



# Preliminary Ignition Investigation Report

<b>Ignition Database Index:</b>	20240875N
<b>Electric Incident Investigation (EII) Number:</b>	N/A
<b>Incident Name:</b>	Rocky - 06 Jul 2024
<b>PG&amp;E Facility Ignition?</b>	Yes
<b>CPUC Reportable Ignition?</b>	Yes
<b>Date &amp; Time of Incident:</b>	July 6, 2024, at 0351 hours <sup>1</sup>
<b>Street Address:</b>	Old Gulch Road and Rocky Road
<b>City:</b>	San Andreas
<b>County:</b>	Calaveras
<b>Latitude/Longitude:</b>	38.1753471926, -120.5895900754
<b>State Responsibility Area (SRA) / Local Responsibility Area (LRA) / Federal Responsibility Area (FRA)</b>	State Responsibility Area (SRA)
<b>PG&amp;E Division:</b>	Stockton
<b>High Fire Threat District (HFTD):</b>	Tier 2
<b>High Fire Risk Area (HFRA):</b>	Yes
<b>EPSS Buffer:</b>	No
<b>Fire Index Area (FIA):</b>	320
<b>Fire Potential Index (FPI) Rating: FIA</b>	R4
<b>Fire Potential Index (FPI) Rating: Circuit</b>	R4
<b>Was there a PSPS event at the time of ignition?</b>	No
<b>Suspected Initiating Event:</b>	Vegetation
<b>Failure Driver:</b>	Contact from Object
<b>Failure Sub-driver:</b>	Contact – Vegetation
<b>Circuit:</b>	Calaveras Cement 1101
<b>Circuit Protection Zone:</b>	Calaveras Cement 1101502
<b>Nominal Voltage:</b>	12kV
<b>Pole SAP Equipment ID:</b>	104174502, 101280385
<b>Subject to PRC 4292 Veg Pole Clearance:</b>	No
<b>PG&amp;E Equipment associated with ignition:</b>	Conductor – Primary
<b>EPSS enabled at time of ignition?</b>	Yes
<b>Fault Type:</b>	Line to Line
<b>Wire Down (Primary)?</b>	Yes
<b>Lead Agency/Agency Having Jurisdiction:</b>	CAL FIRE
<b>Fire Size:</b>	0.26 to 9.99 acres

<sup>1</sup> First no light (FNL) via ILIS 24-0084511.

<b>FAS Field Remarks:</b>	“tree fell through wires. broke 2 phases, pinned down the 3rd. damaged 2 xarms. started fire”	
<b>HAWC Summary:</b>	“Fire resources responded to a vegetation fire at Rocky Road and Old Gulch Road in a Tier 2 area. The fire was last reported at 4.5 acres. Fire resources have a hose lay around the perimeter. There was an outage in the immediate area. The outage was on the EPSS enabled Calaveras Cement 1101, initially impacting 1,050 customers. At the time of this writing, there are only 170 customers still affected. OIS # 2507281. SIPT E441 responded to the incident. Tmen are on scene and assessing the situation. Unknown damages currently. An Everbridge Alert has been sent out. Notifications have been made to HAWC Ops, PSS, DCC and EII. Closing the incident barring any significant changes in the situation.”	
<b>Injuries / Fatalities / Property Damage / Media Attention:</b>	None	
<b>Weather Conditions:</b>	<p>At 0400 hours on the incident date, a weather observation site (PG829) approximately 3.5 miles south-southeast of the Incident Location recorded the following conditions:</p> <ul style="list-style-type: none"> <li>• Temperature: 72.5°F</li> <li>• Relative Humidity: 49%</li> <li>• Wind Speed: 5.5 mph out of the east</li> <li>• Wind Gust: 8.8 mph</li> </ul>	
<b>Red Flag Warning (RFW) / High Wind Warning (HWW):</b>	None	
<b>911 Standby Relief Time:</b>	4 minutes	
<b>OIS #:</b>	2507281, 2507650	
<b>ILIS #:</b>	24-0084511	
<b>FAS #:</b>	T006440132, T006440138, T006440141, T006440199, T006440304	
<b>TOTL #:</b>	N/A	
<b>Assigned Attorney:</b>	N/A	
<b>Ignition Investigator &amp; Phone:</b>	██████████ ██████████	██████████ ██████████

