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23 COMPANY

24 UNITED STATES DISTRICT COURT  
25 NORTHERN DISTRICT OF CALIFORNIA  
26 SAN FRANCISCO DIVISION

27 UNITED STATES OF AMERICA,  
28  
29 Plaintiff,  
30  
31 v.  
32  
33 PACIFIC GAS AND ELECTRIC COMPANY,  
34  
35 Defendant.

Case No. 14-CR-00175-WHA

**RESPONSE TO REQUEST FOR  
ADDITIONAL INFORMATION  
FOLLOWING PG&E'S NOVEMBER  
18 BRIEFING**

Judge: Hon. William Alsup

1 **Question 1:** State the full extent to which PG&E itself (as opposed to its contractors  
2 and/or subcontractors) maintains records with respect to individual distribution lines in  
3 Tier 2 and Tier 3 areas:

- 4 a. Setting forth the reports of inspections identifying trees or limbs for  
5 removal and the data thereof;
- 6 b. Setting forth the full extent to which the work identified in such  
7 inspections was accomplished and dates accomplished
- 8 c. Setting forth the full extent to which the work identified in such  
9 inspections has NOT been performed.

9 **PG&E Response:**

10 PG&E's vegetation management ("VM") program consists of several types of  
11 VM activities focused on identifying trees or limbs for removal. PG&E is setting forth below the  
12 current recordkeeping practices and records for each of PG&E's core VM programs that include  
13 tree removal or tree trimming in Tier 2 and Tier 3 High-Fire Threat District ("HFTD") areas. All  
14 of the records and databases described below are maintained in PG&E's possession, not in the  
15 possession of PG&E's contractors or subcontractors.

16 Routine/CEMA Patrols: PG&E's routine and Catastrophic Emergency  
17 Memorandum Account ("CEMA") VM programs generally use similar methods to create and  
18 maintain records of trees identified for work. PG&E uses its Project Management Database  
19 ("PMD") to manage the scheduling of routine and CEMA VM patrols. PMD records the start  
20 and end dates of routine and CEMA VM patrols as well as the number of tree units identified by  
21 pre-inspectors and the number of tree units worked by tree trimmers.

22 While in the field, pre-inspectors who perform routine and CEMA pre-inspections  
23 use ruggedized tablet computers to input information about trees identified for work directly into  
24 PG&E's Vegetation Management Database ("VMD"). These devices also provide  
25 pre-inspectors information about trees identified during prior VM patrols. The information  
26 pre-inspectors input into VMD for a tree identified for work using their devices typically  
27 includes:  
28

- 1 (i) the location of the tree identified for work (including latitude and
- 2 longitude coordinates for the tree and a description of the tree's location
- 3 relative to PG&E's facilities);
- 4 (ii) the species, diameter and height of the tree;
- 5 (iii) the type of work prescribed for the tree (if any);
- 6 (iv) the priority assigned to that tree work; and
- 7 (v) other clarifying comments about the tree or work prescribed.

8 If a given tree requires work, the pre-inspector will assign a work type code and a priority to that  
9 request in VMD. If a tree requires immediate work to address an imminent threat to PG&E  
10 facilities, the pre-inspector will generate a priority tag to remove or trim that tree on an expedited  
11 basis. For a given tree, pre-inspectors can also indicate exceptions to the normal flow of VM  
12 work using PG&E's Issue Tracking System ("ITS") within VMD. Such exceptions may include,  
13 for example, situations where a tree identified for work is subject to a customer refusal or  
14 environmental permitting constraint. VMD records the date and time this information is entered  
15 by the pre-inspector. In addition to the inspection records stored on VMD, pre-inspectors who  
16 perform routine and CEMA VM patrols sign hard copy index maps indicating the start and end  
17 date for their pre-inspection of a given section of a distribution circuit. PG&E retains these hard  
18 copy index maps.

19 After a pre-inspector has performed a routine VM or CEMA inspection, the local  
20 VM office responsible for a given distribution line will use VMD to generate work requests  
21 listing any trees the pre-inspector identified for work that do not have restrictions (such as  
22 customer refusals). These work requests are assigned through VMD to tree trimming  
23 contractors, who receive PDF versions of the work requests via email. After tree trimming  
24 contractors complete tree work prescribed on a work request, they use a program that  
25 communicates with VMD to input and record the work that was completed. Any trees identified  
26 for work by pre-inspectors that tree trimming contractors have not completed will appear in the  
27 VMD as incomplete.

1            EVM Program: PG&E’s Enhanced Vegetation Management (“EVM”) program  
2 uses PG&E’s ArcGIS database to store data generated during EVM inspections and associated  
3 tree work. For each line mile subject to the EVM program, pre-inspectors perform two phases of  
4 inspections. During a Phase 1 inspection, pre-inspectors identify for removal or trimming any  
5 vegetation that encroaches on a 12-foot radial clearance of PG&E’s power lines or that  
6 overhangs above the conductor or within the 4-foot zone extending on either side of the  
7 conductor, as well as any dead, dying, or diseased trees that pose a risk to PG&E’s facilities as  
8 vegetation points in Collector, an application further described below. During Phase 2  
9 pre-inspections, pre-inspectors inventory and perform a tree assessment of any tree that has the  
10 potential to strike PG&E equipment and also assess whether there are any trees or branches  
11 requiring work that the first pre-inspector may not have identified. EVM pre-inspectors use the  
12 Collector app on their cell phones or tablets to identify and input information about trees in the  
13 vicinity of PG&E power lines. Data input through the Collector app is stored in PG&E’s  
14 ArcGIS database. Collector is primarily a map-based application that allows pre-inspectors to  
15 identify trees by creating points on a map called vegetation points. For each vegetation point  
16 identified using Collector, EVM pre-inspectors are trained and instructed to record, among other  
17 things, the tree species, diameter, height, health, prescribed work (or whether no work is  
18 prescribed) and the status of that work. After identifying a vegetation point and inputting the  
19 requisite information, EVM pre-inspectors are instructed to use the Tree Assessment Tool  
20 (“TAT”) within the Collector app to determine whether and what work should be prescribed for  
21 that tree. EVM pre-inspectors are instructed to update their prescription in Collector based on  
22 the results of the TAT analysis.

23            After a segment of a line has been patrolled by an EVM pre-inspector and  
24 information inputted into the Collector app, that segment is assigned to a tree trimming  
25 contractor, who uses the Collector app to locate trees that have been identified for work by the  
26 pre-inspector. After work has been performed, tree trimming crews are instructed to record the  
27 status of that work as complete using Collector. Tree trimming crews can also use Collector to  
28

1 note when they are unable to complete work due to a customer refusal or other delay, such as  
2 environmental issues. Using Collector, tree trimming crews input for each vegetation point they  
3 work the name of the tree trimming company, the tree trimming subcontractor (if applicable), the  
4 tree trimming foreman, the code for the tree work performed, the date the tree work was  
5 completed and any comments about the tree work. PG&E can track the status of work on any  
6 given line segment or for any tree identified by EVM pre-inspectors through the Collector app or  
7 by running a query of the ArcGIS database where PG&E stores and maintains data input through  
8 Collector for its EVM program. These records can be accessed and exported as necessary from  
9 PG&E's ArcGIS database.

10 All work prescribed under EVM is subject to PG&E's 100% work verification  
11 process. Please see PG&E's response to Question 2 below for a description of EVM work  
12 verification and the associated record management process.

13 Non-Routine/Emergency VM Work: Beginning with the Camp Fire, PG&E  
14 implemented its own version of the ArcGIS database and Collector app for use in post-fire and  
15 emergency VM work. The version of Collector used for emergency VM work is functionally  
16 similar to the version used to record EVM work, but the information required for each vegetation  
17 point is tailored to the emergency.<sup>1,2</sup>

18  
19 <sup>1</sup> PG&E's VM program also includes its Vegetation Clearing ("VC") program in addition to  
20 routine, CEMA, EVM and wildfire/emergency VM work. The VC program is aimed at ensuring  
21 compliance with Public Resource Code § 4292, which requires utilities to maintain clearance of  
22 no less than 10 feet around a subset of utility poles to which certain equipment is attached. The  
results of VC inspections are inputted through PCD2, an application specifically designed for VC  
inspectors and are recorded in VMD.

