BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

REPLY TESTIMONY OF QUALEN CHAVIS IN SUPPORT OF JOINT APPLICATION OF HORIZON WEST TRANSMISSION, LLC (U222E), FORMERLY KNOWN AS NEXTERA ENERGY TRANSMISSION WEST, LLC, AND PACIFIC GAS AND ELECTRIC COMPANY (U39E) FOR PERMITS TO CONSTRUCT THE ESTRELLA SUBSTATION AND PASO ROBLES REINFORCEMENT PROJECT APPLICATION 17-01-023

1. I, Qualen Chavis, offer this testimony in support of the Joint Application of Horizon West Transmission, LLC ("Horizon West") and Pacific Gas and Electric Company ("PG&E") for Permits to Construct the Estrella Substation and Paso Robles Reinforcement Project ("Estrella Project"), Application 17-01-023 (the "Application"), submitted to the California Public Utilities Commission ("CPUC" or "Commission") on January 25, 2017.

2. On September 1, 2023, I submitted Opening Testimony in this proceeding, which included Exhibit 1 and Exhibit 2 attached thereto, which is incorporated herein by reference.

3. I am offering this testimony to respond to the Testimony of James Clark ("Clark") on Behalf of California Unions for Reliable Energy, submitted in this proceeding on September 1, 2023. My testimony will address the claim made by Clark that "Neither the FEIR nor the record contain substantial evidence that EMF will be successfully reduced by 15% or greater at the utility ROW." Clark Testimony at 12.

4. The CPUC's EMF Policy set forth in Decision 06-01-042[1] requires utilities to consider "no-cost" and "low-cost" measures, where feasible, to reduce magnetic field exposure from new or upgraded utility facilities. The EMF Policy established a benchmark of four percent

[1] "Order Instituting Rulemaking to update the Commission's policies and procedures related to electromagnetic fields emanating from regulated utility facilities." D.06-01-042 (Jan. 26, 2006).

of total project costs to implement mitigation measures that achieve incremental magnetic field reductions of at least 15% at the edge of right-of-way ("ROW").

5. Decision 06-01-042 does not require PG&E to model the magnetic field at the edge of the ROW; rather it requires PG&E to achieve a reduction of magnetic field strength of 15% at the edge of the ROW as compared to the original design of the project:

> "Our review of the modeling methodology provided in the utility design guidelines indicates that it accomplishes its purpose, which is to measure the relative differences between alternative mitigation measures. Thus, the modeling indicates relative differences in magnetic field reductions between different transmission line construction methods, but does not measure actual environmental magnetic fields. In the same way, these relative differences in mitigation measures will be evident regardless of whether a maximum peak or a projected peak is used for the comparisons.
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> It is also true that post construction measurement of EMF in the field cannot indicate the effectiveness of mitigation measures used as it would be extremely difficult to eliminate all other EMF sources. We note that ordering EMF field measurements would lead to arguments regarding the risks associated with absolute EMF values and an attempt to determine health based standards, an issue excluded from this proceeding." (pp. 11-12.)

6. As stated in the Final Environmental Impact Report ("FEIR") prepared by the CPUC for the Estrella Project (March 2023), "[T]he CPUC does not consider electric and magnetic fields (EMF) to be an environmental issue in the context of CEQA because there is no agreement among scientists that EMF creates a potential health risk and because CEQA does not define or adopt standards for defining any potential risk from EMF and the CPUC's EMF Policy." FEIR at 2-121 et seq.

7. As I stated in my Opening Testimony, PG&E applied for a Permit to Construct ("PTC") to construct, among other things: (i) the Union Substation; (ii) a new, approximately 7-mile long, double circuit 70 kilovolt ("kV") line from Union Substation that would connect to the existing San Miguel-Paso Robles 70 kV line; and (iii) reconductor approximately 3 miles of the existing San Miguel-Paso Robles 70 kV line from the point at which the new 70 kV line

would connect southward to the existing Paso Robles Substation. As a point of clarification, I note that if it is completed, the Estrella Project would create two new 70 kV circuits: (i) the Union-San Miguel 70 kV line running from the new Union Substation to the existing San Miguel Substation; and (ii) the Union-Paso Robles 70 kV line running from the new Union Substation to the existing Paso Robles Substation. These two 70 kV circuits are configured as a double-circuit line from Union Substation to the point of connection with the existing San Miguel-Paso Robles 70 kV line. At that point, one of the new 70 kV circuit will be looped into the existing line and run northward to San Miguel Substation, becoming the new Union-San Miguel 70 kV line. The other new 70 kV circuit will be looped into the existing line and run southward to San Miguel Substation, becoming the new Union-Paso Robles 70 kV line.

8. As I stated in my Opening Testimony, the Applicants submitted a Preliminary Field Management Plan as Exhibit E to the Application for the new 70 kV line ("Original Field Management Plan"), as required by Commission General Order 131-D, Section X(A).