## Executive Summary

On July 6, 2024, at 0351 hours, Line Recloser (LR) 502 on the EPSS-enabled three-phase Calaveras Cement 1101 12kV Overhead Distribution Circuit opened on a line-to-line fault on phases A and C, de-energizing 1,050 customers. At 0359 hours, PG&E dispatched a troubleshooter ("Troubleshooter #1") to investigate the outage. At 0445 hours, PG&E dispatched a second troubleshooter ("Troubleshooter #2") for support.<sup>2</sup> At approximately 0500 hours, Troubleshooter #1 arrived at LR 502 to patrol the circuit up to LR 80930 and isolate the location of the fault. Troubleshooter #1 identified fault indicators on the A and C phases of the circuit downstream of Switch (SW) L3467 and subsequently opened the switch at 0536 hours. At 0544 hours, CAL FIRE alerted PG&E Dispatch of an active fire with downed power lines located 1,000 feet north of the intersection of Rocky Road and Old Gulch Road ("Incident Location") in the unincorporated Calaveras County near the community of San Andreas, California (Figure 1). At 0546 hours, the Fresno Distribution Control Center ("DCC") closed LR 502, restoring service to 880 impacted customers, and Troubleshooter #1 proceeded to the Incident Location. The Incident Location was within an HFTD Tier 2 and HFRA.

By 0551 hours, Troubleshooter #1 arrived at the Incident Location and observed CAL FIRE on-site. Troubleshooter #1 observed that an uprooted tree ("Incident Tree") had fallen into three phases of 2-ACSR primary overhead conductors ("Incident Span") spanning between fiberglass pole SAP ID 104174502 ("load-side pole") and wood pole SAP ID 101280385 ("source-side pole"). The Incident Tree broke two of three wires and was leaning on the third wire (Figure 2, Figure 3, Figure 4).<sup>3</sup>

At 0634 hours, Troubleshooter #1 created electric corrective (EC) notification no. 129177054 to replace a broken crossarm and 100 feet of wire on all three phases at the load-side pole. At 0928 hours, Troubleshooter #1 created EC notification no. 129177172 to replace a broken crossarm at the source-side pole. At 0915 hours, a PG&E repair crew began restoration work. At 0949 hours, Troubleshooter #1 completed a patrol of the Calaveras Cement 1101 12kV line between SW L3467 and Fuse Cutout (FUCO) L1193 (Figure 5, Figure 6) and reported no additional abnormalities. At 1000 hours, Troubleshooter #2 closed SW L3467 for the repair crew to begin work. By 1506 hours, the PG&E repair crew completed all repairs and restored service to all remaining impacted customers.

On July 8, 2024, PG&E Vegetation Management ("VM") patrolled the Incident Location and observed that the fallen tree was an approximately 80-foot tall ponderosa pine with a 16-inch diameter at breast height (DBH). The tree was located to the east of the conductors of the Incident Span (Figure 7, Figure 8), with a tree-to-conductor clearance of approximately 50 feet. Based on their observations, VM determined that the potential causal factors contributing to the tree uprooting included:

1. The tree was growing on a 50% slope with poor soil conditions.
2. The tree canopy grew primarily on the conductor side due to competition with surrounding ponderosa pine trees.
3. The tree had a heavy cone load at the time of the incident.
4. The excessive heat from the days leading to the ignition incident may have increased stress on the tree.

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<sup>2</sup> Two more troubleshooters were also dispatched for this incident at 0724 hours and 1000 hours (OIS #2507281).

<sup>3</sup> Comment from EC notification 129177054: "replace xarm and conductor. 1 phase pinned down by tree top."

Since the Incident Tree likely did not have any visible defects and the failure mode was uprooting, it is unlikely that past Limited Visual Assessment (Level 1)<sup>4</sup> inspections during Annual and Second Vegetation Management Patrols would have identified conditions that would have been required to prescribe mitigation. Even in light of the 50% slope, it is unclear whether the Basic Assessment (Level 2)<sup>5</sup> protocol would have led to prescribing mitigation at the Incident Tree in the absence of other obvious visual defects.

From July 8 to July 10, 2024, VM performed an extent-of-condition patrol that included vegetation adjacent to 28 spans immediately surrounding the Incident Location (Figure 9). The expanded patrol did not reveal any other similarly uprooting trees in the area.

