STATE OF CALIFORNIA

Energy Resources Conservation and Development Commission

In the Matter of:

Investigation of Possible Energy Commission Power Facility Siting Jurisdiction Over Two 49.9 MW Geothermal Units Known as the East Brawley and the North Brawley Geothermal Developments

Complaint No.

VERIFIED COMPLAINT AND REQUEST FOR INVESTIGATION

BY

CALIFORNIA UNIONS FOR RELIABLE ENERGY

June 28, 2011

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VERIFIED COMPLAINT AND REQUEST FOR INVESTIGATION

Pursuant to section 1231 of Title 20 of the California Code of Regulations, California Unions for Reliable Energy ("CURE") files this Verified Complaint and Request for Investigation ("Complaint") against Ormat Nevada Inc., ("Ormat") for violating Public Resources Code section 25500 and the Commission's implementing regulations.[1] CURE concurrently and in the alternative requests the California Energy Commission ("Commission") initiate the investigation proceedings that are necessary to adjudicate this Complaint.[2]

INTRODUCTION

Ormat violated section 25500 of the Warren-Alquist Act by circumventing the Commission's jurisdiction with regard to the licensing of a 150 megawatt ("MW") facility within the North Brawley Known Geothermal Resource Area in Imperial County. Ormat's proposed geothermal complex will occupy approximately 5,000 acres of agricultural lands along the east and west banks of the New River, one mile north of the City of Brawley, and comprises Ormat's existing North Brawley Geothermal Development ("North Brawley") and Ormat's proposed East Brawley Geothermal Development ("East Brawley"). Ormat claims that North Brawley and East Brawley are

[1] In this Complaint, "Ormat" refers to Ormat Nevada Inc. and its subsidiaries.
[2] Section 1231 authorizes "any person" to file a complaint alleging a violation of a statute, regulation, order, program, or decision adopted, administered, or enforced by the CEC. Pursuant to 1231, a single proceeding may involve both a complaint and an investigation.

distinct facilities, each including a 49.9 MW power plant and associated well field.

Ormat's claims are directly contradicted by a California Public Utilities Commission ("CPUC") resolution approving a power purchase agreement ("PPA") between Southern California Edison Company ("SCE") and Ormat. Pursuant to the CPUC resolution, attached as Exhibit C, SCE is authorized to purchase 50 MW, and up to 100 MW, of generation from Ormat's geothermal facility in North Brawley, California. Ormat has indicated that it intends to sell 50 MW from the North Brawley facility, and may sell an additional 50 MW from the East Brawley facility, to SCE pursuant to the terms of the PPA. The CPUC resolution approving the PPA together with Ormat's representations provide a reasonable basis to conclude that both the North Brawley facility and the East Brawley facility meet the Commission's 50 MW jurisdictional threshold and are both subject to the Commission's licensing authority.

In the alternative, the Commission must assume jurisdiction over North Brawley and East Brawley because it is one facility with a combined generating capacity of 150 MW. Together, North Brawley and East Brawley will function as interdependent and physically interconnected generation units, sharing both transmission and water supply infrastructure, all of which are owned or will be developed by Ormat. North Brawley and East Brawley were designed, are owned and will be controlled by Ormat, and are

proposed on adjoining parcels, which are leased or owned by Ormat. As such, their energy and environmental impacts are that of a single facility for the purpose of the Warren-Alquist State Energy Resources Conservation & Development Act ("Warren-Alquist Act").

The Commission must take immediate action to enjoin the ongoing licensing and construction of North Brawley and East Brawley, initiate an investigation of Ormat's violations of section 25500 of the Warren-Alquist Act, and seek all appropriate remedies against Ormat for any willful violations of the Act.

INFORMATION REQUIRED BY CALIFORNIA CODE OF REGULATIONS TITLE 20, SECTION 1231

I. Name and Address of Complainant

CALIFORNIA UNIONS FOR RELIABLE ENERGY
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601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
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CURE is a coalition of labor unions whose members help solve the State's energy problems by building, maintaining, and operating conventional and renewable energy power plants. CURE is committed to building a strong economy and a healthier environment. Since its founding in 1997, CURE has helped cut smog-forming pollutants in half, reduced toxic emissions, increased the use of recycled water for cooling systems and pushed for groundbreaking pollution control equipment as the standard for all new power plants. CURE has also successfully advocated for the use of low

impact development techniques, dry cooling technology, and enforceable and effective compensatory mitigation for impacts to sensitive biological resources in the siting and licensing of renewable energy projects throughout California, all while ensuring new power plants are built with highly trained, professional workers who live and raise families in nearby communities.

Individual members of the unions that comprise CURE live, work, recreate, and raise their families in Imperial County, including the vicinity of the North Brawley and the East Brawley facilities. Accordingly, they would be directly affected by the facilities' environmental and health and safety impacts. Individual members of the unions that comprise CURE may also work on the North Brawley and the East Brawley facilities. They will, therefore, be first in line to be exposed to any hazardous materials, air contaminants, or other health and safety hazards that exist on site.

In addition, CURE has an interest in enforcing environmental laws that encourage sustainable development and ensure a safe working environment for its members. Environmentally detrimental projects jeopardize future jobs by making it more difficult and more expensive for business and industry to expand in the region. Additionally, continued degradation can, and has, caused construction moratoriums and other restrictions on growth which, in turn, reduce future employment opportunities.

II. Name and Address of Respondent

Ormat Nevada Inc.
980 Greg Street
Sparks, NV 89431-6039

Ormat is headquartered in Sparks, Nevada. Ormat designs, develops, builds, owns, operates, and supplies geothermal power plants in Nevada and California. Ormat is the parent company of ORNI 18, LLC, the conditional use permit holder for the construction and operation of the North Brawley facility, and ORNI 17, LLC, the applicant for a conditional use permit to construct and operate the East Brawley facility.

Ormat is a subsidiary of Ormat Technologies, Inc. ("OTI"), a publicly traded company which owns and operates geothermal facilities within and outside of the United States. OTI is the developer and owner of the 92 MW Heber geothermal complex in Imperial County and the 114 MW Ormesa geothermal complex, also located in Imperial County.

III. Statement of Facts

In 2007, Ormat commenced developing a 150 MW geothermal facility in the North Brawley Known Geothermal Area by entering into a Facility Study Agreement with the Imperial Irrigation District ("IID")[3] and a PPA with SCE for the sale of up to 100 MW of generation from a new geothermal

[3] *See* Imperial Irrigation District, North Brawley System Impact Study, (revised) January 8, 2009, p. 1 (analyzing "the proposed North Brawley 150 MW generation project") (an excerpt of the study is attached as Exhibit A); see also Facility Study Agreement between Imperial Irrigation District and Ormat Nevada Inc., North Brawley Geothermal Project (attached as Exhibit B).

facility in North Brawley, California.[4] On March 13, 2008, the CPUC authorized SCE to procure up to 100 MW from Ormat pursuant to the PPA through Resolution E-4126 on March 13, 2008.[5] However, for the purpose of environmental review, Ormat segmented the 150 MW facility into two geothermal development projects, each with a gross generating capacity of 75 MW.[6] [7] Ormat proceeded to file sequential conditional use permit applications with the County to obtain authorization to construct and develop the North Brawley and East Brawley power plants and their associated well fields.

A. The North Brawley Conditional Use Permit Application

On June 26, 2007, Ormat filed a conditional use permit application with the County to construct the North Brawley facility. According to Ormat's application, the North Brawley facility comprised: a 49.9 net MW, wet-cooled, binary plant with six Ormat Energy Converters ("OEC"); a geothermal well field of 20-26 production wells and 14-20 injection wells and interconnecting brine and water pipelines; and a gen tie transmission line, connecting the facility to IID's system through a new substation, owned by Ormat.

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[4] *See* Energy Division, California Public Utilities Commission Redacted Resolution E-4126, March 13, 2008, pp. 1, 8, 16 ("Resolution E-4126") (attached as Exhibit C).
[5] Exhibit C, p. 16.
[6] According to IID's system interconnection study, each facility's load is 25 MW.
[7] *See* Imperial County Planning & Development Services, Draft Environmental Impact Report for the East Brawley Geothermal Project ("DEIR"), March 2011, Appendix D, p. 11, *available at http://www.icpds.com/?pid=2666* (last visited May 20, 2011); *see also* Revised Application for Authority to Construct for the East Brawley Geothermal Development Project, September 14, 2010 ("2010 Revised ATC Application") (attached as Exhibit D).

Ormat proposed to site the North Brawley power plant at 4982 Hovley Road in Imperial County, approximately one mile north of the City of Brawley on a parcel owned by Ormat. The North Brawley well field would be located within approximately 1,800 acres of agricultural lands, leased by Ormat, abutting the west bank of the New River.[8]

On October 11, 2007, the County made available for public review a Mitigated Negative Declaration ("MND") for the North Brawley project, pursuant to the California Environmental Quality Act ("CEQA").[9]

On December 28, 2007, the County adopted the MND and granted Ormat a conditional use permit to construct and operate the North Brawley facility.

B. The Expansion of the North Brawley Well Field

On May 12, 2008, Ormat submitted a Request for Minor Amendment to the County, for authorization to expand the North Brawley well field northward and to the west bank of the New River.[10]

According to Ormat, the amendment was necessary to encompass lands that had been secured by Ormat through new lease agreements with surrounding landholders.[11]

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[8] Conditional Use Permit Application, pp. 6, 20-21.
[9] Pub. Resources Code §§ 21000 et seq.
[10] Letter from Charlene L. Wardlow, Environmental/Regulatory Affairs Administrator, ORMAT, to Mr. Jurg Heuberger, Planning Director, Imperial County Planning & Development Services regarding CUP#07-0017 Request for Amendment, March 12, 2008 (attached as Exhibit E).
[11] *Id.*

On May 28, 2008, the County approved Ormat's Request for Minor Amendment without further environmental review.[12] Ormat constructed the North Brawley facility; however, the facility's commercial operation was delayed due to engineering problems.[13]

C. The East Brawley Conditional Use Permit Application

On August, 8, 2008, approximately two months after the County approved Ormat's Request for Minor Amendment to the North Brawley conditional use permit, Ormat filed a conditional use permit application with the County to construct the East Brawley facility.

The East Brawley project proposal is virtually identical to the North Brawley facility. According to Ormat, East Brawley comprises: a 49.9 net MW binary, wet-cooled geothermal power plant; a well field of up to 30 production and 30 injection wells and associated brine and water pipeline network; and a 2-mile gen tie transmission line spanning the New River to connect to IID's system through Ormat's North Brawley substation.

Ormat proposes to site the East Brawley power plant approximately three miles north the City of Brawley and east of the New River, on a parcel owned by Ormat. The East Brawley well field would be located within approximately 3,000 acres of agricultural lands abutting the east bank of the

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[12] Letter from Jurg Heuberger, Director Imperial County Planning & Development Services to Charlene Wardlow, Environmental Regulatory Affairs Administrator, Request for Minor Amendment to CUP No. 07-0017, May 28, 2008 (attached as Exhibit F).

[13] A high amount of undissolved solids in the geothermal fluid limited the plant's generating capacity. Think GeoEnergy, *Ormat's North Brawley plant with 17 MW short of its 50 MW potential*, February 10, 2010 (attached as Exhibit G).

New River. As with the North Brawley facility, the parcels underlying the well field are leased by Ormat.[14]

On October 30, 2007, the County placed Ormat's application on hold because Ormat was unable to timely secure a water source to meet East Brawley's construction and operational water demands.[15]

D. The Expansion of the East Brawley Well Field

On August 4, 2009, Ormat submitted a revised conditional use permit application, proposing to expand the East Brawley well field in a westerly direction and across the New River. The expanded well field would occupy areas previously leased by Ormat for the North Brawley well field. Wells on either side of the New River would be connected by geothermal brine lines, noncondensible gas lines, and power and control cables, routed across the New River.

E. Water Supply Infrastructure for the East Brawley and North Brawley Facilities

On January 29, 2010, Ormat revised the East Brawley project proposal by reducing the proposed well field to 34 wells (half injection, half production).[16] Ormat also proposed to finance the construction of water supply infrastructure which would deliver cooling water to both the East Brawley and North Brawley facilities.

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[14] A map of the East Brawley and North Brawley projects is attached as Exhibit H.
[15] Letter from Jurg Heurberger, Planning & Development Services Director, County of Imperial to Charlene L. Warldlow, Director of Project Development, Ormat Nevada Inc., regarding Conditional Use Permit #08-0023 (East Brawley Facility) APN: 037-140-006-000, October 30, 2008 (attached as Exhibit I).

According to the updated conditional use permit application for the East Brawley facility, Ormat proposed to finance the construction and maintenance of a tertiary treatment system for the City of Brawley's Wastewater Treatment Plant ("BWWTP") in exchange for 100 percent of the City's daily effluent outflow for the life of the East Brawley facility. Ormat's construction of the tertiary treatment system cannot commence until the City completes the ongoing secondary treatment system upgrades to the BWWTP.[17] According to the updated conditional use permit application, treated wastewater from the BWWTP would supply the majority of the East Brawley facility's operational water demand. Treated effluent from the BWWTP would also supply the North Brawley facility.[18]

In the updated conditional use permit application, Ormat indicated that during peak heat conditions the East Brawley facility could rely on cooling water blowdown from the North Brawley facility for power plant cooling.[19]

On March 16, 2011, the County published a Notice of Availability of the Draft Environmental Impact Report ("DEIR") for the East Brawley conditional use permit in accordance with CEQA. In the DEIR, the County concluded that a project alternative which relies on reclaimed water from the

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[16] East Brawley Geothermal Development Project, Updated Project Description, January 29, 2010 (attached as Exhibit J).
[17] *See* Ormat, Brawley Wastewater Treatment Facility Conceptual Design Report (attached as Exhibit K).
[18] *Id.*, p. 1.
[19] *See* DEIR, p. 6.0-8.

BWWTP and cooling tower blowdown from the North Brawley facility (as well as from the on-site cooling towers) was the environmentally preferred project alternative for the East Brawley facility. The public comment period on the DEIR closed on May 10, 2011.

F. The Net Generating Capacity of the East Brawley and North Brawley Power Plants

The net generating capacity of the East Brawley and North Brawley power plants cannot be conclusively determined based on publicly available information. Neither the County, nor Ormat have provided supporting documentation verifying Ormat's generating capacity calculations of 49.9 MW each for the North Brawley and East Brawley facilities. However, CPUC Resolution E-4126 and Ormat's representations to the County show that the generating capacity of the North Brawley and East Brawley power plants each exceeds 49.9 MW.

In particular, Ormat stated that it entered into a PPA with SCE, pursuant to which Ormat is obligated to deliver 50 MW of generation from the North Brawley power plant to SCE's system with an option to increase sales to 100 MW of generation.[20] The CPUC has authorized SCE to procure up to 100 MW of generation from Ormat's North Brawley geothermal facility. Ormat indicated that it may exercise the option to increase sales to 100 MW once the East Brawley facility comes online.[21]

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[20] East Brawley Geothermal Development Project, Updated Project Description, January 29, 2010, p. 28.
[21] *Id.*

IV. Statutes, Regulations, and Decision Upon Which Complaint Is Based

A. Warren-Alquist Act (Pub. Resources Code § 25110)

Public Resources Code section 25110 provides:

> "Facility" means any electric transmission line or thermal powerplant, or both electric transmission line and thermal powerplant, regulated according to the provisions of this division.

B. Warren-Alquist Act (Pub. Resources Code § 25120)

Public Resources Code section 25120 provides:

> "Thermal powerplant" means any stationary or floating electrical generating facility using any source of thermal energy, with a generating capacity of 50 megawatts or more, and any facilities appurtenant thereto . . . .

C. Warren-Alquist Act (Pub. Resources Code § 25500)

Public Resources Code Section 25500 provides:

> In accordance with the provisions of this division, the commission shall have the exclusive power to certify all sites and related facilities in the state, whether a new site and related facility or a change or addition to an existing facility. . . . [N]o construction of any facility or modification of any existing facility shall be commenced without first obtaining certification for any such site and related facility by the commission, as prescribed in this division.

D. California Code of Regulations, Title 20, Section 2003 subd.(a)

Section 2003(a) of Title 20 of the California Code of Regulations provides:

> The "generating capacity" of an electric generating facility means the maximum gross rating of the plant's turbine generator(s), in megawatts ("MW"), minus the minimum auxiliary load.

E. California Code of Regulations, Title 20, Section 2003 subd. (b)(1)

Section 2003(b)(1) of Title 20 of the California Code of Regulations provides:

> The "maximum gross rating" of the plant's turbine generator(s) shall be determined according to this subdivision. If there is more than one turbine generator, the maximum gross rating of all turbine generators shall be added together to determine the total maximum gross rating of the plant's turbine generator(s).
>
> The maximum gross rating of a steam turbine generator shall be the output, in MW, of the turbine generator at those steam conditions and at those extraction and induction conditions which yield the highest generating capacity on a continuous basis.

F. California Code of Regulations, Title 20, Section 2003 subd. (b)(3)

Section 2003(b)(3) of Title 20 of the California Code of Regulations provides:

> The maximum gross rating cannot be limited by an operator's discretion to lower the output of the turbine generator(s) or by temporary design modifications that have no function other than to limit a turbine generator's output.

G. California Code of Regulations, Title 20, Section 2003 subd. (b)(4)

Section 2003(b)(4) of Title 20 of the California Code of Regulations provides:

> The maximum gross ratings specified in the overall plant heat and mass balance calculations shall be subject to verification by commission review of the steam or combustion turbine generator manufacturer's performance guarantee, specifications and procurement contract, if available.

H. California Code of Regulations, Title 20, Section 2003 subd. (c) (Cal. Code Regs., tit. 20, § 2003)

Section 2003(c) of Title 20 of the California Code of Regulations provides:

> The "minimum auxiliary load" means the electrical rating (in MW) of the sum of the minimum continuous and the average intermittent on-site electrical power requirements necessary to support the maximum gross rating as defined in subsection (b) of this regulation and which are supplied directly by the power plant. For geothermal projects, the minimum auxiliary load includes the minimum electrical operating requirements for the associated geothermal field which are necessary for and supplied directly by the power plant. Discretionary loads, i.e., those which can be curtailed without precluding power generation, are not included in minimum auxiliary loads.

I. California Energy Commission Resolution Providing Direction to Staff, In the Matter of Staff Investigation of Possible Energy Commission Power Facility Siting Jurisdiction over Five 30 Megawatt Units Known as Luz SEGS Units III-VII ("Luz SEGS Decision")

In the Luz SEGS Decision, dated October 29, 1986, the Commission determined that:

> [I]n order for its jurisdiction over generation facilities to be equitably administered, the Commission must assert its jurisdiction in an even-handed fashion when it appears that there is a reasonable basis for doing so.

(Luz SEGS Decision, p. 1.)

In that proceeding, the Commission determined that a reasonable basis exists to conclude that separately proposed thermal power plants, each with a generating capacity less than 50 MW, should be aggregated and deemed one facility for the purpose of the Warren-Alquist Act where the power plants are installed, owned and operated by the same entity, are

proposed for contiguous parcels of land, and where "the energy and environmental impact" of the power plants is that of one facility. (*Id.* at pp. 1-2, 4.)

V. DISCUSSION

Ormat violated section 25500 of the Warren-Alquist Act by circumventing the Commission's licensing authority with regard to the permitting of the North Brawley and East Brawley facilities. Ormat conceived of the North Brawley and East Brawley facilities, representing 150 MW of gross generation, as early as 2007. Subsequently, Ormat filed multiple permit applications with the County to obtain approvals for the incremental expansion and reconfiguration of the North Brawley and East Brawley facilities, which today represent one, indivisible, 150 MW geothermal facility. Ormat has separately contracted for the sale of 50 MW of generation from the North Brawley facility with the option to increase sales to 100 MW with generation from the East Brawley facility.

The Commission must immediately commence a jurisdictional investigation regarding the North Brawley and East Brawley facilities and find, based upon this Complaint and any further investigation undertaken by Staff, that the facilities are individually and collectively subject to the Commission's jurisdiction. Further, in order to implement the Warren-Alquist Act in an even-handed and equitable fashion, the Commission must, pursuant to Public Resources Code section 25900, request the Attorney General to petition for an injunction to halt the construction of the proposed

East Brawley facility, as well as any ongoing expansions of the existing North Brawley facility, until Ormat obtains an appropriate certification to proceed from the Commission.

A. Ormat Violated Section 25500 of the Warren-Alquist Act By Failing to Submit to the Commission's Exclusive Jurisdiction to License the North Brawley Facility and East Brawley Facility

Pursuant to the Warren-Alquist Act, the Commission has power to certify all sites and related facilities in California for thermal power plants with a net generating capacity of 50 MW or greater. (Pub. Resources Code §§ 25500, 25120.) The Commission's authority is exclusive:

> The issuance of a certificate by the commission shall be in lieu of any permit, certificate, or similar document required by any state, local or regional agency, or federal agency to the extent permitted by federal law, for such use of the site and related facilities, and shall supersede any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law.
>
> After the effective date of this division, ***no construction of any facility or modification of any existing facility*** shall be commenced without first obtaining certification for any such site and related facility by the commission, as prescribed in this division.

(Pub. Resources Code § 25500 (emphasis added).)