23 <sup>2</sup> PG&E's VM programs are also subject to Quality Assurance ("QA") and Quality  
24 Verification ("QV") reviews. A typical QA review consists of a field audit of line segments  
25 selected through a statistically valid random sampling process, during which a QA inspector (a  
26 PG&E employee) inspects the line segments for any regulatory non-compliance. The results of  
27 these field audits are recorded on a spreadsheet saved to the QA shared drive. That information  
is ultimately published in a report by the QA department on their overall findings for a given  
region. The QA department publishes the report on its SharePoint site and notifies the local VM  
supervisor whose territory was audited as well as VM program leadership via email. In addition,  
any regulatory compliance issue identified by a QA inspector results in a Corrective Action

1 **Question 2:** In its response dated November 3, 2020, PG&E stated on page two its  
2 intention to improve contractor fidelity to the EVM program and stated that mid-2019  
3 improvements “included 100% work verification, increased contractor training,  
4 contractor competency tests, and numerous changes to improve EVM recordkeeping.”  
5 State in plain terms what each of these changes are, the date of their implementation, and  
6 contractor compliance since that implementation.

7 **PG&E Response:**

8 100% Work Verification: PG&E’s EVM program consists of two phases of  
9 pre-inspections. No line mile is claimed as complete under PG&E’s EVM program until that  
10 mile has been subject to both phases of pre-inspection and tree work under the EVM program  
11 scope and has been verified as complete to EVM standards by PG&E’s Work Verification  
12 (“WV”) team. The final step of this process is referred to as “100% work verification.” Under  
13 100% work verification, the WV team confirms both that the pre-inspections performed under  
14 the EVM program satisfy the scope and standards of the EVM program (including identification  
15 and assessment of any trees with the potential to strike PG&E’s power lines) and that all tree  
16 work has been completed in accordance with EVM standards. This verification is performed  
17 only after both phases of EVM patrols are complete and the tree crew has reported that it has  
18 completed the identified EVM work.

19 To verify EVM work, the WV team uses Survey123, a survey-based application  
20 that overlays a map on top of the Collector app, to view every vegetation point associated with a  
21

22 \_\_\_\_\_  
23 Program (“CAP”) report being generated for that nonconformance and issued to the local VM  
24 supervisor. At the conclusion of each audit, a separate CAP report is issued to the local VM  
25 supervisor to assign corrective actions to any significant findings from the audit. A CAP report  
26 must be closed by the individual to whom it is issued with comments explaining the resolution to  
27 the issue identified in the CAP. Similarly, PG&E’s QV department performs field audits to  
28 check the quality of both pre-inspections and tree trimming work performed by contractors.  
Findings made by the QV inspectors are stored in the Quality Control Database (“QCD”). QV  
emails findings directly to the VM operations team. As with the QA process, any regulatory  
compliance issue identified at a sample location by a QV inspector results in a CAP report being  
generated and issued to the local VM supervisor.

1 given line segment and to input any findings during their patrol. Survey123 is a survey-based  
2 application which guides users through a series of questions, such as whether all trees tall enough  
3 to potentially strike the line were assessed using the TAT. The WV inspectors walk the line  
4 segments to ensure that (1) the primary overhead conductor is present in the field (*e.g.*, is not  
5 underground), (2) all trees along the span meet EVM requirements for tree work (*i.e.*, vegetation  
6 trimmed for 12-foot radial clearance and 4-foot conductor-to-sky clearance, and all dead or dying  
7 trees with potential to strike PG&E power lines have been identified and removed), and (3) all  
8 trees with potential to strike PG&E's power lines are captured as vegetation points in Collector.  
9 WV inspectors document their findings using Survey123 to identify whether each vegetation  
10 point has "passed" or "failed" its inspection. Additionally, at the end of a WV inspection, WV  
11 inspectors submit a work verification survey identifying any trees that do not meet the EVM  
12 scope or were not captured in Collector as vegetation points, if any.

13           Absent any findings by the WV inspector, that line segment is assigned a status of  
14 "Work Verification Pass". If any one vegetation point in the line segment is given a "fail," then  
15 the entire line segment will be given a work verification status of "Work Verification Fail".  
16 Collector will then automatically update the "Inspection Status" field to "Inspection Needed",  
17 automatically reverting the line segment to the pre-inspection and tree work phase to address the  
18 issues discovered during the WV inspection. After another round of pre-inspections and tree  
19 work for that line segment, the WV process will repeat. This process continues until the line  
20 segment achieves a "Work Verification Pass" status. The line segment is not counted toward  
21 PG&E's completed EVM miles until it acquires the "Work Verification Pass" status.

22           PG&E committed to and implemented 100% work verification at the start of  
23 2019. In mid-2019, in response to the contractor confusion issues that arose in the EVM  
24 program's first year, PG&E instituted what was referred to as "Double Work Verification" for  
25 the remainder of 2019. This Double Work Verification process was implemented to ensure that  
26 the pre-inspections and tree work were being performed consistently with the revised scope.  
27 Double Work Verification required two separate WV inspectors to "pass" the line segment for it  
28



1 to be considered complete. If a WVI failed the line segment, two subsequent WV inspectors  
2 would need to “pass” the line in consecutive WV patrols for a conductor segment to be  
3 considered complete. The Double Work Verification process continued through the end of 2019.  
4 At the beginning of 2020, after the contractor workforce had been re-trained on the revised EVM  
5 scope and the EVM process had stabilized, PG&E returned to 100% work verification and the  
6 process as it is described above. PG&E and its contractors have met the goal of 100% work  
7 verification for 2020.

8 Increased Contractor Training and Testing: At the start of 2019, PG&E  
9 implemented a centralized in-person introductory training course for all pre-inspectors, called  
10 Veg-0100 and a corresponding course for tree crews called Veg-0200. Approximately 2,600  
11 pre-inspectors and tree crews participated in these courses in 2019.

12 In mid-2019, to address contractor confusion in the EVM program’s first year,  
13 PG&E introduced a three-day in-person training course for EVM pre-inspectors called Veg-  
14 0400. This course provided pre-inspectors with classroom instruction on the scope of EVM,  
15 techniques for tree identification and use of the Collector app, as well as field training with the  
16 forester who would supervise their EVM work once they passed the training. Veg-0400 also  
17 included knowledge testing and field assessments to ensure the pre-inspectors adequately  
18 understood the information taught in the course. The Federal Monitor attended several of these  
19 training sessions, which continued from July 2019 through October 2019. Beginning in  
20 December 2019, PG&E transitioned the Veg-0400 course to its centralized training program for  
21 the pre-inspectors performing EVM work. As with the three-day program, on the final day of  
22 this Veg-0400 course, participating contractors were given a competency test which measured  
23 their knowledge of the EVM scope and inspection process.

24 By mid-2020, due in part to the Covid-19 pandemic preventing in-person  
25 trainings, PG&E transitioned from the three-day Veg-0400 course to a series of web-based  
26 training courses. Pre-inspectors are required to take the series of web-based trainings  
27 sequentially before they can access the Collector app and other EVM technological tools and  
28



1 begin performing EVM work. As part of this series of courses, PG&E introduced two web-  
2 based trainings, an introductory level course called Veg-0100: Vegetation Management for  
3 Inspectors and an EVM-specific course called Veg-0410: EVM Scope – Experienced Vegetation  
4 Patrollers. Both of these courses are still active today. Veg-0100 consists of nine web-based  
5 courses and culminates in a skill assessment whereby pre-inspectors participate in a simulated  
6 VM inspection. The Veg-0100 course is designed to review safety protocols, introduce  
7 contractors to PG&E procedures and to educate the contractors on the role they play in reducing  
8 wildfire risk. Contractors must pass the skills assessment portion of Veg-0100 before they are  
9 eligible to enroll in and complete Veg-0410, an EVM-specific training course. Veg-0410 is  
10 designed to explain the scope of the EVM program, the process of conducting an EVM  
11 inspection and how to use the Collector App. When a pre-inspector has completed both  
12 Veg-0100 and Veg-0410, the pre-inspector is permitted to perform EVM work. PG&E records  
13 indicate that approximately 1,700 contractors have completed the Veg-0100 course and 175  
14 contractors have completed the Veg-0410 course since the courses were rolled out at the  
15 beginning of 2020.