At the time of the incident, PG&E meteorology data from the nearest weather station, 3.5 miles south-southeast of the Incident Location, recorded clear weather with a temperature of 73°F, a relative humidity of 49%, sustained winds of 5.5 miles per hour (mph), and wind gusts up to 8.8 mph.

This information is preliminary, and all times, customer numbers, and measurements mentioned in this report are approximate.

## System Protection Analysis

The incident occurred on the Calaveras Cement 1101 12kV circuit, and Enhanced Powerline Safety Settings (EPSS) were enabled on upstream LR 502 (brand: RVE, type: Viper Oil Retrofit-R1.3) at the time of the incident. LR 502 opened automatically on a line-to-line fault, impacting 1,050 customers. FUCO L1193 was the closest protective device upstream of the Incident Location. Distribution Protection Engineering reviewed oscillography from the event and reported that LR 502 responded in 87 milliseconds, which is within the desired EPSS program target of 100 milliseconds. Therefore, system protection performed as expected.

## Ignition Impact

The treefall event ignited a 4.5-acre fire near the load-side pole of the Incident Span. The fire was suppressed by CAL FIRE. The incident resulted in a sustained outage that affected 880 customers for a total duration of 105 minutes, 54 customers for a total duration of 6 hours and 25 minutes, and 116 customers for a total duration of 11 hours and 15 minutes.

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<sup>4</sup> A Limited Visual Assessment (Level 1) is a visual assessment of trees from a specified perspective (i.e., foot, vehicle, or aerial patrol) that is intended to identify conditions or obvious defects of concern (TD-7102P-01).

<sup>5</sup> A Basic Assessment (Level 2) is a detailed visual inspection of a tree and surrounding site that requires a 360° inspection around the tree trunk. This includes inspecting the visible aboveground roots, trunk, and branches (TD-7102P-01).



## Sequence of Events

July 6, 2024

- 0351 hours – LR 502 opens on a line-to-line fault, impacting service to 1,050 customers.
- 0359 hours – PG&E dispatches Troubleshooter #1.
- 0445 hours – PG&E dispatches Troubleshooter #2.
- 0452 hours – HAWC alerted that CAL FIRE was responding to a vegetation fire in the area of the Calaveras Cement 1101 circuit.
- 0500 hours – Troubleshooter #1 arrives at LR 502 and begins patrolling the circuit.
- 0510 hours – Troubleshooter #2 arrives at LR 502.
- 0536 hours – Troubleshooter #1 observes activated fault indicators downstream of SW L3467 and subsequently opens the switch.
- 0544 hours – CAL FIRE alerts PG&E Dispatch of an active fire with downed wires at the Incident Location.
- 0546 hours – DCC closes LR 502, restoring power to 880 customers.
- 0550 hours – Troubleshooter #1 arrives at Incident Location, and DCC alerts CAL FIRE that a PG&E troubleshooter is on-site.
- 0634 hours – Troubleshooter #1 creates EC 129177054 at the load-side pole.
- 0914 hours – PG&E repair crew opens overhead jumpers on wood pole SAP ID 104191978<sup>6</sup> in preparation for restoration work.
- 0928 hours – Troubleshooter #1 creates EC 129177172 at the source-side pole.
- 0949 hours – Troubleshooter #1 completes patrol between SW L3467 and FUCO L1193.
- 1000 hours – Troubleshooter #2 closes SW L3467, restoring power to 54 customers.
- 1449 hours – Repair crew opens SW L3467, forcing out power for 54 customers.
- 1505 hours – Repair crew closes overhead jumpers at wood pole SAP ID 104191978 and closes SW L3467 upon completion of restoration work, restoring power to 170 customers.

## Corrective Notification Associated with Ignition

Two EC notifications were created in response to this incident for immediate replacement of broken crossarms and overhead conductors.

Type	Number	Description	Priority	Date Identified	Due Date
EC Notification	129177054	Replaced crossarm on pole 104174502 (load-side pole) and 100 ft of wire on all three phases	A	July 6, 2024	N/A
EC Notification	129177172	Removed crossarm on pole 101280385 (source-side pole)	A	July 6, 2024	N/A

<sup>6</sup> Overhead Distribution Transformer California Grid Coordinate (CGC) 319790061445

## Pending Work

EC notification no. 126486820 was pending at the time of this ignition incident. The notification flagged birdcaging<sup>7</sup> near a splice on one phase of the Incident Span.

