



BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT  
COMMISSION OF THE STATE OF CALIFORNIA  
1516 NINTH STREET, SACRAMENTO, CA 95814  
1-800-822-6228 – WWW.ENERGY.CA.GOV

***IN THE MATTER OF COMPLAINT AGAINST  
ORMAT NEVADA, INC. BROUGHT BY  
CALIFORNIA UNIONS FOR RELIABLE ENERGY***

Docket No. 11-CAI-02

**DOCKET**

**11-CAI-02**

DATE Sept 12 2011

RECD. Sept 12 2011

**STAFF'S PREHEARING CONFERENCE STATEMENT**

Staff submits the following in response to the Committee's Notice of Prehearing Conference and Evidentiary Hearing Order, dated August 19, 2011.

1. Staff will present a panel of technical experts who will discuss the calculation of the generating capacities of the North Brawley and East Brawley projects. The staff include Joseph Hughes, Shahab Khoshmashrab, and Geoff Lesh. Each of the witnesses are expert engineer. The direct examination of this panel will take ten minutes. Terry O'Brien, Deputy Director of the Siting Division, will be staff's witness about whether the two powerplants should be aggregated for purposes of jurisdiction. His direct examination will take ten minutes.
2. The exhibit list is attached along with the two staff declarations.
3. Staff does not have any proposals for briefing deadlines or other scheduling matters at this time.
4. Staff agrees with the Committee's proposal to use the informal hearing procedure.

Dated: September 12, 2011

Respectfully submitted,

/S/

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**STAFF EXHIBIT LIST**

<b>Exhibit</b>	<b>Brief Description</b>	<b>Offered</b>	<b>Admitted</b>
<b>STAFF'S EXHIBITS</b>			
<b>300</b>	Testimony of Joseph Hughes, Shahab Khoshmashrab, and Geoff Lesh		
<b>301</b>	Declaration of Terrence O'Brien		

CURE'S COMPLAINT AGAINST ORMAT NEVADA, INC. (11-CAI-02)  
JURISDICTIONAL DETERMINATION OF NORTH BRAWLEY AND EAST BRAWLEY  
GEOTHERMAL PROJECTS

**STAFF ASSESSMENT**

Testimony of Joseph Hughes, Shahab Khoshmashrab, and Geoff Lesh

## **INTRODUCTION**

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In response to a June 28, 2011 complaint filed by California Unions for Reliable Energy (CURE), staff was directed by the Commission to assess the merits of the complaint. Pursuant to Title 20, California Code of Regulations, section 2003 (CCR § 2003), staff requested information from Ormat Nevada (ORMAT) to determine the generating capacity of the existing North Brawley Geothermal project (North Brawley) and planned East Brawley Geothermal project (East Brawley), and to determine whether they meet the 50 MW threshold of the Commission's jurisdiction separately, or combined.

Staff received ORMAT's responses to this request on September 2, 2011 and September 8, 2011.

This staff assessment represents staff's analysis and conclusions in response to Ormat's responses and CURE's complaint.

## **ANALYSIS**

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Staff typically performs an independent review by verifying project owner's claim of gross output, auxiliary loads, and net output. This verification involves reviewing heat and mass balance diagrams containing power cycle energy contents and gross output in MW at ambient site design conditions for the project's normal mode of operation, consistent with CCR § 2003. It also involves verifying individual auxiliary loads by reviewing manufacturer's specifications showing the equipment's power rating at normal mode of operation. Staff has done all of this for both of the North Brawley and East Brawley projects. Staff has also examined whether or not the two projects can be aggregated as a single project. (Please see below for analysis.)

The power cycle for these two projects is classified as a Binary cycle, also called organic Rankine cycle (ORC). It is similar to a typical Rankine cycle, except instead of steam, the working fluid is an organic fluid with a lower boiling point than water. ORMAT has chosen this technology because of the lower geothermal brine temperature in the projects area, compared to other resource areas within the Salton Sea geothermal region.