The Commission promulgated regulations which determine whether a proposed thermal power plant is subject to the Commission's jurisdiction. (*See generally*, Cal. Code Regs., tit. 20, § 2003.) According to the Commission's regulations, the "generating capacity" of an electric generating facility is the maximum gross rating of the plant's turbine generator(s), in

MW minus the plant's minimum auxiliary load. (Cal. Code Regs., tit. 20, § 2003 subd. (a).)

The "maximum gross rating" of the plant's turbine generator refers to the output of a turbine generator at those steam conditions which yield the highest generating capacity on a continuous basis. (Cal. Code Regs., tit., 20 § 2003 subd. (b)(1).) The plant's minimum auxiliary load, also referred to as the plant's parasitic load, is defined as the electrical rating in MW of the sum of the minimum continuous and the average intermittent on-site electrical power requirements necessary to support the maximum gross rating and which are supplied directly by the power plant. (Cal.Code Regs., tit. 20, § 2003 subd. (c).) For geothermal projects, the minimum auxiliary load includes the minimum electrical operating requirements for the associated geothermal field which are necessary for and supplied directly by the power plant. (*Id.*)

The North Brawley and East Brawley facilities are each individually subject to the Commission's licensing authority pursuant to section 25500 of the Warren-Alquist Act because they are thermal power plants, each with a generating capacity equal to or in excess of 50 MW. In a conditional use permit application for the East Brawley facility, Ormat states that it has entered into a PPA with SCE for the sale of 50 MW of generation from the North Brawley facility. Pursuant to the terms of the same PPA, Ormat may exercise an option to increase sales to SCE to 100 MW with 50 MW of

generation from the proposed East Brawley facility. The CPUC approved the PPA, authorizing SCE to procure up to 100 MW of generation from Ormat's geothermal facilities.

The CPUC Resolution and Ormat's representations regarding its intent to sell generation from East Brawley to SCE provide a reasonable basis to conclude that, contrary to Ormat's claims, the generating capacity of the North Brawley and East Brawley facilities meet the Commission's 50 MW jurisdictional threshold. The 50 MW of generation, which Ormat is contractually obligated to sell to SCE from North Brawley – and the additional 50 MW of generation it intends to sell to SCE from East Brawley – is the difference between the facilities' maximum gross rating and minimum auxiliary load. (*See* Cal. Code Regs. § 2003 subd. (a)-(c).) Accordingly, North Brawley and East Brawley are each subject to the Commission's jurisdiction. (Pub. Resources Code §§ 25500, 25120.)

To assist the Commission in reaching a jurisdictional determination with regard to the North Brawley and East Brawley facilities, the Commission must order Ormat to produce all relevant information, including its PPA with SCE. (Pub. Resources Code § 25210; *see also* Cal. Code Regs., tit. 20, §§ 2003 subd. (a)-(c).) The Commission must then immediately assume licensing jurisdiction over the North Brawley and East Brawley facilities.

B. Ormat Violated Section 25500 of the Warren-Alquist Act By Failing to Submit to the Commission's Jurisdiction to License a 100 MW Geothermal Facility

Whether or not each of the facilities has an individual generating capacity of 50 MW, the East Brawley and North Brawley facilities are one facility with a net generating capacity of 100 MW, within the meaning of the Warren-Alquist Act. Accordingly, the Commission should find that Ormat violated the Warren-Alquist Act and immediately assume jurisdiction over the County's ongoing licensing proceedings. In the Luz SEGS Decision, attached as Exhibit L, the Commission determined that the generating capacities of separately proposed power plants, the energy and environmental impacts of which may be deemed to be that of one facility, should be aggregated for the purpose of a jurisdictional determination under the Warren-Alquist Act. (Luz SEGS Decision, pp. 1-2, 4.)

In that proceeding, the Commission concluded that the five, 30 MW Luz SEGS units were one "facility" for the purpose of the Warren-Alquist Act because they were designed, owned and controlled by one entity, and were sited on contiguous parcels of land. (*See* Pub. Resources Code § 25120; *see also* Luz SEGS Decision, pp. 1-2; *id.* at Appendix A, pp. 3-4.) The facts of this case are the same as the Luz SEGS Units III-VII proceeding.

North Brawley and East Brawley were conceived simultaneously by Ormat as early as 2007. North Brawley and East Brawley will be owned and operated by Ormat, are virtually identical, and are proposed on adjoining parcels of land, also owned or leased by Ormat. As in the Luz SEGS

Units III-VII proceeding, the element of shared ownership and control is plainly satisfied here.

North Brawley and East Brawley also exhibit the elements of physical interconnectedness found to be determinative by the Commission in the case of the Luz SEGS units. (*See generally*, Luz SEGS Decision, Appendix A.) Both facilities will interconnect to the electrical grid through one substation, which is owned and operated by Ormat and which is located on land also owned or leased by Ormat. North Brawley and East Brawley will also share utility service pursuant to a water supply agreement between Ormat and the City of Brawley for 100 percent of the daily effluent (once available) from the BWWTP. The infrastructure that will convey treated wastewater from the BWWTP to the North Brawley and East Brawley facilities, as well as the necessary tertiary treatment system upgrades to the BWWTP, will be funded and constructed by Ormat. Additionally, the North Brawley and East Brawley power plants will be physically joined to facilitate cooling water blowdown delivery from the North Brawley facility to the East Brawley facility to help meet East Brawley's peak water demand in the summer months. Finally, and based upon the engineering descriptions included in Ormat's sequential conditional use permit applications to the County, the well fields associated with each facility will be physically interconnected through cables and brine and cooling water pipelines spanning the New River. In sum, the North Brawley and East Brawley facilities are one

geothermal facility with a generating capacity of 100 MW. The Commission should immediately assume jurisdiction of the East Brawley project, and evaluate the combined environmental impacts of North Brawley and East Brawley as one, 100 MW geothermal facility.

C. Ormat's Violations of the Warren-Alquist Act

In the Luz SEGS Decision, the Commission determined that it had no evidence to conclude that Luz had intentionally sought to circumvent the requirements of the Warren-Alquist Act. (*Id.* at p.3; *id.* at p. 3 fn.2.) This finding and the viability of the Luz SEGS units supported the Commission's exercise of prosecutorial discretion with respect to Luz's violations of the Warren-Alquist Act. (*Id.* at pp. 2-4.) The Commission cannot reach the same conclusion in this case. The Commission's policies encouraging renewable generation development counsel for the forceful assertion of its jurisdiction in this case.

Ormat is an experienced developer and owner of geothermal facilities, which has sited and operates numerous geothermal facilities within California. Ormat avoided Commission jurisdiction through its practice of incrementally permitting and constructing the North Brawley and East Brawley facilities to develop one, interconnected geothermal complex, all while executing a PPA for the sale of up to 100 MW of generation from the North Brawley and East Brawley facilities. Although Ormat has devoted more than three years to developing the combined facilities, it never sought to obtain a jurisdictional determination from the Commission. Any one of

these factors is enough to raise significant doubt regarding Ormat's good faith ignorance of the Commission's licensing authority. However, all of these factors combined strongly suggest that Ormat willfully evaded the Commission's jurisdiction. Accordingly, the Commission should investigate and pursue all available remedies against Ormat for any willful violations of the Act.

Finally, the policy considerations that warranted the Commission's exercise of prosecutorial discretion with respect to Luz demand the opposite result in this case. In light of the finite water supplies in Imperial County and the limited carrying capacity of the State's resources in general, it is imperative that the Commission promote the development of viable renewable energy projects. Accordingly, the Commission must assume an active role, consistent with its mandate under the Warren-Alquist Act, in the certification of the States' growing inventory of renewable generation. This case is an opportunity for the Commission to affirm its commitment to implement the Act in a just and even-handed fashion.

VI. Requested Action

CURE requests the Commission do the following:

1. In accordance with Public Resources Code Section 25210, immediately commence an investigation of Ormat for the purpose of a jurisdictional determination regarding the North Brawley and East Brawley facilities.

2. In accordance with Public Resources Code section 25210, immediately commence an investigation to determine the nature and extent of any violations by Ormat.

3. In accordance with Public Resources Code section 25210, request the Attorney General to petition for an injunction of any ongoing licensing and construction activities relating to the North Brawley and East Brawley facilities.

4. Find that North Brawley and East Brawley are individually and collectively subject to the Commission's licensing jurisdiction under the Warren-Alquist Act.

5. Take any other action necessary and appropriate under the Commission's statutory and regulatory authority to assume licensing jurisdiction of the North Brawley and East Brawley projects.

6. Take any other action necessary and appropriate under the Commission's statutory and regulatory authority to prevent any further violation by Ormat and to remedy any and all adverse impacts to the public health, safety, and welfare, and the environment, resulting from the violation.

7. In accordance with section 1232, Title 20 of the California Code of Regulations, serve a copy of this complaint on Ormat, provide notice of this Complaint and future investigatory proceedings to petitioners, respondents, and all entities identified in this Complaint, schedule any necessary

hearings, and take additional steps to notify other individuals, organization, and businesses which the committee or the chairman has reason to believe would be adversely affected by a decision.

VII. Authority for Requested Action

In addition to its plenary jurisdiction to certify sites for thermal power plants 50 MW or greater, the Commission has broad authority to take action in response to this Complaint.

First, Public Resources Code section 25210 empowers the Commission to hold any hearings and conduct any investigations in any part of the State necessary to carry out its powers and duties and, for those purposes, has the same powers as are conferred upon heads of departments of the state by Government Code sections 11180, et seq. Those powers include conducting investigations and prosecuting actions concerning: all matters relating to the business activities and subjects under the jurisdiction of the Commission; violations of any law or rule or order of the Commission; and such other matters as may be provided by law. (Gov't. Code § 11180.)

In connection with such investigations and actions, the Commission may: inspect and copy books, records, and other items; hear complaints; administer oaths; certify to all official acts; issue subpoenas for the attendance of witnesses and the production of papers; promulgate interrogatories pertinent or material to any inquiry, investigation, hearing, proceeding, or action; divulge information or evidence related to the investigation of unlawful activity to state and federal authorities; and

present information or evidence obtained or developed from the investigation of unlawful activity to a court or at an administrative hearing in connection with any action or proceeding. (Gov't. Code § 11181.)

Furthermore, Public Resources Code section 25900 authorizes the Commission to request the Attorney General to petition a court to enjoin any violation or threatened violation which constitutes an emergency requiring immediate action to protect the public health, welfare, or safety. The court

> shall have jurisdiction to grant such prohibitory or mandatory injunctive relief as may be warranted by way of temporary restraining order, preliminary injunction, and permanent injunction.

(Pub. Resources Code § 25900.)

Finally, section 25218(e) authorizes the Commission to "[a]dopt any rule or regulation, or take any action, it deems responsible and necessary to carry out the provisions of [the Warren-Alquist Act]" while section 25218.5 provides that "the provisions specifying any power or duty of the commission shall be liberally construed, in order to carry out the objectives of this division." In sum, the Public Resources Code, the Government Code, and the Commission's own regulations provide ample authority for the Commission to take the requested actions.

Ormat's conduct flies squarely in the face of the Commission's jurisdiction over thermal power plant development in general, and the procedural mandates of its facility siting process in particular. It also prejudices the Commission's ability, and its obligation, to ensure that all

significant environmental impacts from thermal power plant development are mitigated and to evaluate all feasible alternatives to such development. The Commission should take firm, deliberate, and immediate action to affirm its jurisdiction over Ormat's activities, to act to halt them immediately pending a complete review of this investigation, and to impose whatever sanction and/or remedial measures are necessary and proper to effectuate the Warren-Alquist Act.

VIII. Names and Addresses of Individuals, Organizations, and Businesses Potentially Affected by the Relief Sought

1. Imperial County
   Planning and Development Services
   801 Main Street
   El Centro, CA 92243

2. Imperial County Air Pollution Control District
   150 South 9th Street
   El Centro, CA 92243-2801
   Fax (760) 353-9904

3. Imperial Irrigation District
   333 E. Barioni Boulevard
   Imperial, CA 92251
   Fax: (760) 339-9262

CONCLUSION

Based on the foregoing, CURE respectfully requests the Commission to take immediate action, consistent with its authority, to investigate and halt the ongoing violation of Section 25500 by Ormat and to order and seek any necessary and proper corrective actions to remedy Ormat's violations.

Dated: June 28, 2011

Respectfully submitted,

Marc D. Joseph
Tanya A. Gulesserian
Elizabeth Klebaner
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601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
(650) 589-1660 Voice
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tgulesserian@adamsbroadwell.com
eklebaner@adamsbroadwell.com

Attorneys for CURE

DECLARATION

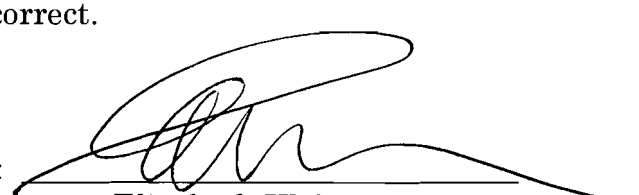
I, Elizabeth Klebaner, declare as follows:

1. I am the attorney of record for Petitioner California Unions for Reliable Energy.

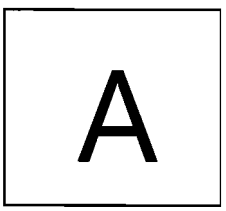
2. I have read the foregoing VERIFIED COMPLAINT AND REQUEST FOR INVESTIGATION BY CALIFORNIA UNIONS FOR RELIABLE ENERGY and all attachments thereto and know the contents thereof.

3. I am informed and believe that the matters stated therein are true and correct and, on that ground, I allege that the matters stated therein are true and correct.

I declare, under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

Dated: 6/28/2011 By: 

Elizabeth Klebaner


A

North Brawley System Impact Study

An Analysis for the
Imperial Irrigation District

~Final Report~
December 11, 2007

REVISION 1
January 8, 2009

TABLE OF CONTENTS

LIST OF APPENDICES

Revision #1:

The North Brawley project representative reported via email to IID Energy Department a change on the project Phase B 13.2/92 kV transformer impedance value on November 24, 2008. The new transformer impedance value changed from 12% @ 37 MVA base to 12% @ 55 MVA base. It triggered the need for re-study the North Brawley project system impact study on the power flow and short circuit analyses sections.

The re-study was considering the following: a) The North Brawley project modeled with all the three phases (A, B, and C) in-service, b) The original IID system topology and c) The IID system demand and generating resources as in the Final Report issued on 12/11/2007.

The purpose of the re-study was to compare study results by implementing the transformer impedance value change and determine if there will be any new or modification to the previously reported system impact that requires mitigation.

The re-study results for the power flow (Heavy Summer and Light Winter conditions) and short circuit (all generation in-service) analyses were very similar to the ones obtained before making the transformer impedance change. The most relevant change in study results was on the short circuit value for the Euclid Substation 92 kV bus which before the change was 20,159 Amperes (101 % of the breaker interrupting capability) and after the transformer impedance change it became 20,172 Amperes (101%). This represents a breaker interrupting capability violation that requires mitigation.

Therefore, once we have completed the re-study for this project, IID does not report any new or modification to the previously reported system impacts that require mitigation. The differences between the Final Report and the attached Revision #1 are the following:

- This additional summary page
- Appendix F – Short Circuit Analysis
- Appendix G – Sensitivity Short Circuit Analysis

If you have any questions, please call me at (760) 482-3443.

Jorge L. Barrientos, PE
IID System Planning Supt.

EXECUTIVE SUMMARY

Power Flow Analysis

KEMA Inc. and IID's Planning Section performed the Power Flow Analysis to review the impact of the proposed North Brawley 150 MW generation project ("Project") when delivering power to IID internal electrical network (50 MW), (50 MW) to SCE and 50 MW for North Brawley load project in the 2010 timeframe. The base case has modeled the new IID Niland Generation Project with 100 MW (Heavy Summer ON-Line, Light Winter OFF-Line). The Project was modeled as Twelve 12.5 MW generators connected to the "CO" 92 kV line. The System Impact Study included power flow, transient and post-transient stability analysis for peak (heavy summer) and off-peak (light winter) conditions, modeled using Western Electric Coordinating Council ("WECC") cases with a detailed IID system representation for 2010. The short circuit analysis, performed by PDS consulting, PLC, is also included as part of this system impact study at the request of IID.

For the conditions modeled, the system impact study indicated that the addition of the North Brawley Project will have some impact on IID's voltage and thermal loading conditions for the different scenarios studied under normal and contingency conditions. Voltage deviation and thermal rating violations attributable to the addition of the Project will require the design and implementation of a few System Operating Procedures (SOPs) and/or system upgrades. The addition of the Project and its associated dispatch to Southern California Edison showed 2.5 MW increase on IID system losses for the Heavy Summer and 5.0 MW for the Light Winter system condition. The study results show that there were pre-existing voltage and thermal violations under outage conditions that were not attributable to the project. These system violations were not included in this report and are being addressed in other planning forums.

Transient Stability

KEMA, Inc. on behalf of Imperial District ("IID") performed this Transient Stability analysis indicated that the addition of the Project does not adversely impact the stability response of the system. On stability outages of the generator transformers, it has been noted that the generator itself must be tripped. Generation tripping for the loss of the step-up transformer is a common practice and does not represent any additional problems to the IID system.

Short Circuit Analysis

A short circuit analysis was performed by PDS consulting, PLC. The executive summary reports the following:

A short circuit study and breaker capability analysis has been performed to determine the impact of the additional North Brawley generation facility to the IID Energy transmission system. The analysis found minimal impacts to the interrupting capability of the IID Energy transmission system due to the addition of the North Brawley generation facility. The analysis also found that the interrupting capability of two of the breakers, H40 and H50, at the Euclid Substation will be exceeded (the pre-Project fault levels were at 99% of the interrupting capability while the post-Project fault level was found to be 101%), however IID Energy can re-schedule to an earlier date a project to replace the affected equipment with sufficient interrupting capacity prior to the in-service date of the North Brawley project.

The results of the study also indicated that there are a few fault interrupting devices on the IID Energy system which have fault current exposure levels near of their respective interrupting ratings (specifically Imperial Valley 230kV and El Centro 92kV). However, these interrupting rating concerns have been identified as pre-existing conditions and not directly related to the North Brawley generation project.

Sensitivity Short Circuit Analysis

A sensitivity analysis of to the original short circuit study and breaker capability analysis has been performed per project owner request to determine the impact of the North Brawley project phase A (6 generators in the amount of 12.5MW each) connected to the IID Energy transmission system.

The analysis found that the fault duty at the Euclid 92 kV substation will exceed the interrupting capability of two of the breakers, H40 and H50, at this substation (the pre-Project fault levels were at 98.4% of the interrupting capability while the post-Project fault level was found to be 100.04%), Even though these short circuit violations are marginal, the IID standard requires the replacement of these breakers once they reach their interrupting capability.

Post-Transient Stability Analysis

The addition of the North Brawley Project did not impact the existing reactive power margins at selected buses for all the outage simulation studied with the exception of the Imperial Valley – Miguel 500 kV line outage. An outage of the Imperial Valley-Miguel 500 kV line caused the reactive power margin at five (5) IID buses to decrease up to 4 MVAR. In particular, the addition of the North Brawley Project and the subsequent outage of the Imperial Valley –Miguel 500 kV line caused the reactive power margin at N. LAQUITA 92 kV bus to decrease from 103 MVAR to 99 MVAR.

A summary of the post-transient reactive power margin analysis can be found at Appendix B. Positive reactive power margins were obtained at all the buses monitored following the selected outages.

1 INTRODUCTION

KEMA Inc. and PDS Consulting, on behalf of Imperial Irrigation District ("IID"), performed this System Impact Study to review the impact of the proposed North Brawley 150 MW generation project ("Project") when delivering power to IID internal network (50 MW), (50 MW) to SCE and 50 (MW) to serve the Project internal load in the 2010 timeframe. The base case has modeled the new IID Niland Generation Project with 100 MW (Heavy Summer ON-Line, Light Winter OFF-Line). The Project was modeled as Twelve 12.5 MW generators connected to the "CO" 92 kV line. The System Impact Study included power flow, transient and post-transient stability analysis for peak (heavy summer) and off-peak (light winter) conditions, modeled using Western Electric Coordinating Council ("WECC") cases with a detailed IID system representation for 2010. The short circuit analysis, performed by PDS consulting, PLC, is also included as part of this system impact study at the request of IID.

2 STUDY ASSUMPTIONS

2.1 Cases Studied

This North Brawley analysis used power flow models representative of an IID 2010 system. The following peak (heavy summer) and off-peak (light winter) scenarios were studied:

Season	PSLF Case Name	Description
Heavy Summer	Pre-Project	Planned heavy summer configuration without the Project
Heavy Summer	Post-Project	Planned heavy summer configuration with Project - net output 100 MW
Light Winter	Pre-Project	Planned light winter configuration without the Project
Light Winter	Post-Project	Planned light winter configuration with the Project - net output 100 MW

2.2 Case Assumptions

The two WECC Approved Power Flow Base Cases used to develop the North Brawley System Impact Study were:

Heavy summer . . . 10hs1a.SAV .....Approved 08/24/05
Light winter . . . . . 12lw1sa.SAV.....Approved 01/19/06

Both cases were selected because they were the most recently developed and available cases in the WECC library in the vicinity of the Project's in-service date. The IID system loads, resources, and topology were adjusted to represent the conditions expected in the year the Project planned to initiate operations.