## Asset Info & Most Recent Inspections and Tests

<b>Load Side Structure</b>	104174502	
<b>Info / Inspection</b>	<b>Most Recent Date</b>	<b>Findings</b>
Install Date:	May 8, 2023	45-foot Class 3 fiberglass pole
Inspection:	June 30, 2023	Inspector noted birdcaging at a splice on the primary conductors, created EC notification no. 126486820. No issues found with pole, framing, or vegetation (Figure 10).
	May 14, 2020	Last enhanced GO165 inspection for ancestor pole SAP ID 101280386.
Corrective History:	June 30, 2023	EC notification no. 126486820 (priority E) created to repair birdcaging at a compression splice on the primary conductors. Current pole was installed May 8, 2023, but due to outdated photos from iHawk taken on April 5, 2023, pole was re-flagged for replacement. Work was not complete at the time of the ignition incident.
Aerial Inspection Records:	January 31, 2024	"Conductor bird caging at splice." (Figure 11) No other abnormal conditions noted.
VM Inspection:	May 21, 2024	Span inspection (OneVM-035626). No findings at the Incident Span.

<b>Source Side Structure</b>	101280385	
<b>Info / Inspection</b>	<b>Most Recent Date</b>	<b>Findings</b>
Install Date:	1947 (GIS installation date)	40-ft Class 4 Douglas Fir pole
Inspection:	June 30, 2023	Inspector added comments to the open EC notification no. 119027625 (Figure 12).
	June 4, 2018	-
Corrective History:	May 13, 2020	EC notification no. 119027625 (priority E) created to fix incorrectly installed connector on armor rod and a cracked insulator on the phase closest to the road. August 28, 2020: Connectors installed on armor rod. July 29, 2022: Field Safety Assessment, noted a tap installed on armor rod and small crack on road phase insulator.

<sup>7</sup> The unraveling of stranded wire in a pattern resembling a birdcage (examples shown in TD-2305M-JA02).

		June 30, 2023: Field Safety Assessment, noted damage to insulator, splice, tie wire, pole (woodpecker), armor rod, and guy insulator. November 26, 2023: Work completed.
Aerial Inspection Records:	March 20, 2024	No abnormal conditions observed
VM Inspection:	May 21, 2024	Span inspection (OneVM-035626). No findings at the Incident Span.
Pole Intrusive Test:	May 28, 2014	Passed, top/bottom condition: fair Notification no. 203312020
WSIP Inspection:	February 7, 2019	No findings

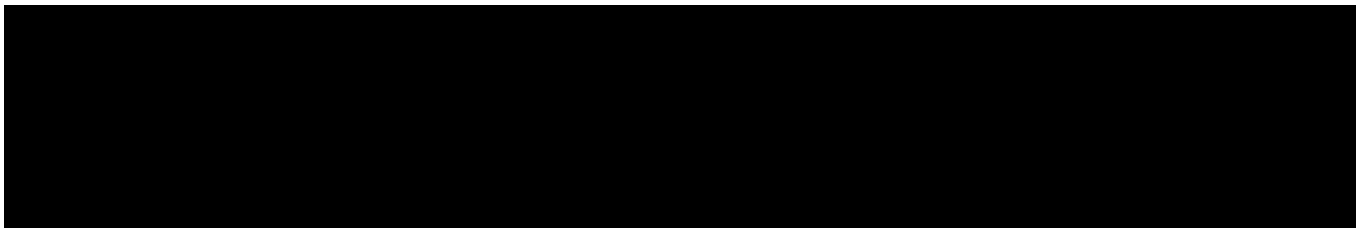
### Hazard Barrier Analysis:

Hazard	Vegetation Contact	Sub-Hazard	Fallen Tree
Target	Fallen tree in HFTD Tier 2 leading to 4.5-acre ignition.		
Barrier	Expected vs. Observed Performance	Why did the barrier not prevent the ignition event? (See <a href="#">ICF Codes</a> )	Opportunity
Barriers that Positively Affected the Ignition			
Enhanced Powerline Safety Settings - Instantaneous Trip Settings  TD-2700P-26 Rev. 1, TD-1470S Rev. 0	Expected Performance: Protective device automatically trips when fault is detected; Observed Performance: Barrier performed as expected	A1B2C2D3 - Limitation: Equipment Limitation; EPSS Limitation; Device tripping time is limited	Barrier likely prevented a larger ignition by automatically shutting off power when fault was detected.
Barriers that Were Assessed as Opportunities			
Level 2 Basic Tree Assessment  TD-7102P-01 Rev. 1	Expected Performance: Identify conditions or obvious defects of concern; Observed Performance: Barrier did not exist	N/A	Annual and Second Patrols did not identify defects at the Incident Tree during the Level 1 inspection that would have led to a Level 2 inspection.