## **NORTH BRAWLEY GEOTHERMAL PROJECT**

The project utilizes five, 16 MW (nameplate gross output) ORMAT Energy Convertors (OECs). At baseload (plant's normal mode of operation) and site design conditions, each OEC is rated at 14.56 MW (maximum gross output), for a plant maximum gross total of 72.8 MW. After subtracting the plant's minimum auxiliary loads of 22.6 MW and the electrical losses of 0.7 MW (due to transformers and cable losses) from this gross

output, the resultant output is 49.5 MW net (please see Table-1 below and ORMAT's responses to staff on September 2, and September 8, 2011).

**Table-1**

	Quantity	Power Per Unit MW	Total MW
OEC - Generator Gross Power	5	14.56	72.80
OEC Feed Pumps	5	0.73	3.63
OEC Aux	5	0.04	0.20
Cooling Tower Fans	15	0.17	2.55
Cooling Tower Pumps	5	0.55	2.75
Production Wells Pumps	13	0.78	10.10
BOP Aux. (Compressors Etc.)	1	0.20	0.20
Brine Injection Pumps	13	0.20	2.60
Make Up Pumps	2	0.12	0.24
Blow Down Pumps	2	0.16	0.32
<b>Total Gross Power</b>			<b>72.80</b>
<b>Total Load (Aux)</b>			<b>22.60</b>
Electrical Losses			0.70
<b>Net Power</b>			<b>49.50</b>

Note that the project has been built to support a gross rating of 14.56 MW (per OEC) on a continuous baseload basis at average annual site conditions. The plant equipment, such as the production and injection pumps, cooling and makeup water pumps, vaporizers, and heat exchangers, in addition to wells and pipelines, are currently built to support this rating and not the nameplate rating of 16 MW. Staff has not considered this nameplate rating while evaluating North Brawley for the purpose of Energy Commission's jurisdictional determination, because it is inconsistent with CCR § 2003 which considers site design conditions (resulting in the output a project is actually built, or would be built, to produce). In addition, for the project to be able to produce an output of 16 MW per OEC, the plant equipment must be upgraded, wells must be added, and adequate brine (in terms of quantities and energy content) must be available. Current resource constraints do not seem to justify that (see the following paragraph).

Staff has reviewed the heat and mass balance diagrams, the equipment manufacturer's specifications, and pertinent data provided in ORMAT's responses to staff on September 2, and September 8, 2011 (Docket No. 11-CAI-02). Based on this review, the plant's gross rating and auxiliary loads presented by ORMAT, and ORMAT's claim of a net output of 49.5 are very reasonable.

Please also note that historical operational data (January 1, 2011 through September 6, 2011) from North Brawley (ORMAT's responses to staff on September 2, and September 8, 2011) demonstrate that North Brawley has produced a net power output of no more than approximately 34 MW. ORMAT states that this is due to geothermal resource constraints.

## **EAST BRAWLEY GEOTHERMAL PROJECT**

The project was initially designed with five OECs, each rated at 13.95 MW (maximum gross output) at project site design conditions, for a plant maximum gross total of 69.75 MW at baseload (plant's normal mode of operation). After subtracting the plant's

minimum auxiliary loads of 19.62 MW and the electrical losses of 0.63 MW (due to transformers and cable losses) from this gross output, the resultant output is 49.5 MW net (please see Table-2 below and ORMAT's responses to staff on September 2, and September 8, 2011).

**Table-2**

	Quantity	Power Per Unit MW	Total MW
OEC - Generator Gross Power	5	13.95	69.75
OEC Feed Pumps	5	0.72	3.60
OEC Aux	5	0.04	0.20
Cooling Tower Fans	15	0.17	2.55
Cooling Tower Pumps	5	0.55	2.75
Production Wells Pumps	10	0.78	7.75
BOP Aux. (Compressors Etc.)	1	0.20	0.20
Brine Injection Pumps	10	0.20	2.00
Make Up Pumps	2	0.12	0.24
Blow Down Pumps	2	0.16	0.32
<b>Total Gross Power</b>			<b>69.75</b>
<b>Total Load (Aux)</b>			<b>19.62</b>
Electrical Losses			0.63
<b>Net Power</b>			<b>49.50</b>

For the reasons described above, although each OEC is rated at 16 MW (nameplate gross), staff has considered each unit's gross output of 13.95 MW at ambient design conditions for the purpose of jurisdictional determination. Unlike North Brawley, East Brawley is only in the design stage. Although East Brawley's power output rating is based on a plant total of five OECs, due to geothermal brine resource constraints, as expressed by ORMAT (ORMAT's responses to staff on September 2, 2011), ORMAT anticipates employing only three OECs instead of the previously planned five units.