16 Improvements to EVM Recordkeeping: The changes to improve EVM  
17 recordkeeping noted in PG&E's November 3, 2020 submission refers to three updates to the  
18 Collector application that were deployed in May 2019, September 2019 and March 2020 to  
19 improve the EVM data collection process. The updates included changes to Collector aimed at  
20 improving data accuracy—for example, converting the field for identifying the diameter of the  
21 tree from a range input to an integer input, allowing pre-inspectors to note the precise diameter  
22 of a given tree. The update also included a change that locked users from editing any vegetation  
23 points and conductor segments that had already passed work verification, avoiding confusion  
24 that would arise if pre-inspectors inadvertently edited a vegetation point that had already been  
25 addressed and confirmed by work verification. The updates were also aimed at making the data  
26 entry process more efficient and uniform for pre-inspectors and tree crews by, for example,  
27 converting a number of fields from manual text entries to dropdown menus, removing extraneous  
28

1 data fields and requiring that users operate the app on an iOS product (*i.e.*, an iPhone or iPad) for  
2 added stability. These updates also added to the pre-inspector maps the locations of trees  
3 identified during a 2019 LiDAR survey to assist with the pre-inspector identification of trees that  
4 have strike potential or need to be removed or worked under EVM and introduced and  
5 incorporated into Collector the Tree Assessment Tool (“TAT”)<sup>3</sup> to replace the Hazard Tree  
6 Rating System (“HTRS”).

7 **Question 3:** Explain each type of consequence that PG&E considers when evaluating a  
8 region for the Black Swan criteria. Also explain the source of the information informing  
9 each consequence. (For example, if potential loss of life is a “consequence” factored in,  
10 explain how the estimated potential loss of life is calculated and from what source the  
11 underlying population figures are derived).

12 **PG&E Response:**

13 In terms of inputs, a grid cell satisfies the Black Swan criteria if its forecast  
14 sustained wind speed is greater than 30 mph; Fire Potential Index (“FPI”) is greater than 0.3;  
15 relative humidity is less than 20%; and Nelson Dead Fuel Moisture (“DFM”) 10-hour, 100-hour,  
16 and 1000-hour are less than 8%, 10%, and 14%, respectively, as listed in footnote 9 to PG&E’s  
17 November 18, 2020 response.

18 The primary source of each of these criteria is the PG&E Operational Mesoscale  
19 Modeling System (“POMMS”) model that forecasts the weather conditions for each grid cell in  
20 PG&E’s service territory. The primary source of data input to the POMMS model is weather  
21 forecasts at approximately 22 kilometer resolution from the Global Forecast System (“GFS”), a  
22 model produced by the U.S. National Centers for Environmental Prediction (“NCEP”), part of  
23  
24  
25

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26 <sup>3</sup> PG&E developed the TAT in collaboration with third-party experts—a team of  
27 International Society of Arbocultural Certified Utility Arborists—to evolve its risk-based  
28 criterion and further reduce the level of subjectivity inherent in determining whether a tree  
should be removed.

1 the National Weather Service.<sup>4</sup> Utilizing an instance of NCEP’s Weather Research and Forecast  
2 (“WRF”) model, the POMMS model analyzes the GFS model’s 22 kilometer resolution forecasts  
3 to produce more granular 2 kilometer and 3 kilometer resolution forecasts. To do so, the  
4 POMMS model relies on recent real-world weather observations reported in resolutions smaller  
5 than GFS’s 22 kilometer resolution forecasts, including recent temperature observations from  
6 NCEP’s Sea Surface Temperature (“SST”) database and air and wind observations from NCEP’s  
7 Meteorological Assimilation Data Ingest System (“MADIS”). Using this data from the GFS,  
8 SST and MADIS, the POMMS model provides weather forecasts for each grid cell in PG&E’s  
9 service territory.

10 A grid cell’s forecast values for each of the Black Swan criteria either comes  
11 from, or is derived from, the POMMS model.

12 The forecast windspeed and forecast relative humidity of a grid cell are outputs of  
13 the POMMS model. The forecast sustained wind speed is 10 meter above ground level in mph  
14 and the forecast relative humidity is two meters above ground level.

15 Dead-fuel moisture represents the forecast moisture content within that type of  
16 dead vegetation and, specifically, it is the percentage of the fuel’s forecast water weight divided  
17 by the fuel’s forecast weight without any water. While POMMS does not forecast values for the  
18 DFM 10-hour, 100-hour and 1000-hour, these values are a function of weather conditions  
19 forecast by POMMS at a two-by-two kilometer resolution: air temperature, relative humidity,  
20 solar radiation and accumulated precipitation. Using the POMMS forecasts, a DFM is then  
21 calculated for each of three types of dead fuels. Dead fuels are divided into various time-lag  
22 classes, including 10-hour, 100-hour and 1000-hour. The shorter the time lag, the more  
23 responsive the fuel is to changing weather conditions. For example, 10-hour fuels typically only  
24

25  
26 <sup>4</sup> The GFS model forecasts at a ¼° resolution, which, at the equator, results in a  
27 28 kilometer-by-28 kilometer resolution. However, further from the equator, due to the curved  
28 nature of the Earth, that ¼° resolution becomes smaller and results in a resolution of  
approximately 28 kilometers-by-22 kilometers in the Bay Area.

1 take on the order of 10 hours to respond to changing weather conditions, while 100-hour fuels  
2 typically take on the order of 100 hours to respond to changing weather conditions.<sup>5</sup>

3 Similarly, while the POMMS model does not provide the FPI output itself, it  
4 provides the inputs that feed into the Utility FPI model. The Utility FPI model was described in  
5 PG&E’s November 18 response and is further described below in response to Question 4.

6 **Question 4:** Please provide a real-life example of calculations using the equations  
7 described in footnote seven of PG&E’s November 18 response. In responding, please re-  
8 state the equations, identify an example from the real world of values associated with  
9 each variable, and perform the calculation while “showing your work.”

10 **PG&E Response:**

11 The Utility FPI model output for a grid cell is based on that grid cell’s Land Use  
12 (“LU”) categorization, as well as the forecast values for the grid cell’s Live Fuel Moisture  
13 (“LFM”), Dead Fuel Moisture of 10-Hour Fuels (“DFM<sub>10hr</sub>”) and the Fosberg Fire Weather  
14 Index (“FFWI”). The formula is provided below.

$$15 \quad \text{FPI} = \frac{1}{1+e^{-y}}$$

16 Here,  $y$  is the log odds and is calculated as:

$$17 \quad y = -1.68 - 0.24 * \text{LFM} - 0.26 * \text{DFM}_{10\text{hr}} + 0.22 * \text{FFWI} + 0.06 * \text{LU}_{\text{Shrublands}} + 0.47 * \text{LU}_{\text{Forest}}$$

18 A grid cell’s LFM represents the forecast moisture content within living  
19 vegetation fuel and, specifically, it is the percentage of the fuel’s forecast water weight divided  
20 by the fuel’s forecast weight without any water. The forecast LFM for a grid cell is derived from  
21 the grid cell’s soil type, the forecast length of the day and the Julian day of year in conjunction  
22 with the forecasts from PG&E’s POMMS model for the grid cell’s temperature, irradiance, soil  
23 moisture and soil temperature.

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25 <sup>5</sup> Specifically, each time lag is the amount of time it takes for that category of dead fuel to  
26 reach 63% of the difference between initial and equilibrium moisture contents given constant  
27 environmental conditions. The equilibrium moisture content is the moisture content that a fuel  
28 particle will attain if exposed for an infinite period in an environment of specified constant  
temperature and humidity.