The 2010 case used to model the impact of the Project included planned transmission elements internal to the IID system for the timeframe as well as the following changes to the base case:

- Generation was modeled according to the IID's current generation interconnection (IID Queue list) that reflects generation expected to be in operation during the study time frame. The generation at Niland 92 kV substation was dispatched according to typical usage, Heavy Summer ON-Line, Light Winter OFF-Line.
- IV – Dixieland 230 kV line and 230/92 kV transformer.
- El Centro 230/92 kV transformer.

2.3 Dynamic Models

The stability models used for the Project were provided by the Project sponsor and included:
Generator – GENSA1 - Salient pole generator represented by equal mutual inductance rotor modeling.
Exciter – EXAC8B – Brushless exciter with PID voltage regulator.
Governor –W2301- Woodward 2301 governor and basic turbine model.

2.4 Loads and Resources

The table below shows the IID loads, losses, generation, and area interchange for the cases studied.

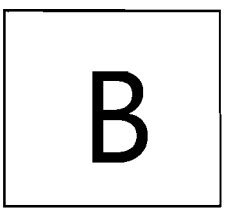
Case	Summer Pre	Summer Post	Winter Pre	Winter Post
Load (MW)	1193.6	1243.6	268.5	318.5
Load (MVAR)	443.8	474.7	60.7	91.6
Losses (MW)	58.1	59.5	37.0	42.7
Losses (MVAR)	323.5	332.6	195.3	243.3
Interchange (MW)	74	174	770.7	870.3
Total IID Shunts (MVAR)	-558.7	-587.8	-197.4	-214.4
IID Generation (MW)	1325.5	1476.9	1076.3	1231.5
IID Generation (MVAR)	179.9	209.7	60.7	112.1

2.5 Power Flow Evaluation Criteria

For this analysis, the system was evaluated for its thermal loading capacity and voltage performance (primarily voltage drop). The system was evaluated both with all lines in service and under emergency or unplanned outage conditions that might occur such as the outage of a line or transformer. WECC Reliability Criteria and the North American Electric Reliability Council ("NERC") Planning Standards were used to evaluate the system as noted below. While the NERC/WECC criteria are applicable, the interconnecting transmission system owner/operator may have stricter voltage or thermal conditions based on operating or reliability needs.

The following criteria were used to determine the impact of the facility on IID's system for pre-contingency and post-contingency conditions:

- Pre-disturbance bus voltage must be between 0.95 per unit and 1.05 per unit. (an IID-specific requirement)
- Allowable voltage deviation of five (5) percent for N-1 Contingencies (deviation from pre-disturbance voltage).
- Allowable voltage deviation of ten (10) percent for N-2 contingencies (deviation from pre-disturbance voltage).
- Post-transient bus voltage must be at least 0.90 per unit (an IID-specific requirement)
- Pre- and post-disturbance loading to remain within the emergency ratings of all equipment and line conductors. The emergency ratings are determined by the owner/operator of each equipment item.


B

FIRST AMENDED AND RESTATED ENGINEERING AND PROCUREMENT AGREEMENT

BETWEEN

IMPERIAL IRRIGATION DISTRICT

AND

ORMAT NEVADA INC.

FOR THE

NORTH BRAWLEY GEOTHERMAL PROJECT

FIRST AMENDED AND RESTATED
ENGINEERING AND PROCUREMENT AGREEMENT
between
IMPERIAL IRRIGATION DISTRICT
and
ORMAT NEVADA INC.

THIS FIRST AMENDED AND RESTATED AGREEMENT is made and entered into this ____ day of May, 2008 (the "Effective Date") by and between Ormat Nevada Inc., a California corporation organized and existing under the laws of the State of California ("Interconnection Customer"), and Imperial Irrigation District, an irrigation district organized under the Water Code of the State of California, ("Transmission Provider"). Interconnection Customer and Transmission Provider each may be referred to as a "Party," or collectively as the "Parties."

RECITALS

WHEREAS, Interconnection Customer is proposing to develop a geothermal generating facility ("Generating Facility") or additional generating capacity to an existing Generating Facility consistent with the interconnection request submitted by Interconnection Customer dated December 13, 2007 (the "Interconnection Request"); and

WHEREAS, Interconnection Customer desires to interconnect the Generating Facility with the Transmission System; and

WHEREAS, Transmission Provider has completed an interconnection system impact study (the "System Impact Study") and provided the results of said study to Interconnection Customer; and

WHEREAS, Interconnection Customer has requested Transmission Provider to perform an interconnection facilities study (the "Interconnection Facilities Study") to specify and estimate the cost of the equipment, engineering, procurement and construction work needed to implement the conclusions of the System Impact Study to physically and electrically connect the Generating Facility to the Transmission System; and

WHEREAS, In parallel with the performance of the Interconnection Facilities Study, Interconnection Customer has authorized the Transmission Provider to begin engineering and procurement of long lead-time items necessary for the establishment of the interconnection in order to advance the implementation of the Interconnection Request; and

WHEREAS, This Agreement is subject to the terms and conditions set forth in Transmission Provider's Open Access Transmission Tariff (the "OATT"), including any future amendments thereto, and the OATT is hereby incorporated herein by reference;

WHEREAS, Capitalized terms used herein but not expressly defined herein shall have the meanings set forth in Transmission Provider's Generator Interconnection Procedure (the "GIP"), including any future amendments thereto, and the GIP is hereby incorporated herein by reference; and

WHEREAS, this Agreement supersedes and replaces the Engineering and Procurement Agreement dated on or about March 14, 2008 between the Parties.

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein the Parties agreed as follows:

1.0 Voluntary Agreement. Interconnection Customer acknowledges and understands that Transmission Provider is not required to enter into this Agreement, or any other engineering and procurement contract, but Transmission Provider is doing so voluntarily in the spirit of cooperation. Interconnection Customer also acknowledges and understands that this agreement is not a formal interconnection agreement, but is merely an interim contract, and that Interconnection Customer is still required to execute a definitive Generator Interconnection Agreement with Transmission Provider.

2.0 Queue Position. The Parties acknowledge and agree that this Agreement will not impact Interconnection Customer's queue position or the Generating Facility's in-service date.

3.0 Authorization to Proceed; Costs and Expenses. As of the Effective Date, Interconnection Customer authorizes Transmission Provider to proceed with the authorized activities identified in Attachment A hereto (the "Authorized Activities"). Interconnection Customer agrees to pay all costs and expenses directly related to the Authorized Activities. Interconnection Customer shall provide an initial deposit in the amount of $869,758.00 which Transmission Provider may draw upon as necessary to fund each Authorized Activity. If additional monies are required to complete the Authorized Activities, then Transmission Provider shall promptly notify Interconnection Customer, and Interconnection Customer agrees to make a second deposit to cover such additional costs and expenses. Transmission Provider shall be under no obligation to perform any Authorized Activity unless Interconnection Customer shall have deposited adequate funds to pay for such work.

4.0 Estimates Only. Since Transmission Provider has no control over the cost of labor, materials or equipment furnished by others, or over the resources provided by others to meet proposed timetables, the estimated costs set forth in Attachment A and the estimated schedule set forth in Attachment B are furnished only for the convenience of Interconnection Customer. They are intended to reflect the costs and timetables of similar work under favorable conditions. Because of unforeseen contingencies

and other factors, the actual costs may be considerably higher or lower, and the actual completion date(s) may be considerably earlier or later. Therefore, the estimated costs and schedule are not a guarantee by Transmission Provider of the actual cost and time required to complete all of the Authorized Activities.

5.0 **Statements; Surplus Funds.** Upon the completion of all Authorized Activities, Transmission Provider shall provide Interconnection Customer with an accounting of all costs incurred in performing said work in sufficient detail to allow verification of such costs. Such costs may include, but shall not be limited to, associated labor, materials and supplies, outside services, and administrative and general expenses. If there are surplus funds following the completion of all Authorized Activities, then the remaining monies shall be promptly refunded to Interconnection Customer without interest.

6.0 **Periodic Updates.** Transmission Provider agrees to interface with a designated Interconnection Customer representative regarding the Authorized Activities, and to provide said representative with periodic updates on work schedules and milestones, as well as current and anticipated costs and expenses.

7.0 **Standard of Care; Express Disclaimer.** Transmission Provider shall exercise the same degree of care, skill and diligence in the performance of the Authorized Activities as is ordinarily exercised by an irrigation district utility under similar circumstances. No other warranty, express or implied, is included in this Agreement, or in any drawing, specification or report produced pursuant to this Agreement. Further, Interconnection Customer acknowledges and agrees that this Agreement shall not be construed as confirming or endorsing in any manner or fashion the design of the Generating Facility, or as any warranty of safety, durability, reliability or suitability of the Generating Facility or installation thereof for any use, including the use intended by Interconnection Customer.

8.0 **Termination.** This Agreement shall terminate automatically upon the completion of all Authorized Activities set forth in Attachment A, or upon the execution of the Generator Interconnection Agreement by both Interconnection Customer and Transmission Provider. Transmission Provider may terminate this Agreement early for cause upon five (5) days advance written notice in the event Interconnection Customer (a) fails to timely comply with any material requirement of this Agreement, (b) fails to meet any of the milestones specified in the GIP, or (c) fails to comply with any of the prerequisites specified in the GIP. Interconnection Customer may terminate this agreement early for cause upon five (5) days advance written notice in the event Transmission Provider fails to timely comply with any material requirement of this Agreement, or for convenience upon ten (10) days advance written notice. Upon termination

of this Agreement pursuant to this Article 8.0, the rights and obligations of the Parties hereunder shall terminate, except for (x) rights and obligations accrued as of the time of termination, (y) rights and obligations arising out of events occurring prior to the termination, and (z) all other rights and obligations of the Parties which by their terms survive termination or which by their nature or by implication are intended to survive termination.

9.0 Cancellation Costs. In the event this Agreement is terminated early for cause by Transmission Provider, or terminated early for convenience by Interconnection Customer pursuant to Article 8.0 above, then Interconnection Customer shall pay any cancellation costs incurred by Transmission Provider for all equipment ordered prior to the termination date which cannot be reasonably mitigated. In the event this Agreement is terminated early for cause by Interconnection Customer pursuant to Article 8.0 above, then Transmission Provider shall bear all cancellation costs incurred for all equipment ordered prior to the termination date.

10.0 Treatment of Equipment. In the event this Agreement is terminated early for cause by Transmission Provider, or terminated early for convenience by Interconnection Customer pursuant to Article 8.0 above, then Transmission Provider may elect the following if the equipment cannot be reasonably canceled:

(a) Take title to the equipment, in which event Transmission Provider shall refund to Interconnection Customer any amounts paid by Interconnection Customer for such equipment, including delivery costs; or

(b) Transfer title to and deliver such equipment to Interconnection Customer, in which event Interconnection Customer shall pay any unpaid balance and cost of delivery for such equipment.

11.0 Indemnity. The Parties shall at all times indemnify, defend, and hold the other Party harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other Party's action or inactions of its obligations under this Agreement on behalf of the Indemnifying Party, except in cases of gross negligence or intentional wrongdoing by the Indemnified Party.

(a) Promptly after receipt by an Indemnified Party of any claim or notice of the commencement of any action or administrative or legal proceeding or investigation as to which the indemnity provided for in this Agreement may apply, the Indemnified Party shall notify the Indemnifying Party of such fact. Any failure of or delay in such

notification shall not affect a Party's indemnification obligation unless such failure or delay is materially prejudicial to the Indemnifying Party.

(b) The Indemnifying Party shall have the right to assume the defense thereof with counsel designated by such Indemnifying Party and reasonably satisfactory to the Indemnified Party. If the defendants in any such action include one or more Indemnified Parties and the Indemnifying Party, and if an Indemnified Party reasonably concludes that there may be legal defenses available to it and/or other Indemnified Parties which are different from or additional to those available to the Indemnifying Party, the Indemnified Party shall have the right to select separate counsel to assert such legal defenses and to otherwise participate in the defense of such action on its own behalf. In such instances, the Indemnifying Party shall only be required to pay the fees and expenses of one additional attorney to represent an Indemnified Party or Indemnified Parties having such differing or additional legal defenses.

(c) The Indemnified Party shall be entitled, at its expense, to participate in any such action, suit or proceeding, the defense of which has been assumed by the Indemnifying Party. Notwithstanding the foregoing, the Indemnifying Party (i) shall not be entitled to assume and control the defense of any such action, suit or proceedings if and to the extent that, in the opinion of the Indemnified Party and its counsel, such action, suit or proceeding involves the potential imposition of criminal liability on the Indemnified Party, or there exists a conflict or adversity of interest between the Indemnified Party and the Indemnifying Party, in such event the Indemnifying Party shall pay the reasonable expenses of the Indemnified Party, and (ii) shall not settle or consent to the entry of any judgment in any action, suit or proceeding without the consent of the Indemnified Party, which shall not be unreasonably withheld, conditioned or delayed.

(d) If an Indemnified Party is entitled to indemnification under this Agreement as a result of a claim by a third party, and the Indemnifying Party fails, after notice and reasonable opportunity to proceed, to assume the defense of such claim, such Indemnified Party may, at the expense of the Indemnifying Party, contest, settle or consent to the entry of any judgment with respect to, or pay in full, such claim.

(e) If an Indemnifying Party is obligated to indemnify and hold any Indemnified Party harmless under this Agreement, the amount owing to the Indemnified Party shall be the amount of such Indemnified Party's actual Loss, net of any insurance or other recovery.

12.0 **Consequential Damages.** In no event shall either Party be liable under any provision of this Agreement for any losses, damages, costs or expenses for any special, indirect, incidental, consequential, or punitive damages, including but not limited to loss of profit or revenue, loss of the use of equipment, cost of capital, cost of temporary equipment or services, whether based in whole or in part in contract, in tort, including negligence, strict liability, or any other theory of liability.

13.0 **Confidentiality.** "Confidential Information" shall include, without limitation, all information relating to a Party's technology, research and development, business affairs, and pricing, and any information supplied or disclosed by either Party to the other prior to the execution of this Agreement. Information is Confidential Information only if it is clearly designated or marked in writing as confidential on the face of the document or, if the information is conveyed orally or by inspection, if the Party providing the information orally informs the Party receiving the information that the information is confidential. Confidential Information supplied or disclosed pursuant to this Agreement shall be subject to the confidentiality provisions set forth in the OATT.

14.0 **Delay in Performance.** Neither Transmission Provider nor Interconnection Customer shall be considered in breach of this Agreement for delays in performance caused by circumstances beyond the reasonable control of the nonperforming party.

15.0 **Obligations of the Parties.** The obligations of the Parties hereunder shall be several and not joint, and neither Party shall have any right, power or authority to enter into any agreement for, act on behalf of, or to act as an agent or representative of, or to otherwise bind or obligate the other Party. This Agreement shall not be interpreted or construed to create an agency, association, joint venture or partnership relationship between the Parties.

16.0 **Third Party Rights.** This Agreement and all rights hereunder are intended for the sole benefit of the Parties and, to the extent expressly provided, for the benefit of the Indemnified Parties, and shall not imply or create any rights on the part of, or obligation to, any other person or entity.

17.0 **Assignment.** Neither Party shall voluntarily assign its rights nor delegate its duties under this Agreement, or any part of such rights or duties, without the written consent of the other Party, which consent shall not be unreasonably withheld, except in connection with the sale, merger, or transfer of a substantial portion of its assets and/or properties (or in the case of Transmission Provider, its transmission facilities) so long as the assignee in such a sale, merger, or transfer assumes directly all rights, duties and obligations arising under this Agreement. Any such assignment or delegation made without such written consent or assumption, as the case may be, shall be null and void.

18.0 Dispute Resolution. Disputes under this Agreement shall be resolved in accordance with procedures set forth in the OATT. The Parties acknowledge and agree that arbitration under the OATT is discretionary. In the event the designated senior representatives of Interconnection Customer and Transmission Provider are unable to resolve a dispute by mutual agreement within thirty (30) days (or such other period as the Parties may agree upon), nothing in this Article 18.0 shall restrict either Party from thereafter electing to resolve the dispute in state or federal court located in Imperial County, California.

19.0 Governing Law. The validity, interpretation and performance of this Agreement and each of its provisions shall be governed by the applicable laws of the State of California without regard to its conflicts of law provisions.

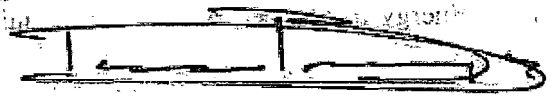
20.0 Amendments. No alterations or amendment of this Agreement shall be binding on either Party unless reduced to writing and signed by the authorized representative of Interconnection Customer and the authorized representative of Transmission Provider. The terms and conditions of this Agreement shall be amended, as mutually agreed to by the Parties, to comply with changes or alterations made necessary by any valid applicable order of any Governmental Authority, or any court, having jurisdiction over this Agreement.

21.0 Integration. This Agreement constitutes the entire and integrated agreement between Interconnection Customer and Transmission Provider. It supersedes all prior and contemporaneous communications, proposals, representations, negotiations or agreements, whether written or oral, relating to the subject matter of this Agreement.

* * *

IN WITNESS WHEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

IMPERIAL IRRIGATION DISTRICT

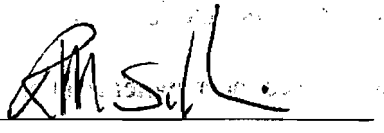
By: 

Name: David L. Barajas

Title: Gen. Supt. Transmission Planning and Contracts

Date: Jun 2/08

ORMAT NEVADA INC.

By: 

Name: Robert Sullivan

Title: Authorized Representative

Date: 29 May 08

ATTACHMENT A

Authorized Activities

A short circuit study and breaker capability analysis has been performed to determine the impact of the additional North Brawley generation facility to the IID Energy transmission system (*North Brawley System Impact Study Report dated December 11, 2007*).

The analysis identified the interrupting capability of two (2) IID Energy owned breakers, H40 and H50, at the Euclid Substation exceed the interrupting capabilities. To mitigate the impacts Ormat Nevada Inc. authorizes IID Energy to proceed with all the required activities required to procure the following:

1. Quantity of two (2) high voltage three phase, sulfur hexafluoride, 121kV, 550kV BIL, 60 Hertz, 2000 Ampere, 40kA Interrupting, Dead Tank Power Circuit Breakers with Synchronous Switching Control at an estimated cost of $55,447.00 each for a total of $110,894.00.

ATTACHMENT A - FIRST AMENDMENT AND RESTATMENT

Following the results of the *Facility Study Draft dated April 24, 2008,* other requirements must be met to interconnect the North Brawley generating facility with the IID Energy electrical grid. To mitigate the impacts, Ormat Nevada Inc. authorizes IID Energy to proceed with all the activities required to procure and engineer the following:

2. 92kV line tap equipped with a group operated disconnect switches at an estimated cost of $194,641.00.
3. 92kV line protection panel commissioning and testing and fiber optic multiplexing equipment for current differential relaying at and estimated cost of $154,792.00.
4. Remote relay replacement at and estimated cost of $26,809.00, see note 1.
5. Coordination study to determine the appropriate settings for all protective equipment at an estimated cost of $15,000.00.
6. Special Protection Schemes (SPS) design and installation at an estimated cost of $250,000.00.
7. SCADA and Revenue Metering at an estimated cost of $36,276.00.
8. Communications and Fiber Optic at an estimated cost of $63,994.00.
9. Project Commissioning at an estimated cost of $0.00, note 2.
10. Euclid H20 and H50 Circuit Switcher Replacement at an estimated cost of $28,246.00, see note 3.
11. Expediting charges for the procurement of equipment at an estimated cost of $100,000.

Authorized Activities Total: $869,758.00

Notes:

1. Interconnection Customer will contract this portion of work which includes engineering and material procurement. Transmission Provider will approve the design and procurement.
2. Interconnection Customer will allocate Project Commissioning cost to Transmission Provider for the Construction Phase of the project.
3. Interconnection Customer to replace two new circuit switchers at current market value. Transmission Provider will install two circuit switchers from stock. Interconnection Customer has remitted $110,894.00 for reservation of the two circuit switchers stocked by Transmission Provider. Remaining costs are for engineering review by Transmission Provider.

ATTACHMENT B

Schedule

(1) The Schedule below lists the activities required to procure two (2) high voltage three phase, sulfur hexafluoride, 121kV, 550kV BIL, 60 Hertz, 2000 Ampere, 40kA Interrupting, Dead Tank Power Circuit Breakers with Synchronous Switching Control.

