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# Response to Workshop Follow Up: Informal Data Request Set 3

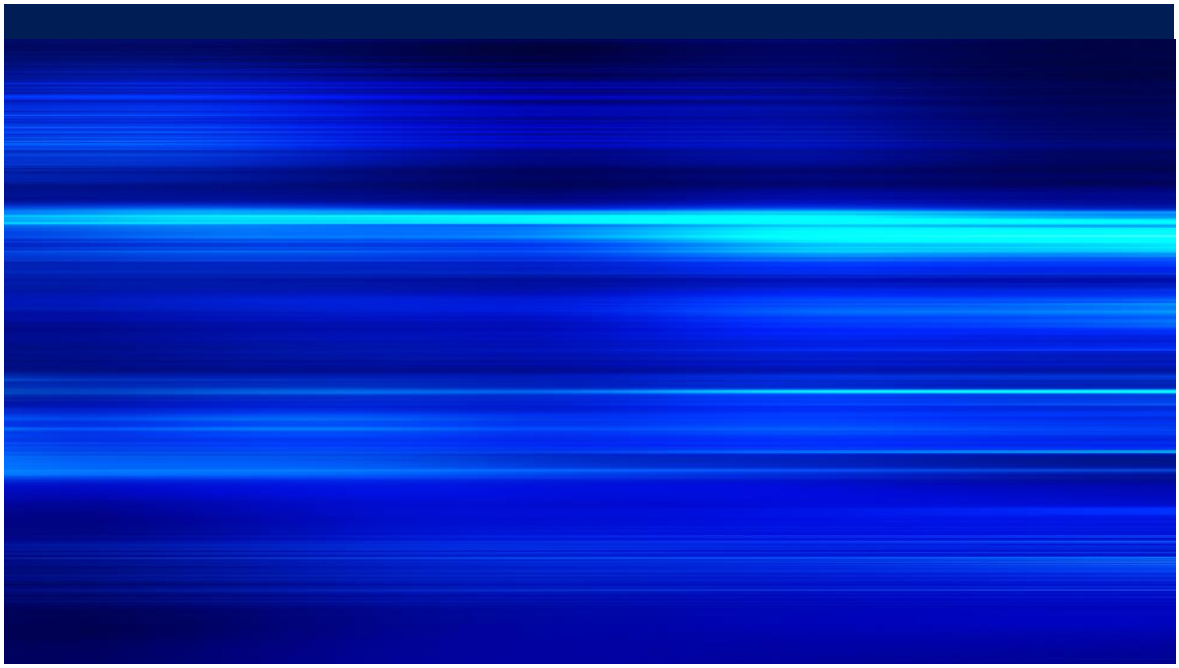
*Submitted to*
California Energy Commission

*Prepared by*
Morton Bay Geothermal LLC

With assistance from
Jacobs

**Morton Bay Geothermal Project (23-AFC-01)**

December 6, 2024



# Introduction

Attached are the responses from Morton Bay Geothermal LLC[1] to the California Energy Commission (CEC) Staff's *Workshop Follow Up: Informal Data Request Set 3*, regarding the Application for Certification (AFC) for the Morton Bay Geothermal Project (MBGP; 23-AFC-01)[2].

New or revised graphics or tables are numbered in reference to the Informal Data Request number. For example, the first table used in response to Informal Data Request 28 would be numbered Table IDRR28-1. The first figure used in response to Informal Data Request 28 would be Figure IDRR-1, and so on. Figures or tables from the MBGP AFC that have been revised have a "R" following the original number, indicating a revision.

Additional tables, figures, or documents submitted in response to an informal data request (for example, supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of each discipline specific section and are not sequentially page numbered consistently with the remainder of the document, though they may have their own internal page numbering system.

[1] An indirect, wholly owned subsidiary of BHE Renewables, LLC ("BHER").

[2] TN#: 259522.

