asked them if I could access the fire from their property. They told me I could
27 drive a short distance and walk the rest of the way. I spoke with them for a short period of
28 time and found they had witnessed the start of the fire and had called 911 to report it.

29
30 [REDACTED] told me he was in his bathroom preparing for bed when he saw a huge arc

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

18
19 At 2:50 AM, I walked onto the property owned by [REDACTED]. The fire was actively burning in
20 a patch of blackberry bushes. The fire had lost momentum as the vegetation transitioned
21 into the green grass of the pasture. I looked to the south and noticed the fire was burning in
22 the same fashion to the west along two other fence lines separating the properties. Each
23 property line was separated by approximately 100 yards of green fields. I saw oak trees
24 within the perimeter of the fire actively burning and casting embers with the wind in a
25 southwest direction. I saw the fire had burned on both sides of the creek and was now
26 smoldering as it reached the edges of the blackberry bushes. I looked east and saw a slow
27 moving backing fire burning towards Powerhouse Road. The backing fire was in the creek
28 drainage slowly burning against the northeast wind. I looked south and saw the fire had
29 burned underneath the conductors between the two transmission towers. The fire
30 appeared to be isolated from the main fire.

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

9
10 I wanted to confirm the conductors were deenergized and safe to work around. The
11 assigned radio channels were congested with radio traffic. The channels were being used
12 for life safety and firefighting operations. Therefore, a face to face conversation with the
13 Incident Commander was more appropriate at the time. Potter Valley Fire Engine 6361
14 stayed at this location. At 3:40 AM, I drove to the staging area to talk with CAL FIRE
15 Incident Commander SERRANO. SERRANO told me the power was being shut off by
16 PG&E but wasn't positive it was completely safe in the area I was at. While talking to
17 SERRANO, I saw a PG&E utility truck drive by and I spoke with the driver, who identified
18 himself as PG&E Lineman [REDACTED]. I asked if he would secure the power near N.
19 Busch Road. He followed me in his truck and we arrived back at 3:54 AM. I showed
20 [REDACTED] the conductor on the ground and asked him to cut a five-foot section off the
21 end. We then walked to the north transmission tower to cut the other end of the broken
22 conductor. The end of the conductor was hanging approximately twenty feet from the
23 ground. [REDACTED] couldn't reach this end with his extension pole so he cut the lower
24 hanging section in the middle to get the conductor down. He then cut a five-foot section off
25 the broken end. I took the two cut sections back to my truck. I coiled both conductors and
26 taped them with red evidence tape. I placed them into two separate brown paper evidence
27 bags and labeled them north and south and locked them in the cab of my truck.

28
29 I waited to further investigate this area until the fire stopped burning and the wind died
30 down. There was still the possibility of more branches falling from the swaying trees. I tried

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

10
11 I drove to Eastside Road where I received a cell phone reception and placed a phone call
12 to the Howard Forest ECC. I spoke with Howard Forest ECC communications operator
13 Sean FARRELLE and asked if there was any updated information on the other reported
14 fires. From the information he had received, he now thought there might be one fire in
15 Potter Valley and another fire in Redwood Valley. I asked him who the Incident
16 Commander was on the fire in Redwood Valley and was told it was CAL FIRE Battalion
17 Chief Ray TAGLIO. I called TAGLIO to see where the fire was with the intention of having
18 the origin secured. I asked him if the fire in Redwood Valley was a separate fire from the
19 one in Potter Valley. He told me he now thought it was all part of the same fire. At that
20 time, Deputy Chief Kyle PINSON drove up to my location on Eastside Road. He also
21 thought it was all the same fire. With the information I gathered, I drove back to 13801 N.
22 Busch Road to start an origin and cause investigation.

23
24 At 5:50 AM, I returned to 13801 N. Busch Road. I was met by [REDACTED] who opened
25 a gate for me to access the back of their property. [REDACTED] told me she had reported the
26 fire by calling 911. She described the event as though lightning had struck near the
27 northeast side of their field. She said a fire then started in the blackberry bushes. [REDACTED]
28 told me no one else had accessed their property besides the Potter Valley Fire Engines. I
29 spoke with the firefighters on the Potter Valley Engine 6361 and was told no one had
30 entered the area. I waited for sunrise to start my investigation. I used the time to transfer

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

2
3 *Origin #1: North Busch Road October 9, 2017*

4
5 At 7:10 AM, I started my origin and cause investigation by walking counter clockwise
6 around the perimeter of the fire on [REDACTED] property. I made the same observations I
7 saw earlier in the morning when the fire was actively burning. The primary fuel of the fire
8 was the blackberry bushes. The fire self-extinguished when it reached the higher fuel
9 moisture of the green irrigated pasture. The fire was isolated in the pasture approximately a
10 quarter of a mile east of N. Busch Road. The fire was located on flat terrain and was
11 approximately 4.15 acres in size. The blackberry bushes that grew between the two
12 transmission towers were approximately six to ten feet tall and approximately thirty feet
13 wide.