Material - 92kv Breakers	32w	03/10/08	08/25/08
Prepare Purchase Order	3w	03/10/08	03/17/08
Manufacturing/Delivery	29w	03/17/08	08/17/08
Prepare Approval Drawings	6w	03/17/08	04/14/08
Review Approval Drawings	3w	04/14/08	04/16/08
Issue Final Drawings	4w	04/16/08	05/05/08
Delivery - 92kV Breakers	16w	05/05/08	08/25/08

(2) The Schedule below lists the activities necessary to meet the requirements of the Facility Study Draft:

Additional Modifications	22w	05/14/08	10/15/08
92kV Line Tap	22w	05/14/08	10/15/08
92kV Line Protection Panel	20w	05/14/08	10/01/08
Remote Relay Replacement	20w	05/14/08	10/01/08
Coordination Study	4w	05/14/08	06/11/08
SPS Design & Installation	20w	05/14/08	10/01/08
RTU Engineering & Installation	20w	05/14/08	10/01/08
Revenue Metering	22w	05/14/08	10/15/08

C

MAILED 03/14/08

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

ENERGY DIVISION

RESOLUTION E-4126
March 13, 2008

REDACTED

R E S O L U T I O N

Resolution E-4126. Southern California Edison Company requests approval of two renewable portfolio standard power purchase agreements between Caithness Dixie Valley, LLC and ORNI #18, LLC. These contracts are approved without modifications.

By Advice Letter (AL) 2137-E filed on July 13, 2007, AL 2137-E-A filed on August 16, 2007 and AL 2137-E-B filed on January 10, 2008

SUMMARY

Southern California Edison's (SCE) renewable energy contracts comply with the Renewable Portfolio Standard (RPS) procurement guidelines and are approved

SCE filed advice letter (AL) 2137-E on July 13, 2007 requesting Commission review and approval of two renewable energy power purchase agreements (PPAs) executed with Caithness Dixie Valley, LLC (Dixie Valley) and ORNI #18, LLC (ORNI 18). SCE filed AL 2137-E-A on August 16, 2007 to supplement, in part, AL 2137-E in order to include the Independent Evaluation Report for SCE's 2006 renewable resource solicitation. SCE filed Al 2137-E-B on January 10, 2008 to supplement, in part, AL 2137-E and AL 2137-E-A to reflect changes to the PPAs made in order to comply with Commission Decision (D.) 07-11-025, "Opinion on Amended Petition for Modification of Decision 04-06-014 Regarding Standard Terms and Conditions", issued November 19, 2007.

Generating facility	Type	Term Years	MW Capacity	GWh Energy	Online Date	Location
Dixie Valley	Geothermal, existing	20	50	394	7/2018	Dixie Valley, NV
ORNI #18	Geothermal, new	20	50-100	416-832	12/2009	North Brawley, CA

The Agreement between Caithness Dixie Valley and SCE is for 20 years of geothermal energy from an existing plant. Currently, SCE receives eligible renewable energy from this facility under an interim standard offer no. 4 (ISO4) contract. The Dixie Valley contract will begin in July 2018, when the ISO4 is set to expire. The ORNI 18 project is for 20 years of geothermal energy from a new facility, expected to be come online in December 2009.

Deliveries from these PPAs are reasonably priced and the contract prices are fully recoverable in rates over the life of the contract, subject to Commission review of SCE's administration of the contracts. Both contract prices are below the 2006 market price referent.

Confidential information about the contract should remain confidential

This resolution finds that certain material filed under seal pursuant to Public Utilities (Pub. Util.) Code Section 583, General Order (G.O.) 66-C, and D.06-06-066 should be kept confidential to ensure that market sensitive data does not influence the behavior of bidders in future RPS solicitations.

BACKGROUND

The RPS Program requires each utility to increase the amount of renewable energy in its portfolio

The California RPS Program was established by Senate Bill 1078, effective January 1, 2003. It requires that a retail seller of electricity such as SCE purchase a certain percentage of electricity generated by Eligible Renewable Energy Resources (ERR). The RPS program is set out at Public Utilities Code Section 399.11, et seq. SB 1078 required each utility to increase its total procurement of ERRs by at least 1% of annual retail sales per year so that 20% of its retail sales would be supplied by ERRs by 2017.

The State's Energy Action Plan (EAP) called for acceleration of this RPS goal to reach 20 percent by 2010. This was reiterated again in the Order Instituting Rulemaking (R.04-04-026) issued on April 28, 2004[1], which encouraged the utilities to procure cost-effective renewable generation in excess of their RPS annual procurement targets[2] (APTs), in order to make progress towards the goal expressed in the EAP.[3] On September 26, 2006, Governor Schwarzenegger signed

[1] http://www.cpuc.ca.gov/Published/Final_decision/36206.htm

[2] APT - An LSE's APT for a given year is the amount of renewable generation an LSE must procure in order to meet the statutory requirement that it increase its total eligible renewable procurement by at least 1% of retail sales per year.

[3] Most recently reaffirmed in D.06-05-039

Senate Bill 107[4], which officially accelerated the State's RPS targets to 20 percent by 2010.

CPUC has established procurement guidelines for the RPS Program

In response to SB 1078, the Commission has issued a series of decisions that establish the regulatory and transactional parameters of the utility renewables procurement program. On June 19, 2003, the Commission issued its "Order Initiating Implementation of the Senate Bill 1078 Renewable Portfolio Standard Program," D.03-06-071[5]. Instructions for utility evaluation (known as 'least-cost, best-fit') of each offer to sell products requested in a RPS solicitation were provided in D.04-07-029.[6] The Commission adopted Standard Terms and Conditions for RPS power purchase agreements in D.04-06-014[7] as required by Public Utilities Code Section 399.14(a)(2)(D). In addition, D.06-10-050, as modified by D.07-03-046, refined the RPS reporting and compliance methodologies.[8] In this decision, the Commission established methodologies to calculate an LSE's initial baseline procurement amount, annual procurement target (APT) and incremental procurement amount (IPT).[9]

On June 9, 2004, the Commission adopted its market price referent (MPR) methodology[10] as required by Public Utilities Code Sections 399.14(a)(2)(A) and 399.15(c). On December 15, 2005, the Commission adopted D.05-12-042 which refined the MPR methodology for the 2005 RPS Solicitation.[11] Subsequent resolutions adopted MPR values for the 2005, 2006 and 2007 RPS Solicitations.[12]

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[4] SB 107, Chapter 464, Statutes of 2006

[5] http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/27360.PDF

[6] http://docs.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/38287.PDF

[7] This decision has subsequently been modified. See next subsection.

[8] D.06-10-050, Attachment A, http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/61025.PDF) as modified by D.07-03-046 (http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/65833.PDF.

[9] The IPT represents the amount of RPS-eligible procurement that the LSE must purchase, in a given year, over and above the total amount the LSE was required to procure in the prior year. An LSE's IPT equals at least 1% of the previous year's total retail electrical sales, including power sold to a utility's customers from its DWR contracts.

[10] D.04-06-015; http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/37383.pdf

[11] http://www.cpuc.ca.gov/word_pdf/FINAL_DECISION/52178.pdf

[12] Respectively, Resolution E-3980: http://www.cpuc.ca.gov/WORD_PDF/FINAL_RESOLUTION/55465.DOC, Resolution E-4049: http://www.cpuc.ca.gov/word_pdf/FINAL_RESOLUTION/63132.doc,

In addition, the Commission has implemented Pub. Util. Code 399.14(b)(2), which states that before the Commission can approve an RPS contract of less than ten years' duration, the Commission must establish "for each retail seller, minimum quantities of eligible renewable energy resources to be procured either through contracts of at least 10 years' duration (long-term contracts) or from new facilities commencing commercial operations on or after January 1, 2005." On May 3, 2007, the Commission approved D.07-05-028, which established a minimum percentage of the prior year's retail sales (0.25%) that must be procured with contracts of at least 10 years' duration or from new facilities commencing commercial operations on or after January 1, 2005 in order for short-term contracts to be used towards RPS compliance.

Commission requires certain terms and conditions in all RPS power purchase agreements

On June 9, 2004, the Commission adopted standard terms and conditions for RPS power purchase agreements as required by Pub. Util. Code Section 399.14(a)(2)(D). Of the fourteen standard terms and conditions adopted in D.04-06-014[13], the Commission specified five that could be modified by parties, and nine that may not be modified or only modified in part. Two parties jointly filed a petition for modification on this decision, and subsequently an amended petition for modification. The Commission granted relief in substantial part in D.07-11-025, the "Opinion on Amended Petition for Modification of Decision 04-06-014 Regarding Standard Terms and Conditions". [14]

As a result of the D.07-11-025, ten standard terms and conditions are modifiable and four are non-modifiable. The non-modifiable terms and conditions that must be in every RPS power purchase agreement include: CPUC Approval, RECs and Green Attributes, Eligibility and Applicable Law. The Commission also requires that pending advice letters with contracts which have not yet been approved or rejected should be amended to comply with D.07-11-025.

Above-MPR costs can now be recovered in rates

Pursuant to SB 1078 and SB 107, the California Energy Commission (CEC) was authorized to "allocate and award supplemental energy payments" to cover above-market costs[15] of long-term RPS-eligible contracts executed through a

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Resolution E-4110:
http://www.cpuc.ca.gov/word_pdf/FINAL_RESOLUTION/73594.pdf

[13] http://docs.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/37401.PDF

[14] http://docs.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/75354.PDF

[15] "Above-market costs" refers to the portion of the contract price that is greater than the appropriate market price referent (MPR).

competitive solicitation.[16] The statute required that developers seeking above-market costs apply to the CEC for supplemental energy payments (SEPs).

This above-market cost recovery mechanism was reformed on October 14, 2007 when Governor Schwarzenegger signed SB 1036[17], which authorizes the CPUC to provide above-MPR cost recovery through electric retail rates for contracts that are deemed reasonable. Above-MPR cost recovery has a 'cost limitation' equal to the amount of funds currently accrued in the CEC's New Renewable Resources Account, which had been established to collect SEP funds, plus the portion of funds that would have been collected through January 1, 2012. In addition, pursuant to SB 1036, Pub. Util. Code § 399.15(d)(2) provides that:

> "The above-market costs of a contract selected by an electrical corporation may be counted toward the cost limitation if all of the following conditions are satisfied:
>
> (A) The contract has been approved by the commission and was selected through a competitive solicitation pursuant to the requirements of subdivision(d) of Section 399.14.
>
> (B) The contract covers a duration of no less than 10 years.
>
> (C) The contracted project is a new or repowered facility commencing commercial operations on or after January 1, 2005.
>
> (D) No purchases of renewable energy credits may be eligible for consideration as an above-market cost.
>
> (E) The above-market costs of a contract do not include any indirect expenses including imbalance energy charges, sale of excess energy, decreased generation from existing resources, or transmission upgrades."

The CEC and CPUC are currently working collaboratively to implement SB 1036, which has an effective date of January 1, 2008.

SCE requests approval of two renewable energy contracts

On July 13, 2007, SCE filed AL 2137-E requesting Commission approval of two renewable power procurement contracts. SCE filed AL 2137-E-A and AL 2137-E-B to supplement, in part, AL 2137-E in order to include the Independent Evaluation Report for SCE's 2006 renewable resource solicitation and to comply with D.07-11-025, adopted on November 19, 2007. The ORNI 18 and Dixie Valley

[16] Pub. Util. Code 399.15(d)

[17] Chapter 685, Statutes of 2007 (SB 1036)

PPAs result from SCE's 2006 solicitation for renewable bids; which was authorized by D.06-05-039.

The Commission's approval of the PPAs will allow SCE to accept future deliveries of renewable resources and contribute towards the renewable energy procurement goals required by California's RPS statute.[18] The proposed Dixie Valley will enable SCE to continue receiving renewable energy deliveries from this facility after the existing ISO4 contract expires in 2018. Procurement from the proposed ORNI 18 project is expected to contribute towards SCE's APT starting in 2009.

SCE requests "CPUC Approval" of PPAs

SCE requests a Commission resolution containing the following findings in order to satisfy the "CPUC Approval" terms in both the Dixie Valley and ORNI 18 Agreements:

1. Approval of the Dixie Valley and ORNI 18 Contracts in their entirety.
2. Approval of the modification of certain terms and condition in the Dixie Valley and ORNI 18 Contracts that are provided for in D.04-06-014[19].
3. A finding that any electric energy sold or dedicated to SCE pursuant to the Dixie Valley and ORNI 18 Contracts constitute procurement by SCE from an eligible renewable resource (ERR) for the purpose of determining SCE's compliance with any obligation that it may have to procure from ERRs pursuant to the RPS Legislation or other applicable law concerning the procurement of electric energy from renewable energy resources.
4. A finding that all procurement under the Dixie Valley and ORNI 18 Contracts count, in full and without condition, towards any annual procurement target established by the RPS Legislation or the Commission which is applicable to SCE.
5. A finding that all procurement under the Dixie Valley and ORNI 18 Contracts count, in full and without condition, towards any incremental procurement target established by the RPS Legislation or the Commission which is applicable to SCE.

[18] California Public Utilities Code section 399.11 et seq., as interpreted by D.03-07-061, the "Order Initiating Implementation of the Senate Bill 1078 Renewables Portfolio Standard Program", and subsequent CPUC decisions in Rulemaking (R.) 04-04-026, R.06-02-012 and R.06-05-027.

[19] SCE requested this list of findings in Al 2137-E. Subsequently, SCE has modified the contract terms and conditions to comply with D.07-11-025, the "Opinion on Amended Petition for Modification of Decision 04-06-014 Regarding Standard Terms and Conditions".

6. A finding that all procurement under the Dixie Valley and ORNI 18 Contracts count, in full and without condition, towards the requirement in the RPS Legislation that SCE procure 20% (or such other percentage as may be established by law) of its retail sales from ERRs by 2010 (or such other date as may be established by law).
7. A finding that the Dixie Valley and ORNI 18 Contracts, and SCE's entry into these PPAs, is reasonable and prudent for all purposes, including, but not limited to, recovery in rates of payments made pursuant to the PPAs, subject only to further review with respect to the reasonableness of SCE's administration of the PPAs.
8. Any other and further relief as the Commission finds just and reasonable.

SCE's Procurement Review Group participated in review of the contracts

In D.02-08-071, the Commission required each utility to establish a "Procurement Review Group" (PRG) whose members, subject to an appropriate non-disclosure agreement, would have the right to consult with the utilities and review the details of:

1. Overall transitional procurement strategy;
2. Proposed procurement processes including, but not limited to, RFO; and
3. Proposed procurement contracts before any of the contracts are submitted to the Commission for expedited review.

SCE's PRG was formed on or around September 10, 2002. Current participants include representatives from the Commission's Energy Division, the Division of Ratepayer Advocates, The Utility Reform Network, the Natural Resources Defense Council, the Consumers' Union, California Utility Employees, and the California Department of Water Resources.

SCE asserts that its PRG was consulted during each step of the renewable procurement process. Among other things, SCE informed the PRG of the initial results of its request for proposals (RFP); explained the evaluation process; and updated the PRG periodically concerning the status of contract formation. On December 19, 2006, SCE advised the PRG of its proposed short-list of bids. On March 13, 2007, SCE updated the PRG as to the status of negotiations with bidders into SCE's 2006 RPS solicitation. On April 11, 2007, SCE briefed the PRG concerning the successful conclusion of discussions with Dixie Valley. On June 27, 2007, SCE briefed the PRG concerning the conclusion of discussions with ORNI 18.

Although Energy Division is a member of the PRG, it reserved its conclusions for review and recommendation on the PPA to the advice letter process.

NOTICE

Notice of Al 2137-E, AL 2137-E-A and AL 2137-E-B were made by publication in the Commission's Daily Calendar. Southern California Edison states that a copies of the Advice Letter were mailed and distributed in accordance with Section III-G of General Order 96-A.

PROTESTS

Advice Letters 2137-E, 2137-E-A and 2137-E-B were not protested.

DISCUSSION

Description of the projects

The following table summarizes the substantive features of the PPAs. See confidential Appendices C-1 and C-2 for detailed discussions of contract prices, terms, and conditions:

Generating facility	Type	Term Years	MW Capacity	GWh Energy	Online Date	Location
Dixie Valley	Geothermal, existing	20	50	394	7/2018	Dixie Valley, NV
ORNI #18	Geothermal, new	20	50-100	416-832	12/2009	North Brawley, CA

PPAs are consistent with SCE's CPUC adopted 2006 RPS Plan

California's RPS statute requires the Commission to review the results of a renewable energy resource solicitation submitted for approval by a utility. [20] The Commission will then accept or reject proposed PPAs based on their consistency with the utility's approved renewable procurement plan (Plan). SCE's 2006 Plan includes an assessment of supply and demand for renewable energy and bid solicitation materials, including a pro-forma agreement and bid evaluation methodology documents. The Commission conditionally approved SCE's 2006 RPS procurement plan, including its bid solicitation materials, in D.06-05-039. As ordered by D.06-05-039, on June 9, 2006 SCE filed and served its amended 2006 Plan. After the Director of the Energy Division temporarily suspended SCE's 2006 RPS solicitation and authorized SCE to further amend its 2006 Plan and 2006 RFP, SCE filed an amended 2006 RPS procurement plan and amended

[20] Pub. Util. Code, Section §399.14

2006 RFP protocol. In the amended 2006 Plan, SCE made the necessary changes that were required and/or suggested by D.06-05-039. The Proposed PPAs are consistent with SCE's Commission-approved RPS Plan.[21]

PPAs fit with Plan's identified renewable resource needs

SCE's 2006 RPS Plan called for SCE to issue competitive solicitations for electric energy generated by eligible renewable resources from either existing or new generating facilities that would deliver in the near term or long term. SCE also considered any new or repowered facilities that operate on co-fired fuels or a mix of fuels that include fossil fuel hybrid. SCE's 2006 request for proposals (RFP) solicited proposals for projects that would supply electric energy, environmental attributes, capacity attributes and resource adequacy benefits from eligible renewable energy resources. SCE requested proposals based upon standard term lengths of 10, 15 or 20 years with a minimum capacity of 1 MW. SCE indicated a preference to take delivery of the electric energy at SP-15, but considered proposals based upon any designated delivery point within California.

Both the Dixie Valley and ORNI 18 projects fit SCE's identified renewable resource needs. Both projects convey electric energy, environmental attributes, capacity attributes and resource adequacy to SCE. ORNI 18 satisfies both SCE's locational preference and delivery requirements. Additionally, Dixie Valley satisfies SCE's delivery requirements for a facility located outside of California.

PPA selections are consistent with RPS Solicitation Protocol

SCE distributed an RFP package that included a procurement protocol, which set forth the terms and conditions of the RFP, requirements for proposals, selection procedures, approval procedures and the RFP schedule. As part of the bid submission, SCE required bidders to submit comments on SCE's pro-forma agreement, to execute non-disclosure agreements and to send a letter stating that the bidder agrees to be bound by the terms and conditions of the protocol. The protocol also requested that proposals contain complete, accurate, and timely information about the project's supplier, generating facility, and commercial terms and the pricing details of the proposal.

According to SCE, the Dixie Valley and ORNI 18 bids were consistent with SCE's RPS solicitation protocol. Both bids offered power from eligible renewable energy resources, submitted the standard forms, agreed to be bound by the protocol and signed a non-disclosure agreement.

[21] Modifications to SCE's pro-forma contract terms and conditions were required to comply with D.07-11-025.

Bid evaluation process consistent with Least-Cost Best-Fit (LCBF) decision

The CPUC's LCBF decision[22] directs the utilities to use certain criteria in their bid ranking. It offers guidance regarding the process by which the utility ranks bids in order to select or "shortlist" the bids with which it will commence serious negotiations.

SCE's LCBF bid review process used for its 2006 solicitation is in compliance with the applicable Commission decisions. SCE's LCBF analysis evaluates both quantitative and qualitative aspects of each proposal to estimate its value to SCE's customers and relative value in comparison to other proposals.

Quantitative Assessment

SCE quantitatively evaluates bids based on individual benefit-to-cost (B-C) ratios. It is this B-C ratio that is used to rank and compare each project. The B-C ratios measure total benefits divided by total costs according to the following equation:

$$\text{B-C Ratio} = \frac{\text{Capacity Benefit + Energy Benefit}}{\text{Payments + Integration Cost + Transmission Cost + Debt Equivalence}}$$

The capacity benefits are assigned based on SCE's forecast of capacity value and a technology-specific effective load carrying capability (ELCC). SCE evaluates the project energy benefits using a production simulation model that compares the total production costs of SCE's base resource portfolio with the total production costs of the portfolio including the proposed RPS project. This calculation takes into account forecasted congestion charges, dispatchability and curtailability. This modeling methodology evaluates the impact of portfolio fit for all projects.

The market valuation of each project includes an assessment of the payments, an all-in price for delivered energy adjusted in each time-of-delivery period, and integration costs. By Commission policy (D.04-07-029 and clarified by D.07-02-011), integration cost adders for all proposals must be zero. Further, the transmission upgrade costs are estimated using SCE's transmission ranking cost report for resources that do not have an existing interconnection to the electric system or a completed Facilities Study.
The benefit-to-cost ratios for both the Dixie Valley and ORNI 18 projects were favorable in comparison to the bids in SCE's 2006 solicitations. See Confidential Appendix A for more detailed bid comparisons.

[22] D.04-07-029

Independent evaluators (IE) oversaw SCE's RPS procurement process

Consistent with D.06-05-039, SCE retained an independent evaluator (IE), Sedway Consulting, to report to SCE's procurement review group about the 2006 RPS solicitation, to ensure that the solicitation was conducted fairly and to evaluate whether the best resources were acquired. According to the IE Report submitted in AL 2137-E-A, Sedway Consulting performed its duties overseeing the 2006 solicitation and has provided assessment reports to the PRG and the CPUC.