### Potential Next Steps / Associated CAP Items:

No next steps were identified as a result of this investigation.

## Single Line Diagram



### LEGEND



Substation



Fuse



Line  
Recloser



Area of  
Interest

## Photos and Diagrams of Events

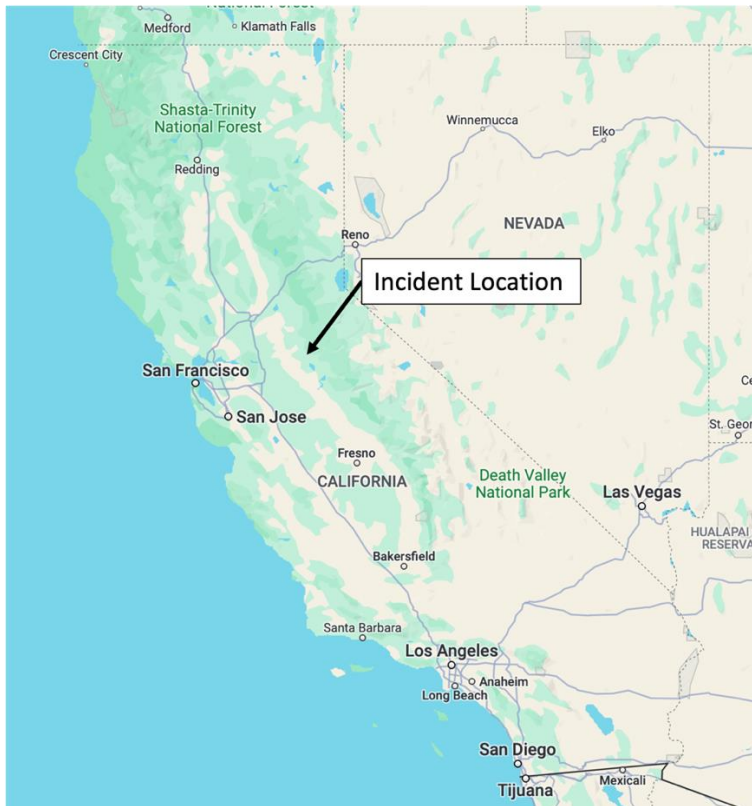


Figure 1. Map indicating Incident Location.





Figure 2. Incident photo of fallen ponderosa pine tree (taken July 6, 2024).

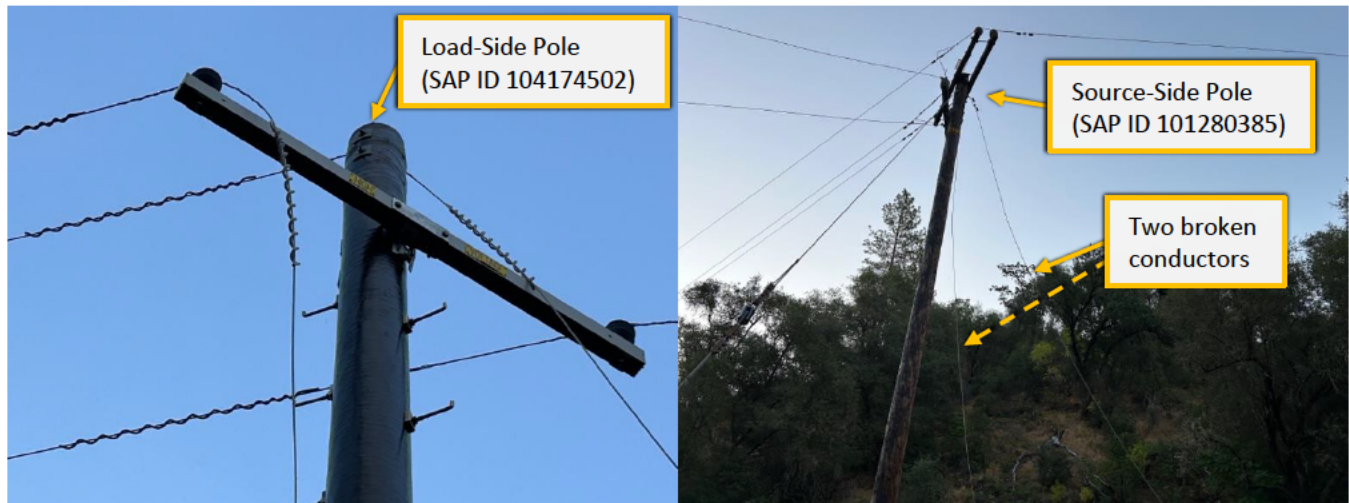


Figure 3. Incident photos of the load-side and source-side poles of the Incident Span (taken July 6, 2024).