1 The forecast  $DFM_{10hr}$  for a grid cell is also calculated using inputs from PG&E's  
2 POMMS model, as described above in response to Question 3.

3 A grid cell's land-use categorization is based on the Land Use Index from the  
4 International Geosphere-Biosphere Programme ("IGBP") Modified MODIS 17-Category Land  
5 Use Categories, a global vegetation class map developed based on data from the Moderate  
6 Resolution Imaging Spectroradiometer ("MODIS") instrument aboard NASA satellites. The  
7 land-use category can be grassland, shrubland or forest. The variable  $LU_{Shrublands}$  has a value of  
8 1 when the land-use category is shrubland, and is otherwise 0. The variable  $LU_{Forests}$  has a  
9 value of 1 when the land-use category is forest, and is otherwise 0.

10 The FFWI is a non-linear model of fire potential that aids modeling small-scale  
11 and short-term weather variations on fire danger. Inputs to the FFWI for a grid cell are the  
12 forecast temperature in Fahrenheit,  $T$ , the forecast wind speed in mph,  $U$ , and the forecast  
13 relative humidity,  $RH$ . Each of these three inputs is provided by PG&E's POMMS model. The  
14 formula for FFWI is listed below:

$$15 \quad FFWI = \frac{\eta * \sqrt{1+U^2}}{0.3002}$$

16 The variable  $\eta$  is a function of the equilibrium moisture content ( $M_{eq}$ ) content:

$$17 \quad \eta = 1 - 2 * \left(\frac{M_{eq}}{30}\right) + 1.5 * \left(\frac{M_{eq}}{30}\right)^2 - 0.5 * \left(\frac{M_{eq}}{30}\right)^3$$

18  
19 The variable  $M_{eq}$  is calculated by one of the three equations below, depending on  
20 the forecast relative humidity and, after the forecast relative humidity identifies the correct  
21 equation to use, that equation uses the forecast temperature and relative humidity:

$$22 \quad M_{eq} = \begin{cases} 0.03229 + 0.28 * RH - 0.00058 * RH * T & \text{for } RH < 10\% \\ 2.22749 + 0.16 * RH - 0.0148 * T & \text{for } 10\% \leq RH < 50\% \\ 21.0606 - 0.483199 * RH + 0.005565 * RH^2 - 0.00035 * RH * T & \text{for } RH \geq 50\%. \end{cases}$$

24 After the initial values for each of the five inputs to the Utility FPI model—LFM,  
25  $DFM_{10hr}$ ,  $LU_{Shrublands}$ ,  $LU_{Forest}$  and FFWI—are calculated, they are standardized based on that  
26 input's mean and standard deviation observed in the fire occurrence dataset used to train the  
27

1 Utility FPI model.<sup>6</sup> Because the Utility FPI model was developed using a regularization  
 2 methodology to improve interpretability, each input is standardized using the below equation,  
 3 where  $z$  is the standardized value,  $x$  is the initial value,  $\mu$  is the mean of that input and  $s$  is the  
 4 standard deviation of the input:

$$z = \frac{x - \mu}{s}$$

5  
 6 The mean and standard deviation observed in the fire occurrence dataset for each  
 7 input is listed below.<sup>7</sup>

| <b>Input</b>             | <b>Mean (<math>\mu</math>)</b> | <b>Standard Deviation (<math>s</math>)</b> |
|--------------------------|--------------------------------|--|
| LFM                      | 80.46                          | 18.11                                      |
| DFM <sub>10hr</sub>      | 0.05350                        | 0.02471                                    |
| FFWI                     | 38.13                          | 13.91                                      |
| LU <sub>Shrublands</sub> | 0.07547                        | 0.2642                                     |
| LU <sub>Forest</sub>     | 0.4316                         | 0.4953                                     |

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 15 In light of the Court’s request for a real-world example of calculations using the  
 16 Utility FPI model equations, PG&E has selected as an example the two kilometer-by-  
 17 two kilometer grid cell 128\_377 at 00:00 PT on September 28, 2020 using the forecast data  
 18 provided by the September 27, 2020, 00:00 UTC model run.

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 22  
 23 <sup>6</sup> As discussed in PG&E’s November 18 filing, the Utility FPI model looks to two historical  
 24 fire datasets: the U.S. Forest Service’s Fire Program Analysis—Fire-Occurrence Database and a  
 25 database compiled by PG&E of large fires and their associated perimeters from the Visible  
 26 Infrared Imaging Radiometer Suite. Further, the Utility FPI model looks to weather, fuels, and  
 27 associated information for the fire occurrences in such datasets, which it gets from state and  
 28 federal fire agencies, including the USDA Forest Service, the Bureau of Land Management, the  
 Bureau of Indian Affairs, the National Park Service and CAL FIRE.

<sup>7</sup> The values in this table and in the following equations have been rounded.

1 The relevant data that feed into the Utility FPI model for that grid cell, at that  
2 time, are listed below:

| 3 Input                   | Value     |
|---------------------------|-----------|
| 4 Temperature, $T$        | 71.19°F   |
| 5 Windspeed, $U$          | 13.17 mph |
| 6 Relative Humidity, $RH$ | 18.58%    |
| 7 Land Use Type           | Forest    |
| 8 DFM <sub>10hr</sub>     | 0.06146   |
| 9 LFM                     | 61.76%    |

10  
11 These are the initial values for each of the inputs to the Utility FPI Model other  
12 than FFWI, which is a function of certain of these variables, as discussed above. Because the  $RH$   
13 is between 10% and 50%, the first step in determining the FFWI is calculating the  $M_{eq}$  as seen  
14 here:

15 (1)  $M_{eq} = 2.22749 + 0.16 * RH - 0.0148 * T$

16 (2)  $M_{eq} = 2.22749 + 0.16 * 18.58 - 0.0148 * 71.19$

17 (3)  $M_{eq} = 4.151$

18 The next step is to calculate the variable  $n$  using this  $M_{eq}$  value:

19 (1)  $\eta = 1 - 2 * \left(\frac{M_{eq}}{30}\right) + 1.5 * \left(\frac{M_{eq}}{30}\right)^2 - 0.5 * \left(\frac{M_{eq}}{30}\right)^3$

20 (2)  $\eta = 1 - 2 * \left(\frac{4.151}{30}\right) + 1.5 * \left(\frac{4.151}{30}\right)^2 - 0.5 * \left(\frac{4.151}{30}\right)^3$

21 (3)  $\eta = 0.7505$

22 FFWI is then calculated based on this  $\eta$  value and forecast windspeed,  $U$ :

23 (1)  $FFWI = \frac{\eta * \sqrt{1+U^2}}{0.3002}$

24 (2)  $FFWI = \frac{0.750 * \sqrt{1+13.17^2}}{0.3002}$

25 (3)  $FFWI = 33.03$



The equations in the below table show step-by-step how the FFWI, as well as the other four initial inputs to the Utility FPI model, are standardized into the final values that are used by Utility FPI model.

| Feature Name             | Initial Value | Standardization Equation  |
|--------------------------|---------------|---|
| LFM                      | 61.76%        | (1) $LFM = \frac{LFM_x - LFM_\mu}{LFM_s}$<br>(2) $LFM = \frac{61.76 - 80.457}{18.11}$<br>(3) $LFM = -0.34$  |
| DFM <sub>10hr</sub>      | 0.06146       | (1) $DFM_{10hr} = \frac{DFM_{10hr_x} - DFM_{10hr_\mu}}{DFM_{10hr_s}}$<br>(2) $DFM_{10hr} = \frac{0.06146 - 0.0535}{0.0247}$<br>(3) $DFM_{10hr} = 0.3221$                          |
| FFWI                     | 33.03         | (1) $FFWI = \frac{FFWI_x - FFWI_\mu}{FFWI_s}$<br>(2) $FFWI = \frac{33.03 - 38.13}{13.91}$<br>(3) $FFWI = -0.3670$   |
| LU <sub>Shrublands</sub> | 0             | (1) $LU_{Shrublands} = \frac{LU_{Shrublands_x} - LU_{Shrublands_\mu}}{LU_{Shrublands_s}}$<br>(2) $LU_{Shrublands} = \frac{0 - 0.07547}{0.264}$<br>(3) $LU_{Shrublands} = -0.2857$ |
| LU <sub>Forest</sub>     | 1             | (1) $LU_{Forest} = \frac{LU_{Forest_x} - LU_{Forest_\mu}}{LU_{Forest_s}}$<br>(2) $LU_{Forest} = \frac{1 - 0.4316}{0.495}$<br>(3) $LU_{Forest} = 1.148$                            |

