DOCKETED	
Docket Number:	23-AFC-01
Project Title:	Morton Bay Geothermal Project (MBGP)
TN #:	254077
Document Title:	Cover Letter with CURE Data Requests Set 4
Description:	N/A
Filer:	Alisha Pember
Organization:	California Unions for Reliable Energy
Submitter Role:	Intervenor
Submission Date:	1/22/2024 4:25:36 PM
Docketed Date:	1/22/2024

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January 22, 2024

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Re: CURE Data Requests Set 4 for Morton Bay Geothermal Project (23-AFC-01)

Dear Ms. Neumyer and Mr. Salamy:

California Unions for Reliable Energy ("CURE") submits this fourth set of data requests to Morton Bay Geothermal, LLC, an indirect wholly owned subsidiary of BHE Renewables, LLC, ("Applicant") for the Morton Bay Geothermal Project ("Project"), pursuant to Title 20, section 1716(b), of the California Code of Regulations. The requested information is necessary to: (1) more fully understand the Project; (2) assess whether the Project will be constructed and operated in compliance with all laws, ordinances, regulations, and standards; (3) assess whether the Project will result in significant environmental impacts; (4) assess whether the Project will be constructed and operated in a safe, efficient, and reliable manner; and (5) assess potential mitigation measures.

Pursuant to section 1716(f), written responses to these requests are due within 30 days. If you are unable to provide or object to providing the requested information by the due date, you must send a written notice of your objection(s) and/or inability to respond within 20 days.

Please contact me at agraf@adamsbroadwell.com if you have any questions. Thank you for your cooperation with these requests.

Sincerely,

Andrew J. Graf

AJG:acp

6707-030acp

STATE OF CALIFORNIA

STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

IN THE MATTER OF: MORTON BAY GEOTHERMAL PROJECT APPLICATION FOR CERTIFICATION	Docket No. 23-AFC-01

CALIFORNIA UNIONS FOR RELIABLE ENERGY DATA REQUESTS SET 4

January 22, 2024

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STATE OF CALIFORNIA

STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

IN THE MATTER OF: MORTON BAY GEOTHERMAL PROJECT APPLICATION FOR CERTIFICATION	Docket No. 23-AFC-01

CALIFORNIA UNIONS FOR RELIABLE ENERGY DATA REQUESTS SET 4

The following data requests are submitted electronically via California Energy Commission ("CEC") Docket No. 23-AFC-01 by California Unions for Reliable Energy ("CURE") to Morton Bay Geothermal, LLC ("Applicant"). Please provide your responses as soon as possible, but no later than Wednesday, February 21, 2024 to:

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Please identify the person who prepared the Applicant's responses to each data request. If you have any questions concerning the meaning of any data requests, please let us know.

WATER RESOURCES

BACKGROUND: WATER SHORTAGES

The Morton Bay Geothermal Project ("Project") will rely on Imperial Irrigation District ("IID") supplied water. IID relies on the Colorado River for meeting water user demands. (AFC at p. 5.15-12). The Colorado River Basin continues to be largely in abnormally dry to severe drought conditions, continuing the historic decadal drought. Climate projections indicate these dry conditions are not expected to change dramatically either short-term or long-term. Several laws, regulations, and agreements control IID's water rights along the Colorado River and influence future decisions regarding water supply availability during periods of shortages.

For example, the U.S. Bureau of Reclamation ("BOR") responded to a multi-year drought in the Colorado River Upper Basin by developing the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead ("2007 Interim Guidelines"). (TN 253193) The 2007 Interim Guidelines are in place from 2008 through December 31, 2025. (*Id.*) In 2007, BOR announced that "Conservation Before Shortage" was the selected preferred alternative for the Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations of Lake Powell and Lake Mead ("Final Preferred Alternative"). (*Id.*) This Final Preferred Alternative is comprised of four key operational elements that guide operations of Lake Powell and Lake Mead through 2026. (*Id.*)

In October of 2023, BOR published the Revised Draft Supplemental Environmental Impact Statement ("SEIS") for Near-Term Colorado River Operations, which is intended to replace the 2007 Interim Guidelines under which the Colorado River has been operating and making water deliveries. The BOR is proposing to revise the 2007 Interim Guidelines for the operation of Glen Canyon and Hoover Dams beginning in the 2024 operating year to address the potential for continued low-runoff conditions in the Colorado River Basin. As stated in the SEIS, "[u]nder the Proposed Action, there is the possibility that the IID and [Coachella Valley Water District] could take additional shortages;…." (SEIS 2023 at 3-133) The SEIS also discusses the No Action and other Alternatives that may impact surface water deliveries to IID. BOR has not yet identified a preferred alternative, which will be identified in the Final SEIS.

DATA REQUESTS:

252. Please provide the minimum volume of average annual water demand in acre feet per year ("AFY") for the Project to operate.

