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May 1, 2024

Mr. Jesus Ramirez
APC Division Manager
Imperial County Air Pollution Control District
150 South Ninth Street
El Centro, California 92243

RE: Selected Responses to the California Unions for Reliable Energy Comments on the Preliminary Decision to Grant a Preliminary Determination of Compliance for the Elmore North Geothermal Power Generation Plant

Dear Mr. Ramirez:

Elmore North Geothermal LLC (the Applicant) appreciates the work of the Imperial County Air Pollution Control District (ICAPCD) to produce a comprehensive Preliminary Determination of Compliance (PDOC) for the Elmore North Geothermal Project (ENGP or Elmore North).

The Applicant welcomes this opportunity to submit selected responses to certain comments submitted by the California Unions for Reliable Energy (CURE) on the Preliminary Determination of Compliance for Elmore North. CURE's comments on the PDOC were docketed with the California Energy Commission (CEC) on March 4, 2024¹. The Applicant remains available to provide additional information in furtherance of issuance of the Final Determination of Compliance (FDOC) for the Elmore North Geothermal Project.

1. The Dispersion Model Used the Most Representative, Accurate, and Reliable Meteorological Data Available and is Consistent with U.S. Environmental Protection Agency ("EPA) Guidelines.

In Section IV, Subsection A.1 of its comments, CURE asserts that the air quality model relied upon by the Air District to determine the Project's compliance with Ambient Air Quality Standards (AAQS) failed to utilize representative meteorological data.² This assertion is incorrect.

First, the dispersion model utilized the most representative, accurate, and reliable meteorological data available, consistent with U.S. Environmental Protection Agency (EPA) Guidelines. In particular, the Applicant reviewed the meteorological data collected at the Sonny Bono monitoring station, which is the monitoring station that CURE recommended the Air District analyze within its comments.³ Only two years of recent data (2020 and 2022) from that station meet the EPA requirements of 90 percent minimum completeness before substitution on a quarterly basis.⁴ To ensure the worst-case meteorological conditions

¹ The CURE PDOC comments for the project (Transaction Number [TN] #254833) are available at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=254833&DocumentContentId=90487>.

² *Id.* at page 5.

³ *Id.* at page 6, CURE recommends "that meteorological data from the nearby IID-operated Sonny Bono monitoring station be used because it is the best representation of the conditions that will exist during Project operation."

⁴ Refer to Section 5.3.2 of EPA's *Meteorological Monitoring Guidance for Regulatory Modeling Applications* (EPA-454/R-99-005), which is available online at https://www.epa.gov/sites/default/files/2020-10/documents/mmgrma_0.pdf.



Jon Trujillo
General Manager, Geothermal Development

are adequately represented in the model results, the EPA requires the use of five years of adequately representative National Weather Service (NWS) meteorological data, at least one year of site-specific data, or at least three years of prognostic meteorological data.⁵

In addition, the Sonny Bono monitoring station is not an Automated Surface Observing Systems (ASOS) station, unlike the Imperial County Airport NWS station. ASOS stations are those monitoring stations which collect sub-hourly 1 to 5-minute wind speed and wind direction readings. To reduce the number of calms and missing winds in the surface data, archived 1-minute winds for the ASOS stations can be used to calculate hourly average wind speeds and wind directions, which are used to supplement the standard archive of hourly observed winds processed in the American Meteorological Society/EPA Regulatory Model (AERMOD) Meteorological Preprocessor (AERMET).

Lastly, although the Imperial County Airport is located over 28 miles from the project site, there are no significant geographic features between the two locations and both are located south/southeast of the Salton Sea. The lack of significant geographic features between the two locations is itself an indicator of representativeness of the Imperial County Airport meteorological data,⁶ but also leads to the expectation that wind speeds and wind directions in the project vicinity are similar to those incurred at the Imperial County Airport. This expected similarity is verified by comparing the wind rose for the Imperial County Airport (for years 2015 to 2018 and 2021) to the wind rose for the Sonny Bono monitoring station (for years 2020 to 2022). As shown in Figure IV.A.1-1, attached hereto, both wind roses share the predominant wind directions from the west and southeast.

Based on the above, the meteorological data collected at the Sonny Bono monitoring station is not more suitable for modeling as the data does not meet the minimum requirements for completeness, and would not be any more representative of the project site than the Imperial County Airport data based on a comparison of wind roses. Furthermore, as an ASOS station, the Imperial County Airport NWS station may provide fewer missing hours of wind speeds and wind directions. For these reasons, the Applicant supports the continued use of the Imperial County Airport NWS station meteorological data, as previously approved both by the ICAPCD and CEC.⁷

2. The Cumulative Impacts Modeling Appropriately Evaluated All Sources Not Represented in the Background Ambient Monitoring Data.

In Section IV, Subsection A.2 of its comments, CURE asserts that the cumulative impact analysis modeling “must also consider other existing and proposed facilities within 6 miles of the project site including: JM Leathers, Vulcan, Hudson Ranch Power, Salton Sea Units 1-5, Morton Bay, Black Rock, and Hell’s Kitchen.”⁸ CURE is incorrect. As described below, the cumulative impacts analysis appropriately considered all existing and proposed facilities.