The log odds  $y$  for the Utility FPI model is then calculated using the value of the standardized variables:

$$(1) y = -1.68 - 0.24 * LFM - 0.26 * DFM_{10hr} + 0.22 * FFWI + 0.06 * LU_{Shrublands} + 0.47 * LU_{Forest}$$

$$(2) y = -1.68 - 0.24 * (-1.032) - 0.26 * 0.3221 + 0.22 * (-0.3670) + 0.06 * (-0.2857) + 0.47 * 1.147$$

$$(3) y = -1.68 - (-0.2477) - 0.0841 + (-0.0813) + (-0.0172) + 0.5387$$

$$(4) y = -1.080$$

1 The value of the log odds  $y$  is then inserted into the FPI equation, resulting in a  
2 raw FPI output of 0.2535:

3 (1)  $FPI = \frac{1}{1+e^{-y}}$

4 (2)  $FPI = \frac{1}{1+e^{-(1.080)}}$

5 (3)  $FPI = \frac{1}{1+2.945}$

6 (4)  $FPI = 0.2535$

7  
8 PG&E notes that, following the above-demonstrated application of the equations  
9 from footnote 7 of PG&E's November 18 filing, two additional steps are performed to calculate  
10 the FPI input that is used by the LFP<sub>D</sub> model and Black Swan criteria. *First*, for two kilometer-  
11 by-two kilometer grid cells, to increase the alignment of PG&E's identification of fire risk with  
12 agency forecasts and warnings, if a Red Flag Warning ("RFW") has been issued by the National  
13 Weather Service ("NWS") for the grid cell during the forecast hour, the FPI is raised to 0.23 if  
14 the above equations resulted in a raw value below 0.23. *Second*, to capture fire conditions before  
15 they occur, the FPI is then averaged with the FPI for each of the following two forecast hours to  
16 arrive at the FPI input for the LFP<sub>D</sub> model and Black Swan criteria.

17 **Question 5:** Explain the ArcGIS and Collector App systems in detail. Specifically:

- 18 a. Explain how the ArcGIS records operate with respect to the "  
19 TC\_Worked" field. When and how is the TC\_Worked field  
20 generated? Do any alternative field(s) account for tree(s) or portions  
21 of line that were inspected but where inspectors did not identify any  
22 hazard trees/limbs?
- 23 b. Explain whether these system(s) allow and/or require workers to  
24 upload evidence of tree removal or trimming along with an indication  
25 that work was completed. Explain how the ArcGIS and Collector App  
26 systems communicate, if at all, with PG&E's PMD system, including  
27 the degree to which the PSPS decision-makers including the  
28 meteorology team have access to tree inspection and  
removal/trimming data from the ArcGIS and Collector App systems.

**PG&E Response:**

26 The ArcGIS database and Collector app used to support the post-Carr Fire  
27 restoration efforts were maintained by a PG&E contractor, Mountain G Enterprises, Inc.

1 (“Mountain G”). The Mountain G version of ArcGIS and Collector is different from the versions  
2 currently maintained by PG&E to support post-fire VM work and PG&E’s EVM program  
3 (described above in PG&E’s responses to Questions 1 and 2). PG&E’s version of Collector used  
4 to support its EVM program does not have a “TC\_WORKED” field and instead has several  
5 fields used to indicate the status of work for a given vegetation point.

6 With respect to Mountain G’s version of Collector used for the post-Carr Fire  
7 restoration efforts, PG&E presently understands that information in the “TC\_WORKED” field  
8 was intended to be filled in by tree trimming contractors who performed tree work prescribed by  
9 pre-inspectors, along with other fields listing the name of the tree crew company, the date the  
10 work was completed and whether any additional tree units were identified and worked by the  
11 tree crew contractor. As noted in PG&E’s prior submission, the post-Carr Fire response work  
12 was an early implementation of Mountain G’s Collector system, and PG&E understands that tree  
13 removal contractors were not consistent in recording this information regarding completed trees  
14 using the Collector app. PG&E further understands that, in response to the inconsistent usage of  
15 Collector by tree removal crews, the team managing the post-Carr Fire restoration effort began to  
16 provide paper work order packets to tree crews, to provide an alternative means of tracking tree  
17 work.

18 PG&E’s current version of the Collector app used for EVM work has a function  
19 to allow inspectors and tree crews to upload photos of vegetation associated with each vegetation  
20 point, but this function is currently disabled because the bandwidth it would require may  
21 destabilize the data upload process. PG&E notes that the 100% work verification process for  
22 EVM work, as described in PG&E’s response to Question 2, provides in-field verification that  
23 tree crews have completed the work identified by pre-inspectors.

24 PG&E understands that the version of Collector used during the post-Carr Fire  
25 restoration effort did not allow pre-inspectors or tree crews to upload photos of vegetation  
26 associated with each vegetation point.

1 Mountain G's versions of ArcGIS and the Collector app do not communicate with  
2 any PG&E database systems.

3 PG&E's versions of ArcGIS and the Collector app do not communicate with  
4 PG&E's Project Management Database ("PMD") or its Vegetation Management Database  
5 ("VMD").

6 PSPS decision-makers do not currently access tree inspection and  
7 removal/trimming data from vegetation management systems. PG&E refers to its response to  
8 Question 9 for additional information in response to this Question.

9 **Question 6:** Is the gray pine now in PG&E's possession, a portion of which was  
10 removed by CalFire, marked by any spray paint?

- 11 a. PG&E shall ask CalFire and/or the Shasta County District Attorney's  
12 office to answer, *first*, whether the portions of the gray pine that  
13 CalFire removed show any spray paint and, *second*, whether the  
14 portion of tree that it removed contained burn marks that could  
15 obscure such paint.

14 **PG&E Response:**

15 PG&E did not observe any spray paint that had been applied to the sections of the  
16 Gray Pine that had been left in the area of interest by CAL FIRE.

17 On December 1, 2020, PG&E submitted letters to CAL FIRE and the Shasta  
18 County District Attorney's Office relaying the questions in Subpart a of this Question. A PG&E  
19 representative subsequently spoke with the Shasta County District Attorney, who referred  
20 PG&E to CAL FIRE because it is conducting a criminal investigation in which CAL FIRE is the  
21 lead investigating agency. CAL FIRE's response to PG&E's letter is attached as Exhibit A to this  
22 submission.

23 **Question 7:** The declaration dated November 18, 2020, attached to the response as  
24 Exhibit A states at paragraph 23:

25 "[A]t times in 2019, PG&E's vegetation management team gave guidance not to  
26 perform separate CEMA inspection and to close the CEMA project in PG&E's  
27 PMD following the commencement of the routine patrol in situations where, as a  
28

1 result of risk-based prioritization changes to the routine patrol schedule, the  
2 CEMA patrol (the scope of which is subsumed in a routine patrol) had been  
3 scheduled close in time to the routine patrol.”

4 How many CEMA inspections, required by the 2019 Wildlife Mitigation Plan, were NOT  
5 conducted as a result of these schedule changes during PG&E’s pre-inspection annual  
6 calendar, November 16, 2019, to November 15, 2020?

7 **PG&E Response:**

8 PG&E tracks completion of its vegetation management patrols in its PMD.  
9 Vegetation management patrols of circuits or segments thereof are assigned unique project  
10 numbers based on certain operational considerations, such as location, anticipated duration,  
11 terrain, weather, access and permitting requirements. By way of example, vegetation  
12 management patrols along the Girvan 1101 Circuit are broken into multiple projects within  
13 PG&E’s PMD, with the routine and CEMA patrols along the portion of the circuit that includes  
14 the Zogg Mine Road area both having unique project numbers.