253. State the maximum volume of average annual water demand in AFY for the Project to operate.

254. State whether the Applicant has identified alternative sources of water for the Project if IID does not meet the Project's total water demand.

255. If alternative sources of water for the Project have been identified, please describe the alternative sources of water.

REFERENCES:

SEIS 2023 – U.S. Bureau of Reclamation, *Near-Term Colorado River Operations Revised Draft Supplemental Environmental Impact Statement* (October 2023), available at https://cra.utah.gov/wp-content/uploads/2023/10/Revised-Draft-Supplemental-Environmental-Impact-Statement-for-Near-term-Colorado-River-Operations.pdf.

BACKGROUND: EQUITABLE DISTRIBUTION PLAN

The SB 610 Water Supply Assessment ("WSA") states that the water supply for the Project has been assured by Imperial County Planning and Development Services ("ICPDS"). (TN 253193) The WSA also explains that the proposed Project would be designated as a non-agricultural water user, and water will be supplied under an Industrial Water Supply Agreement with IID, or alternatively, under IID's Interim Water Supply Policy. (*Id.*)

Due to ongoing Colorado River drought conditions, Lake Mead's declining elevation, reduced inflows from Lake Powell, and the suspension of the federal Inadvertent Overrun and Payback Policy, the IID Board has implemented an annual apportionment program known as the Equitable Distribution Plan ("EDP"). In general, IID apportions the available water supply among all its water users equitably under the EDP. The intent of the EDP is to address times when customers' demand would exceed IID's Colorado River supply. (*Id.*) The EDP indicates that the basis for the equitable distribution for the industrial/commercial apportionment is based on the average of the previous three calendar years of water used. The EDP also has a provision that the apportionment may be changed for any calendar year prior to the notification period at the discretion of the IID Board of Directors.

DATA REQUESTS:

256. State whether the Applicant and IID have discussed the apportionment of water to the Project pursuant to the EDP.

257. If the response to Data Request No. 256 is "Yes," please:

a. Summarize this discussion(s) and any outcomes; and

b. Provide all documents referring or related to the Applicant's discussions with IID regarding the apportionment of water to the Project pursuant to the EDP.

BACKGROUND: GEOTHERMAL RESERVOIR PROPERTIES

The geothermal reservoir characteristics dictate the applicable technologies for energy production. In CURE Data Response Set 1 concerning the geothermal reservoir, the Applicant's response focuses on system state variables, namely temperature, pressure, and fluid chemistry rather than the reservoir properties. (TN 253374) Information regarding reservoir properties pertains to reservoir permeabilities and their distribution (heterogeneity), porosity, fracture density and orientations, thermal conductivity and heat capacity of reservoir rock, capillary pressure curves.

DATA REQUESTS:

258. Provide data or documents describing reservoir permeability.

259. Provide data or documents describing the reservoir porosity.

260. Provide data or documents describing fractures in the reservoir.

261. Provide data or documents describing the reservoir thermal conductivity.

BACKGROUND: HULEN, ET AL (2002), HULEN, ET AL (2003)

In CURE Data Response Set 1 No. 9 (TN 253374), the Applicant cited to Hulen et al. (2003); Geology and a Working Conceptual Model of the Obsidian Butte (Unit 6) Sector of the Salton Sea Geothermal Field, California; Proceedings GRC 2003; and Hulen et al. (2002); Refined Conceptual Modeling and a New Resource Estimate for the Salton Sea Geothermal Field, Imperial Valley, California; Proceedings GRC 2002, but did not attach these reports.

DATA REQUESTS:

262. Provide a copy of Hulen et al. (2003); Geology and a Working Conceptual Model of the Obsidian Butte (Unit 6) Sector of the Salton Sea Geothermal Field, California; Proceedings GRC 2003.3.

263. Provide a copy of Hulen et al. (2002); Refined Conceptual Modeling and a New Resource Estimate for the Salton Sea Geothermal Field, Imperial Valley, California; Proceedings GRC 2002.

BACKGROUND: MODEL CALIBRATION

In CURE Data Response Set 1 No. 18 (TN 253374), the summary results of model calibration should include estimated properties of the reservoir not just the history matching of system state data. Additionally, such estimates should be accompanied by measures of uncertainty. For example, estimates of permeability are averages, which should be accompanied by measures estimation error (variance or confidence intervals). When performing history matching (calibration) the modeler modifies reservoir properties (permeability, porosity, fractures, thermal conductivity) to determine the optimal values that lead the modeled pressures and temperatures to match the corresponding measured (historical) values. Information regarding uncertainty associated with the estimated reservoir properties has not been provided. It is sufficient if the history matching is accompanied by a cone of (predictive) uncertainty. Figure DRR 10c-1 would not be considered adequate without some measure of uncertainty.