In its Independent Evaluator Report, Sedway Consulting concluded that SCE "conducted a fair and effective evaluation of the proposals that it received in response to its 2006 RPS RFP and made the correct selection decisions in its short list." Sedway Consulting performed its own evaluation of all 2006 proposals using a model developed to simulate SCE's LCBF ranking results. The IE ranked all proposals using its model and compared the results to SCE's bid ranking results. The IE's ranking results were similar to SCE's, and as a result, Sedway Consulting agreed with SCE's shortlisting decisions. In addition, the IE monitored SCE's shortlisting discussions, contract negotiations and meetings with management where SCE made decisions, for example, regarding bid prioritizations and negotiation positions. Overall, the IE concludes that SCE conducted a fair and effective evaluation of its 2006 renewable energy proposals.

For the IE's contract-specific evaluations, see Confidential Appendix E.

Consistency with adopted standard terms and conditions

In D.04-06-014, the Commission set forth standard terms and conditions (STCs) to be incorporated into RPS agreements. Appendix A of that decision identified nine of the fourteen STCs as "may not be modified." On November 19, 2007, after the filing of AL 2137-E and AL 2137-E-A, the Commission decided to grant, in part, an amended petition for modification of D.04-06-014. This decision, D.07-11-025, which granted in part the petition for modification, stated that all renewable power purchase agreements must contain four non-modifiable standard terms and conditions. D.07-11-025 also required that electrical corporations, such as SCE, file amendments to any pending advice letters for renewable PPAs in order to comply with the decision.

SCE filed AL 2137-E-B to supplement, in part, terms and conditions in both the Dixie Valley and ORNI 18 Agreements. As a result, the STCs for both PPAs are in compliance with D.07-11-025.

Contract prices are below 2006 MPR

The levelized contract price for the ORNI 18 contract does not exceed the relevant 2006 MPR. For the Dixie Valley contract, SCE had to modify the 2006 MPR model since it only calculated values for generating facilities with online dates between 2006 and 2015. SCE modified the 2006 MPR model, issued in Resolution E-4049, by extrapolating forward the data available in the 2006 MPR model in order to calculate an MPR for a facility with a 2018 online date. The Energy Division has reviewed the revised MPR model and finds the modifications to be reasonable. Using the modified model, SCE calculated the MPR for a 20-year contract with an online date in 2018 as $101.95/MWh. Therefore, the levelized contract price for the Dixie Valley contract does not exceed the MPR.[23]

As a result, the net present value of the sum of payments to be made under each PPA are less than the net present value of payments that would be made at the market price referent for the anticipated delivery. Therefore, for each contract, the contract price payments are below the MPR and per se reasonable as measured according to the net present value calculations explained in D.04-06-015, D.04-07-029, and D.05-12-042.

PPAs are viable projects

SCE believes that both projects are viable. However, ORNI 18's project viability is affected by the uncertainty surrounding whether the federal production tax credit will be extended past 2008.

Project Milestones

The ORNI 18 PPA identifies the necessary milestones, including permit applications, financing, construction and startup deadlines. Since the Dixie Valley PPA concerns an existing facility, there is no development necessary prior to delivery or any associated milestones.

Financeability of Resource

Both projects have financing in place.

Production Tax Credit

The ORNI 18 project, but not the Dixie Valley project, is contingent upon the extension of the federal production tax credits (PTC) as provided in Section 45 of the Internal Revenue Code of 1986, as amended. The PTC is set to expire

[23] See Confidential Appendix C for a more detailed analysis of the modified MPR model.

December 31, 2008, and ORNI 18's initial online date is December 2009. The PTC has been extended several times in recent history, and there is potential that it will again be extended. However, this poses a project viability concern for the ORNI 18 project since it is uncertain whether the PTC will be extended.

Sponsor's Creditworthiness and Experience

Both developers have been providing SCE with renewable energy for many years. According to SCE, they are both reliable and experienced.

Transmission Upgrades

The Dixie Valley project is operating and has no transmission upgrade issues. The ORNI 18 project will interconnect to the Imperial Irrigation District. While a new substation must be built and transmission upgrade studies are not yet complete, the developer has indicated a low risk that transmission upgrades will delay the project's online date. Initially, the ORNI 18 project will not be scheduled to deliver the energy to SCE's service territory because transmission upgrades are necessary to transmit the energy from IID to SCE's territory. However, because the RPS program allows the RPS-eligible energy to be delivered anywhere in California, SCE can remarket the energy until the necessary transmission upgrades are completed.[24]

Fuel/Technology

The Dixie Valley project is online and reliably delivering geothermal energy. While the resource has been delivering for nearly 20 years, SCE believes that the geothermal resource will remain viable and will deliver the expected energy throughout the term of the contract.

SCE has reviewed the ORNI 18 resource test well results and spoke with the developer's geotechnical and drilling staff about the potential of the geothermal resource. As a result, SCE believes that the ORNI 18 project's geothermal resource will be able to sustain at least a 50 MW facility, and likely provide adequate supply for a 100 MW facility. Thus, there is an identifiable, yet low, risk that ORNI 18's untapped geothermal resource will affect the project's viability.

Confidential information about the contracts should remain confidential

Certain contract details were filed by SCE under confidential seal. Energy Division recommends that certain material filed under seal pursuant to Public Utilities (Pub. Util.) Code Section 583 and General Order (G.O.) 66-C, and

[24] D. 06-05-039, Conclusion of Law #3, allows delivery of RPS-eligible energy anywhere in California.

considered for possible disclosure, should be kept confidential to ensure that market sensitive data does not influence the behavior of bidders in future RPS solicitations.

COMMENTS

Public Utilities Code section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30 days public review and comment prior to a vote of the Commission. Section 311(g)(2) provides that this 30-day period may be reduced or waived upon the stipulation of all parties in the proceeding.

The 30-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed to parties for comments and will be placed on the Commission's agenda no earlier than 30 days from today.

FINDINGS OF FACT

1. The RPS Program requires each utility, including SCE, to increase the amount of renewable energy in its portfolio to 20 percent by 2010, increasing by a minimum of one percent per year.
2. D.04-06-014 set forth standard terms and conditions to be incorporated into RPS power purchase agreements.
3. D.07-11-025 granted an amended petition for modification of D.04-06-014, and set forth four non-modifiable standard terms and conditions to be incorporated into RPS power purchase agreements.
4. D.06-05-039 directed the utilities to issue their 2006 renewable RFOs, consistent with their renewable procurement plans.
5. The Commission required each utility to establish a Procurement Review Group (PRG) to review the utilities' interim procurement needs and strategy, proposed procurement process, and selected contracts.
6. Levelized contract prices below the 2006 MPR are considered *per se* reasonable as measured according to the net present value calculations explained in D.04-06-015, D.04-07-029, and D.05-12-042.
7. SCE filed Advice Letter 2137-E on July 13, 2007, requesting Commission review and approval of two renewable energy contracts with Caithness Dixie Valley and ORNI #18.
8. SCE filed Supplemental Advice Letter 2137-E-A on August 16, 2007 to supplement, in part, AL 2137-E in order to include the Independent Evaluation Report for SCE's 2006 renewable resource solicitation.

9. SCE filed Supplemental Advice Letter 2137-E-B on January 10, 2008 to supplement, in part, AL 2137-E and AL 2137-E-A to amend contract terms and conditions in both Caithness Dixie Valley and ORNI #18 contracts in order to comply with D.07-11-025.

10. SCE briefed its PRG on December 19, 2006 and March 13, 2007 on issues related to its 2006 shortlist and RFO. Also, on April 11, 2007 and June 27, 20007, SCE briefed the PRG concerning the successful conclusion of discussions with Dixie Valley and ORNI #18.

11. The proposed contract price for the ORNI 18 project is below the 2006 MPR released in Resolution E-4049.

12. SCE modified the 2006 MPR model in order to be able to evaluate a contract with a start date in 2018.

13. The Caithness Dixie Valley contract price is below the 2006 MPR modified by SCE.

CONCLUSIONS OF LAW

1. The Commission has reviewed the proposed contracts and finds them to be consistent with SCE's approved 2006 renewable procurement plan.

2. These Agreements are reasonable and should be approved in their entirety.

3. The costs of the contracts between SCE and Sellers are reasonable and in the public interest; accordingly, the payments to be made by SCE are fully recoverable in rates over the life of each project, subject to CPUC review of SCE's administration of the PPAs.

4. Certain material filed under seal pursuant to Public Utilities (Pub. Util.) Code Section 583 and General Order (G.O.) 66-C, and considered for possible disclosure, should not be disclosed. Accordingly, the confidential appendices, marked "**[REDACTED]**" in the redacted copy, should not be made public upon Commission approval of this resolution.

5. Procurement pursuant to these Agreements is procurement from eligible renewable energy resources for purposes of determining Buyer's compliance with any obligation that it may have to procure eligible renewable energy resources pursuant to the California Renewables Portfolio Standard (Public Utilities Code Section 399.11 *et seq.*), Decision 03-06-071, or other applicable law.

6. All procurement under the Dixie Valley and ORNI #18 Contracts count, in full and without condition, towards any annual procurement target established by the RPS Legislation or the Commission which is applicable to SCE.

7. All procurement under the Dixie Valley and ORNI #18 Contracts count, in full and without condition, towards any incremental procurement target established by the RPS Legislation or the Commission which is applicable to SCE.
8. A finding that all procurement under the Dixie Valley and ORNI #18 Contracts count, in full and without condition, towards the requirement in the RPS Legislation that SCE procure 20% (or such other percentage as may be established by law) of its retail sales from ERRs by 2010 (or such other date as may be established by law).
9. Any indirect costs of renewables procurement identified in Section 399.15(a)(2) shall be recovered in rates.
10. AL 2137-E, Al 2173-E-A and Al 2173-E-B should be approved without modifications.

THEREFORE IT IS ORDERED THAT:

1. Advice Letters (AL) 2137-E, 2137-E-A and 2137-E-B are approved without modifications.
2. The costs of the contracts between SCE and Sellers are reasonable and in the public interest; accordingly, the payments to be made by SCE, at or below the MPR, are fully recoverable in rates over the life of the project, subject to CPUC review of SCE's administration of the PPAs.
3. This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on March 13, 2008; the following Commissioners voting favorably thereon:

/s/PAUL CLANON
PAUL CLANON
Executive Director

MICHAEL R. PEEVEY
PRESIDENT
DIAN M. GRUENEICH
JOHN A. BOHN
RACHELLE B. CHONG
TIMOTHY ALAN SIMON
Commissioners

Confidential Appendix A

Overview of 2006 Solicitation Bids

[REDACTED]

Confidential Appendix B

LCBF Bid Evaluations

[REDACTED]

Confidential Appendix C-1

Contract Summary: Caithness Dixie Valley

[REDACTED]

Confidential Appendix C-2

Contract Summary: ORNI #18

[REDACTED]

Confidential Appendix E:
Independent Evaluator's Contract-Specific Assessments (Dixie Valley and ORNI 18) [REDACTED]

Confidential Appendix F-1:

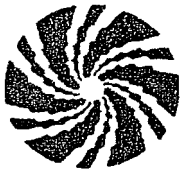
Project's Contribution Toward RPS Goals - Caithness Dixie Valley

[REDACTED]

Confidential Appendix F-2:
Project's Contribution Toward RPS Goals - ORNI #18

[REDACTED]

D



September 14, 2010

Mr. Brad Poiriez
Air Pollution Control Officer
Imperial County Air Pollution Control District
150 S. 9th Street
El Centro, CA 92243

Subject: Revised Application for Authority to Construct for the East Brawley Geothermal Development Project

Dear Mr. Poiriez:

ORNI 19, LLC, a wholly owned subsidiary of Ormat Nevada Inc., is proposing the East Brawley Geothermal Development Project (Project or Facility), consisting of a new 49.9 MW (net) binary power plant; a geothermal well field (owned by ORNI 17, LLC and ORNI 19, LLC), consisting of a total of 34 geothermal wells; pipelines to bring the geothermal fluids produced from the production wells to the power plant and spent geothermal fluids to the injection wells for injection into the geothermal reservoir; an interconnection transmission line to the Imperial Irrigation District's existing electrical transmission system; and a water conveyance system to bring water to the power plant to provide cooling water for the power plant.

The Project is located east of the New River, and north-northeast of the City of Brawley in Imperial County, California. The approximately 15 acre power plant site (which includes the substation and storm water retention basin) is located on private agriculture lands northwest of the intersection of Best and Ward Roads, in the southeast quarter of Section 15, Township 13 South, Range 14 East, SBB&M, identified as Assessor's Parcel Number (APN) 037-140-06-01, a parcel of 32.81 acres. The geothermal well field is also located on private agricultural lands in Sections 10, 11, 14, 15, 16, 21, 22, and 23, Township 13 South, Range 14 East, SBB&M.

Ormat anticipates that construction on the project would start during the fourth quarter of 2010, with commercial start-up in late-2011.

The enclosed application replaces the Authority to Construct application originally submitted for this project on October 31, 2008 and determined complete by the ICAPCD on December 2, 2008. It consists of the completed Authority to Construct Application form; two supplemental Internal Combustion Engine Summary forms for the two emergency engines; and an attachment to the ATC Application form which provides a complete description of the proposed project, projected air pollutant emission rates, an assessment of project compliance with the ICAPCD regulations, and a health risk assessment for the noncondensible gases emitted by the scrubber. We understand that the check for the $157.00 application processing fee submitted with the original application in 2008 will be applied to this application. If this is not correct, please let us know and we will replace or supplement this check as appropriate.

We understand that pursuant to District Rule 902, a synthetic minor permit requires a 30-day public notice and a 30-day review by the U.S. Environmental Protection Agency. We ask that the District schedule these two reviews to run concurrently, and take whatever additional steps may be possible to facilitate the timely review and approval of this permit application so that the construction of the modified facility can be initiated as soon as Imperial County approved the Conditional Use Permit for the project.

ORMAT Nevada
6225 Neil Road, Reno, NV, 89511-1163 • Telephone (775) 356-9029 • Facsimile (775) 356-9039

ORMAT®

775-336-0173

Please call me at ~~760.351.8555~~ if you have any questions or need more information. We would also be happy to meet with you and your staff to review any aspect of the project.

rleiken@ormat.com

Sincerely,

Ron Leiken, QEP
Environmental/Regulatory Affairs Administrator

Enclosures (5)

cc: Dwight Carey, EMA (w/ Enclosures)
David Levy, Ormat Nevada Inc. (w/ Enclosures)

ORMAT Nevada
6225 Neil Road, Reno, NV, 89511-1163 • Telephone (775) 356-9029 • Facsimile (775) 356-9039

150 South Ninth Street
El Centro, CA 92243
(760) 482-4606

IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

RECEIVED
SEP 10 2010
AIR POLLUTION CONTROL DISTRICT

APPLICATION FOR

- [X] Authority to Construction
- [ ] New
- [ ] Amendment
- [ ] Permit to Operate
- [ ] Transfer of Ownership
- [ ] Relocation
- [ ] Name change
- [ ] Emission Credit Banking $85.00
- [ ] Change of Permit Conditions
- [ ] Equipment Modification or Addition

PERMIT NUMBER (if any) N/A

1. Name of Applicant: **ORNI 19, LLC – ORMAT NEVADA, INC.**
2. Responsible Person: **David Levy**
3. Mailing Address: **6225 Neil Road**
4. Title: **Project Manager**
5. City: **Reno** | State: **NV** | Zip Code: **89511-1153**
6. Phone (Area Code): **760.351.8555** | Cell Phone (Area Code): **775.376.2023**
7. Type of Organization (Corp., Government, Individual, etc.): **Limited Liability Corporation - Corporation**
8. Brief Description of Project/Activity: **East Brawley Geothermal Development Project-49.9 MW (net) binary power plant and geothermal well field**
9. Location of Project/Activity: **North-northeast of the City of Brawley -- Sections 10, 11, 14, 15, 16, 21, 22, and 23, T13S, R14E, SBB&M**
10. Property Owner: **ORNI 19, LLC (power plant site in Section 15)**
11. Person in Charge at Location: **David Levy**
12. Title: **Project Manager**
13. Phone Number (Area Code): **775.376.2023**
14. Anticipated Date of Construction: Start **Spring 2011**; Completion **Spring 2012**
15. Anticipated Life of Project: **30+ years**
16. Estimated Emissions

		Uncontrolled lbs/day	Controlled lbs/day
For largest single pollutant	ROC	416.76	154.31
Total for all emissions	H2S/PM10/CO/NOx	72.62/124.31/4.41/7.14	3.93/136.31/4.41/29.89

17. Other Permits Have Been or Will be Obtained From: **ICPDSD, ICPWD, CRWQCB, IID, ICDHS-EHS, CDTSC, Caltrans, CSWRCB**
18. [X] Plot plans, flow charts, calculations, equipment description and other information required by "List and Critieria" attached.
19. [ ] The information previously submitted with _____ is still valid and no changes have been made except as shown on attachement.
20. [ ] Request for confidential handling of attached.
21. [X] Total pages attached **89**

"I am familiar with the Rules and Regulations of the Imperial County Air Pollution Control District and I certify that the operation of the plant and/or equipment which is subject to the application will comply with said Rules and Regulations."

9/15/10
Date

D. LeVy
Signature of Responsible Person

OFFICE USE ONLY: All payments must be made by Check or Money Order. Cash will not be accepted Thank you.
Note: An application fee of $157.00 is due upon submission of an application.

Date application submitted: _____ **Amount paid:** _____

Received by: _____ **Receipt Number:** _____

Staff Comments:

ATTACHMENT 1

REVISED APPLICATION FOR AUTHORITY TO CONSTRUCT

ORNI 19, LLC – ORMAT NEVADA, INC.

EAST BRAWLEY GEOTHERMAL DEVELOPMENT PROJECT

ATTACHMENT 1

REVISED APPLICATION FOR AUTHORITY TO CONSTRUCT

ORNI 19, LLC – ORMAT NEVADA, INC.

EAST BRAWLEY GEOTHERMAL DEVELOPMENT PROJECT

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150 South Ninth Street
El Centro, CA 92243
(760) 482-4606

IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

INTERNAL COMBUSTION ENGINE SUMMARY FORM

NOTICE

An application will not be processed unless ALL fields in "Section A" are complete.

Section A

Company/Agency **ORNI 19, LLC – ORMAT NEVADA, INC.**	Phone Number **760.351.8555**
Equipment Location **Section 15, Township 13 South, Range 14 East, SBB&M.**	Existing Permit # (if any) **N/A**
Engine Manufacturer **Caterpillar**	Model Number **C15**
Engine Serial Number: **FSE02024**	EPA/C.A.R.B. 12-character Engine Family Name **7CPXL15.2ESK**
Manufacturer Date: **Model Year 2007**	Is unit equipped with a non-resettable hour meter? ☒ Yes ☐ No

Utilization of Engine

☒ Electrical Generator **535** Kw ☐ Fire Pump ☐ Portable
☐ Compressor Driver _____ cfm ☐ Other _____
☐ Pump Driver _____ gpm ☐ Rental

Fuel Information — Air to Fuel Ratio _____

☐ Natural Gas ☐ Gasoline ☐ LPG ☐ Other _____
☐ Digester Gas ☐ Landfill Gas ☒ Diesel Oil

Engine Size (Manufacturers Rating) BHP@ **717** RPM **1800**

Operating Schedule

1 Hr/Days _____ Days/Week

_____ Weeks/Year Maximum Operating Hours **50 hrs** Hrs/Days

☒ Emergency Only (indicate hours operated for testing & maintenance)

Section B

Is this unit designed to be moved or carried from one location to another, or does it have wheels, skids,
☐ Yes (Portable) ☒ No (Stationary)

150 South Ninth Street
El Centro, CA 92243
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IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

INTERNAL COMBUSTION ENGINE SUMMARY FORM

Section C

Engine Description — Number of Cylinders: _____

☐ Two Cycle or ☒ Four Cycle

☐ Lean Burn or ☐ Rich Burn

☐ Turbocharged ☒ Turbocharged/Aftercooled ☐ Naturally Aspirated

Sulfer Content of Disgester Gas, Landfill Gas or Diesel

CARB Diesel

Maximum Rated Fuel Consumption (Gas/Hr, Cu. Ft/Hr)

241.7 lbs/hr

Average Load Percentage %

Energy Recovery From Exhaust ☐ Yes ☒ No If yes, please explain

Emission Control Device ☐ Yes ☒ No If yes, please explain

Emission Data:

POLLUTANT	EMISSION BEFORE CONTROL Gr/BHP PPM Lb/Day	EMISSION AFTER CONTROL Gr/BHP PPM Lb/Day
NMHC or TOC	CARB Tier 3 Standard = NMHC+NOx=4 g/kWhr	
NOx	CARB Tier 3 Standard = NMHC+NOx=4 g/kWhr	
CO	CARB Tier 3 Standard = 3.5 g/kWhr	
PM10	CARB Tier 3 Standard = 0.20 g/kWhr	
SOx	0.0074 g/kWhr	

☒ Manufacturer Data ☐ Source Test Data

Section D

Stationary Engines Only

Stack Dimensions

Height Above Grade **Approx. 10** Ft Height Above Building **N/A** Ft

Exhaust Cross Section

Diameter **8** In Width **N/A** In Length **N/A** In

Exhaust Temperature **942** °F Direction of Stack Outlet ☐ Horizontal ☒ Vertical ☐ Other

End of the Stack ☐ Open ☐ Capped ☒ Flapper Valve

Stack Serves

☒ Only this equipment

☐ Other equipment also

Exhaust Flow **3,845** CFM

Total Flow Rate **3,845** CFM

Exhaust Pressure **0 psig** CFM

Receptor Information. A receptor is a residence or business whose occupants could be exposed to toxic emissions from your facility.