14
15 I looked at the fire's direction of travel by identifying the macro and micro burn indicators. I
16 observed burn indicators underneath the conductors midway between the two transmission
17 towers, such as cupping on the blackberry stems and protection on the wooden fence
18 posts, showing the fire traveling north to south. To the east of the north transmission tower
19 I saw burn indicators, such as staining on glass bottles, protection on animal bones and
20 stem fall, showing the fire traveling east towards Powerhouse Road. To the west of the
21 north transmission tower I saw burn indicators such as, cupping on the blackberry stems,
22 foliage freeze on the smaller oak trees and angle of char on their trunks, showing the fire
23 traveling west towards N. Busch Road. With the burn indicators and the fire spread I
24 observed earlier that morning, I was able to establish a General Origin Area (GOA). The
25 GOA I established was an approximate 200 square foot in size. I walked the perimeter of
26 the GOA in a counter clockwise direction identifying macro and micro burn indicators. I
27 observed micro burn indicators, such as charring on the wooden posts supporting a barbed
28 wire fence and cupping on blackberry stems. I finished walking counter clockwise and
29 retraced my path in a clockwise direction. I marked the fire's direction of travel with colored
30 flags along the GOA perimeter. I marked advancing burn indicators with red flags, lateral

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

9
10 At 11:19 AM, CAL FIRE Mendocino Bureau Chief Ryan SMITH arrived at the incident.
11 SMITH told me we were the only CAL FIRE investigators on the Redwood Incident due to
12 the high fire activity in Northern California. SMITH informed me he had requested a CAL
13 FIRE Survey LIDAR team from Sacramento to take measurements and map the origin. I
14 briefed SMITH on the events leading up to his arrival and the status of the investigation.
15 Together we walked the fire and retraced the steps I made earlier. SMITH and I continued
16 identifying burn indicators and marking them with colored flags. We used a systematic
17 approach until we located the Specific Origin Area (SOA), which we identified as a 32-foot
18 by 25-foot section. The SOA we identified was located on the northeast corner of [REDACTED]
19 [REDACTED] property under the conductors. Located in the SOA was a branch that appeared to
20 be the top section of an oak tree ten feet away. The tree branch was one foot in diameter
21 and approximately nineteen feet long. The branch had broken into two different sections.
22 The break at the end of the branch appeared to match the break at the top of the oak tree.
23 The oak tree was approximately six feet in diameter and approximately forty feet tall. The
24 oak tree had a lean away from the conductors.

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

1 transmission towers for future reference. The transmission tower to the north of the SOA
2 was 111 feet 4 inches away and the transmission tower to the south was 546 feet 8 inches
3 away. SMITH and I measured the distance from base of the oak tree to the eastern
4 overhead conductors and received a measurement of 13 feet. The oak tree leaned away
5 from the overhead conductors, which made the trunk the closest part of the tree to the
6 conductors.

7
8 At 4:45 PM CAL FIRE Firefighter Jeremy WHITAKER arrived at the incident to secure the
9 SOA overnight. WHITAKER was instructed not to let anyone into the SOA or disturb the
10 investigation. He was left with a marked CAL FIRE vehicle and a portable radio to notify us
11 if any issues arose. At 6:30 PM, SMITH and I left the incident for the night.

12
13 *Origin #1: North Busch Road October 10, 2017*

14
15 On Tuesday October 10, 2017, I met SMITH at the Redwood Incident Base located in
16 Ukiah. SMITH put in a request for an arborist to examine the condition of the oak tree. After
17 obtaining information on the fire and attending the morning briefing, I drove back to Potter
18 Valley to continue the investigation. At 10:15 AM, I arrived back at the incident. SMITH was
19 already there and told me he had requested CAL FIRE Forester II Charles MARTIN to
20 examine the oak tree. MARTIN has over twenty years of experience as a Registered
21 Professional Forester and Arborist. MARTIN arrived at the incident at 11:27 AM to examine
22 the oak tree for health and structural defects. MARTIN concluded there were no signs of
23 structural defect, disease, or other pest negatively affecting the branch at the break
24 location. MARTIN identified the tree as a Valley Oak (see arborist report attachment 10).