DATA REQUESTS:

264. Provide the reservoir numerical modeling report.

BACKGROUND: BIOLOGICAL SURVEY AREA

Figure 5.2-1 in the AFC identifies the boundaries of the Biological ***Study*** Area ("BSA") and the Biological ***Survey*** Area. With regards to the Biological ***Survey*** Area, the AFC at page 5.2-1 states: "[f]or the purposes of the biological resources analysis, biologists surveyed a larger area than the final Project footprint to allow for flexible placement of Project features while avoiding sensitive areas (Figure 5.2-1)." The Biological Survey Area includes numerous areas outside of the BSA (AFC Figure 5.2-1), including the water-bearing portions of Morton Bay that are inaccessible to vehicles or pedestrians. It is unclear what resources were surveyed in the Biological Survey Area, if any, and the methods utilized.

DATA REQUESTS:

265. Describe the survey methods utilized and resources surveyed in the Biological Survey Area, including the portions that overlap with Morton Bay.

266. State the criteria utilized to avoid sensitive areas in the Biological Survey Area, as discussed in the AFC at page 5.2-1.

BACKGROUND: BIOLOGICAL STUDY AREA

The AFC at page 5.2-14 states that the Project's botanical surveys in the BSA were conducted by driving fifteen (15) to twenty (20) miles per hour along dirt and paved roads throughout the entire BSA. When natural communities with potentially suitable habitat for special-status plants were encountered, the AFC explains that botanists conducted surveys in accordance with California Department of Fish and Wildlife ("CDFW") and U.S. Fish and Wildlife Service ("USFWS") protocols, but the AFC does not identify the areas that were surveyed in accordance with these protocols. (*Id.*)

The AFC at page 5.2-14 provides the following description of the reconnaissance-level wildlife surveys within the BSA: "[b]iologists conducted windshield surveys and pedestrian surveys when burrowing owl, burrows, or burrowing owl sign was observed." Areas that were subject to pedestrian surveys are not identified in the AFC, but the discussion generally states that the wildlife surveys were conducted in the BSA. The AFC at page 5.2-15 states that the aquatic resource delineation was also confined to the BSA.

DATA REQUESTS:

267. Provide a map that identifies the areas that were subject to surveys for botanical resources according to the CDFW and USFWS protocols.

268. Provide a map that identifies the roads that were driven during the "windshield surveys" for wildlife.

269. Provide a map that identifies the areas that were walked during the pedestrian surveys for wildlife.

BACKGROUND: HABITAT MAPPING WITHIN BUFFER AREAS

The AFC at page 5.2-9 suggests that special-status species within a one-mile buffer of the Project could be subject to impacts from construction and operation of the Project. The AFC at page 5.2-13 states that the Applicant's biologists and botanists conducted reconnaissance-level habitat mapping within the Project's buffer areas, i.e., one mile for the geothermal plant area and 1,000 feet for well pads, pipelines, auxiliary features, and linear features. However, the habitats within the Project's buffer areas are undisclosed. For example, AFC Figure 5.2-4 only depicts the land cover and vegetation types within the Biological Study Area, which is considerably smaller than the Project's buffer areas.

DATA REQUESTS:

270. Provide a map that depicts the habitats within the Project's one-mile and 1,000-foot buffer areas.

271. Describe the methods that were used to map habitats within the Project's one-mile and 1,000-foot buffer areas, including areas that lie outside of the Biological Survey Area.

BACKGROUND: IMPACTS TO CANALS, DRAINS, AND DESERT PUPFISH HABITAT

CURE Data Request Set 2 No. 183 asked the Applicant to provide a map that identifies the path of agricultural return flows (irrigation runoff) from the agricultural fields that would be impacted by the Project. In response, Figure DR 183 shows the agricultural return flows from the proposed Project plant site, but not from any of the other agricultural fields that would be impacted by the Project. (TN 254015)

CURE Data Request Set 2 No. 184 asked whether the Applicant analyzed how reduced agricultural return flows associated with the Project would indirectly

impact: (a) habitat for the desert pupfish, and (b) vegetation communities that are dependent on the agricultural return flows. The Applicant's response states the analysis "is underway with IID as part of the WSA and impact study analysis." (TN 254015)

DATA REQUESTS:

272. Provide maps that identify the path (including receptor drains) of agricultural return flows (irrigation runoff) from all agricultural fields that would be impacted (permanently or temporarily) by the Project (i.e., fields that will be impacted by the proposed well pads, laydown areas, borrow pits, and construction camp).

273. State an estimate of when the analysis referenced in CURE Data Response Set 2 No. 184 (TN 254015) will be available for review.

274. Provide copies of maps or data used to inform or conduct the analysis of reduced agricultural return flows associated with the Project referenced in CURE Data Response Set 2 No. 184 (TN 254015).