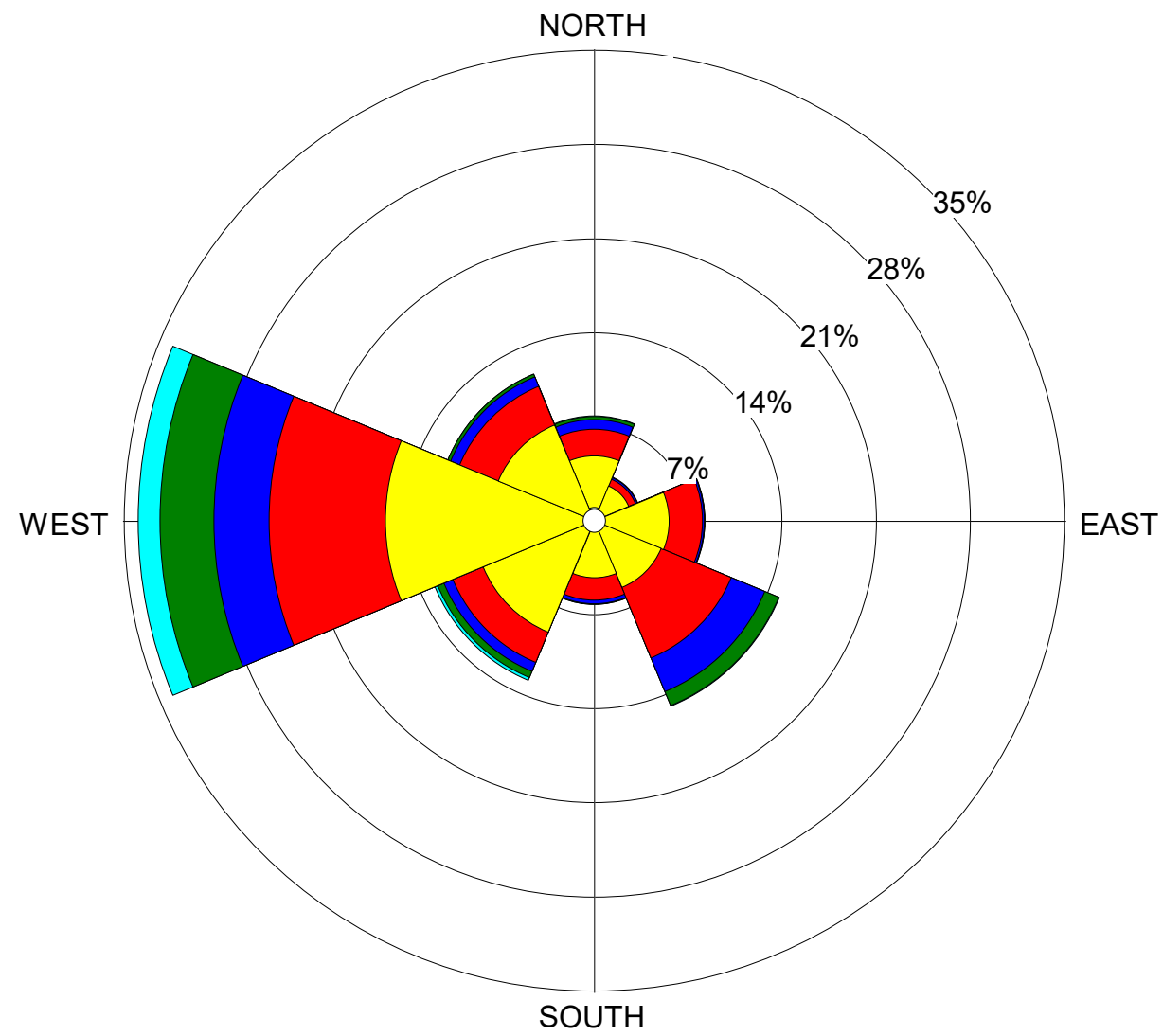
⁵ Refer to Section 8.4.2(e) of Appendix W to 40 Code of Federal Regulations (CFR) Part 51, *Guideline on Air Quality Models*.

⁶ Refer to Section 8.4.1(b)(2) of Appendix W to 40 CFR Part 51, *Guideline on Air Quality Models*.