# Contents

# Acronyms and Abbreviations

| | |
|---|---|
| AFC | Application for Certification |
| APN | assessor's parcel number |
| BMP | Best Management Practice |
| CDFW | California Department of Fish and Wildlife |
| CEC | California Energy Commission |
| CEQA | California Environmental Quality Act |
| dBA | A-weighted decibels |
| IDRR | Informal Data Request Response |
| IID | Imperial Irrigation District |
| MBGP | Morton Bay Geothermal Project |
| USFWS | U.S. Fish and Wildlife Service |

# 1. Cultural and Tribal Cultural Resources/Alternatives

## Background:

*A tribal consultation conducted on October 29 highlighted informational needs related to Alternatives that overlap with Cultural and Tribal Cultural Resources due to the need to identify potentially feasible ways to reduce impacts on tribal cultural resources. Of concern to consulting tribes are impacts to the Southeast Lake Cahuilla Active Volcanic Cultural District (District) which include visual and other impacts to major contributing elements of the cultural district. Tribal representatives have indicated that the proposed location of the Morton Bay Geothermal Project (MBGP) is too close to the District and that its proximity to the Old Mud Pots and Mud Volcanoes could alter their functioning and damage them by drawing more non-Indian visitors and traffic to this contributor. Visual continuity between Red Hill and the Old Mud Pots and Mud Volcanoes, the view of the sunset from the Old Mud Pots and Mud Volcanoes, and views of the Chocolate Mountains have also been identified as culturally important values of the District that need to be preserved to allow for its continued cultural use.*

*Staff will evaluate the potential feasibility of an offsite alternative for MBGP to include in the final staff assessment. The offsite alternative is on the approximately 160-acre portion of APN 020-010-035 that is directly northeast of the proposed MBGP property. (Please see the attached graphic.) The property was removed from initial consideration because the applicant does not own the mineral rights. The applicant does own the mineral rights for the properties bordering the west and south sides of the alternative site property, according to Figure 2-3 in the MBGP AFC (TN 249723).*

***Informal Data Request:***

1. *Please provide a site plan map and description for a technically feasible relocation of the MBGP to the property with APN 020-010-035. Identify if the planned production and injection wells would be close enough to feasibly serve this alternative site or would the production wells also require relocation.*

**Response**: It is not possible to provide a conceptual site plan or description for a "technically feasible relocation" of the proposed MBGP to assessor's parcel number (APN) 020-010-035. Development of a geothermal power plant requires an evaluation of several factors, including a geotechnical survey of the project site and control over the underlying mineral rights.

### *Lack of Control Over Mineral Rights*

It is not feasible to relocate the MBGP to APN 020-010-035 because the Applicant does not control the underlying mineral rights or have a surface use (surface non-disturbance) agreement for the parcel. The right to produce geothermal energy from a property, as with any mineral, may be severed from ownership of the land and held separately.[3] When that occurs, California law treats the severed right to the minerals as a *profit á prendre*, that is, the right to remove a part of the substance of the land, which is an encumbrance on the land indistinguishable in legal effect from an easement.[4] The specific right to

[3] *Kennecott Corp. v. Union Oil Co.* (1987) 196 Cal.App.3d 1179, 1186; *Callahan v. Martin (1935) 3 Cal.2d 110, 118; Dabney Johnston Oil Corp. v. Walden (1935) 4 Cal.2d 637, 649; Gerhard v. Stephens* (1968) 68 Cal.2d 864, 890.

[4] *Callahan, supra,* 3 Cal.2d at 118*; Dabney Johnston, supra,* 4 Cal.2d at 649*; Gerhard, supra,* 68 Cal.2d at 890.

produce geothermal steam and brine from a property has been treated by California courts as a *profit á prendre*.[5]

As explained in *Callahan,* the *profit á prendre* rights of the lessee extend to the use of the surface as necessary to exercise that right:

> The rights of the lessee present a clear case of a *profit á prendre* in gross, a right to remove a part of the substance of the land. If the oil and gas lessee is not granted exclusive possession of the surface by the terms of the lease, *he has nevertheless a right to such possession as is necessary and convenient for the exercise of the profit, which, in fact, may preclude any other surface possession*. This *profit á prendre* vests in the lessee an incorporeal hereditament, a present estate, an interest in the land, which is a chattel real if it is to endure for years. (*Callahan, supra*, 3 Cal.2d. at 122 (emphasis added).)

In other words, if the mineral owner of a parcel can demonstrate that their proposed use of the surface is reasonably necessary and convenient to produce the minerals, that proposed use of the surface will trump any conflicting proposed use by the surface owner.