9. In March 2023, the Commission issued the FEIR for the Estrella Project that identified an alternative route for the proposed new 70 kV line as the "environmentally superior" route, which is referred to in the FEIR as Alternative PLR-1A. Although Alternative PLR-1A would result in the creation of a new Union-San Miguel 70 kV line and a new Union-Paso Robles 70 kV line, as requested in the Application, the new double circuit 70 kV line would traverse a different route and be approximately 3.5 miles longer and require reconductoring of approximately 3 more miles of the existing San Miguel-Paso Robles 70 kV line.

10. It is my understanding that PG&E has determined that the Alternative PLR-1A 70 kV route is the appropriate alignment for the Estrella Project and intends to seek approval from the Commission to construct it. In support of that determination, PG&E directed me to prepare a

Preliminary Field Management Plan for Alternative PLR-1A ("PLR-1A Field Management Plan"), which I submitted with my Opening Testimony as Exhibit 2. I revised that document, which is titled the Revised Preliminary Transmission Magnetic Field Management Plan for Alternative PLR-1A ("Revised PLR-1A Field Management Plan"), and is attached hereto as Exhibit 1 and incorporated by reference.

11. I prepared the Revised PLR-1A Field Management Plan in compliance with the Commission's policies governing the mitigation of EMF effects using low-cost and no-cost measures. The purpose of my testimony is to show how the Revised PLR-1A Field Management Plan complies with the Commission's policies.

12. Section A.I of the Revised PLR-1A Field Management Plan describes the transmission lines that will be constructed and/or modified by PG&E for the Estrella Project if Alternative PLR-1A is constructed. It also includes the estimated total cost of the portion of the Estrella Project that PG&E will construct, i.e., the transmission line work and the new Union Substation, which is approximately $105 million. As it notes, four percent of this estimated total is $4.2 million.

13. Section A.IV of the Revised PLR-1A Field Management Plan describes the "no cost" magnetic field reduction measures proposed to be implemented and the incremental reduction in magnetic field strength achieved at the ROW boundary. Specifically, the measure proposed is to optimally phase the Union-San Miguel and Union-Paso Robles 70 kV circuits in the new 10.5 mile double-circuit 70 kV line. A table is presented showing that without optimal phasing, the "Base Case," the magnetic field strength would be 94.1 milligause ("mG") at each edge of the ROW (the "North ROW" and "South ROW"), and that with optimal phasing, the "Optimal Case," the magnetic field strength would drop to 32.8 mG at each ROW edge. This

constitutes a reduction of 65.1%, which is well above the 15% standard required by the CPUC's EMF Policy.

14. I calculated the magnetic field reductions achieved by implementing the "no cost" measures using a software program called "FIELDS," originally developed by Southern California Edison. This software is one of several programs available at PG&E to perform the computer modeling of the magnetic field environment of electric transmission lines. This program has been used by PG&E and other California utilities to model magnetic field strength reductions achieved by implementing "no cost" and "low cost" measures.

15. Section A.IV also describes the "low cost" magnetic field reduction measures proposed to be implemented along the new 10.5-mile double circuit 70 kV line. Specifically, the measure proposed is to raise the conductor height by 10 feet more than required to meet minimum clearance requirements. A table is presented showing the Base Case magnetic field strength at each edge of the ROW is 32.8 mG, which is the strength achieved through optimal phasing (the "no cost" measure described above). By raising the conductor height 10 feet, the magnetic field drops to 20.3 mG, an additional reduction of 38.2%.

16. Exhibit 2, which is attached hereto and incorporated by reference, presents the input parameters that I used to model the magnetic field strength for the Base Case and Optimal Phasing for the new 10.5 mile double-circuit 70 kV line in Alternative PLR-1A. Key inputs found in Table 1 of Exhibit 2 is a ROW width of 30 feet from the centerline. Key inputs in Table 2 of Exhibit 2 include: current of 975 amperes, minimum conductor height of 29 feet, and phasing of the three conductors in each 70 kV circuit. Exhibit 2 also includes a diagram illustrating how the three conductors in each 70 kV circuit are arranged on a double-circuit pole.

17. Exhibit 3, which is attached hereto and incorporated by reference, is a chart of the output data from the FIELDS software using the data inputs presented in Exhibit 2. It shows the modeled field strength of the new double-circuit 70 kV line at various distances from the centerline of the ROW at the base case (no optimal phasing and minimum conductor height), with optimal phasing, and raising conductor height by 10 feet.