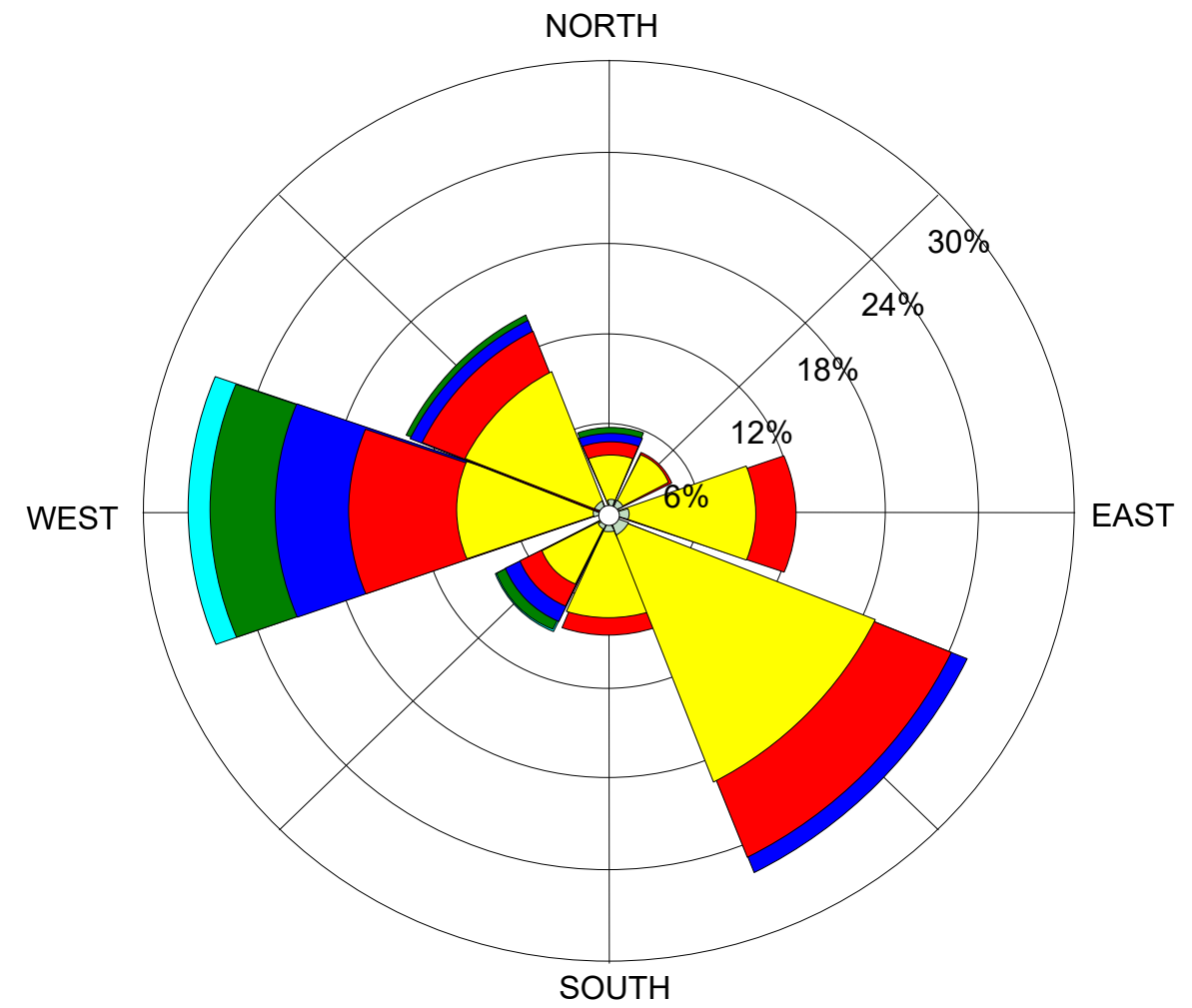
⁷ CEC Staff provided informal approval via electronic mail to the Applicant on December 14, 2022 and did not have any subsequent data requests associated with the modeling protocol. ICAPCD similarly did not have any comments regarding the modeling protocol during its completeness review of the permit application.

⁸ CURE PDOC Comments, p. 8.

Imperial County Airport (2015 – 2018 and 2021)



Sonny Bono Monitoring Station (2020 – 2022)



WIND SPEED (m/s)

- >= 10.00
- 7.00 - 10.00
- 5.00 - 7.00
- 3.00 - 5.00
- 1.00 - 3.00
- 0.00 - 1.00

Calms: 0.00%

Figure IV.A.1-1
Comparison of Wind Roses
Elmore North Geothermal Project
Imperial County, California



Jon Trujillo
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In a cumulative impact analysis, the EPA's guidance requires the evaluation of all sources which could contribute to impacts. However, the guidance only requires modeling of nearby sources that are not adequately represented in the background ambient monitoring data, particularly if those sources could contribute to areas where the project alone has Significant Impact Level (SIL) exceedances.⁹ Of the facilities listed by CURE, all are existing, operational facilities that are adequately represented in background monitoring data, with the exception of Morton Bay, Black Rock, and Hell's Kitchen. Both Morton Bay and Black Rock were modeled in the cumulative impact analysis.¹⁰ Further, as described in the *Air Dispersion Modeling Report for Black Rock, Elmore North, and Morton Bay Geothermal Projects*, Hell's Kitchen was considered for inclusion in the cumulative impacts analysis as a proposed future project. However, Hell's Kitchen was ultimately not included in the cumulative impacts analysis because it is currently in the entitlement process, which occurs before any air emissions-related permitting and licensing. As such, it is impossible to predict what its potential emissions may be or if the project will even be built in the future.

In addition, as shown in Table 4-1 and Appendix A of the *Air Dispersion Modeling Report for Black Rock, Elmore North, and Morton Bay Geothermal Projects*, the SIL impact radius for the project's 24-hour and annual particulate matter with aerodynamic diameter less than or equal to 2.5 microns (PM_{2.5}) impacts is small (i.e., 0.3 kilometer (km) or less). At such limited distances, it is unlikely that PM_{2.5} impacts from nearby existing sources would overlap with the project's impact areas. This conclusion is further supported through consideration of the wind rose and the location and orientation of similar existing emission sources in the project vicinity. For example, JJ Elmore is located southwest of the project and, like the project, emits PM_{2.5} from cooling towers. JJ Elmore's cooling towers are similarly located along the eastern edge of the property but are oriented west to east instead of northwest to southeast. Given the proximity of these two facilities and their slightly staggered positioning, PM_{2.5} impacts from both facilities would be expected to occur in the same general direction (i.e., west of both property boundaries) under the same meteorological conditions instead of overlapping in an area requiring different wind directions (i.e., south of the project but west of JJ Elmore). Furthermore, in the rare event that PM_{2.5} impacts from both facilities did overlap, they would have to do so persistently for 24-hours or the majority of a year to affect the modeled results, based on the averaging periods of the PM_{2.5} standards. For these reasons, it is unlikely that the project's highest PM_{2.5} impacts would overlap with the highest PM_{2.5} impacts from nearby existing sources; therefore, inclusion of such nearby existing sources in the cumulative impact analysis is not warranted.