By way of illustration, in *Costa Mesa Union School Dist. of Orange County v. Security First Nat. Bank* (1967) 254 Cal.App.2d 4, involving an eminent domain proceeding to condemn a parcel encumbered by an oil and gas lease, the appellate court held it was "clear error" by the trial court to value the mineral owner's attendant surface rights as merely nominal in amount. (*Id*. at 12.) Likewise, in *Wall v. Shell Oil Co.* (1962) 209 Cal.App.2d 504, the court held that although an oil and gas lease encumbering the subject lands would not preclude a subdivision of those lands, if a particular facility were deemed necessary and convenient to the operations of the mineral owner, "*it may be placed anywhere upon the surface area in which he has the right of user*, so long as such placement is reasonable under prevailing conditions *and even though such placement in particular instances may work a hardship on the surface owner*." (*Id*. at 517 (emphasis added).)

Here, although an affiliate of the Applicant owns the surface rights to the property in question (APN 020-010-035), the mineral rights are presently owned by someone else – an entity over which neither the Applicant nor its affiliates has control. Under established California law, if the mineral owner reasonably requires the use of any portion of the surface as necessary and convenient to its operations, that portion of the surface of the subject property may not be encumbered. Therefore, APN 020-010-035 is not a feasible alternative location for the MBGP as construction of the approximately 70-acre site would potentially impede the mineral owner's property rights, with resulting serious legal implications for the plant. As such, it is not a feasible alternative site.

### *Summary of Additional Impacts*

Furthermore, siting MBGP on APN 020-010-035 rather than APN 020-100-007, if feasible by ignoring the potential impedance of mineral property rights and the associated legal implications, would cause the following impacts and/or challenges:

1. Two additional pipeline crossings of Imperial Irrigation District drains, and potential take of Desert Pup Fish if the district requires their drains be modified for the pipe crossings.

[5] *Kennecott, supra,* 196 Cal.App.3d at 1186.

2. Constrained siting of MBGP and associated pipelines due to the surface location of Hudson Ranch Power I's 13-4 production well (API 02591530), well pad and pipeline in the southwest 1/4 section of APN 020-010-035, which limit pipeline routes and power plant placement on the parcel.
3. Closer proximity to a residential receptor (immediate north of APN 020-010-035 in Section 12 which abuts the proposed parcel) and the Niland community.
4. Increased lengths of transmission generation tie lines and potential impacts to avian wildlife and view sheds. See below.
5. Increased production pipeline lengths that will result in efficiency losses for the power plant and reduction in energy output or increased emissions.

The siting of the MBGP and corresponding production wells were carefully considered relative to the need for the facility to be located in close proximity to the geothermal resource. The CEQA Guidelines specifically recognize that there may be certain situations where there are no feasible alternative locations to a project, such as a geothermal power plant, because the facility "must be in close proximity to natural resources at a given location" (14 C.C.R. § 15126.6(f)(2)). Similarly, the MBGP must be located in close proximity to the planned production wells to access the geothermal resources necessary for electrical generation. As a result, relocating the MBGP to APN 020-010-035 or another alternative site is infeasible for several reasons.

### *Geotechnical Surveys*

As noted above, development of a geothermal power plant requires an evaluation of several factors, including a geotechnical survey. The geotechnical survey informs the basics of infrastructure placement on the site. Geotechnical surveys require development of a potential site layout, identification of required geotechnical borings, definition of investigatory scope, mobilization of soil boring drill rig, conducting borings, analysis of results, issuance of a preliminary report, and review of geotechnical results against the potential site layout.

In the best-case scenario, these activities would be expected to take a minimum of 12 months and significant resources to complete the geotechnical evaluation for a new parcel, including the deep foundations design for the plant. This best-case schedule assumes the alternative parcel is remarkably similar from a geotechnical perspective to the already surveyed parcel. If any adverse conditions were to be identified, additional time and resources would be required to design and engineer the facility to address the different site conditions (e.g. additional and/or deeper piles, a more elevated Class II Surface Impoundment to avoid higher ground water) and/or relocate the project site again if the site conditions result in excessive design, engineering, and construction costs. As recognized by the California Public Utilities Commission's Decisions 21-06-035, 23-02-040, and D.24-02-047 at least 1,000 megawatts of new capacity from long lead-time clean firm resources, such as geothermal were ordered to be procured to "ensure that there are sufficient resources available to ensure reliability and to meet the state's greenhouse gas (GHG) emission reduction goals."[6] These resources must be online by June 1, 2028, unless otherwise authorized for an extension to June 1, 2031, through the use of replacement resources. These projects require upwards of 33 months to order long-lead equipment and another 29 months to