18. Exhibit 4, which is attached hereto and incorporated by reference, presents a graph of the output data from the FIELDS software using the data inputs presented in Exhibit 3. The X-axis represents distance from the centerline of the ROW, which is "0" on the X-axis. The Y-axis represents magnetic field strength. The blue line represents the modeled magnetic field in the base case at various distances from the ROW centerline. The green line represents the modeled magnetic field implementing "no cost" optimal phasing at various distances from the ROW centerline. The red line presents the modeled magnetic field at various distances from the ROW centerline implementing "no cost" optimal phasing and the "low cost" measure of raising conductor height by 10 feet. The yellow vertical lines represent a distance of 30 feet from the ROW centerline. The graph provides a visual representation of the relative, incremental reduction of magnetic field strength that implementation of the no cost and low cost measures achieves.

19. Based on the modeling I conducted using the FIELDS software, and as presented in Section A.IV of the Revised Alternative PLR-1A Field Management Plan, the total reduction in modeled magnetic field strength at the ROW edge achieved along the new 10.5 mile double-circuit 70 kV line by implementing "no-cost" and "low cost" measures is 73.8 mg. Compared to the modeled base case field strength of 94.1 mG without optimal phasing and conductors at the minimum clearance height, implementing both measures results in a reduction of magnetic field

strength at the ROW boundary of 78.4%, which is well above the 15% reduction standard in the CPUC's EMF Policy.

20. Section A.IV of the Revised Alternative PLR-1A Field Management Plan also presents the incremental reduction in modeled magnetic field strength resulting from implementing "low cost" measures along the 6-mile portion of the existing San Miguel-Paso Robles line that would be reconductored if Alternative PLR-1A is constructed. This reconductored section would be composed of the single circuit portion of the new Union-San Miguel 70 kV line running northward to the existing San Miguel Substation and the single circuit portion of the new Union-Paso Robles 70 kV line running southward to existing Paso Robles Substation. "No cost" measures cannot be implemented along this line because it is a single 70 kV circuit, not a double circuit. The "low cost" measure proposed is to raise the conductor height by 10 feet more than required to meet minimum clearance requirements. A table is presented showing the modeled base case (i.e., conductor height at minimum clearance) magnetic field strength at the western edge of the ROW is 35.5 mG and at the eastern edge of the ROW is 35.9 mG. By raising the conductor height 10 feet, the modeled magnetic field at the western edge of the ROW drops to 25.3 mG and drops to 25.7 mG at the eastern edge of the ROW, a reduction of 28.6% and 28.5% respectively.

21. Exhibit 5, which is attached hereto and incorporated by reference, presents the input parameters that I used to model the magnetic field strengths for the base case in which the conductor along the 6-mile portion of the existing single circuit San Miguel-Paso Robles 70 kV line, which would be reconductored under Alternative PLR-1A, is at the minimum clearance height and if raised by 10 feet. The key input found in Table 1 of Exhibit 2 is a ROW width of 30 feet from the centerline. Key inputs in Table 2 of Exhibit 2 include: current of 975 amperes,

minimum conductor height of 29 feet, and phasing of the three conductors in the 70 kV circuit. Exhibit 2 also includes a diagram illustrating how the three conductors in the 70 kV circuit are arranged on a single-circuit pole.

22. Exhibit 6, which is attached hereto and incorporated by reference, is a chart of the output data from the FIELDS software using the data inputs presented in Exhibit 5. It shows the modeled field strength of the reconductored 70 kV line at various distances from the centerline of the ROW at the base case (minimum conductor height) and raising conductor height by 10 feet.

23. Exhibit 7, which is attached hereto and incorporated by reference, presents a graph of the output data from the FIELDS software using the data inputs presented in Exhibit 5. Similar to Exhibit 4, the X-axis represents distance from the centerline of the ROW, which is "0" on the X-axis. The Y-axis represent magnetic field strength. The blue line represents the modeled magnetic field in the base case at various distances from the ROW centerline. The red line represents the modeled magnetic field implementing the "low cost" measure of raising conductor height by 10 feet at various distances from the ROW centerline. The yellow vertical lines represent a distance of 30 feet from the ROW centerline. The graph provides a visual representation of the relative, incremental reduction of magnetic field strength that implementation of the low cost measures achieves.

24. Based on the modeling I conducted using the FIELDS software, and as presented in Section A.IV of the Revised Alternative PLR-1A Field Management Plan, the incremental reduction in modeled magnetic field strength at the ROW edge achieved along the new approximately 10.5 mile double-circuit 70 kV line by implementing "no-cost" and "low cost" measures is 78.4%, and the incremental reduction in magnetic field strength achieved by

implementing "low cost" measures along the approximately 6 miles of reconductored line is between 28.6% and 28.5%. All of these incremental reductions are well above the 15% reduction standard in the CPUC's EMF Policy.

25. If the Commission grants PG&E a PTC that authorizes PG&E to construct Alternative PLR-1A, it is my understanding that PG&E will incorporate the Revised PLR-1A Field Management Plan into the design and construction of that new 70 kV route.

Executed on September 15, 2023, at San Ramon, California.

/s/

QUALEN CHAVIS