25
26 The CAL FIRE LIDAR team was already at the incident taking measurements of the SOA.
27 Walking in front of the LIDAR equipment will disrupt the measurements, so I used this time
28 to examine how the fire progressed from the SOA towards N. Busch Road. I walked the
29 two fields southwest of the SOA and saw multiple spot fires. I observed a few spot fires on
30 [REDACTED] property, but the majority of them were located on [REDACTED] property.

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

14
15 After the LIDAR team was done surveying the area, SMITH and I tried to locate the Ignition
16 Area within the SOA. SMITH and I examined the tree branch in the SOA and were unable
17 to find any evidence on it, such as marks from the overhead conductors. SMITH used a
18 chain saw to cut the small limbs and debris from around the tree branch to try to locate
19 more burn indicators and an Ignition Area. I ran a magnet over the SOA and was not able
20 to find any magnetic material except an old section of metal fence that was no longer in
21 use. The fence line stopped near the south edge of the SOA. It was not continuous and
22 was no longer maintained. Rusted remains of an electrical wire were near the metal fence.
23 The wiring was in sections and partially buried in the ground. [REDACTED] said the fence
24 hadn't been used or energized for over ten years. The blackberry bushes acted as a fence
25 to keep the cattle on the property. After examining the burned area within the SOA, we
26 were unable to locate the Ignition Area.

27
28 After talking with witnesses and investigating the fire, SMITH and I determined the middle
29 east conductor started the fire when the top section of the oak tree broke through it. The
30 fire advanced west with the wind along the property line and creek until it reached irrigated

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

8
9 *Origin #2: Hawn Creek Road October 12, 2017*

10
11 On Thursday October 12, 2017, I drove to Potter Valley to interview witnesses who were
12 there the night of the fire. I went to the Potter Valley Fire Station to speak with Chief PAULI
13 and the firefighters who were part of the initial response. I was met by Warren FOSTER,
14 who is a CAL FIRE firefighter with the Lassen Modoc Unit and a former Potter Valley
15 firefighter. He told me there was a separate fire from the initial fire on N. Busch Road. I
16 asked FOSTER if he would show me it's location. I followed him in my vehicle to the
17 intersection of Main Street and Hawn Creek Road. We then walked north towards the
18 driveway of 12300 Hawn Creek Road. I looked to the east and saw a burned area on the
19 property of 9100 Main Street. I estimated the burned area to be approximately an acre and
20 a half in size. I walked to the fires edge and saw it had burned along an irrigation canal in
21 short annual grass. I saw pieces of fulgurite on the ground near the bank of the canal.
22 Above the pieces of fulgurite were three distribution conductors. All but three pieces of
23 fulgurite were in the burn. Two of the three pieces had a small burned area around them
24 approximately 3 inch by 3-inch in size. To the south of the fire appeared to be a scaffold
25 (main) tree branch that broke from an oak tree located on the east bank of the irrigation
26 canal. The tree branch had been moved to the west from where it had fallen. I saw drag
27 marks in the dirt and grass from where the branch had landed to where it was currently
28 located. I called SMITH and told him there was a separate fire from the one we
29 investigated on N. Busch Road. SMITH told me he was on his way from Willits.

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

13
14 SMITH and I continued our investigation by determining the fire's direction of travel by
15 identifying the macro and micro burn indicators. We started walking counter clockwise
16 along the north edge of the fire. We crossed into the field to the west of Hawn Creek Road
17 and saw macro burn indicators such as angle of char in the tree crowns and on their
18 trunks. These macro burn indicators showed the fire traveling west from Hawn Creek
19 Road. SMITH marked the macro and micro burn indicators with red flags identifying
20 advancing fire. The angle of char on the trees along the west side of Hawn Creek Road
21 showed advancing fire. We walked across the road and identified advancing burn
22 indicators along the east side of Hawn Creek Road. We observed fire burn indicators such
23 as staining and ash deposits on a mail box post, angle of char on a small tree stump and
24 protection on the metal fence posts. SMITH and I determined the GOA to be approximately
25 an acre and a half on the east side of Hawn Creek Road. We followed the perimeter of the
26 GOA by walking both counter clockwise and clockwise and entered from the advancing
27 side. We identified the SOA as a 6-foot by 60-foot area located next to the irrigation canal.
28 We continued identifying advancing burn indicators until we reached the apex of the burn.
29 At the apex of the burn was a piece of fulgurite, which SMITH and I identified as our
30 primary point of ignition. From the Ignition Area, the fire burned in a V pattern towards