15 In total, there were 2,520 unique CEMA patrol projects in PG&E’s PMD, totaling  
16 43,568 line miles, scheduled to occur between November 16, 2019 and November 15, 2020 (the  
17 “2020 CEMA projects”). As of December 14, 2020 PG&E’s PMD indicated that 203 of the  
18 2020 CEMA projects, totaling 6,084 line miles, were not completed or otherwise closed<sup>8</sup> prior to  
19 November 15, 2020. This represents 8.1% of the projects and 14.0% of the line miles associated  
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21  
22

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23 <sup>8</sup> PG&E’s PMD indicates that as of December 14, 2019, 54 of the 2020 CEMA projects  
24 were closed without a separate CEMA patrol having occurred. Eleven of these projects were  
25 closed after they were determined to be duplicate or combined projects. Ten of these projects  
26 were closed after the circuits or circuit segments associated with those projects were patrolled as  
27 part of PG&E’s enhanced vegetation management (“EVM”) program. Four of these projects  
28 were in fire footprints and were closed after post-fire patrols of the circuits or circuit segments  
associated with those projects were conducted. Twenty-nine of these projects were closed after  
PG&E determined that the circuits or circuit segments associated with those projects were not  
within the scope of PG&E’s CEMA program for 2020.

1 with PG&E’s CEMA program in 2020. PG&E is on track to complete these remaining 2020  
2 CEMA projects by December 31, 2020.<sup>9</sup>

3 The mid-year adjustments in 2019 to PG&E’s vegetation management patrol  
4 schedule were unique to 2019, when PG&E transitioned to a risk-prioritized basis for scheduling  
5 routine vegetation management patrols. For 2020, as noted above, PG&E is on track to complete  
6 the 2020 CEMA projects by year end.

7 **Question 8:** Update PG&E’s response to this question based on any new information,  
8 investigation, or conclusions reached since the filing of the November 18 response: “Is  
9 there specific evidence that the particular gray pine [removed by CalFire] was trimmed or  
10 removed prior to the Zogg fire? Was this tree identified for work by any patrol?”

11 **PG&E Response:**

12 PG&E is providing the Court with certain additional facts PG&E has learned in  
13 the course of its investigation since its November 18 submission relating to whether the Gray  
14 Pine of interest was identified for work prior to the Zogg Fire. PG&E’s preliminary  
15 investigation into these matters is ongoing, and its understanding of the facts may change as the  
16 investigation continues. The information below is based on PG&E’s understanding of the facts  
17 as of December 16, 2020.<sup>10</sup>

18 As discussed in PG&E’s November 18 submission, following the Carr Fire in  
19 July 2018, PG&E engaged a number of contractors to perform vegetation management work in  
20 the Carr Fire footprint, which included the portions of the Girvan 1101 Circuit that served the  
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23 <sup>9</sup> If, for operational reasons, a patrol is not completed by year end, it will be completed in  
24 early 2021.

25 <sup>10</sup> In its November 18 submission, PG&E stated that it would submit a declaration, as  
26 requested by the Court, regarding the vegetation management work performed in the area of  
27 interest following the Carr Fire once it had analyzed further records and advanced its  
28 investigation. (Dkt. 1265 at 2.) PG&E is attaching to this submission as Exhibit B, a  
declaration attesting to facts included in PG&E’s initial response to this Question and its updated  
response herein.

1 Zogg Mine Road area.<sup>11</sup> PG&E’s review of the records indicates that tree work was performed  
2 in the Zogg Mine Road area between August and October 2018 to remove or trim trees identified  
3 for work by pre-inspectors as part of the post-Carr Fire response effort.<sup>12</sup> Based on its  
4 investigation, PG&E understands that tree removal work in that area was interrupted at least  
5 twice by a resident opposed to tree work on Zogg Mine Road. Each incident involved the  
6 brandishing of a firearm or the threat to brandish a firearm.

7           After the first work interruption by this resident, in September 2018, PG&E  
8 contractors working on the post-Carr Fire response effort asked the contractor-employed arborist  
9 who had performed or participated in the routine inspection of the Zogg Mine Road area on  
10 PG&E’s behalf since 2015 to speak with the resident to secure the resident’s agreement to allow  
11 workers to resume work without being threatened. Because this arborist had previously  
12 performed PG&E’s routine VM patrols of the Zogg Mine Road area, he had experience  
13 interacting with this resident of Zogg Mine Road successfully. Following that conversation in  
14 late September 2018, the arborist reported that tree crews could resume tree work.

15           However, a second work interruption occurred on October 8, 2018. During that  
16 incident, workers reported that the resident of Zogg Mine Road had covered the paint used to  
17 mark a tree for work with black paint and told the contractors that no tree crew would touch the  
18 tree the resident blacked out. This tree was not on the resident’s property. According to the  
19 report from the contractors, this resident would brandish a firearm again if they touched the tree.  
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22           <sup>11</sup> As used herein, the “Zogg Mine Road area” refers to the entire length of Zogg Mine Road  
23 that runs from the intersection of Zogg Mine Road and S. Fork Road through and beyond Jenny  
24 Bird Lane to the terminus of Zogg Mine Road.

25           <sup>12</sup> In September 2018, members of the post-Carr Fire team began to transition from the fire  
26 restoration effort to support the Accelerated Wildfire Risk Reduction (“AWRR”) program (a  
27 precursor to PG&E’s Enhanced Vegetation Management program) in the Paradise and Magalia  
28 areas. When the Camp Fire started on November 8, 2018 additional resources were transitioned  
from the post-Carr Fire restoration effort to the Paradise area to support the post-Camp Fire  
restoration work. PG&E understands that some tree work continued on the post-Carr Fire  
restoration effort until at least November 15, 2018.



1           The following day, on October 9, 2018, a supervisor for the contractor that  
2 handled routine patrols on the Girvan 1101 Circuit stated to one of the individuals managing the  
3 post-Carr Fire response work that he would coordinate to have an arborist perform a routine  
4 vegetation management patrol of the Zogg Mine Road area in order to minimize the impact to  
5 residents, and that the routine patrol arborists with experience working the Zogg Mine Road area  
6 would reach out to coordinate working with the Zogg Mine Road resident that was threatening to  
7 brandish a firearm at tree crews and interrupting work.

8           The day after that, on October 10, 2018, an arborist—specifically, the arborist  
9 who had previously performed routine patrols on Zogg Mine Road and had a history of  
10 successful interactions with the resident of Zogg Mine Road who was threatening tree crews—  
11 began the routine patrol of the Zogg Mine Road area for 2018. At the time of this patrol, PG&E  
12 understands that this arborist was ISA-certified and had four years of experience patrolling utility  
13 lines, including multiple prior patrols of Zogg Mine Road area.

14           PG&E currently understands the following about the October 2018 routine  
15 vegetation management patrol. The arborist was aware that a fire had just come through the area  
16 and had burned, to varying degrees, many trees; he was aware that certain trees had been marked  
17 for work as part of the post-Carr Fire response work but had not been worked as of the time of  
18 his routine inspection, and he was further aware that work stoppages had occurred because of  
19 threats from the armed resident of Zogg Mine Road. PG&E understands the arborist performed  
20 an independent review of the route he inspected and marked for work any tree that, in his  
21 professional opinion, posed a risk to PG&E facilities, regardless of whether that tree had been  
22 marked or not marked for work during post-Carr Fire restoration patrols.