Further, a cumulative impacts analysis was conducted for PM_{2.5} per the modeling protocol approved by both the ICAPCD and CEC,¹¹ based on the project's operational emissions exceeding the SIL for both 24-hour and annual PM_{2.5}. As described in Section 4.2 of the *Air Dispersion Modeling Report for Black Rock, Elmore North, and Morton Bay Geothermal Projects*,¹² the predominant contributor to PM_{2.5} emissions within Imperial County is windblown dust, which is not attributed to localized emission sources. Apart from windblown dust, on-road vehicles are a greater contributor of PM_{2.5} emissions within Imperial County

⁹ Refer to Section 8.3.1 of Appendix W to 40 CFR Part 51, *Guideline on Air Quality Models*.

¹⁰ Refer to Attachment DRR 12-1 of the *Elmore North Geothermal Project Data Request Response Set 1 (Revised Responses to Data Requests 3, 4, 7, 10 to 13, and 69 to 73)* (TN #253081).

¹¹ The *Air Dispersion Modeling Protocol for Elmore North Geothermal Plant Cumulative Impact Analysis* was docketed on September 28, 2023 (TN #252437). CEC Staff did not have any subsequent data requests associated with this submittal. ICAPCD similarly did not have any comments regarding this modeling protocol during its completeness review of the permit application.

¹² Refer to Attachment DRR 12-1 of the *Elmore North Geothermal Project Data Request Response Set 1 (Revised Responses to Data Requests 3, 4, 7, 10 to 13, and 69 to 73)* (TN #253081).



Jon Trujillo
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than electric generating facilities. Based on this profile, the Applicant selected background monitors located in urban areas near the predominant contributors (i.e., arterial streets, interstates, and highways), thereby providing for the purposes of the analyses a potentially higher localized PM_{2.5} background concentration than what is expected to be emitted by existing geothermal power plants in the project vicinity. This approach is consistent with EPA's recently released draft guidance on the development of background concentrations for use in modeling analyses, which suggests that selecting a background monitor located in an urban area may provide a more conservative assessment when the project source is in a more rural location.¹³

The portion of Imperial County in which the project is located is currently designated as an attainment area for PM_{2.5} under both federal and state standards. For consistency with the project's location and the location of the meteorological monitoring data, the PM_{2.5} background concentrations used in the Applicant's analysis were collected at monitoring stations located south of the Salton Sea, which are in or near the nonattainment portion of Imperial County. Use of these PM_{2.5} background concentrations resulted in modeled cumulative impacts below the applicable standards, even with inclusion of contributions from the proposed Morton Bay and Black Rock Geothermal Projects. As documented above, electric generating facilities are a smaller contributor to PM_{2.5} emissions within Imperial County than fugitive dust and on-road vehicles. As such, it is unlikely that existing electric generating facilities already adequately represented in background monitoring data within Imperial County, such as JJ Elmore, present a significant PM_{2.5} impact within the project vicinity.

3. The Project Would Not Cause or Contribute to a Violation of Newly Revised NAAQS for Annual PM_{2.5}.

In conjunction with the EPA's release of its final rule to strengthen the annual National Ambient Air Quality Standard (NAAQS) for PM_{2.5}, the EPA also released an implementation guide¹⁴ to help affected parties understand the timeline under which changes to permitting, area designations, etc. would be made. According to this guidance, all applicants for permits to construct a new major source or major modification of an existing stationary source after the effective date of the final rule (60 days after publication in the *Federal Register* or May 6, 2024) will need to conduct an air quality analysis that considers the revised PM_{2.5} NAAQS. Because this project's permit application was deemed complete on June 22, 2023, which is well before the effective date of the final rule, and because the project is neither a major source nor a Prevention of Significant Deterioration (PSD) source of PM_{2.5} emissions, an air quality analysis considering the revised PM_{2.5} NAAQS is not required.

In addition, the Applicant's analysis conservatively assumed the project's cooling towers would operate 8,760 hours per year at the maximum PM_{2.5} emission rate, without any consideration of periods of downtime or reduced cooling tower demand due to seasonal temperature variations. This condition simply cannot exist during operations. The Applicant could refine this assumption to reflect actual expected, much less frequent, cooling tower operations, rather than the conservative assumptions presented in the application,

¹³ Section 4.3 of EPA's *Draft Guidance on Developing Background Concentrations for Use in Modeling Demonstrations* (EPA-454/P-23-001), which is available online at <https://www.epa.gov/system/files/documents/2023-10/draft-guidance-on-developing-background-concentrations-for-use-in-modeling-demonstrations.pdf>.

¹⁴ Available online at <https://www.epa.gov/system/files/documents/2024-02/pm-naaqs-implementation-fact-sheet.pdf>.



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but nothing in Section A.2.b of Rule 207 requires such an exercise, especially where the project's application has already been deemed complete.

Further, the background concentration used in this modeling analysis comprises 96 percent of the new, reduced annual NAAQS for PM_{2.5}. During consideration of the PM_{2.5} State Implementation Plan (SIP) for Imperial County, it was noted that Imperial County is impacted year-round by the international transport of pollutants from Mexicali, Mexico. Although the SIP is not required to address pollution originating from outside the borders of the United States, implementation of the revised PM_{2.5} NAAQS will undoubtedly encourage implementation of additional control technologies throughout the state to bring down background concentrations within California. These new regulations and policies will ultimately reduce the project's potential PM_{2.5} impacts.