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

3
4 SMITH and I then placed white flags next to the items we were going to collect as
5 evidence. We placed a white flag next to the conductor found on the ground and marked it
6 Item 1. We placed white flags next to the pieces of fulgurite along the irrigation canal. We
7 marked individual pieces of fulgurites as one piece of evidence and numbered them as
8 Item 2. The last item we marked was approximately a 4 ½ -inch long copper conductor
9 fused to a piece of fulgurite and numbered it Item 3. SMITH and I took measurements of
10 the primary point of ignition for future reference. We triangulated it by taking two
11 measurements from Hawn Creek Road. We used two 3-inch vertical culvert posts used as
12 part of the construction of the irrigation canal running underneath Hawn Creek Road. The
13 measurement from the north post to the primary point of ignition was 92 feet 3 ¾ inches.
14 The measurement from the south post to the primary point of ignition was 88 feet 2 ½
15 inches.

16
17 SMITH and I examined the tree branch that was moved approximately 30 feet to the west
18 from the irrigation canal and approximately 30 feet to the south of the SOA. We observed a
19 broken section on the branch that appeared to match the tree located on the east side of
20 the canal. The branch was approximately 45 feet 8 inches long and was 14-inches in
21 diameter. SMITH and I measured the distance from the trunk of the tree to the closest
22 eastern conductor and received a measurement of 36 feet 6 inches. We measured the
23 distance of the closest tree branch to the closest east conductor and received a
24 measurement of 20 feet 8 inches. SMITH and I concluded our investigation at 1:44 PM.

25
26 To support our investigation at Hawn Creek Road, a recording from the Howard Forest
27 ECC has a radio transmission from CAL FIRE Heavy Fire Equipment Operator Sean
28 SWEENY telling the Incident Commander of a new vegetation fire at Hawn Creek Road
29 and Main Street. The radio transmission was recorded at 12:27 AM. I later spoke with
30 SWEENY, who told me he was driving to the staging area the night of the fire. He turned

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

9
10 SMITH requested CAL FIRE LIDAR Surveyors GREGORY and KAROLY to map the SOA
11 at Hawn Creek Road. Due to the high fire activity in Northern California and other
12 assignments they weren't able to come to Potter Valley until October 19, 2017. SMITH also
13 requested CAL FIRE Forester II MARTIN to examine the tree for health and structural
14 defects. On October 19, 2017, I met with both the LIDAR Surveyors and MARTIN in Potter
15 Valley to show them the fire's SOA and the tree to be examined. I showed MARTIN the
16 tree branch and the oak tree east of the irrigation canal. MARTIN concluded the branch
17 was solid and did not have any signs of decay where the break occurred. He saw no signs
18 of structural defect, disease, or other pest negatively affecting the branch at the break
19 location. MARTIN identified the tree as a Valley Oak (see arborist report attachment 10).
20 Shortly after MARTIN examined the oak tree, CAL FIRE LIDAR Surveyors GREGORY and
21 KAROLY arrived at the incident to take measurements and map the SOA.

22
23 Before showing MARTIN the oak tree, I was approached by [REDACTED] who
24 said he saw the fire start on Hawn Creek Road. [REDACTED] told me he was assisting
25 his neighbors evacuate the night of the fire. He said he was driving south on Hawn Creek
26 Road when he saw a flash to the east and saw the conductors come down. He said the
27 conductors sparked and started a fire about 50 feet east of Hawn Creek Road. He said the
28 fire crossed the road within seconds. [REDACTED] filled out a witness statement form
29 describing the events he saw (see witness statements attachment 12).