23           PG&E understands that when the arborist identified a tree that required work, he  
24 would record the tree in PG&E’s Vegetation Management Database (“VMD”) and would mark  
25 the tree with spray paint with a color distinct from the paint color used to mark trees identified  
26 during the post-Carr Fire restoration patrols. PG&E further understands that if the arborist  
27 identified a tree for work that had already been marked with the spray paint used by the  
28

1 post-Carr Fire pre-inspectors, the arborist would re-mark the tree with the routine-colored paint  
2 to ensure the tree trimmers scheduled to perform tree work for the trees identified during the  
3 routine patrol would know to work these trees. If the arborist identified a tree that had spray  
4 paint or markings from the post-Carr Fire work, his practice was to examine that tree carefully,  
5 and if he judged that it would not pose a risk to PG&E’s facilities at least until the tree would be  
6 re-evaluated during the next year’s routine vegetation management patrol, then he would not  
7 mark the tree for work as part of the routine program. PG&E records indicate that, during his  
8 October 2018 routine patrol, while the arborist marked several Gray Pines for work, he did not  
9 mark any Gray Pines for work during the routine patrol in October 2018 with locations  
10 consistent with the location of the Gray Pine from which CAL FIRE appears to have collected  
11 sections after the Zogg Fire. Based on PG&E records, the October 2018 routine patrol occurred  
12 between October 10 and October 26, 2018. In addition to the trees that had already been worked  
13 as part of the Carr Fire response, the arborist marked approximately 250 additional trees for work  
14 during his routine patrol in October 2018, and those trees were subsequently worked.  
15 Specifically in the area of interest,<sup>13</sup> during the routine patrol that occurred after the Carr Fire in  
16 October 2018, the arborist marked four trees for removal and one tree for trimming. PG&E  
17 records indicate that this work was subsequently performed.

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26 <sup>13</sup> The “area of interest” refers to the area from which CAL FIRE has collected evidence,  
27 specifically, the area surrounding the three spans between pole 103320099 and  
28 pole 101457898 about a quarter mile southeast of the intersection of Jenny Bird Lane and Zogg  
Mine Road, as depicted in Exhibit C to PG&E’s October 26, 2020 submission. (Dkt. 1250-003.)

1 **Question 9:** In its response dated November 3, 2020, PG&E states that it utilizes a risk  
2 model to select areas to be worked for EVM. Why can't the system for determining  
3 whether a distribution line will be de-energized in a PSPS event operate on a risk model,  
4 which takes into account the extent to which the relevant distribution lines are in  
5 compliance with Public Resource Code Sections 4292 and 4293 and PG&E's own  
6 Wildfire Mitigation Plan?

7 **PG&E Response:**

8 PG&E's distribution-line scoping model for PSPS events, the Large Fire  
9 Probability ("LFP<sub>D</sub>") model, does not take into account the extent to which vegetation in an area  
10 had been cleared or trimmed. PG&E understands the Court's question to be why PG&E does not  
11 modify PSPS decision-making to account for line sections where a vegetation management  
12 patrol has identified trees for work pursuant to Public Resource Code Sections 4292 and 4293  
13 but the completion of that work (which happens after the pre-inspection patrol) remains pending.

14 As noted below, PG&E will undertake an assessment of whether that would  
15 reduce risk and is practicable. PG&E preliminarily notes the following: Whether there is  
16 outstanding vegetation management work on a circuit is not necessarily indicative of risk.  
17 Routine vegetation management patrols typically happen once a year and are typically intended  
18 to prescribe work that will keep the line in compliance for at least the next year—in other words,  
19 they include in a sense preventative maintenance, and pending work does not necessarily suggest  
20 elevated risk at the time of the findings. A line that has not yet been inspected in a given year  
21 may not have any outstanding vegetation management work pending, but may present more risk  
22 than a recently inspected circuit where tree work is ongoing.

23 Notably, the vegetation that PG&E views as highest risk are trees that present a  
24 "Priority 1" risk designation under PG&E's procedures, which require mitigation within  
25 24 hours of being entered into PG&E's system. Even if such work were outstanding at the time  
26 PSPS scoping decisions were made, the work should be completed before a PSPS event  
27 occurred.

1           PG&E will evaluate whether and how the existence of outstanding vegetation  
2 management work would be incorporated into PG&E's scoping, and whether the data shows that  
3 such an approach would reduce risk in an operationally executable manner. PG&E will share  
4 with the Court its evaluation and any proposed steps by June 2021, in advance of next year's  
5 peak fire season.

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1 Dated: December 16, 2020

Respectfully Submitted,

2 JENNER & BLOCK LLP

3  
4 By: /s/ Reid J. Schar  
Reid J. Schar (*pro hac vice*)

5 CRAVATH, SWAINE & MOORE LLP

6  
7 By: /s/ Kevin J. Orsini  
8 Kevin J. Orsini (*pro hac vice*)

9 CLARENCE DYER & COHEN LLP

10  
11 By: /s/ Kate Dyer  
12 Kate Dyer (Bar No. 171891)

13 Attorneys for Defendant PACIFIC  
14 GAS AND ELECTRIC COMPANY

# **EXHIBIT A**



## DEPARTMENT OF FORESTRY AND FIRE PROTECTION

P.O. Box 944246  
SACRAMENTO, CA 94244-2460  
(916) 651-6337  
Website: [www.fire.ca.gov](http://www.fire.ca.gov)



December 16, 2020

Mr. Tim Lucey  
Pacific Gas and Electric  
PO Box 7442  
San Francisco, CA  
94120-7442

Re: 2020 Zogg Fire

Dear Mr. Lucey,

CAL FIRE received your December 1, 2020 communication requesting that CAL FIRE respond to two questions posed by Judge Alsup in PG&E's ongoing probation and that CAL FIRE provide PG&E access to physical evidence collected by CAL FIRE in its investigation of the Zogg Fire.

As you are likely aware, CAL FIRE treats all wildland fire origin and cause investigations as criminal investigations unless and until the investigation is concluded and no criminal violation is indicated or apparent. CAL FIRE is treating the Zogg Fire in the same manner. This is not to say that CAL FIRE has made any conclusion as to whether the Zogg Fire resulted from potential criminal violations. CAL FIRE's policy is motivated simply by the reality that if an investigation is not treated as a criminal investigation from its inception, steps taken during the investigation may prejudice future criminal prosecution if the investigation does later uncover criminal violations. On the other hand, treating an investigation as a criminal investigation until satisfied there were no criminal violations does not prejudice potential future civil or other actions.

Accordingly, CAL FIRE is not willing to allow PG&E, or any other party, access to physical evidence until the investigation is complete and the Shasta County District Attorney has made a determination as to whether criminal charges will be filed. CAL FIRE also will not comment on any aspect of its investigation, including any evidence seized. CAL FIRE continues to pursue its investigation into the Zogg Fire, which began roughly two and a half months ago. This is not an unreasonable amount of time to conduct an investigation of a fire of this size and complexity. To further CAL FIRE's investigation, CAL FIRE requests, in addition to its past information requests, the following:

- Work orders, maintenance records and inspections records specifically related to the tree of interest and its surrounding area.
- Any information/data PG&E has in the area of the tree of interest obtained from Hyperspectral Imaging or Electrical Overhead Tag work.
- The ArcGIS and Collector data referenced in PG&E's latest response to Judge Alsup. We would like these layers as well as periodic updates to them.



Lucey Letter  
Page 2

Out of respect for Judge Alsup, CAL FIRE is considering providing responses to his two questions directly to the Court.

Sincerely,

A handwritten signature in black ink that reads "Bruce A. Crane". The signature is written in a cursive style with a large, prominent initial "B".

Bruce A. Crane  
Chief Counsel  
CAL FIRE

# **EXHIBIT B**

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23 COMPANY

24 UNITED STATES DISTRICT COURT  
25 NORTHERN DISTRICT OF CALIFORNIA  
26 SAN FRANCISCO DIVISION

27 UNITED STATES OF AMERICA,  
28  
29 Plaintiff,  
30  
31 v.  
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33 PACIFIC GAS AND ELECTRIC COMPANY,  
34  
35 Defendant.

Case No. 14-CR-00175-WHA

**DECLARATION OF [REDACTED]  
[REDACTED] IN SUPPORT OF  
PG&E'S RESPONSE TO ORDER  
REQUESTING ADDITIONAL  
INFORMATION FOLLOWING  
PG&E'S NOVEMBER 18  
BRIEFING**

Judge: Hon. William Alsup

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I, [REDACTED] declare as follows:

1. I am the Director of Vegetation Management Execution at Pacific Gas and Electric Company (“PG&E”). In this role, I am responsible for overseeing the execution of all of PG&E’s vegetation management programs. I have held this position since July 2019. While I was not the Director of Vegetation Management Execution during the post-Carr Fire restoration effort in 2018 and therefore do not have personal knowledge of the events described below, I understand the following based on my review of relevant records.