4. The Project Would Not Cause or Contribute to a Violation of CAAQS for Hydrogen Sulfide.

As stated in Section 5.1.9.6 of Attachment DRR 7-1 of the *Elmore North Geothermal Project Data Request Response Set 1 (Revised Responses to Data Requests 3, 4, 7, 10 to 13, and 69 to 73)* (Transaction Number [TN] #253081), "H₂S in the ambient air near the Salton Sea is subject to episodic events that result in concentrations which temporarily exceed the California Ambient Air Quality Standard (CAAQS) of 0.03 parts per million (ppm). These episodic events of H₂S exceedances are well known and largely due to biogenic sources and activity (SCAQMD 2021). As a result, monitoring data in the region may not be representative for use in a CAAQS modeling analysis and the project's modeled maximum impacts will instead be compared to the CAAQS directly."

To confirm these factual circumstances, the South Coast Air Quality Management District (SCAQMD) established hydrogen sulfide (H₂S) monitors along the north side of the Salton Sea to support notification and reporting of odor nuisances. Data collected at these monitors have exceeded the one-hour CAAQS of 0.03 ppm on numerous occasions. Despite these known and reported results, the California Air Resources Board (CARB) continues to designate the area as attainment for H₂S. This designation supports the use of these monitored H₂S concentrations for odor evaluations only, which are often attributed to episodic events. Furthermore, the Salton Sea itself is a predominant source of naturally-occurring H₂S within the region; such biogenic sources should not prohibit the development of stationary sources which utilize the resources for renewable energy.

Consistent with the above, the Applicant initially proposed to model H₂S only as an odor nuisance. Following discussion with the ICAPCD and CEC, the Applicant agreed to conduct an H₂S modeling analysis for demonstration of compliance with the one-hour CAAQS despite such an analysis never having been requested for other geothermal power plants in the project vicinity. As shown in Table 5.1-31 of Attachment DRR 7-1 of the *Elmore North Geothermal Project Data Request Response Set 1 (Revised Responses to Data Requests 3, 4, 7, 10 to 13, and 69 to 73)* (TN #253081), the project's maximum modeled H₂S concentration of 36.7 micrograms per cubic meter (µg/m³) is less than the one-hour CAAQS of 42 µg/m³. This analysis, the methodology of which was agreed to by both the ICAPCD and CEC, demonstrates a good faith effort by the Applicant to comply with requests made by the reviewing agencies and that, during routine operations, the project will not cause or contribute to an exceedance of the one-hour CAAQS for H₂S.



Jon Trujillo
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5. The Air District Properly Utilized Representative Ambient Air Quality Data for PM₁₀

The Applicant reviewed the particulate matter with aerodynamic diameter less than or equal to 10 microns (PM₁₀) data collected at the Sonny Bono monitoring station and found only two years of recent data (2018 and 2019) to meet the EPA's minimum requirements of 75 percent completeness of the scheduled sampling days on a quarterly basis.¹⁵ Based on this evaluation, the Sonny Bono monitoring station does not provide a complete three-year dataset to compute a design value for PM₁₀ for the air dispersion modeling analysis and is not recommended for use. In turn, the Applicant appropriately used PM₁₀ monitoring data collected at the quality assured air quality monitoring station located in Niland. This "regional" monitoring station is located upwind of the project area, has recent quality assured data available, and is impacted by similar or adequately representative sources; therefore, it is considered suitable for use per Section 8.3.2(b) of Appendix W to 40 Code of Federal Regulations (CFR) Part 51, *Guideline on Air Quality Models*.

6. Condition B.9 Was Developed Consistent With the Applicant's PTE Estimate and is Independent of the Yearly Anticipated HCl.

Although the project's hydrochloric acid (HCl) emissions were attributed to the 20,000-gallon storage tank, the HCl emissions estimate was developed independent of the HCl concentration and size of the storage tank. The project's HCl emissions assumed a maximum filling rate of 100 gallons per minute (gpm) with the scrubber operating up to 365 days per year. These conservative assumptions are inclusive of scrubber operation for both the 20,000-gallon and 800-gallon HCl storage tanks and represent the project's potential to emit (PTE) HCl. Permit Condition B.9 was developed consistent with the Applicant's PTE estimate and is independent of the anticipated annual HCl throughput expected each year.

7. Elmore North and JJ Elmore Are Not Under Common Control.

The Elmore North Geothermal Project will be owned and operated, if approved, by Elmore North Geothermal LLC, an indirect, wholly owned subsidiary of BHE Renewables, LLC (BHER) formed for development of the project. In contrast to this permitting process, the JJ Elmore facility is an existing, operating facility. The operating facility has separate ownership and operations which will continue, with or without the approval of Elmore North. The two separate legal entities are affiliates; however, they are not under common control, as JJ Elmore operates and will continue to operate independent of the yet to be approved Elmore North Geothermal Project.

To illustrate the point of the separate interests, while there are no current plans to divest either project, either project company could, in theory, be sold to a third party without any notice, review, or approval of the other. Each is independently formed. Each is required to remain in good standing with the entity governing formation. They have separate compliance obligations, none of which are ascribed to the other. From a liability perspective, the acts of one would not create a benefit or a liability for the other because they are separate. From a corporate perspective, they are not under common control and their ownership interests could be separately divested.

¹⁵ Refer to Table 8-1 of EPA's *Guideline on Data Handling Conventions for the PM NAAQS* (EPA-454/R-99-009), which is available online at https://www3.epa.gov/ttn/naaqs/aqmguides/collection/cp2/19990401_oaqps_epa-454_r-99-009_guideline_data_handling_pm_naaqs.pdf.