Staff has reviewed the heat and mass balance diagrams, the equipment manufacturer's specifications, and pertinent data provided in ORMAT's responses to staff on September 2, and September 8, 2011 (Docket No. 11-CAI-02). Based on this review, the plant's gross rating and auxiliary loads presented by ORMAT, and ORMAT's claim of a net output of 49.5 are very reasonable.

Staff notes that ORMAT has stated that current development plans for East Brawley, which will be designed to maximize the use of the available resource, include an expected net output of 29.7 MW, significantly less than 50 MW (please see the document entitled "Verified Answer of Respondent Ormat Nevada, Inc. to Verified Complaint and Request for Investigation by California Unions for Reliable Energy", Docket No. 11-CAI-02).

Also, Staff notes that auxiliary loads may vary significantly for different geothermal projects due to a number of factors, such as the geothermal brine's energy content, operating temperatures, the quantity and capacity of wells, the generating units and overall plant size. Only a careful project-specific design can closely determine its expected net power output; ORMAT has done this for both of these projects.

## **BOTH PROJECTS COMBINED**

In assessing whether two or more power plant projects should be considered a single project for the purpose of determining if they fall under the Energy Commission's licensing jurisdiction of 50 MW or more, Energy Commission considers several factors. These factors typically consist of the following:

1. the timing between when the projects were conceived; this helps to determine if the projects were planned to be aggregated;
2. the distance between the project sites; a distance of over one mile could mean that it's unlikely that the projects will share facilities;
3. whether or not the projects share generating or linear facilities;
4. whether or not the projects will be located on contiguous parcels in a common location; and
5. whether or not the projects will have a common power purchase agreement, transmission interconnection agreement, or cooling water supply agreement.

In its responses to the Energy Commission and the staff on September 2, 2011, ORMAT states the following.

1. East Brawley application for a conditional use permit (CUP) was submitted to Imperial County more than a year after North Brawley's CUP application, and the two projects are currently a minimum of three years apart in schedule.
2. North Brawley and East Brawley are located 1.75 miles apart on separate, non-adjointing sites.
3. The sites of the two projects are physically separated by the New River.
4. The projects will not share production/injection wells, and generating or linear facilities;
5. The projects do not currently share, or propose to share, a water supply agreement, a transmission interconnection agreement, a transmission service agreement, or a power purchase agreement.
6. The projects' designs are different, with only the East Brawley facility employing a unique project design that reduces the facility's water demand, an improved non-condensable gas treatment system, an improved sand separation system, and offering a slight improvement in the overall plant heat rate as compared to North Brawley.
7. Each project will have its own dedicated production and injection wells.
8. The two projects will not share any control systems. However, there will be a single central dispatch room for both projects.

Note that the plant operator will not be able to order any operational changes to one of the plants (i.e. OEC output ramp-up or turn-down) by executing a command from the other plant's control system. The operator can only control the operation of each plant separately, from a central location (similar to a utility company that operates several of its power plants from a central location).

## **CONCLUSIONS**

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It is staff's opinion that each project's gross power ratings and its individual auxiliary loads as presented in the above tables are reasonable. This conclusion is primarily based on staff's verification of the project's gross output and individual and total auxiliary loads, after reviewing the heat and mass balance diagrams, the equipment specifications and data, and pertinent documents provided to staff by ORMAT. Therefore, staff can reasonably conclude that North Brawley and East Brawley, when viewed separately, can generate a maximum net output of less than 50 MW.