[6] California Public Utilities Commission Fact Sheet: Decision Requiring Clean Energy Procurement for Mid-Term Reliability

construct. Adding an additional year (at minimum) to the development timeline to conduct the geotechnical analysis and other resultant permitting delays for the alternative site threatens the ability of the MBGP to meet the June 1, 2031, online date.

### *Renewable Resource Inefficiency*

Assuming that geotechnical studies confirmed the viability of the site for the power plant, relocating the MBGP to APN 020-010-035 would require longer production pipelines from the power plant facility to the planned production well locations. The diameter of the gathering system (production pipelines) would also have to be increased and in certain sections double pipelines would be needed to mitigate the energy (pressure and heat) loss from a longer pipeline. If the larger diameter gathering system described above is not used, then the increased length of the production pipelines would result in lower pressure flows than the current design. This would produce lower quality steam from the separator that would damage the steam turbine, resulting in avoidable and otherwise unnecessary maintenance costs as well as reduced generation output. To avoid the lower quality steam, the high-pressure separator for MBGP would have to be redesigned. High level calculations indicate the vessel length would at least increase from a 72-foot long to an 85-foot long, which would likely require the vessel to be fabricated in the field instead of a fabrication shop, adding project risk. Fabrication of pressure vessel that is clad with exotic alloy in a controlled shop environment is strongly preferred by the project due to the potential for weather (including dust) induced quality and project schedule risks when fabrication is performed in the field. Additionally, there may be a need to add scale inhibition chemicals upstream of the high pressure separator to prevent earlier silica precipitation due to losses of pressure and heat content from the longer production pipeline, which is also likely to have negative effects downstream of the high pressure separator and would require reevaluation and remodeling of the entire brine process before determining the viability of a similar power plant design. Even if all of these changes were incorporated, the same brine flow would lead to a reduction of at least 28,032 megawatt-hours of power generation annually due to the increased distance in the production pipeline length. Brine flows could not be increased to make up the lost generation without a corresponding increase in emissions and increased water demand from the project.

Second, the generation-tie transmission line connecting MBGP to the Sinclair Switching Station approached MBGP from the south. As such, moving the project site north and east would require the generation-tie line to increase by 1.7 miles. This could increase construction environmental impacts, including particulate emissions. Additionally, the generation-tie line would need to cross an existing 230kV transmission line, which would increase the height of the structures and increase the risk of bird strikes. Moreover, schedule impacts associated with acquiring addition crossing agreements for the extended generation-tie line, performing geotechnical for the pole foundations and cost impacts associated with the additional power poles, conductors and foundations required would add further and significant construction and maintenance costs.

Third, relocating the MBGP to APN 020-010-035 would add significant costs to the project. The increased length of the gathering system pipeline would, in the simple extension to connect to the power plant scenario, add approximately 7,960 feet (1.51 miles) of large diameter, alloy, insulated gathering system pipeline. The diameter of the gathering system pipelines would have to be increased from 24 inches to 36 inches. Procurement and installation of this alternative pipeline configuration is expected to increase project construction and maintenance costs significantly. To mitigate the generation loss, certain sections of the gathering system will require parallel double pipelines, further increasing the piping length by

12,135 feet (2.3 miles) of large diameter, alloy, insulated piping. Procurement and installation of this additional pipeline is expected to increase project construction and maintenance costs significantly. This challenge is not one that can be remedied by shifting production well locations along with the MBGP. The production well locations must remain unchanged due to the location of the geothermal mineral holdings assigned to the MBGP. Additionally, the Applicant and its affiliates do not have rights to access the minerals under APN 020-010-035.

In conclusion, the significant increased marginal up-front costs and the reduced project generating output result in disparate economic, operational, and technical downfalls, when compared to the Applicant's proposed site, that render the alternative site infeasible.