Nearest offsite receptor **Home**

Distance to nearest offsite receptor **2,000** feet

Distance to nearest school grounds **10,000** feet

Dwight L. Carey
Name of preparer

10/30/08
Date

150 South Ninth Street
El Centro, CA 92243
(760) 482-4606

IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

INTERNAL COMBUSTION ENGINE SUMMARY FORM

NOTICE

An application will not be processed unless ALL fields in "Section A" are complete.

Section A

Company/Agency **ORNI 19, LLC – ORMAT NEVADA, INC.**	Phone Number **760.351.8555**
Equipment Location **Section 15, Township 13 South, Range 14 East, SBB&M.**	Existing Permit # (if any) **N/A**
Engine Manufacturer **Cummings**	Model Number **CFP83-F40**
Engine Serial Number: **8728-6CTAAG3**	EPA/C.A.R.B. 12-character Engine Family Name **Not Available**
Manufacturer Date: **Model Year 2007**	Is unit equipped with a non-resettable hour meter? ☒ Yes ☐ No

Utilization of Engine

☐ Electrical Generator	215 Kw	☒ Fire Pump	☐ Portable	
☐ Compressor Driver	____ cfm		☐ Other ____	
☐ Pump Driver	____ gpm	☐ Rental		

Fuel Information — Air to Fuel Ratio ____

☐ Natural Gas	☐ Gasoline	☐ LPG	☐ Other ____
☐ Digester Gas	☐ Landfill Gas	☒ Diesel Oil	

Engine Size (Manufacturers Rating) BHP@ **288** RPM **1760**

Operating Schedule

1 Hr/Days ____ Days/Week

____ Weeks/Year Maximum Operating Hours **50 hrs** Hrs/Days

☒ Emergency Only (indicate hours operated for testing & maintenance)

Section B

Is this unit designed to be moved or carried from one location to another, or does it have wheels, skids,

☐ Yes (Portable) ☒ No (Stationary)

150 South Ninth Street
El Centro, CA 92243
(760) 482-4606

IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

INTERNAL COMBUSTION ENGINE SUMMARY FORM

Section C

Engine Description — Number of Cylinders:

☐ Two Cycle or ☒ Four Cycle
☐ Lean Burn or ☐ Rich Burn
☐ Turbocharged ☒ Turbocharged/Aftercooled ☐ Naturally Aspirated

Sulfer Content of Disgester Gas, Landfill Gas or Diesel
CARB Diesel

Maximum Rated Fuel Consumption (Gas/Hr, Cu. Ft/Hr)
14.5 gph
Average Load Percentage %

Energy Recovery From Exhaust ☐ Yes ☒ No If yes, please explain

Emission Control Device ☐ Yes ☒ No If yes, please explain

Emission Data:

POLLUTANT	EMISSION BEFORE CONTROL Gr/BHP PPM Lb/Day	EMISSION AFTER CONTROL Gr/BHP PPM Lb/Day
NMHC or TOC	0.14 g/kWhr	
NOx	5.37 g/kWhr	
CO	0.6 g/kWhr	
PM10	0.09 g/kWhr	
SOx	0.0074 g/kWhr	

☒ Manufacturer Data ☐ Source Test Data

Section D

Stationary Engines Only

Stack Dimensions
Height Above Grade **Approx. 8** Ft Height Above Building **N/A** Ft

Exhaust Cross Section
Diameter **4** In Width **N/A** In Length **N/A** In

Exhaust Temperature **952** °F Direction of Stack Outlet ☐ Horizontal ☒ Vertical ☐ Other

End of the Stack ☐ Open ☐ Capped ☒ Flapper Valve

Stack Serves
☒ Only this equipment
☐ Other equipment also

Exhaust Flow **1,632** CFM
Total Flow Rate **1,632** CFM
Exhaust Pressure **0 psig** CFM

Receptor Information. A receptor is a residence or business whose occupants could be exposed to toxic emissions from your facility.

Nearest offsite receptor **Home**
Distance to nearest offsite receptor **2,000** feet
Distance to nearest school grounds **10,000** feet

Dwight L. Carey
Name of preparer

10/30/08 - rev 9/14/10
Date

ATTACHMENT 1

REVISED APPLICATION FOR AUTHORITY TO CONSTRUCT

ORNI 19, LLC – ORMAT NEVADA, INC.

EAST BRAWLEY GEOTHERMAL DEVELOPMENT PROJECT

INTRODUCTION

ORNI 19, LLC, a wholly owned subsidiary of Ormat Nevada, Inc., (Ormat) is proposing the East Brawley Geothermal Development Project (Project or Facility), consisting of a new 49.9 MW (net) binary power plant; a geothermal well field (owned by ORNI 17, LLC and ORNI 19, LLC), consisting of a total of 34 geothermal wells; pipelines to bring the geothermal fluids produced from the production wells to the power plant and spent (cooled) geothermal fluids to the injection wells for injection into the geothermal reservoir; an interconnection transmission line to the Imperial Irrigation District's existing electrical transmission system; and a a system to bring water to the power plant to provide cooling water for the power plant.

The Project is located east of the New River, and north-northeast of the City of Brawley in Imperial County, California (see Figure 1). The approximately 15 acre power plant site (which includes the substation and storm water retention basin) is located on private agriculture lands northwest of the intersection of Best and Ward Roads, in the southeast quarter of Section 15, Township 13 South, Range 14 East, SBB&M, identified as Assessor's Parcel Number (APN) 037-140-06-01, a parcel of 32.81 acres. The geothermal well field is also located on private agricultural lands in Sections 10, 11, 14, 15, 16, 21, 22, and 23, Township 13 South, Range 14 East, SBB&M (see Figure 2).

Ormat anticipates that construction on the project would start during the fourth quarter of 2010, with commercial start-up in late-2011.

The Project will be similar to the North Brawley geothermal power plant, which is currently completing startup approximately 1.75 miles to the west under Authority to Construct No. 3731A. As a result, this application follows the format of the Application for Amendment to Authority to Construct No. 3731, submitted August 11, 2008 by ORNI 18, LLC and Ormat Nevada, Inc. The well field for the East Brawley Project has filed a separate application for an amendment to Authority to Construct No. 3783 to drill and test the wells required for the East Brawley Project.

EQUIPMENT AND SYSTEM DESCRIPTIONS

The Project consists of the following proposed equipment:

- a new 49.9 MW (net) binary power plant, consisting of:
  - six 12.5 MW (gross) binary Ormat Energy Converter (OEC) Units (OEC Units 1 through 6), each with vaporizers, turbines, generators, condensers, preheaters, pumps, and piping (manufactured by Ormat Turbines Ltd.);

- two 12,000 gallon motive fluid (isopentane) storage tanks;
- integrated OEC Unit motive fluid (isopentane) vapor recovery systems on each OEC Unit condenser (manufactured by Ormat Turbines Ltd.);
- a maintenance vapor recovery unit, consisting of a diaphragm pump, a vacuum pump, and activated carbon canisters (manufactured by Ormat Turbines Ltd.);
- two film, counter-flow, induced-draft cooling towers (each with seven to ten cells), each circulating a maximum of 110,000 gpm of cooling water;
- two to four cooling water blowdown injection wells;
- a regenerative thermal oxidizer (RTO) unit (for the abatement of benzene and hydrogen sulfide in the emitted geothermal noncondensible gases) and caustic scrubber abatement system (for the abatement of sulfur oxides from the RTO oxidization of the hydrogen sulfide in the geothermal noncondensible gases);
- a control room, office, and maintenance shop;
- an electrical substation;
- a 215 kW emergency standby diesel engine fire-water pump (manufactured by Daybreak Technologies, Inc.);
- a 625 kVA/535 kW emergency standby diesel engine-generator to supply electrical power for plant auxiliaries when the plant trips (manufactured by Hawthorn Power Systems); and
- other related ancillary equipment.

- a geothermal well field, consisting of a total of 34 geothermal wells:
  - Approximately 17 geothermal fluid production wells, each about 4,500 feet deep, with associated electrically powered pumps, well pad piping, sand separators to remove sand from the produced geothermal fluid, electrical power supply, geothermal noncondensible gas separators and related ancillary equipment (tanks, valves, controls, and flow monitoring devices), and
  - Approximately 17 geothermal fluid injection wells, each about 4,500 feet deep, with associated well pad piping, a geothermal fluid filter system, electrical power supply and related ancillary equipment (tanks, valves, controls, and flow monitoring devices);
- pipelines to bring the geothermal fluids produced from the production wells to sand separators and the power plant, and the spent geothermal fluids to the injection fluid filter system and the injection wells for injection into the geothermal reservoir;
- pipelines to bring the separated noncondensible gases produced from the production wells to the power plant for processing through the RTO unit and release to the atmosphere;
- an approximately two-mile long 92 kv/13.8 kV transmission interconnection line to the North Brawley substation;
- a communication tower on the plant site to facilitate communications with a central Ormat Imperial Valley control room; and
- a water conveyance system to bring water to the power plant to provide cooling tower makeup water for the power plant.

The East Brawley Project consists of four principal systems: the geothermal fluid system, the motive fluid system, the cooling water system and the geothermal noncondensible gas system (including the regenerative thermal oxidizer (RTO) unit/caustic scrubber system and the cooling tower geothermal noncondensible gas bypass). Although the geothermal fluid system and the motive fluid system are each generally closed systems, each would emit small quantities of air contaminants during normal and maintenance operations. The cooling water system and the geothermal noncondensible gas system are at least partially open to the atmosphere.

Figure 3 shows the general arrangement of the Project power plant facilities. Figure 4 and Figure 5 are basic block diagrams of the power plant, which each shows how the three separate power plant fluid systems (geothermal fluid, motive (working) fluid and cooling water) flow through each of the six OEC Units. Figure 6 shows a perspective view of one of the six OEC Units. Each of the six OEC Units would be able to operate independently of the others, but would share common ancillary components (additional working fluid storage, geothermal fluid supply and injection, etc.). Figure 7 presents the simplified process flow diagram for the geothermal noncondensible gas (NCG) system, including the high pressure NCG separator, the RTO unit/caustic scrubber system and the cooling tower bypass. Figure 8 presents the RTO unit/caustic scrubber system general arrangement – plan and elevation views, while Figure 9 presents the RTO unit/caustic scrubber system mass flow diagram.

Geothermal resources required to provide heat energy to the power plant would be supplied from a total of approximately 17 geothermal production wells (see Figure 2). Each production well would be equipped with a pump driven by a vertical electric motor located on top of the well pump discharge head and corrosion and scale inhibitor systems to deliver corrosion and scale inhibitors into the geothermal fluid. An electric cable installed along the production pipeline from the power plant would provide the electricity to power the well pump motor.

Each of the production wells would deliver geothermal fluid to the power plant through production pipelines. The geothermal fluids would first flow from the production wells through closed, high pressure well pad separators which would separate most of the geothermal noncondensible gases from the geothermal brine (see Figure 7). If the quantity of geothermal noncondensible gases in the geothermal fluid is less than the high end of the possible range, all of these separated geothermal noncondensible gases would flow through other dedicated pipelines to the power plant site, to be dissolved/entrained in the geothermal brine as it is injected into the geothermal fluid injection wells. Small quantities of these separated geothermal noncondensible gases would be discharged to the atmosphere along the dedicated pipelines as condensate created as the steam cools is drained from the pipeline.

However, if the quantity of geothermal noncondensible gases in the geothermal fluid is at the high end of the possible range, up to twenty-five percent of these separated geothermal noncondensible gases would flow through other dedicated pipelines to the RTO unit/caustic scrubber system located at the power plant site. The remaining seventy-five percent of the separated geothermal noncondensible gases would flow through the dedicated pipelines to be dissolved/entrained in the geothermal brine as it is injected into the geothermal fluid injection wells. As described above, small quantities of these separated geothermal noncondensible gases

would be discharged to the atmosphere along the dedicated pipelines as condensate created as the steam cools is drained from the pipeline.

The geothermal brine and the geothermal noncondensible gases remaining in the geothermal brine would then flow through sand separators at each well pad to remove sand and other debris from the produced geothermal fluid. These sand separators would discharge a small amount of geothermal fluid and accompanying geothermal noncondensible gases when purging the sand. The produced geothermal fluid would then proceed through booster pumps and the geothermal fluid pipelines to the power plant site, through additional sand separators, then through the OEC units. The spent geothermal fluid would then run through an injection fluid filtrations system and into the geothermal injection wells without coming into direct contact with the motive fluid or the atmosphere. The geothermal injection fluid filtration system would also discharge a small amount of geothermal fluid and accompanying geothermal noncondensible gases when purging the filtered sand.

The produced geothermal fluid would flow through the level 1 and level 2 vaporizers and preheaters of each OEC Unit, transferring the heat to the motive (working) fluid through the OEC Unit shell-and-tube heat exchangers. Injection pumps located at the power plant site would pump the geothermal injection fluid through the injection pipeline system, providing sufficient pressure to inject the cooled geothermal fluid back into the geothermal reservoir through the approximately 17 injection wells.

The Project would use isopentane as the motive (working fluid). The pressure of the isopentane working fluid vaporized from each OEC Unit level 1 and level 2 vaporizers would turn each OEC Unit level 1 and level 2 turbine, which together would turn a common generator, which would produce the electrical energy which would be delivered to the existing IID electrical transmission systems through the North Brawley substation. The isopentane vapor exiting each turbine would be condensed back into a liquid in a shell-and-tube condenser and returned to the preheaters and vaporizers to repeat the essentially closed cycle.

Each OEC Unit would contain approximately 23,000 gallons of isopentane (in the vaporizers, preheaters, condensers and piping). Each OEC Unit would have minor leaks of isopentane from the valves, connections, seals, and tubes which would be released either to the atmosphere or into the geothermal fluid or circulating cooling water lines. Power plant operators would frequently inspect and monitor the OEC Units for isopentane leaks and visual signs of fugitive isopentane emissions.

Small amounts of air or water vapor typically leak into the OEC Unit isopentane system in the condensers and would eventually reduce the operating efficiency of the OEC Unit unless removed. In order to remove these noncondensible gases, each OEC condenser would have a small (~0.106 scf) "OEC vapor recovery unit" (OEC VRU) integrated into the condenser. Each OEC VRU would consist of two chambers and a set of isolation valves. Operation of each OEC VRU would be controlled by the power plant computer control system, which would start the OEC VRU noncondensible gas "purge" sequence whenever the efficiency of the OEC Unit fell below a set point. During "purging," nearly all of the isopentane vapors in the OEC VRU would be compressed into liquid isopentane and returned to the OEC Unit, while the noncondensible

gases, together with a small quantity of isopentane vapors, would be discharged to the atmosphere.

Some OEC Unit major maintenance activities require that at least a portion of an OEC Unit be cleared of isopentane liquid and vapors prior to performing the maintenance activities. To control and minimize isopentane emissions during these infrequent major maintenance activities, the liquid isopentane would first be drained from the section of the OEC Unit (preheater, vaporizer or condenser) to be maintained or repaired and transferred to either another section of the OEC Unit, the isopentane storage tanks, or another OEC Unit. The Maintenance VRU diaphragm pump and vacuum pump would then be used to evacuate and compress most of the remaining isopentane vapors, returning the isopentane liquid to the other sections of the OEC Unit, the isopentane storage tanks, or another OEC Unit. Those isopentane vapors which do not condense would be released to the atmosphere through the Maintenance VRU activated carbon canisters, which would adsorb nearly all of the remaining isopentane vapors.

The shell-and-tube isopentane vapor condensers would be cooled by water circulated from the two cooling towers. Water from the condensers would be cooled in the cooling towers through evaporation of a portion of the circulating cooling water as the water falls through the air drawn into the cooling towers by the cooling tower fans atop each cooling tower cell. A much smaller portion of the circulating cooling water would also be lost as water droplets ("drift") through the top of the cooling tower cells. The cooling towers would be constructed with high efficiency drift eliminators to reduce the quantity of emitted drift. Some of the circulating cooling water would also be injected into the geothermal reservoir with the geothermal injection fluid or through one or more dedicated blowdown injection wells to remove dissolved salts which would be concentrated in the cooling water through the evaporation process. Water would be added to the cooling tower to make up for the water lost through evaporation, drift and blowdown.

The up-to-twenty-five percent of the geothermal noncondensible gases separated at each of the well pads would be delivered through dedicated noncondensible gas pipelines to the RTO unit/caustic scrubber system located at the power plant site (see Figure 7). The proposed RTO unit would receive the noncondensible gases from the noncondensible gas pipelines. These gases are expected to contain sufficient hydrocarbons and oxygen (with supplemental air and a small amount of propane) to support complete combustion once the RTO unit combustion chamber reached the design operating temperatures (about 1500°F). Propane would also be used to pre-heat the RTO unit during cold start-ups and supplement the heat values of the combustible gases.

The RTO unit would oxidize the hydrocarbons in the NCGs and supplemental propane to carbon dioxide and water vapor in an exothermic process. Methane is the hydrocarbon in largest concentration in the noncondensible gas delivered to the RTO unit, with benzene being second. The following equations show the conversion of methane and benzene to water and carbon dioxide:

$$CH_4 + 2O_2 \rightarrow 2H_2O + CO_2$$

$$2C_6H_6 + 15O_2 \rightarrow 6H_2O + 12CO_2$$

The RTO unit would combust and abate at least 98 percent of the benzene, methane and other hydrocarbons in the NCGs it receives. It is considered Best Available Control Technology (BACT) for the abatement of hydrocarbons and volatile organic gases in a wide variety of applications.

The RTO unit would also oxidize at least 98 percent of the hydrogen sulfide in the NCGs delivered to the RTO unit. The oxidation of hydrogen sulfide in the RTO unit would produce sulfur dioxide (SO_2) and water vapor in the following reaction:

$$2H_2S + 3O_2 \rightarrow 2SO_2 + 2H_2O$$

The resulting SO_2 emissions would be controlled by the caustic scrubber (see below).

The low temperature combustion in the RTO unit, around 1500°F, is flameless and would thus not create appreciable nitrogen oxides (NO_X) from the oxidation of atmospheric nitrogen. The oxidation of essentially 100 percent of the ammonia contained in the NCGs by the RTO unit, however, would result in the formation of nitrogen oxides, in the following general reaction:

$$2NH_3 + 3O_2 \rightarrow NO + NO_2 + 3H_2O$$

The RTO unit would oxidize the hydrocarbons in an average of about 5,600 standard cubic feet per minute (scfm) (28,100 lbs/hr) of NCGs using approximately 3,900 scfm (17,400 lbs/hr) of dilution air and up to 5.5 gallons (500,000 btu) per hour of propane. In the RTO unit the NCGs and dilution air enter the oxidation chamber through a hot, porous, ceramic heat-transfer media which heats the gas (see Figure 9). The heat generated by the oxidation of the NCGs and propane in the oxidization chamber sustains the oxidation process. These heated gases exit the oxidation chamber through a second porous, ceramic heat-transfer media which is heated by the exiting gases. Poppet control valves would reverse the direction of the gas flow at regular intervals to maintain an even distribution of temperatures between the two ceramic media.

The proposed caustic scrubber would receive the carbon dioxide, water vapor, sulfur dioxide, nitrogen oxides and other gases produced from the oxidation process in the RTO unit (as well as the gases passing through the RTO unit unoxidized). Before entering the caustic scrubber, the hot gases would be cooled through a direct contact quenching process. The quenched gases would then proceed to the caustic scrubber, where they would be subjected to counter-flows of caustic absorbate (water and sodium hydroxide). The caustic absorbate would react with the sulfur oxides in the quenched gases to produce sodium sulfates and sulfites, both water-soluble compounds that would be dissolved in the caustic scrubber water and piped to a storage sump at the bottom of the scrubber. The remaining gases from the RTO unit would be vented out the top of the caustic scrubber through a 30-foot tall stack. The small quantity of spent absorbate would be drained from the storage sump and piped to one of the cooling towers. Fresh absorbate would be added as needed to make up for the loss of exhausted absorbate. The caustic scrubber would remove at least 97.5 percent of the sulfur oxides in the gases it receives. It is considered BACT for the control of sulfur dioxide.

A control panel with a programmable logic controller would be used to provide monitoring and control of the RTO unit/caustic scrubber system. RTO unit/caustic scrubber system scheduled

maintenance would be coordinated with the maintenance schedule for the East Brawley power plant, such that the East Brawley power plant would operate no more than 276 hours per year without the RTO unit/caustic scrubber system. When the RTO unit/caustic scrubber system is undergoing unscheduled maintenance or otherwise not operating, the geothermal NCGs would bypass the RTO unit/caustic scrubber system and would be delivered to the cooling towers for release to the atmosphere unabated.

APPLICABLE REGULATIONS

The following Imperial County Air Pollution Control District (ICAPCD) regulations apply to the proposed Project.