1 *Origin #3: East Road October 12, 2017*

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

10
11 SMITH and I investigated the field where [REDACTED] had seen the fire. The field was located
12 next to dry river bed of the Russian River and East Road. We accessed the field through a
13 gated fence and started looking at the macro and micro burn indicators. We started walking
14 clockwise towards the dry river bed. We observed burn indicators, such as protection and
15 staining on a white irrigation pipe, rock staining and protection on brush stems, showing the
16 fires direction coming from East Road. We walked in a circular path until we reached a
17 fence along East Road. We saw the burn indicators change direction indicating a
18 transitional zone. We marked these with yellow flags showing lateral fire. We then walked
19 counter clockwise reading advancing burn indicators until we reached the opposite
20 transitional zone. We located the transitional zone and marked the lateral burn indicators
21 with yellow flags. SMITH and I established the GOA as 5 acres in size between the river
22 bed and East Road. SMITH and I entered the GOA where we identified the advancing burn
23 indicators. We marked advancing indicators with red flags. We walked back and forth in a
24 systematic approach between the transitional zones reading the advancing indicators. The
25 distance between these zones became narrower and eventually we reached an area where
26 the burn indicators showed a backing fire. SMITH and I identified the SOA as a ten-foot by
27 ten-foot area. In the SOA, we observed short annual grass that wasn't fully consumed by
28 the fire. SMITH and I continued to identify micro burn indicators until we identified an
29 ignition area approximately 1-foot by 1-foot in size. I ran a magnet over this area and didn't
30 find any ferrous metal fragments or particles. We were unable to find any physical

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

4
5 During the first couple of days of the Redwood Incident, SMITH requested the fire spread
6 and spotting potential for the first two hours of Origin #1 and Origin #2 located in Potter
7 Valley. The map created by CAL FIRE Fire Behavior Analyst Tim CHAVEZ shows the fire
8 from Potter Valley headed directly towards the area we identified as the SOA in Redwood
9 Valley. CHAVEZ's map shows the fire had potential to spot a half mile in front of the fire.
10 CHAVEZ said the results of the data are an underestimate of the fires spread and spotting
11 distances (see fire behavior analyst report attachment 13).

12
13 Through the investigation, SMITH and I established three separate Specific Origin Areas
14 on the Redwood Incident. Within these three SOA, I conducted the following fire cause
15 exclusion analysis.

16
17 Lightning - The sky was clear with no thunderhead or cloud build-up observed. The
18 lightning detection data shows there were no lightning strikes in Potter Valley or Redwood
19 Valley at the time of the fires (see lightning activity attachment 14). The reporting party said
20 it looked like lightning had stuck during the 911 call while reporting the fire east of 13801 N.
21 Busch Road. This was later clarified as the light and noise coming from the conductor
22 breaking. Based on these facts, I eliminated lightning as a cause of these fires.

23
24 Campfire - There were no signs of a campfire observed at any of the SOA. There were no
25 designated campgrounds, tents or shelters in these areas. There were no rock rings, ash
26 pits or cooking stoves. There were no piles of stacked wood associated with camp fires at
27 any of the three fires. Based on these facts, I eliminated a campfire as the cause of these
28 fires.

29
30 Smoking - There were no discarded cigarettes or other smoking material within the SOA of

1 any of the three fires. The three fires were all located behind gated fences on private
2 property away from public access. Based on these facts, I eliminated smoking as a cause
3 of these fires.

4
5 Debris Burning - All burning was suspended in Mendocino County at the time of the
6 Redwood Incident. There was no evidence of debris burning on any of the three properties.
7 I saw no burn piles or burn barrels at or near the SOA. Based on these facts, I eliminated
8 debris burning as the cause of these fires.

9
10 Incendiary - There were no types of incendiary devices observed in the SOA of any of the
11 three fires. There was no evidence of any arson devices such as matches or cigarettes.
12 Access to each SOA involves passing through gated fences onto private land. Based on
13 these facts, I eliminated arson as the cause of these fires.

14
15 Equipment Use - There was no equipment use seen by witnesses at the time of any of the
16 three fires. There was no evidence of equipment use at Origin #1 and Origin #3. It
17 appeared that some type of equipment was used to move a fallen oak branch from
18 underneath the conductors south of Origin #2 after the fire had started. However, there
19 was no evidence of equipment use in the SOA, such as tire marks, carbon particles or rock
20 strikes. Based on these facts, I eliminated the use of equipment as the cause of these
21 fires.

22
23 Railroad - There are no railroads located near the SOA of any of the three fires. There are
24 no railroads in Potter Valley. The closest railroad in Redwood Valley to the SOA is more
25 than two and a half miles to the south. Based on these facts, I eliminated a railroad as a
26 cause of these fires.