2. Following the Carr Fire in July 2018, PG&E engaged a number of contractors to perform vegetation management work in the Carr Fire footprint, which included the section of the Girvan 1101 12 kV Distribution Circuit (the “Girvan 1101 Circuit”) that runs through the Zogg Mine Road area.

3. As used herein, the “area of interest” refers to the area from which CAL FIRE has collected evidence, specifically, the area surrounding the three spans of the Girvan 1101 Circuit between pole 103320099 and pole 101457898 about a quarter mile southeast of the intersection of Jenny Bird Lane and Zogg Mine Road.

4. Following the Carr Fire in July 2018, PG&E engaged Mountain G Enterprises, Inc. (“Mountain G”), to conduct and manage vegetation management work in the Carr Fire footprint.

5. As part of the post-Carr Fire restoration effort, Mountain G maintained a database of information generated during the post-Carr Fire vegetation management work. The database maintained by Mountain G is known as “ArcGIS”.

6. During the post-Carr Fire restoration effort, vegetation management personnel, including pre-inspectors and Quality Control (“QC”) inspectors, were instructed to upload information to the ArcGIS database using a smartphone and computer tablet app called “Collector”.

1           7. I have reviewed reports from the ArcGIS database used to store data  
2 generated during the post-Carr Fire restoration work, as well as other Mountain G records.

3 These records indicate the following:

- 4           a. Pre-inspectors and QC inspectors would identify trees requiring work  
5 through the Collector app.
- 6           b. Pre-inspectors would input information about the tree, including any  
7 additional location information, the tree species and the removal class of  
8 the tree based on its size.
- 9           c. Mountain G would subsequently assign the work to a tree removal  
10 contractor, which included contractors associated with a Mountain G  
11 affiliate (Mountain F Enterprises, Inc. (“Mountain F”)) or one of Mountain  
12 F’s subcontractors, as well as other tree crew contractors.
- 13           d. Tree work was assigned to tree crew contractors directly through Collector  
14 or through paper work orders generated by Mountain G.
- 15           e. Tree removal contractors had access to the Collector app and could note  
16 when work was completed on a given tree.
- 17           f. Tree removal contractors do not appear to have been consistent in  
18 recording completed tree work in the Collector app during the post-Carr  
19 Fire project.
- 20           g. California Forestry and Vegetation Management, Inc. (“CFVM”), was  
21 asked to perform QC inspections of certain areas within the Carr Fire  
22 footprint.
- 23           h. The area of interest was one of the areas subject to such a QC inspection  
24 in August 2018.
- 25           i. The CFVM inspector who performed the QC inspection of the area of  
26 interest in August 2018 used the Collector app to identify for removal two  
27 Gray Pine trees that have a location consistent with the location of the  
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1 Gray Pine from which CAL FIRE appears to have collected sections after  
2 the Zogg Fire.

- 3 j. Following the CFVM QC inspector’s identification of these trees for  
4 removal, Mountain G subsequently generated a work order that included  
5 the two Gray Pines identified by the CFVM QC inspector.
- 6 k. The “TC\_WORKED” field associated with these two trees have “No”  
7 values in the ArcGIS database extract provided by Mountain G to PG&E.
- 8 l. Four trees in the area of interest were removed following post-Carr Fire  
9 vegetation management efforts, including one Ponderosa Pine, one Valley  
10 Oak, one California Oak and one Gray Pine.
- 11 m. Nine other trees in the area of interest were identified during post-Carr  
12 Fire pre-inspections or the August 2018 QC inspection, but have a value  
13 of “delisted” in the “TC\_WORKED” field associated with database entries  
14 for them.
- 15 n. By November 8, 2018, the day the Camp Fire started, the vast majority of  
16 trees identified for work as part of the Carr Fire response had been  
17 completed.
- 18 o. By November 15, 2018, some trees that had been identified by pre-  
19 inspectors for removal or trimming during the post-Carr Fire restoration  
20 effort were blank or had a value of “No” in the “TC\_WORKED” field on  
21 Collector.

22 8. The July 2019 photographs of the area of interest that PG&E previously  
23 submitted to the Court do not appear to show any Gray Pines that had been felled in the  
24 immediate area of the Gray Pine from which CAL FIRE collected sections.

25 9. I have also reviewed records maintained by PG&E and its employees.  
26 The records indicate the following:  
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- a. During the post-Carr Fire restoration effort, pre-inspectors were asked to spray paint trees identified for removal so that the specific trees marked for work could be located by tree work crews.
- b. During the post-Carr Fire restoration work, tree removal work in the area of interest was interrupted at least twice by a resident opposed to tree work on Zogg Mine Road.
- c. In September 2018, contractors working on the post-Carr Fire response effort asked the contractor-employed arborist who had performed or participated in the routine inspection of the Zogg Mine Road area on PG&E's behalf since 2015 to speak with the resident to secure her agreement to allow workers to resume work without being threatened.
- d. Following that conversation in late September 2018, the arborist reported that tree crews could resume tree work.
- e. A second work interruption occurred on October 8, 2018. During that incident, workers reported that the resident of Zogg Mine Road had covered the paint used to mark a tree for work with black paint and told the contractors that no tree crew would touch the tree she blacked out. This tree was not on the resident's property.
- f. According to the report from the contractors, this resident would brandish her firearm again if they touched the tree.
- g. Inquiries were subsequently made in October 2018 about attempting to secure help from law enforcement to stand by and protect tree crews against the resident that had brandished a firearm.
- h. On October 9, 2018, a supervisor for the contractor who handled routine patrols on the Girvan 1101 Circuit stated to one of the individuals managing the post-Carr Fire response work that he would coordinate to have an arborist perform a routine vegetation management patrol of the



1 Zogg Mine Road area in order to minimize the impact to residents, and  
2 that the routine patrol arborist with experience working the Zogg Mine  
3 Road area would reach out to coordinate working with the Zogg Mine  
4 Road resident that was threatening to brandish her firearm at tree crews  
5 and interrupting work.

- 6 i. On October 10, 2018, the arborist who had previously performed routine  
7 patrols on Zogg Mine Road began his routine inspection of Zogg Mine  
8 Road for 2018.
- 9 j. The October 2018 routine patrol occurred between October 10 and  
10 October 26, 2018.
- 11 k. During the routine patrol, when the arborist identified a tree that required  
12 work, he would record the tree in PG&E's Vegetation Management  
13 Database ("VMD").
- 14 l. During the October 2018 routine patrol, the arborist marked several Gray  
15 Pines for work, but did not mark any Gray Pines for work during the  
16 routine patrol in October 2018 with locations consistent with the location  
17 of the Gray Pine from which CAL FIRE appears to have collected sections  
18 after the Zogg Fire.
- 19 m. In addition to the trees that had already been worked as part of the Carr  
20 Fire response, the arborist marked approximately 250 additional trees for  
21 work during his routine patrol in October 2018, and those trees were  
22 subsequently worked.
- 23 n. In the area of interest, during the routine patrol that occurred after the Carr  
24 Fire in October 2018, the arborist marked four trees for removal and one  
25 tree for trimming. This work was subsequently performed.
- 26 o. In September 2018, members of the post-Carr Fire team began to  
27 transition from the fire restoration effort to support the Accelerated  
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Wildfire Risk Reduction (“AWRR”) program (a precursor to PG&E’s Enhanced Vegetation Management program) in the Paradise and Magalia areas.

- p. When the Camp Fire started on November 8, 2018 additional resources that had been supporting the post-Carr Fire effort were allocated to the Paradise area to support the post-Camp Fire restoration work.

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I declare under the penalty of perjury that the foregoing is true and correct and that I executed this declaration on December 15, 2020 in San Ramon, California

  