Figure 4. Incident photos showing fallen ponderosa pine tree and burn area (taken July 6, 2024).

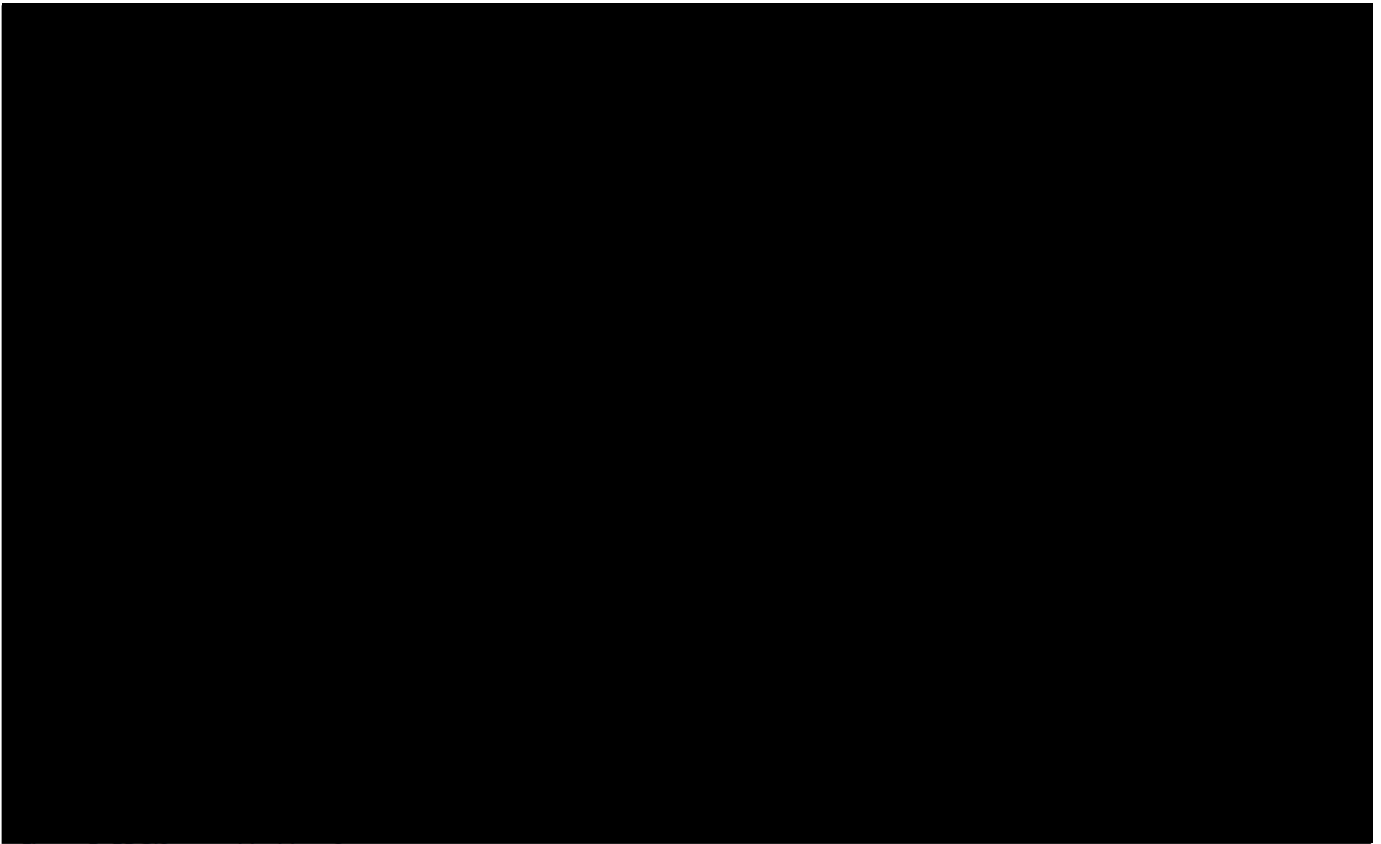


Figure 5. EDGIS map of Incident Span.