BACKGROUND: NOISE IMPACTS ON WILDLIFE

The AFC at page 5.2-27 proposes 80 dBA as the noise threshold for birds, but does not identify the proposed noise threshold level for impacts to other wildlife taxa (e.g., mammals). CURE Data Request Set 2 No. 235 asked the Applicant to identify the noise threshold level and the Applicant's response to Data Request No. 235 states:

> "In general, 80 dB is an acceptable threshold for wildlife noise impacts (AFC Sections 5.2.2.2.6 for wildlife noise discussion and 5.7 for noise). Not all mammals have the same hearing sensitivity. Sensitive mammal species have a similar hearing sensitivity to birds (Dooling, 1978). Mammals present in the Project vicinity are habituated to noise from existing agriculture and power facilities." (TN 254015)

The paper cited in the Applicant's response is not publicly available.

DATA REQUESTS:

275. Provide a copy of Dooling, R.J. 1978. Behavior and Psychophysics of Hearing in Birds. J. Acoust. Soc. Am., Supplement 1, Vol. 65, p. S4.

BACKGROUND: MITIGATION MEASURES FOR RADON EMISSIONS

Table 5.9-2 in the AFC at page 5.9-4 lists radon as a Toxic Air Contaminant ("TAC") that may potentially be emitted from the Project's operations. The AFC at page 5.9-5 includes radon emissions from the cooling tower in Table 5.9-3. Chronic exposure to radon in humans and animals via inhalation, for example, has resulted in respiratory effects (chronic lung disease, pneumonia, fibrosis of the lung, decreased lung function), while animal studies have also reported effects on the blood and a decrease in body weights. Radium and radon are potent human carcinogens. Radium, via oral exposure, is known to cause lung, bone, head, and nasal passage tumors. Radon, via inhalation exposure, causes lung cancer.

DATA REQUESTS:

276. Describe the mitigation measures to reduce impacts on people (i.e., workers, sensitive receptors) from radon emissions identified in the air quality analysis and health risk assessment.

BACKGROUND: VALLEY FEVER

In CURE Data Response Set 1 No. 63, the Applicant generally states that it "takes the health and safety of its employees and contractors seriously, and as part of the Project will prepare and submit a construction and operational health and safety plan that will provide the foundation. These plans will provide the foundation for protecting and reducing employee/contractors from physical, environmental, and chemical impacts, including Valley Fever." (TN 253374) However, it is unclear if the Applicant has surveyed the Project areas to be graded for the presence of Valley Fever spores. Valley Fever is endemic in Imperial County and spores in the soil that are disturbed during construction and/or windstorms may cause significant worker and public health impacts.

DATA REQUESTS:

277. Describe any efforts undertaken or that will be performed to survey areas of the Project site for the presence of Valley Fever spores.

BACKGROUND: CUMULATIVE IMPACTS

Page 5.1-44 of the AFC states that "[c]umulative multi-source modeling assessments, which are used to analyze impacts from the Project plus nearby new or modified sources, will be performed at a later date following consultation with the appropriate agencies and per the methodology described in Section 5.1.9.5." The

AFC at page 5.1-45 states that both 24-hour and annual PM2.5 predicted concentrations during Project operation exceed their respective Significant Impact Level ("SIL") and will require a cumulative modeling analysis. The AFC at page 5.1-50 states that 1-hour and annual NO2, 24-hour and annual PM10, and annual PM2.5 predicted concentrations during construction exceed their respective SIL and will require a cumulative modeling analysis. Finally, the AFC at page 5.1-43 explains that impacts from the Project will be combined with other stationary emissions sources within a 6-mile radius that have received construction permits but are not yet operational or are in the permitting process. "The stationary emissions sources included in the cumulative impacts assessment will be limited to new or modified sources (individual emission units) that would cause a net increase of 5 tpy or more per modeled criteria pollutant." (*Id.*)

In CEC Data Requests Set 1 (TN 252095), CEC staff requested an update on the cumulative impacts analyses mentioned in the AFC, and for the Applicant to provide the modeling files if they are available for review. The Applicant responded that "[a] cumulative impacts analysis modeling protocol is included as Attachment DRR 12-1 and docketed on September 28, 2023 (TN 252436) for CEC Staff's consideration. This protocol outlines the proposed methodology for conducting the cumulative impacts analysis for the MBGP. The Applicant will conduct the cumulative impacts analysis once the cumulative impacts analysis modeling protocol was finalized and will provide the analysis on or before November 10, 2023." (TN 252491-1) However, the cumulative impacts analyses mentioned in the AFC have not yet been provided by the Applicant.

DATA REQUESTS:

278. Provide an update on the cumulative impacts analyses mentioned in the AFC.

279. Provide the modeling files if they are available for review.

Dated: January 22, 2024

Respectfully submitted,

Original Signed by:

/s/ Andrew J. Graf

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