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As a factual matter, the two project companies are separately operating entities with no commonalities. Of course, given that JJ Elmore alone exists today, the projects share no common facilities. Assuming successful permitting of Elmore North, the project companies will remain separate, independent entities. The independence of each of these two facilities is further supported by the following facts:

- The facilities will not share steam, brine, or other resources.
- Elmore North will have its own production and injection wells which are not interconnected to JJ Elmore.
- The facilities will operate under their own, distinct power purchase agreements with individual responsibilities to their own counter-parties.
- Each facility will be operated independently to comply North American Electric Reliability Corporation (NERC) regulations. Elmore North's high-side step up transformer have a voltage of 230 kV (above 100 kV), which will include Elmore North in the Bulk Electrical System ("BES") as defined by NERC Glossary of Terms for entities subject to NERC compliance. Generating resources operated at voltages of 100 kV or higher at the high-side of the step-up transformer(s) are subject to NERC compliance. Where as, JJ Elmore's high-side step up transformer voltage is 92 kV, which excludes the power plant from the BES.
- One facility's operations will not influence operations at the other, based in large part on their independent infrastructure.

In addition, JJ Elmore is more than 30 years old and has continued to operate during this time under its own permit with periodic modifications. Elmore North is not a replacement of JJ Elmore.

8. The Two Projects Cannot and Would Not Be Permitted as a Single Stationary Source Due to the CEC's Exclusive Jurisdiction Over Elmore North.

The CEC has exclusive siting jurisdiction over thermal power plants, defined as "any stationary or floating electrical generating facility using any source of thermal energy, with a generating capacity of fifty (50) megawatts or more, and any facilities appurtenant thereto" (California Public Resources Code Section 25120). Further, the issuance of a certificate by the CEC shall be in lieu of any permit, certificate or similar document required by any state, local or regional agency (California Public Resources Code Section 25500). There can be no dispute that the Elmore North Geothermal Project can and must be licensed by the CEC.

In contrast, the JJ Elmore, an existing facility, is not a CEC jurisdictional project because, at the time of its permitting, it was not both thermal and fifty megawatts or more capacity. As a matter of law, the two projects, separated in time, could and would not be permitted as a single project.

As further evidence of the separateness, a 1979 Memorandum of Understanding (MOU) between the CEC and CARB sets forth how the CEC, CARB, and the local air pollution control districts are to integrate their permitting processes. The critical provision is as follows:

C. Decision: The Commission AFC decision shall include findings and conclusions on conformity with air quality requirements based on the Determination of Compliance. ***If the Determination of Compliance concludes that the facility as proposed by the Applicant will comply with all applicable air quality requirements, the Commission shall include***



Jon Trujillo
General Manager, Geothermal Development

in its certification any and all conditions necessary to insure compliance. * * * (PDF page 7.)

This section has long been read to mean that the CEC incorporates the local air district's conditions into its Certification. This incorporation of an air district's FDOC into the CEC Certification verbatim has been the practice since the inception of the CEC in 1976.

9. The Air District Can Issue the Final Determination of Compliance Consistent with the Requirements of Rule 1401.

ICAPCD can issue an FDOC, consistent with Rule 1401. CURE's arguments to the contrary are unavailing. As presented in Table 5.9-9 of Attachment DRR 7-1 of the *Elmore North Geothermal Project Data Request Response Set 1 (Revised Responses to Data Requests 3, 4, 7, 10 to 13, and 69 to 73)* (TN #253081), the project's total chronic hazard index (HI) and total acute HI do exceed the significance thresholds of 1.0 only at the Point of Maximum Impact (PMI), which was the same receptor conservatively and arbitrarily used for the Maximum Exposed Individual Worker (MEIW).

For the purpose of calculating chronic HI, SCAQMD Rule 1401 considers "any location outside the boundaries of the facility at which a person could experience chronic exposure."¹⁶ Because the PMI for chronic risk is located in the vicinity immediately surrounding the project (i.e., along the project fenceline), as shown in Figure 5.9-1 of Attachment DRR 7-1 of the *Elmore North Geothermal Project Data Request Response Set 1 (Revised Responses to Data Requests 3, 4, 7, 10 to 13, and 69 to 73)* (TN #253081), it is not expected to be a location presenting a potential for long-term or chronic exposure (i.e., it is unlikely and beyond any reasonable possibility for an individual to be present at the project fenceline for 8 hours per day for 25 years). Furthermore, the project's total chronic risk drops to less than 1.0 within 300 feet of the eastern fenceline. Although technically not within the project property, public access to this land is restricted as it is owned by BHER.

For the purpose of calculating acute HI, SCAQMD Rule 1401 considers "any location outside the boundaries of the facility at which a person could experience acute exposure."¹⁷ Although the PMI for acute risk is similarly located in the vicinity immediately surrounding the project, it is reasonable to assume that an individual could be present at the project fenceline for 1 hour. However, ICAPCD has only formally established thresholds at which public notification of potential health risks is required.¹⁸ Exceedance of these public notification thresholds does not prohibit ICAPCD from approving a permit for the emission source.

As stated in Section 5.9.3.5.1 of Attachment DRR 7-1 of the *Elmore North Geothermal Project Data Request Response Set 1 (Revised Responses to Data Requests 3, 4, 7, 10 to 13, and 69 to 73)* (TN #253081), the Applicant will comply with the public notification requirements for the project's acute risks. Furthermore, the project has implemented source-specific Best Available Control Technology for Toxics (T-BACT), which is required by CARB's *Risk Management Guidance for Stationary Sources of Air Toxics*¹⁹ for sources contributing acute health risks greater than the significance threshold.