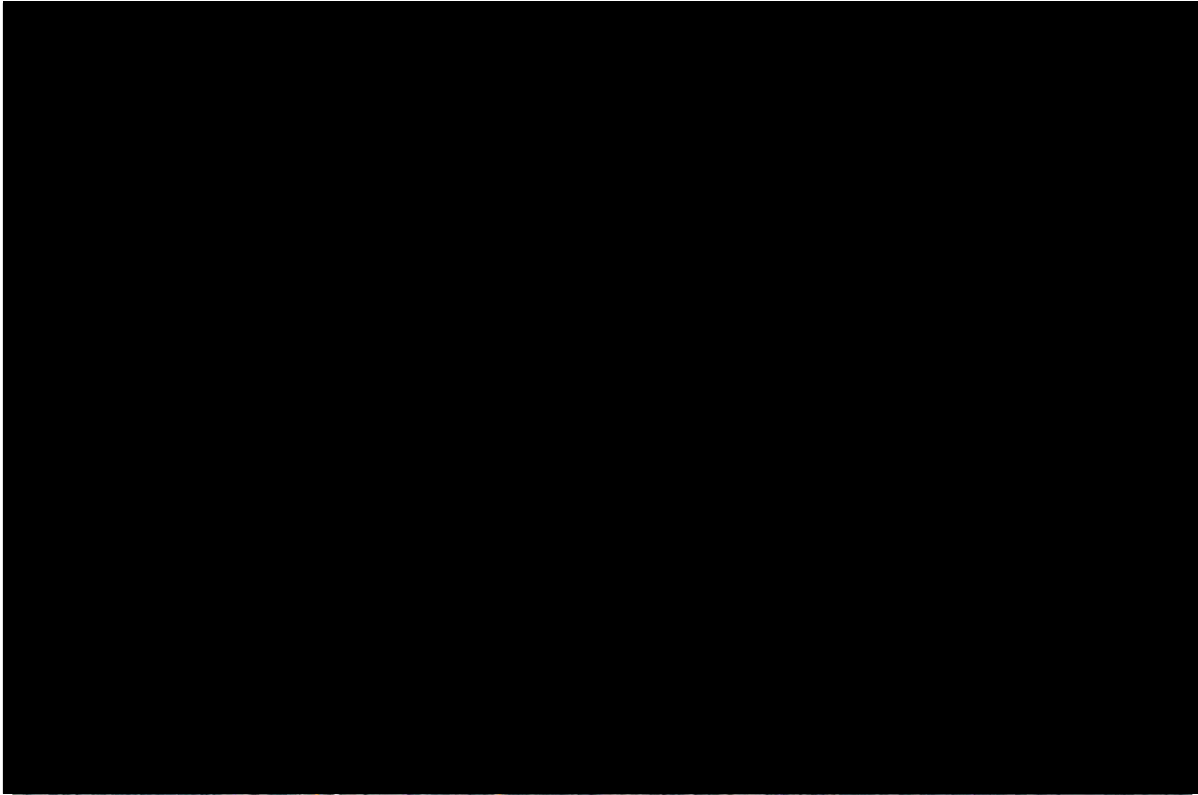


Figure 7. Photos of fallen tree on Incident Span (top) and close-up of tree roots (bottom) (Vegetation Management, taken July 6, 2024).





Figure 8. Photo of ignition site with Incident Tree and load-side Pole (Vegetation Management Incident Extent of Condition (XoC) Patrol Report).



*Figure 9. Patrol area for nearest 28 spans surrounding the Incident Location (Vegetation Management Incident Extent of Condition (XoC) Patrol Report).*



*Figure 10. Pre-incident photo of load-side pole (SAP ID 104174502) from recent inspection (taken June 30, 2023).*





Figure 11. Pre-incident photos of load-side pole (SAP ID 104174502) from recent aerial inspection (taken January 23, 2024).



*Figure 12. Pre-incident photo of source-side pole (SAP ID 101280385) from recent inspection (taken June 30, 2023).*

## Attachments

The ESA folder below contains attachments and references related to this incident:



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