27
28 Children - There was no indication of children being in or near the SOA of any of the three
29 fires. There were no toys left behind. The fires were located away from playgrounds,
30 schools and campsites. The falling tree branches from the strong wind made it unsafe to

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

4
5 Fireworks - The use of fireworks are illegal in Mendocino County. There was no evidence
6 of fireworks in or near the SOA of any of the three fires. While walking the perimeter of
7 GOA I did not observe any remnants of fireworks. Based on these facts, I eliminated
8 fireworks as a cause of these fires.

9
10 Vehicles - The SOA of each of the three fires were located behind gated fences on private
11 property away from paved roads. Each SOA was in a remote area on the properties with
12 no dirt roads or easy access to them. Based on these facts, I eliminated a vehicle as a
13 cause of these fires.

14
15 Glass Refraction - The only glass capable of refracting sunlight were glass bottles located
16 in the burn at N. Busch Road. The glass bottles were located approximately 60 feet from
17 the SOA and were used as a burn indicator showing a backing fire. All three fires occurred
18 at night with the first fire starting at approximately 11:34 PM. Sunset on October 8, 2017
19 was at approximately 6:43 PM. Based on these facts, I eliminated glass refraction as a
20 cause of these fires.

21
22 Electrical Power - Conductors were damaged due to falling tree branches. Evidence at N.
23 Busch Road and Hawn Creek Road show that conductors broke and contacted the ground.
24 Witnesses at N. Busch Road saw the conductors arc and a fire start immediately after.
25 Witnesses saw a fire start on the eastside of Hawn Creek Road on the property of 9100
26 Main Street. Fulgurite pieces and copper wire were found during the investigation of this
27 fire. There was no electrical power in or near the SOA in Redwood Valley. Based on these
28 facts, I included electrical power as a cause of the fires at N. Busch Road and Hawn Creek
29 Road.

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

14
15 The conductors at Origin #1 - N. Busch Road, is a 60kV overhead conductor. The
16 conductor at Origin #2 - Hawn Creek Road, is a 12kV overhead conductor. Per California
17 Public Resource Code 4293, except as otherwise provided in Sections 4294 to 4296,
18 inclusive, any person that owns, controls, operates, or maintains any electrical transmission
19 or distribution line upon any mountainous land, or in forest-covered land, brush-covered
20 land, or grass-covered land shall, during such times and in such areas as are determined
21 to be necessary by the director or the agency which has primary responsibility for the fire
22 protection of such areas, maintain a clearance of the respective distances which are
23 specified in this section in all directions between all vegetation and all conductors which are
24 carrying electric current: (a) For any line which is operating at 2,400 or more volts, but less
25 than 72,000 volts, four feet. (b) For any line which is operating at 72,000 or more volts, but
26 less than 110,000 volts, six feet. (c) For any line which is operating at 110,000 or more
27 volts, 10 feet. In every case, such distance shall be sufficiently great to furnish the required
28 clearance at any position of the wire, or conductor when the adjacent air temperature is
29 120 degrees Fahrenheit, or less. Dead trees, old decadent or rotten trees, trees weakened
30 by decay or disease and trees or portions thereof that are leaning toward the line which

1 may contact the line from the side or may fall on the line shall be felled, cut, or trimmed so
2 as to remove such hazard. The director or the agency which has primary responsibility for
3 the fire protection of such areas may permit exceptions from the requirements of this
4 section which are based upon the specific circumstances involved.

5
6 The Valley Oak at Origin #1 N. Busch Road, leaned away from the conductors. The closest
7 part of the Valley Oak was the base of the tree. The distance from the base of the tree to
8 the closest eastern conductor was 13 feet. The examination of the tree concluded there
9 were no signs of structural defect, disease, or other pest negatively affecting the branch at
10 the break location.

11
12 The Valley Oak at Origin #2 Hawn Creek Road, stood predominantly upright and was 36
13 feet 6 inches away from the closest eastern conductor. The closest part of the Valley Oak
14 was a tree branch that measured 20 feet 8 inches to the closest eastern conductor. The
15 examination of the tree concluded there were no signs of structural defect, disease, or
16 other pest negatively affecting the branch at the break location.

17
18
19
20
21
22
23
24
25
26
27 ERB.thy 6/4/2018
28 Signature Date
29 Eric Bettger, #4703
30 Fire Captain Specialist

10 - ATTACHMENTS:

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