Rule 201 Permits Required

Except as exempted, new or modified sources which may emit or control air contaminants must obtain written authorization from the ICAPCD prior to construction.

Rule 206 Processing of Applications

Rule 206.A.4.c provides that the Air Pollution Control Officer shall take reasonable steps to insure that no Project will emit air contaminants that may endanger the short or long term health, safety or property of Persons.

Rule 207 New and Modified Stationary Source Review

Rule 207 limits the permitted increases of air pollutants that could interfere with the attainment or maintenance of ambient air quality standards.

- Rule 207.C.1.a requires Best Available Control Technology (BACT) for equipment with the potential to emit 25 pounds per day or more of any nonattainment pollutant or its precursors. (Ozone and fine particulate matter (PM10) are nonattainment pollutants in Imperial County, and reactive organic compounds [ROCs, which are most hydrocarbons], nitrogen oxides [NOx] and sulfur oxides [SOx] are precursors to ozone [ROCs] and PM10 [ROCs, NOx and SOx].)
- Rule 207.C.1.c requires Best Available Control Technology (BACT) for equipment with the potential to emit 55 pounds per day or more of hydrogen sulfide or the potential to emit 550 pounds per day or more of carbon monoxide (CO) in attainment areas.
- Rule 207.C.2.a requires offsets for all emissions of ROCs, PM10 and other nonattainment pollutants from a source that exceed 137 pounds per day.
- Rule 207.C.f allows the Air Pollution Control Officer to exempt equipment from the requirements of Rule 207.C.2. if used exclusively as emergency standby equipment for non-utility electrical power generation and not used in conjunction with any utility voluntary demand reduction program, provided that operation for maintenance purposes shall be limited to 100 hours per year, and operation for other than maintenance purposes shall be limited to Actual Interruptions of Power by the serving utility.

Rule 208 Permit to Operate

The ICAPCD may inspect and evaluate the new equipment prior to allowing the project to operate under its Permit to Operate.

Rule 216 Construction or Reconstruction of Major Stationary Sources that Emit Hazardous Air Pollutants

Requires stationary sources of hazardous air pollutants to install best available control technology for toxics (T-BACT) to any constructed major source.

Rule 400 Fuel Burning Equipment – Oxides of Nitrogen

This rule requires that the discharge of NOx from fuel burning equipment not exceed 140 lb/hour. Rule 400 also requires that all fuel burning equipment demonstrate compliance through compliance testing once every 12 months, except that equipment that operates less than 100 hours per 12 month period and emits less than 5 tons NOx shall be tested not less than every 36 months.

Rule 401 Opacity of Emissions

The opacity of the emissions for the new source, other than uncombined water vapor, may not be as dark or darker as designated as No. 1 on the Ringlemann Chart (20% opacity) for more than 3 minutes in an hour.

Rule 403 General Limitations on the Discharge of Air Contaminants

The limitation in Rule 403 establishes maximum emission rates for particulate matter that vary according to the weight of the materials processed and maximum rates for the discharge of air contaminants that vary according to the volume of dry gases discharged.

Rule 405 Sulfur Compounds Emission Standards, Limitations and Prohibitions

Rule 405 prohibits the discharge into the atmosphere emissions of sulfur compounds, calculated as sulfur dioxide, in excess of 0.2 percent by volume, measured at the point of discharge.

Rule 800-805 Fugitive Dust Requirements for Control of Fine Particulate Matter (PM10)

These rules control fugitive dust emissions from construction and earthmoving activities, from carry out and track out, from open areas, and paved and unpaved roads.

Rule 900 Procedures for Issuing Permits to Operate for Sources Subject to Title V of the Federal Clean Air Act Amendments of 1990

Sources subject to Rule 900 include major sources. Rule 900.B.20 defines "major source" as a stationary source which has the potential to emit a regulated air

pollutant or a hazardous air pollutant (HAP) in quantities equal to or exceeding the lesser of any of the following thresholds:

- 100 tons per year (tpy) of any regulated air pollutant;
- 10 tpy of one HAP or 25 tpy of two or more HAPs; or
- Any lesser quantity threshold promulgated by the U.S. EPA.

Rule 902 Request for Synthetic Minor Source Status

This rule authorizes the owners or operators of specified stationary sources that would otherwise be major sources (pursuant to Rule 900) to request and accept federally-enforceable emissions limits sufficient to allow the sources to be considered "synthetic minor sources."

Rule 1101 New Source Performance Standards (NSPS)

Rule 1101 adopts by reference and incorporates the provisions of Part 60, Chapter I, Title 40 of the Code of Federal Regulations (40 CFR Part 60) into the Rules and Regulations of the Imperial County Air Pollution Control District, and incorporates in its entirety Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

40 CFR Part 60, Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines) applies to only stationary diesel engines which were ordered after July 11, 2005 and were manufactured after April 1, 2006 (if not a fire water pump engine) or after July 1, 2006 (if a fire water pump engine). Owners and operators of stationary emergency diesel engines of 2007 model year and later subject to 40 CFR Part 60, Subpart IIII must:

- Comply with the emission standards for new nonroad diesel engines in 40 CFR 60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary diesel engines;
- Operate and maintain the diesel engines according to the manufacturer's written instructions over the entire life of each engine;
- Use fuel which meets the minimum standards set forth in the regulations;
- Install a non-resettable hour meter prior to startup of each engine;
- Limit maintenance checks and readiness testing of each engine to 100 hours per year (there is no time limit on the use of an emergency engine in emergency situations); and

- Keep records of the operation of each engine in emergency and non-emergency service that are recorded through the non-resettable hour meter, including recording the time of operation of each engine and the reason each engine was in operation during that time.

Rule 1002 California Airborne Toxic Control Measures (ATCM)

These regulations adopt the following California Code of Regulations (CCR) titles applicable to the proposed project:

Section 93114 – Standards for Non-vehicular Diesel Fuel

Requires 15 ppm sulfur diesel fuel for use in all non-vehicular engines except locomotives and marine engines.

Section 93115 – Airborne Toxic Control Measures (ATCM) for Stationary Compression Ignition Engines.

Requires that new stationary emergency standby diesel-fueled engines >50 hp that operate no more than 50 hours per year for maintenance and testing emit diesel PM at a rate less than or equal to 0.15 g/bhp-hr and meet the standards for off-road engines in Title 13, CCR Section 2423. The ATCM does not limit emissions during emergency use and compliance testing. Lower emissions rates for PM apply to engines that operate between 50 and 100 hours per year.

Rule 1003 Hexavalent Chromium Emissions from Cooling Towers

Rule 1003 applies to all cooling towers. Since the new cooling tower cells will be made of reinforced fiberglass and not wood and since additives containing hexavalent chromium will not be used at the site, the facilities will be eligible for exemption from testing requirements.

POTENTIAL TO EMIT AND ABATED EMISSIONS FROM PROJECT OPERATIONS

Project operations would create sources of:

- hydrogen sulfide (H_2S), ROCs (including benzene (C_6H_6)) and hazardous air pollutant (HAP) (C_6H_6) emissions from the geothermal noncondensible gases through the plant noncondensible gas system (the RTO unit/caustic scrubber system and the cooling tower bypass), the noncondensible gas pipeline condensate drains, the sand separators and the geothermal injection fluid filter system;
- ROCs (isopentane) from the OEC Units, the OEC VRUs and the Maintenance VRU;
- particulates from the cooling towers; and
- NOx, SO_2, ROCs, CO, and/or PM from the RTO unit/caustic scrubber system, the emergency standby diesel generator engine and the emergency standby fire pump diesel engine.

Geothermal Noncondensible Gas System

Engineering estimates of the up to twenty-five percent of the high end quantity of the geothermal noncondensible gases in the produced geothermal fluid which would be delivered from the high pressure separator are about 28,100 lbs/hr, based on flow testing of the North Brawley Project wells conducted during 2007 and 2008. Approximately 99.97 percent of these gases would be carbon dioxide, methane, argon and nitrogen, with the remainder consisting principally of C_6H_6, H_2S and ammonia. Table 1 lists the hourly, daily and annual potential to emit for these gases from the high pressure separator (see also Figure 7 and APPENDIX A).

Table 1: Noncondensible Gas Potential to Emit from the High Pressure Separator

Pollutant	POTENTIAL TO EMIT		
	(lb/hr)	(lbs/day)	(tons/yr)
Benzene	11.16	267.81	48.88
Hydrogen Sulfide	2.92	70.09	12.79
Methane	365.58	8773.94	1601.24
Ammonia	0.35	8.42	1.54

For most of the hours the East Brawley power plant is operating (equivalent to operating 8,484 hours per year (353.5 days per year) if the power plant operates 8,760 hours per year (365 days per year)) these NCGs would be delivered to the RTO unit/caustic scrubber system. The RTO unit would remove by thermal oxidation essentially all of the ammonia and a minimum of 98 percent of the CH_4, C_6H_6, and H_2S in the geothermal noncondensible gases delivered to the RTO unit. The oxidation of the hydrocarbons in the NCG would produce only water vapor and carbon dioxide. The oxidization of hydrogen sulfide by the RTO unit would produce sulfur dioxide at the ratio of the molecular weights of sulfur dioxide (64.06) to hydrogen sulfide (34.08). The oxidization of ammonia by the RTO unit would produce nitrogen oxides. Conservatively assuming that all of the nitrogen oxides are nitrogen dioxide, oxidization of the ammonia in the NCG by the RTO unit would produce nitrogen dioxide at the ratio of the molecular weights of nitrogen dioxide (45.99) to ammonia (17.03). Table 2 lists the maximum

hourly and daily abated air pollutant emissions from the RTO unit based on the NCG vent stack inlet rates to the RTO unit and the RTO unit control efficiencies.

Table 2: Maximum Hourly and Daily Abated Air Pollutant Emission Rates from Oxidation of the NCGs in the RTO Unit/Caustic Scrubber System

Pollutant	Inlet Rates (lb/hr)	Minimum RTO Control Efficiency	Caustic Scrubber Inlet Rates (lb/hr)	Minimum Caustic Scrubber Control Efficiency	Exhaust Gas Emission Rates	
					(lb/hr)	(lb/day)
Benzene (ROC)	11.159	98.00%	0.223	0.00%	0.223	5.36
Hydrogen Sulfide	2.920	98.00%	0.058	0.00%	0.058	1.40
Methane	365.581	98.00%	7.312	0.00%	7.312	175.48
Ammonia	0.351	100.00%	0.000	0.00%	0.000	0.00
Sulfur Dioxide	0.000	0.00%	5.380	97.50%	0.134	3.23
Nitrogen Oxides	0.000	0.00%	0.948	0.00%	0.948	22.75
PM10	0.000	0.00%	0.000	0.00%	0.500	12.00

The caustic scrubber would remove a minimum of 97.5 percent of the SO_2 created in the RTO unit, but would also create PM_{10} emissions. These PM_{10} emissions from the caustic scrubber would be generated from the dissolved solids in the small amount of caustic scrubbing liquid entrained in the gases emitted from the caustic scrubber stack. Table 2 also lists the maximum hourly and daily abated air pollutant emissions from the caustic scrubber stack based on the outlet from the RTO unit and the caustic scrubber system control efficiency.

Up to 0.5 MMbtu/hr of propane would be burned to supplement the heat in the RTO unit oxidation chamber from the oxidation of the NCGs. Table 3 lists the maximum hourly and daily abated air pollutant emissions from the RTO unit/caustic scrubber system from the combustion of the propane only. Table 4 lists the total maximum hourly and daily abated air pollutant emissions from the RTO unit/caustic scrubber system by adding the NCG oxidation and abatement emissions listed in Table 2 and the propane oxidation and abatement emission from Table 3.

Table 3: Maximum Hourly and Daily Abated Air Pollutant Emission Rates from Propane Combustion for the RTO Unit/Caustic Scrubber System

Pollutant	Inlet Rates (lb/hr)	Minimum RTO Control Efficiency	Caustic Scrubber Inlet Rates (lb/hr)	Minimum Caustic Scrubber Control Efficiency	Exhaust Gas Emission Rates	
					(lb/hr)	(lb/day)
Sulfur Dioxide	0.000	0.00%	0.000	97.50%	0.000	0.00
Nitrogen Oxides	0.000	0.00%	0.077	0.00%	0.077	1.86
PM10	0.000	0.00%	0.002	0.00%	0.002	0.05
Carbon Monoxide	0.000	0.00%	0.010	0.00%	0.010	0.25
Propane ROCs	23.425	100.00%	0.000	0.00%	0.000	0.00

Table 4: Total Maximum Hourly and Daily Abated Air Pollutant Emission Rates from the RTO Unit/Caustic Scrubber System

Pollutant	Inlet Rates (lb/hr)	Minimum RTO Control Efficiency	Caustic Scrubber Inlet Rates (lb/hr)	Minimum Caustic Scrubber Control Efficiency	Exhaust Gas Emission Rates	
					(lb/hr)	(lb/day)
Benzene (ROC)	11.159	98.00%	0.223	0.00%	0.223	5.36
Hydrogen Sulfide	2.920	98.00%	0.058	0.00%	0.058	1.40
Methane	365.581	98.00%	7.312	0.00%	7.312	175.48
Ammonia	0.351	100.00%	0.000	0.00%	0.000	0.00
Sulfur Dioxide	0.000	0.00%	5.380	97.50%	0.135	3.23
Nitrogen Oxides	0.000	0.00%	1.025	0.00%	1.025	24.61
PM10	0.000	0.00%	0.002	0.00%	0.502	12.05
Carbon Monoxide	0.000	0.00%	0.010	0.00%	0.010	0.25
Propane ROCs	23.425	100.00%	0.000	0.00%	0.000	0.00

The annual emissions of the NCG-related air pollutants delivered to the power plant from the high-pressure separators or processed through the RTO unit/caustic scrubber system are the sum of the annual emissions when the RTO unit/caustic scrubber is operating and the annual emissions when the RTO unit/caustic scrubber is not operating. The maximum annual emissions for each power plant NCG-related air pollutant is calculated in Table 5 using RTO unit/caustic scrubber system operations of 8,484 hours (8,760 hours – 276 hours) (353.5 days) per year.

Table 5: Maximum Annual Air Pollutant Emission Rates from the Geothermal Noncondensible Gas System

Pollutant	RTO Not Operating			RTO Operating			Total
	(lb/day)	(days/yr)	(tons/yr)	(lb/day)	(days/yr)	(tons/yr)	(tons/yr)
Benzene (ROC)	267.81	11.50	1.54	5.36	353.50	0.95	2.49
Hydrogen Sulfide	70.09	11.50	0.40	1.40	353.50	0.25	0.65
Methane	8,773.94	11.50	50.45	175.48	353.50	31.02	81.47
Ammonia	8.42	11.50	0.05	0.00	353.50	0.00	0.05
Sulfur Dioxide	0.00	11.50	0.00	3.23	353.50	0.57	0.57
Nitrogen Oxides	0.00	11.50	0.00	24.61	353.50	4.35	4.35
PM10	0.00	11.50	0.00	0.50	353.50	0.09	0.09
Carbon Monoxide	0.00	11.50	0.00	0.25	353.50	0.04	0.04
Pentane ROCs	0.00	11.50	0.00	0.50	353.50	0.09	0.09

Sand Separators

The Project would release up to 125 gallons of separated geothermal brine containing up to 1.1 ppm of hydrogen sulfide, 5.6 ppm benzene and 141.8 ppm ammonia gases from each of the approximately 46 well pad and power plant sand separators up to twelve times per day. Conservatively assuming that half (23) of the 46 sand separators would discharge during the same hour, the hourly potential to emit for H_2S, benzene, ROCs and ammonia is as shown in Table 6. With twelve discharges per day, 365 days per year, the daily and annual potential to emit are as shown in Table 7 and Table 8, respectively (see also APPENDIX A).

Table 6: Balance of Power Plant Hourly Potential to Emit

Emission Source	Potential to Emit (lbs/hr)				
	H2S	PM10	ROC	C6H6	NH3
Sand Separators NCG Emissions	0.10	0.00	0.52	0.52	13.04
Injection Filters NCG Emissions	0.01	0.00	0.04	0.04	0.91
NCG Pipeline Condensate Drains Emissions	0.00	0.00	0.00	0.00	0.02
North Cooling Tower Emissions	0.00	2.58	0.00	0.00	0.00
South Cooling Tower Emissions	0.00	2.58	0.00	0.00	0.00
OEC Isopentane Emissions	0.00	0.00	87.04	0.00	0.00
Plant Source Total:	0.11	5.17	87.60	0.56	13.97

Table 7: Balance of Power Plant Daily Potential to Emit

Emission Source	Potential to Emit (lbs/day)				
	H2S	PM10	ROC	C6H6	NH3
Sand Separators NCG Emissions	2.47	0.00	12.46	12.46	313.08
Injection Filters NCG Emissions	0.06	0.00	0.29	0.29	7.26
NCG Pipeline Condensate Drains Emissions	0.00	0.00	0.02	0.02	0.49
North Cooling Tower Emissions	0.00	62.02	0.00	0.00	0.00
South Cooling Tower Emissions	0.00	62.02	0.00	0.00	0.00
OEC Isopentane Emissions	0.00	0.00	136.00	0.00	0.00
Plant Source Total:	2.53	124.03	148.77	12.77	320.83

Table 8: Balance of Power Plant Annual Potential to Emit

Emission Source	Potential to Emit (tons/yr)				
	H2S	PM10	ROC	C6H6	NH3
Sand Separators NCG Emissions	0.45	0.00	2.27	2.27	57.14
Injection Filters NCG Emissions	0.01	0.00	0.05	0.05	1.32
NCG Pipeline Condensate Drains Emissions	0.00	0.00	0.00	0.00	0.09
North Cooling Tower Emissions	0.00	11.32	0.00	0.00	0.00
South Cooling Tower Emissions	0.00	11.32	0.00	0.00	0.00
OEC Isopentane Emissions	0.00	0.00	24.82	0.00	0.00
Plant Source Total:	0.46	22.64	27.15	2.33	58.55

Injection Filter System

The Project would release up to 25 gallons of separated geothermal brine containing up to 1.1 ppm of hydrogen sulfide, 5.6 ppm benzene and 141.8 ppm ammonia gases from each of the approximately 64 geothermal injection filter system units up to four times per day. Conservatively assuming that half (32) of the 64 filter system units would discharge during the same hour, the hourly potential to emit for H_2S, benzene, ROCs and ammonia is as shown in Table 6. With four discharges per day, 365 days per year, the daily and annual potential to emit are as shown in Table 7 and Table 8, respectively (see also APPENDIX A).

Noncondensible Gas Condensate Drains

The Project would also release up to 18 gallons of condensate each hour from the noncondensible gas pipeline drains containing up to 1.1 ppm of hydrogen sulfide, 5.6 ppm benzene, and 141.8 ppm ammonia gases. The hourly, daily and annual potential to emit from these noncondensible gas condensate drains are as shown in Table 6, Table 7 and Table 8, respectively (see also APPENDIX A).

Isopentane Sources

Each OEC Unit would have minor leaks of ROCs (isopentane) from the valves, connections, seals, and tubes which would be released either to the atmosphere or into the geothermal fluid or circulating cooling water lines. Isopentane would also be discharged to the atmosphere through the OEC VRUs, and during OEC Unit maintenance activities through the Maintenance VRU and opening sections of the OEC VRUs for maintenance. Experience with the most recent generation of OEC Units indicates that about one-third of the isopentane is discharged through fugitive emissions, and two-thirds from maintenance activities. Very little isopentane is discharged to the atmosphere through the OEC VRUs. Based on the results of quarterly inventories of isopentane in storage at other projects, Table 6, Table 7 and Table 8 provide the estimated hourly, daily and annual potential to emit isopentane, respectively (see also APPENDIX A).

Project operators would frequently inspect and monitor the OEC Units for isopentane leaks and visual signs of fugitive isopentane emissions. Ormat would also keep a record of valves, connections, seals, and tubes replaced to reduce pentane fugitive emissions.

Cooling Towers

The two Project cooling towers would each circulate up to 110,000 gallons of cooling water per minute containing up to 9,400 ppm, by weight of total dissolved solids (TDS). High efficiency cooling tower drift eliminators would limit the drift rate to 0.0005 percent of the circulating cooling water rate. Conservatively assuming that all of the aerosols which form when the emitted cooling tower drift evaporated are PM10 or smaller, then the hourly PM10 potential to emit for each cooling tower is as shown in Table 6. With each cooling tower assumed to operate 24 hours per day, 365 days per year, the daily and hourly PM10 potential to emit are as listed in Table 7 and Table 8, respectively (see also APPENDIX A).

Emergency Standby Diesel Engine-Generator

The 535 kW emergency standby diesel engine-generator would meet the applicable California Air Resources Board (CARB) Tier 3 stationary compression ignition engine exhaust emission standards of NMHC+NOx = 4.0, CO = 3.5 and PM = 0.20 grams per kilowatt-hour.

The engine would also comply with the CARB "Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines" for new stationary emergency standby diesel-fueled compression ignition engines >50 bhp (PM≤0.15 g/bhp-hr). As required by the ATCM, this diesel engine would also burn CARB diesel fuel (≤15 ppm sulfur). In compliance with the ATCM, this diesel engine would be tested for a total of less than 50 hours per year (for up to one hour per day). Other than for testing, this engine would operate only in emergencies.