## DECLARATION OF TERRENCE O'BRIEN

I, Terrence O'Brien, hereby declare:

1. I am the Deputy Director of the Energy Commission's Siting, Transmission and Environmental Protection Division ("Siting Division"). I have been Deputy Director since May 2002.
2. Prior to becoming Deputy Director, I have served in the Siting Division in several other capacities, including: Regulatory Program Manager and Policy Coordinator. I have been employed at the Energy Commission since 1979.
3. I have been involved in several staff discussions regarding past Energy Commission jurisdictional matters, including whether the generating capacities of individual power plants should be aggregated and considered by the Energy Commission to be one power plant subject to Public Resources Code section 25120.
4. I have reviewed the Verified Complaint filed by California Unions for Reliable Energy ("CURE") and the Verified Answer filed by Ormat Nevada ("Ormat"). Staff has also discussed the relevant facts with me.
5. In short, I do not recommend that the Energy Commission find that the North Brawley and East Brawley geothermal projects constitute "one power plant" that would be subject to the Commission's jurisdiction.
6. Former Energy Commission General Counsel William Chamberlain first discussed whether or not separate power plants could, taken together, be considered to be a single power plant in his memo dated May 20, 1986 regarding Commission Jurisdiction Over Kern Island Cogeneration Project. On page 8 of this memo to the Commissioners, Mr. Chamberlain set forth the factors that he believed were relevant in the determination of this issue.
7. Those factors include: physical proximity of the generation facilities, the extent to which they are planned and operated as a coordinated larger project, the extent to which they do or could reasonably share common facilities, whether there is common ownership, and the timing of construction of the facilities. All relevant factors should be considered in determining whether the separate facilities are integrated.
8. Staff has been guided by that memo and subsequent legal advice.
9. Ormat's verified answer sets forth the following facts.
  - A. The East Brawley and North Brawley sites are separated by the New River, 1.75 miles apart.

- B. The North Brawley CUP application was filed with Imperial County on June 21, 2007. The CUP was approved by the Imperial County Planning Commission on November 14, 2007. The North Brawley plant has been producing capacity since 2008.
  - C. The East Brawley CUP application was filed with Imperial County on August 8, 2008, more than a year after the East Brawley application. The EIR for the East Brawley project has not been approved so the plant has not been constructed.
  - D. The North Brawley and East Brawley plants will not share water supplies.
  - E. The two projects will have separate control rooms, substations, interconnection facilities, water supply pipelines and cooling towers.
  - F. The two projects are owned by a common entity, Ormat Nevada.
  - G. North Brawley has been operating since 2008. East Brawley is not constructed yet.
10. I believe that the two projects can be operated from a common control room, but there is no information about whether the operations will be coordinated in any way. This factor alone does not outweigh the other factors in this case.
11. Therefore, based upon the facts set forth in the Answer and the information submitted by Ormat in response to Staff's engineering questionnaire, I do not believe the two projects should be aggregated for purposes of the Energy Commission's jurisdiction. If any of the facts are different than what I set forth, I reserve the right to revise my recommendation to the Commission.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, that I am competent to testify to the above and would do so if called as a witness in this matter. Executed in Sacramento, California on September 12, 2011.

\_\_\_\_\_  
/s/  
TERRENCE O'BRIEN



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**Docket No. 11-CAI-02  
(Revised 9/12/11)**

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## DECLARATION OF SERVICE

I, Lynn Tien-Tran, declare that on, September 12, 2011, I served and filed copies of the attached Staff's Prehearing Conference Statement and Staff Exhibit List, dated September 12, 2011. The original document, filed with the Docket Unit or the Chief Counsel, as required by the applicable regulation, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:

[<http://www.energy.ca.gov/proceedings/11-cai-02/index.html>]

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

***(Check all that Apply)***

**For service to all other parties:**

- Served electronically to all e-mail addresses on the Proof of Service list;
- Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses **NOT** marked "email service preferred."

**AND**

**For filing with the Docket Unit at the Energy Commission:**

- by sending an original paper copy and one electronic copy, mailed with the U.S. Postal Service with first class postage thereon fully prepaid and e-mailed respectively, to the address below (preferred method);

**OR**

- by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

**CALIFORNIA ENERGY COMMISSION – DOCKET UNIT**  
Attn: Docket No. 11-CAI-02  
1516 Ninth Street, MS-4  
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***OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:***

- Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission  
Michael J. Levy, Chief Counsel  
1516 Ninth Street MS-14  
Sacramento, CA 95814  
[mlevy@energy.state.ca.us](mailto:mlevy@energy.state.ca.us)

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Original signed by \_\_\_\_\_  
Lynn Tien-Tran