10. The HRA Properly Analyzes and Accounts for Potential Radon Impacts.

¹⁶ SCAQMD Rule 1401(c)(11)(B)

¹⁷ SCAQMD Rule 1401(c)(11)(A)

¹⁸ <https://ww2.arb.ca.gov/ab-2588-district-prioritization-scores-and-risk-threshold-levels>

¹⁹ <https://ww2.arb.ca.gov/sites/default/files/classic/toxics/rma/rmgssat.pdf>



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CURE's claims related to potential radon impacts are unfounded as there are several errors in CURE's review. For example, on Page 12 of Exhibit A of CURE's comments (TN #254833), CURE states that it obtained per-pollutant data from the "BR_8760_Burden_CancerRisk.csv" file for Receptor 50 and summed the results to determine a cancer impact of 21.54 in 1 million. The Burden Cancer Risk scenario assumes a 70-year exposure period; therefore, the file selected by CURE is not appropriate for determining cancer impacts for a worker exposure scenario. Rather, CURE should have obtained per-pollutant data from the "BR_8760_MEIW_CancerRisk.csv" file for Receptor 50 and summed the results to determine a cancer impact of 0.82 in 1 million, as correctly presented in the PDOC. Consistent with guidance from the Office of Environmental Health Hazard Assessment (OEHHA),²⁰ this MEIW scenario assumes a 25-year exposure period. CURE's review is in error.

Radon (Rn-222) primarily is a hazard in occupations where workers may be exposed to Naturally Occurring Radioactive Materials (NORM) and to occupants in buildings overlying soils high in radium (Ra-226).²¹ Radon workplace hazards are addressed as part of a facility occupational health and safety program; risks to the general public from radon exposure are addressed by programs administered by state and county health departments, which primarily involve education about indoor air testing and building mitigation. Selected sources of radon are managed under federal standards, including U.S. Nuclear Regulatory Commission (NRC) regulations and EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAPs). For example, NRC regulations for uranium mill tailings include requirements to control the release of radon. The NESHAP for emissions of radon from U.S. Department of Energy facilities establishes a surface emission standard of 20 picocuries per square meter per second (pCi/m²-s) from impoundments or disposal facilities. Because radon is managed as a radiation health hazard under other programs, it has not been identified as a toxic air contaminant (TAC) in California. An outcome of not being a TAC is that there are no risk assessment methods in OEHHA guidelines for assessing radon emissions to ambient air.

The risk from the project's radon emissions can be assessed based on comparison with background levels in ambient air. An authoritative estimate of a typical concentration of radon in ambient (outdoor) air is 0.4 picocuries per liter (pCi/L).²² Studies conducted by CARB reported a statewide average outdoor air concentration of 0.49 pCi/L.^{23, 24}

Radon emissions from the project's cooling tower were modeled to estimate the annual average radon concentration for the Maximum Exposed Individual Resident (MEIR). As shown in Table VII.B-1 below, the annual average concentration at the MEIR is 0.0072 pCi/L, which is well within existing (background) levels of radon in air in California. While radon cancer risk may not have been included in the project's health risk assessment (HRA), there is sufficient basis to show that radon emissions from the proposed project do not represent an increased health risk. Other hazards associated with radon (for example

²⁰ <https://oehha.ca.gov/media/downloads/crn/2015guidancemanual.pdf>

²¹ International Commission on Radiological Protection (ICRP). 1993. *Protection Against Radon-222 at Home and at Work*. ICRP Publication 65. https://journals.sagepub.com/doi/pdf/10.1177/ANIB_23_2.

²² Agency for Toxic Substances and Disease Registry (ATSDR). 2012. *Toxicological Profile for Radon*. May. <https://www.atsdr.cdc.gov/ToxProfiles/tp145.pdf>.

²³ Liu, K-S et al. 1990. *Survey of Residential Indoor and Outdoor Radon Concentrations in California*. <https://ww2.arb.ca.gov/sites/default/files/classic/research/apr/past/a6-194-53.pdf>.

²⁴ Liu, K-S et al. 1991. *Annual Average Radon Concentrations in California Residences*. Journal of Air and Waste Management Association. 41(9):1207-1212. <https://www.tandfonline.com/doi/abs/10.1080/10473289.1991.10466917>.



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workplace hazards) are addressed through existing regulatory programs. Accordingly, the HRA properly analyzes and accounts for potential radon impacts.

Table VII.B-1. Radon Concentration at the MEIR

Parameter	Value
Annual Maximum Modeled TAC Impact ^a	19.96 µg/m ³ per g/s
	2.00E+07 pCi/m ³ per Ci/s
Annual Radon Emissions ^b	11.4 Ci/year
	3.62E-07 Ci/s
Annual Maximum Radon Impact ^c	7.22 pCi/m ³
	7.22E-03 pCi/L

^a The Annual Maximum Modeled TAC Impact was taken as the maximum annual impact for the cooling towers from the 1 g/s TAC AERMOD run and converted to units of pCi/m³ per Ci/s using the following conversion factors:

- 1 µg = 1.00E-06 g
- 1 g = 1.50E+05 Ci²⁵
- 1 Ci = 1.00E+12 pCi

^b Annual Radon Emissions were taken from Appendix 5.1A, Table 1 of Attachment DRR 7-1 of the *Elmore North Geothermal Project Data Request Response Set 1 (Revised Responses to Data Requests 3, 4, 7, 10 to 13, and 69 to 73)* (TN #253081) and converted to units of Ci/s using the following conversion factor:

- 1 year = 3.15E+07 s

^c The Annual Maximum Radon Impact was calculated by scaling the Annual Maximum Modeled TAC Impact by the Annual Radon Emissions and converted to units of pCi/L using the following conversion factor:

- 1 m³ = 1,000 L

Notes:

- µg = microgram(s)
- µg/m³ = microgram(s) per cubic meter
- Ci = curie(s)
- Ci/s = curie(s) per second
- g = gram(s)
- g/s = gram(s) per second
- L = liter(s)
- m³ = cubic meter(s)
- pCi = picocurie(s)
- pCi/m³ = picocurie(s) per cubic meter
- s = second(s)

²⁵ <https://www.ncbi.nlm.nih.gov/books/NBK158787/table/T23/>



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11. The HRA Modeling Uses Representative Meteorological Data

The meteorological data the HRA relied upon in the PDOC is proper and representative. The Applicant reviewed the meteorological data collected at the Sonny Bono monitoring station and found only two years of recent data (2020 and 2022) to meet the EPA's requirements of 90 percent minimum completeness before substitution on a quarterly basis.²⁶ To ensure the worst-case meteorological conditions are adequately represented in the model results, the EPA requires the use of five years of adequately representative NWS meteorological data, at least one year of site-specific data, or at least three years of prognostic meteorological data.²⁷

In addition, the Sonny Bono monitoring station is not an ASOS station, unlike the Imperial County Airport NWS station. ASOS stations are those monitoring stations which collect sub-hourly 1 to 5-minute wind speed and wind direction readings. To reduce the number of calms and missing winds in the surface data, archived 1-minute winds for the ASOS stations can be used to calculate hourly average wind speeds and wind directions, which are used to supplement the standard archive of hourly observed winds processed in AERMET.

The Imperial County Airport is located approximately 28 miles from the project site. Significantly, for the purposes of the PDOC's conclusions, there are no significant geographic features between the two locations and both are located south/southeast of the Salton Sea. The lack of significant geographic features between the two locations is itself an indicator of representativeness of the Imperial County Airport meteorological data,²⁸ but also leads to the expectation that wind speeds and wind directions in the project vicinity are similar to those incurred at the Imperial County Airport. This expected similarity is verified by comparing the wind rose for the Imperial County Airport (for years 2015 to 2018 and 2021) to the wind rose for the Sonny Bono monitoring station (for years 2020 to 2022). As shown in Figure IV.A.1-1, both wind roses share the predominant wind directions from the west and southeast.

Based on the above, the meteorological data collected at the Sonny Bono monitoring station is not suitable for modeling as the data does not meet the minimum requirements for completeness. Beyond its incompleteness, the use of this data would not be any more representative of the project site than the Imperial County Airport data based on a comparison of wind roses. Furthermore, as an ASOS station, the Imperial County Airport NWS station may provide fewer missing hours of wind speeds and wind directions. For these reasons, the use of the Imperial County Airport NWS station meteorological data in the PDOC's analysis is representative, as previously approved both by the ICAPCD and CEC.²⁹

²⁶ Refer to Section 5.3.2 of EPA's *Meteorological Monitoring Guidance for Regulatory Modeling Applications* (EPA-454/R-99-005), which is available online at https://www.epa.gov/sites/default/files/2020-10/documents/mmgrma_0.pdf.

²⁷ Refer to Section 8.4.2(e) of Appendix W to 40 CFR Part 51, *Guideline on Air Quality Models*.

²⁸ Refer to Section 8.4.1(b)(2) of Appendix W to 40 CFR Part 51, *Guideline on Air Quality Models*.

²⁹ CEC Staff provided informal approval via electronic mail to the Applicant on December 14, 2022 and did not have any subsequent data requests associated with the modeling protocol. ICAPCD similarly did not have any comments regarding the modeling protocol during its completeness review of the permit application.



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12. The HRA Properly Analyzes the Emissions Estimates for Hydrochloric Acid

As explained in the application materials submitted to the ICAPCD, the project's HCl emissions were properly attributed to the 20,000-gallon storage tank. As explained, the HCl emissions estimate was developed independent of the HCl concentration and size of the storage tank. Specifically, the project's HCl emissions assumed a maximum filling rate of 100 gpm with the scrubber operating up to 365 days per year. These conservative assumptions are inclusive of scrubber operation for both the 20,000-gallon and 800-gallon HCl storage tanks.

Furthermore, the project's HRA did include HCl emissions from an HCl scrubber. Because the source modeling parameters were based upon an estimated scrubber size (instead of a specific storage tank) and because the assigned emissions were inclusive of scrubber operation for both HCl storage tanks, the HRA results should be considered to reflect potential health risks resulting from both HCl storage tanks. For these reasons, the additional analysis specific to the 800-gallon HCl storage tank CURE seeks is not required.

The Applicant Remains Available to Support the Issuance of the FDOC

Thank you for the opportunity to address some of the selected comments of CURE. The Applicant looks forward to working with the ICAPCD during the finalization of the Determination of Compliance. Please contact Anoop Sukumaran at (760) 348-4275 (email address: Anoop.Sukumaran@calenergy.com) or Jerry Salamy at (916) 769-8919 (email address: Jerry.Salamy@jacobs.com) if you have any questions or if you need additional information.

Sincerely,

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