Table 9, Table 10 and Table 11 provide the calculated hourly, daily and annual potential to emit, respectively, for this engine for the criteria air pollutants PM_{10}, NO_X, CO and SO_2, and for the criteria air pollutant precursor ROC, assuming that the engine is tested for no more than one hour per day. Table 12 provides the summary of the calculated annual HAP potential to emit, and Table 13 the summary of the calculated annual HAP abated emissions, for this engine.

Table 9: Emergency Diesel Engines Hourly Potential to Emit

Emission Source	Potential to Emit (lbs/hr)				
	PM10	ROC	CO	NOx	SO2
East Brawley Geothermal Development Project					
Emergency Standby Diesel Fire-Water Pump Engine	0.043	0.066	0.284	2.545	0.003
Emergency Standby Diesel Generator Engine	0.236	0.120	4.126	4.595	0.009
Emergency Engines Total:	**0.278**	**0.186**	**4.410**	**7.140**	**0.012**

Table 10: Emergency Diesel Engines Daily Potential to Emit

Emission Source	Potential to Emit (lbs/day)				
	PM10	ROC	CO	NOx	SO2
East Brawley Geothermal Development Project					
Emergency Standby Diesel Fire-Water Pump Engine	0.043	0.066	0.284	2.545	0.003
Emergency Standby Diesel Generator Engine	0.236	0.120	4.126	4.595	0.009
Emergency Engines Total:	**0.278**	**0.186**	**4.410**	**7.140**	**0.012**

Table 11: Emergency Diesel Engines Annual Potential to Emit

Emission Source	Potential to Emit (tons/yr)				
	PM10	ROC	CO	NOx	SO2
East Brawley Geothermal Development Project					
Emergency Standby Diesel Fire-Water Pump Engine	0.0011	0.0017	0.0071	0.0636	0.0001
Emergency Standby Diesel Generator Engine	0.0059	0.0030	0.1031	0.1149	0.0002
Emergency Engines Total:	**0.0070**	**0.0047**	**0.1102**	**0.1785**	**0.0003**

Table 12: Hazardous Air Pollutant Potential to Emit by Emission Unit

Emission Source	Hazardous Air Pollutant Potential to Emit (tons/yr)		
	Diesel HAPs	C6H6	Totals
High Pressure Separator PTE	0.00000	48.8754	48.8754
RTO Unit/Scrubber NCG Abatement System Emissions	0.00000	0.0000	0.0000
Sand Separators NCG Emissions	0.00000	2.2739	2.2739
Injection Filters NCG Emissions	0.00000	0.0527	0.0527
NCG Pipeline Condensate Drains Emissions	0.00000	0.0036	0.0036
North Cooling Tower Emissions	0.00000	0.0000	0.0000
South Cooling Tower Emissions	0.00000	0.0000	0.0000
OEC Isopentane Emissions	0.00000	0.0000	0.0000
Emergency Standby Diesel Fire-Water Pump Engine	0.00184	0.0000	0.0018
Emergency Standby Diesel Generator Engine	0.01015	0.0000	0.0102
Totals:	0.01199	51.2056	51.2176

Table 13: Hazardous Air Pollutant Abated Emissions by Emission Unit

Emission Source	Hazardous Air Pollutant Emissions (tons/yr)		
	Diesel HAPs	C6H6	Totals
High Pressure Separator PTE	0.00000	1.53991	1.53991
RTO Unit/Scrubber NCG Abatement System Emissions	0.00000	0.94671	0.94671
Sand Separators NCG Emissions	0.00000	2.27388	2.27388
Injection Filters NCG Emissions	0.00000	0.05273	0.05273
NCG Pipeline Condensate Drains Emissions	0.00000	0.00356	0.00356
North Cooling Tower Emissions	0.00000	0.00000	0.00000
South Cooling Tower Emissions	0.00000	0.00000	0.00000
OEC Isopentane Emissions	0.00000	0.00000	0.00000
Emergency Standby Diesel Fire-Water Pump Engine	0.00184	0.00000	0.00184
Emergency Standby Diesel Generator Engine	0.01015	0.00000	0.01015
Totals:	0.01199	4.81678	4.82877

Emergency Standby Diesel Fire Pump Engine

Based on manufacturer's certifications, the 215 kW emergency standby diesel fire pump engine would emit less than the applicable CARB Tier 2 stationary compression ignition engine exhaust emission standards of NMHC+NOx = 6.6, CO = 3.5 and PM = 0.20 grams per kilowatt-hour.

The engine would also comply with the CARB "Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines" for new stationary emergency standby diesel-fueled

compression ignition engines >50 bhp (PM≤0.15 g/bhp-hr). As required by the ATCM, this diesel engine would also burn CARB diesel fuel (≤15 ppm sulfur). In compliance with the ATCM, this diesel engine would be tested for a total of less than 50 hours per year (for up to one hour per day). Other than for testing, this engine would operate only in emergencies.

Table 9, Table 10 and Table 11 provide the calculated hourly, daily and annual potential to emit, respectively, for this engine for the criteria air pollutants PM_{10}, NO_X, CO and SO_2, and for the criteria air pollutant precursor ROC, assuming that the engine is tested for no more than one hour per day. Table 12 provides the summary of the calculated annual HAP potential to emit, and Table 13 the summary of the calculated annual HAP abated emissions, for this engine.

Summary of Facility Calculated Potential to Emit

Table 14 provides a summary of the Facility potential to emit air pollutants and air pollutant precursors from all emission units. Table 15 provides a summary of the Facility abated emissions of these air pollutants and air pollutant precursors from all emission units. Table 12 provides the summary of the calculated annual HAP potential to emit, and Table 13 the summary of the calculated annual HAP abated emissions, for each emission unit.

Table 14: Summary of Facility Potential to Emit

Description	Facility Potential to Emit							
	PM10	SO2	CO	NOx	ROC	H2S	NH3	C6H6
Hourly PTE (lbs):	5.45	0.0122	4.41	7.14	98.94	3.03	14.32	11.71
Daily PTE (lbs):	124.31	0.0122	4.41	7.14	416.76	72.62	329.25	280.58
Annual PTE (tons):	22.64	0.0003	0.11	0.18	76.03	13.25	60.09	51.21

Table 15: Summary of Facility Abated Emissions

Description	Facility Abated Emissions							
	PM10	SO2	CO	NOx	ROC	H2S	NH3	C6H6
Hourly PTE (lbs):	5.95	0.1467	4.41	8.09	88.01	0.17	13.97	0.78
Daily PTE (lbs):	136.31	3.2401	4.41	29.89	154.31	3.93	320.83	18.12
Annual PTE (tons):	24.79	0.5708	0.11	4.20	29.64	1.11	58.60	4.82

POTENTIAL EMISSIONS FROM CONSTRUCTION AND WELL FIELD START-UP ACTIVITIES

Grading and Site Construction

Construction of the power plant, new access roads and pipelines would produce fugitive dust from site grading and other construction-related surface disturbing activities. Construction of the power plant would directly disturb about 15 acres of land, and another 10 acres would be disturbed for the adjacent equipment laydown and fabrication yard (although the equipment laydown and fabrication yard would be reclaimed following the completion of construction). All surface-disturbing activities would implement appropriate techniques to comply with ICAPCD Regulation VIII to apply BACT to limit dust emissions. These would include watering the construction area at least twice a day; increasing watering frequency when winds exceed 15 mph; limiting vehicular speed to 15 mph on dirt roads and areas; and using gravel ramps at road entrances.

Existing access roads (paved, graveled or dirt) would be utilized to the extent practical. Any new access required for the Project would be constructed adjacent to the edges of the agricultural fields and parallel to irrigation canals and drains that traverse the Project area. Approximately 14 miles of pipeline would be built, but no new roads would be built for pipeline construction or maintenance and pipeline construction would not require grading of the pipeline routes.

Well Field Start-Up

Geothermal injection wells which are shut in for a period of time may develop a small cap of geothermal noncondensible gases in the well bore above the standing geothermal fluid as these gases are slowly released from the geothermal fluid. The relative proportions of these gases would generally resemble that in the produced geothermal noncondensible gas stream - approximately 99.97 percent carbon dioxide, methane, nitrogen, and argon, with the remainder consisting principally of C_6H_6, H_2S and ammonia.

Prior to placing any injection well into, or back into, service, these geothermal noncondensible gases capping the geothermal fluid would be discharged unabated to the atmosphere through a stack on the well site.

COMPLIANCE WITH APPLICABLE REGULATIONS

Rule 201 Permits Required

The Project is a new Facility that will emit air contaminants and thus requires an Authority to Construct from the ICAPCD.

Rule 206 Processing of Applications

Rule 206.A.4.c provides that the Air Pollution Control Officer shall take reasonable steps to insure that no Project will emit air contaminants that may endanger the short or long term health, safety or property of Persons. Attached as APPENDIX B is an assessment of the potential health risks of the benzene and hydrogen sulfide emissions from the geothermal noncondensible gas system. This assessment demonstrates that the Project would not emit benzene or hydrogen sulfide that would endanger the long-term health of nearby sensitive receptors.

Rule 207 New and Modified Stationary Source Review

Rule 207.C.1.a requires Best Available Control Technology (BACT) for equipment with the potential to emit 25 pounds per day or more of any nonattainment pollutant or its precursors.

The PM10 potential to emit from each cooling tower would exceed 25 lbs/day (see Table 7), and will require BACT, in the form of high efficiency drift eliminators capable of controlling cooling tower drift to 0.0005 percent or less of the circulating cooling water.

Each OEC Unit has the potential to emit more than 25 lbs/day of ROCs (isopentane) from major maintenance activities (see Table 7) and will require BACT. For each OEC Unit, BACT is use of the Maintenance VRU during OEC Unit maintenance activities. In addition, the use of OEC VRUs on each OEC Unit condenser and frequent inspection, monitoring and maintenance of each OEC Unit limits isopentane emissions.

The well pad high pressure separators have the potential to emit ROCs (benzene) in excess of 25 lbs/day (see Table 1) and will require BACT. Seventy-five percent (or more) of the noncondensible gases (including benzene) separated by the high pressure separators will be dissolved/entrained in the geothermal brine as it is injected into the geothermal fluid injection wells. None of these gases will be emitted to the atmosphere. The other twenty-five percent (or less) of these separated geothermal noncondensible gases would flow through dedicated pipelines to the RTO unit/caustic scrubber system located at the power plant site. This system is considered BACT for the ROCs in this noncondensible gas stream as it will remove a minimum of 98 percent of the benzene in this gas stream.

Rule 207.C.1.c requires Best Available Control Technology (BACT) for equipment with the potential to emit 55 pounds per day or more of hydrogen sulfide. None of the well pad high pressure separators will individually have the potential to emit more than 55 lbs/day of hydrogen sulfide, although together they will have the potential to emit more than 55 lbs/day of hydrogen sulfide during operations (see Table 1). These gases will be directed to the RTO unit/caustic scrubber system located at the power plant site, which will remove at least 98 percent of the hydrogen sulfide in this gas stream, which is considered to be BACT for the removal of hydrogen sulfide from these types of gasses.

Best Available Control Technology would not be required for any other emission unit.

Rule 207.C.2.a requires offsets for all emissions of ROCs, PM10 and other nonattainment pollutants from a source that exceed 137 pounds per day. The power plant would emit ROCs in excess of 137 pounds per day, so offsets will be required for the Facility. With ROCs emissions of 154.31 lbs/day (including the two emergency engines - see Table 15), the Facility would require offsets (at a ratio of 1.2 to 1) for 17.31 lbs/day, or 0.79 tons/quarter. However, Rule 207.C.f allows the Air Pollution Control Officer to exempt the two emergency engines from the offset requirements of Rule 207.C.2, which Ormat hereby requests. Without the ROC emissions from the two emergency engines, Facility ROC emissions would be 154.12 lbs/day, and the Facility would require offsets (at a ratio of 1.2 to 1) for 17.12 lbs/day, or 0.78 tons/quarter.

Offsets would not be required for any other attainment or nonattainment air pollutant.

Rule 208 Permit to Operate

The ICAPCD may inspect and evaluate the new equipment prior to allowing the project to operate under its Permit to Operate. The Project would be available to the ICAPCD for inspection once it is constructed and commences operation.

Rule 216 Construction or Reconstruction of Major Stationary Sources that Emit Hazardous Air Pollutants

Rule 216 requires stationary sources of hazardous air pollutants to install best available control technology for toxics (T-BACT) on any constructed major source.

The well pad high pressure separators together have the potential to emit benzene in excess of 10 tons/yr and will require the implementation of T-BACT. Seventy-five percent or more of the benzene separated by the high pressure separators will be dissolved/entrained in the geothermal brine as it is injected into the geothermal fluid injection wells. None of this benzene will be emitted to the atmosphere. The other twenty-five percent (or less) of the benzene in the

separated geothermal noncondensible gases would flow through dedicated pipelines to the RTO unit/caustic scrubber system located at the power plant site. This scrubbing system is considered T-BACT for the benzene in this noncondensible gas stream as it will remove a minimum of 98 percent of the benzene in this gas stream.

Rule 400 Fuel Burning Equipment – Oxides of Nitrogen

Each of the emergency standby diesel engines would emit less than 5 lb/hour of NOx (see Table 9), far less than the standard of 140 lb/hour of NOx. They would each also operate less than 50 hours per 12 month period and emit far less than the annual 5 tons of NOx standard (see Table 11).

The definition of "fuel burning equipment" in Rule 101 excludes equipment that "serves primarily as air pollution control equipment by using a combustion process to destroy air contaminants." Thus, the proposed RTO unit/caustic scrubber system is not considered "fuel burning equipment," and Rule 400 is not applicable to the proposed RTO unit/caustic scrubber.

Rule 401 Opacity of Emissions

The cooling tower water vapor emissions are exempted from the requirements of Rule 401. The emissions of particulates from each of the emergency standby diesel engines would be in compliance with the California diesel particulate ATCM, and thus have an opacity substantially lighter than the No. 1 on the Ringlemann Chart (20% opacity) required by Rule 401.

Rule 403 General Limitations on the Discharge of Air Contaminants

Rule 403 prohibits emission of particulate matter in excess of the emission rates in Table 403-1. The weight of the cooling water circulating through each cooling tower is about 55,000,000 lbs/hr. In Table 403-1, the maximum discharge of particulate matter for any process that handles more than 1,000,000 lbs/hr is 30.0 lbs/hr. The particulate potential to emit from each cooling tower would be less than 3.0 lbs/hr (see Table 7).

Rule 403 also prohibits emission of air contaminants in excess of the rates in Table 403-2. The dry volume of gas (air) flowing through each cell of each cooling tower is estimated at 1,300,000 dry standard cubic feet per minute (dscfm), or about 13,000,000 dscfm for each 10-cell cooling tower. In Table 403-2, the maximum concentration of particulate matter in the discharge of any process that handles more than 2,472,000 dscfm is 0.0100 grains/dscf. The concentration of particulate matter in each cooling tower is calculated at less than 0.00003 gr/dscf (see Table 16).

Table 16: Calculation of Maximum Concentrations of Air Contaminants

Description	Maximum Concentration of Air Contaminants				
	PM	PM10	H2S	H2S	H2S
Cooling Tower emissions [each tower] (lbs/hr):	2.584	2.584			
RTO Unit/Caustic Scrubber System emissions (lbs/hr):			0.058		
Sand separators emissions (lbs/hr):				0.103	
Injection filter emissions (lbs/hr):					0.007
Cooling Tower emissions (grains/min):	301.5	301.5			
Cooling Tower dscfm [each tower]:	13,000,000	13,000,000			
Cooling Tower Air Contaminant Concentrations (grains/dscf):	0.0000232	0.0000232			
Concentration Limitation - Rule 403.B.2:	0.0100	0.0100			
(Exceeded?)	NO	NO			
Noncondensible Gases in Geothermal Brine (%):				0.55%	0.55%
Mass of Noncondensible Gases Emitted (lbs/hr):			45,689.7	505.2	35.1
Molecular Weight of Air:			28.97	28.97	28.97
Molecular Weight of Carbon Dioxide:			44.01	44.01	44.01
CO2/air molecular mass ratio:			1.52	1.52	1.52
Density of Dry Air at STP (lbs/cu ft):			0.075	0.075	0.075
Density of Dry CO2 Gas at STP (lbs/cu ft):			0.114	0.114	0.114
Volume of Noncondensible Gases Emitted (cu ft/hr):			401,008.8	4,434.3	308.5
Molecular Weight of Hydrogen Sulfide:			34.08	34.08	34.08
Molecular Weight of Sulfur Dioxide:			64.06	64.06	64.06
SO2/H2S molecular mass ratio:			1.88	1.88	1.88
Sulfur Dioxide equivalent mass emission rate (lbs/hr):			0.110	0.193	0.013
Density of Dry SO2 Gas at STP (lbs/cu ft):			0.166	0.166	0.166
Volume of Sulfur Dioxide Equivalent Gases Emitted (cu ft/hr):			0.6620	1.1665	0.0811
Sulfur Dioxide Concentration (%):			0.00017%	0.02631%	0.02631%
Sulfur Dioxide Concentration Limit (%) (Rule 405B.1.a):			0.20000%	0.20000%	0.20000%
(Exceeded?)			NO	NO	NO

Rule 405 Sulfur Compounds Emission Standards, Limitations and Prohibitions

Rule 405B.1.a prohibits the discharge into the atmosphere of sulfur compounds, calculated as sulfur dioxide, in excess of 0.2 percent by volume, measured at the point of discharge. The maximum concentration of hydrogen sulfide, calculated as sulfur dioxide, in the geothermal noncondensible gases which would be discharged through the sand separators, injection filter system and condensate drains is 0.02631 percent by volume (see Table 16). The concentration of hydrogen sulfide, calculated as sulfur dioxide, in the RTO unit/caustic scrubber system which would be discharged through the scrubber system stack is 0.00025 percent by volume (see Table 16). Both are substantially below the limit of 0.2 percent by volume.

Rule 800-805 Fugitive Dust Requirements for Control of Fine Particulate Matter (PM10)

These rules control fugitive dust emissions from construction and earthmoving activities, from carry out and track out, from open areas, and paved and unpaved roads. If necessary, Ormat would revise its current dust control plan and provide 10-day advance notice to the ICAPCD. During construction, Ormat would water disturbed lands to reduce dust emissions. After construction fugitive dust from open areas would be controlled through application and maintenance of water or dust suppressant(s) to all unvegetated areas, establishing vegetation on previously

disturbed areas, or paving, applying and maintaining gravel, or applying and maintaining chemical stabilizers/suppressants.

Rule 900 Procedures for Issuing Permits to Operate for Sources Subject to Title V of the Federal Clean Air Act Amendments of 1990

The Facility does not have the potential to emit 100 tons per year (tpy) or more of any regulated air pollutant. The Facility would have the potential to emit 10 tpy or more of benzene, a hazardous air pollutant (HAP), except for the implementation of the RTO unit/caustic scrubber system. If the Facility's request for synthetic minor source status is accepted by the District, the Facility would not be a major source subject to Rule 900.

Rule 902 - Request for Synthetic Minor Source Status

This rule authorizes the owners or operators of specified stationary sources that would otherwise be major sources (pursuant to Rule 900) to request and accept federally-enforceable emissions limits sufficient to allow the sources to be considered "synthetic minor sources." The Facility is submitting as part of this application a request for synthetic minor source status as the proposed implementation of the RTO unit/caustic scrubber system would reduce the Facility's potential to emit benzene, a hazardous air pollutant (HAP), from in excess of 10 tpy to well under 10 tpy. These emission limitations would be set forth in permit conditions practicably enforceable by U.S. EPA and citizens or by the District.

Rule 1101 New Source Performance Standards (NSPS)

All of the stationary emergency engines proposed for the Facility would be new diesel engines, and therefore would be subject to the requirements of 40 CFR Part 60, Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines). Ormat Nevada, Inc. will comply with the requirements of this NSPS by:

- Operating and maintaining the diesel engines according to the manufacturer's written instructions over the entire life of each engine;
- Using fuel which meets the minimum standards set forth in the regulations;
- Installing a non-resettable hour meter prior to startup of the engine;
- Limiting maintenance checks and readiness testing of each engine to less than 50 hours per year; and
- Keeping records of the operation of each engine in emergency and non-emergency service that are recorded through the non-resettable hour meter, including recording the time of operation of each engine and the reason each engine was in operation during that time.

Rule 1002 California Airborne Toxic Control Measures (ATCMs)

Each of the two emergency standby diesel engines would meet the applicable CARB Tier stationary compression ignition engine exhaust emission standards and comply with the CARB "Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines" for new stationary emergency standby diesel-fueled compression ignition engines >50 bhp. In compliance with the ATCM, each of these diesel engines would be tested for a total of less than 50 hours per year (for up to one hour per day). Other than for testing, each emergency standby engine would operate only in emergencies. Each engine would also burn CARB diesel fuel (≤15 ppm sulfur).

Rule 1003 Hexavalent Chromium Emissions from Cooling Towers

The cooling towers would not use additives containing hexavalent chromium, and would thus be eligible for exemption from testing requirements.

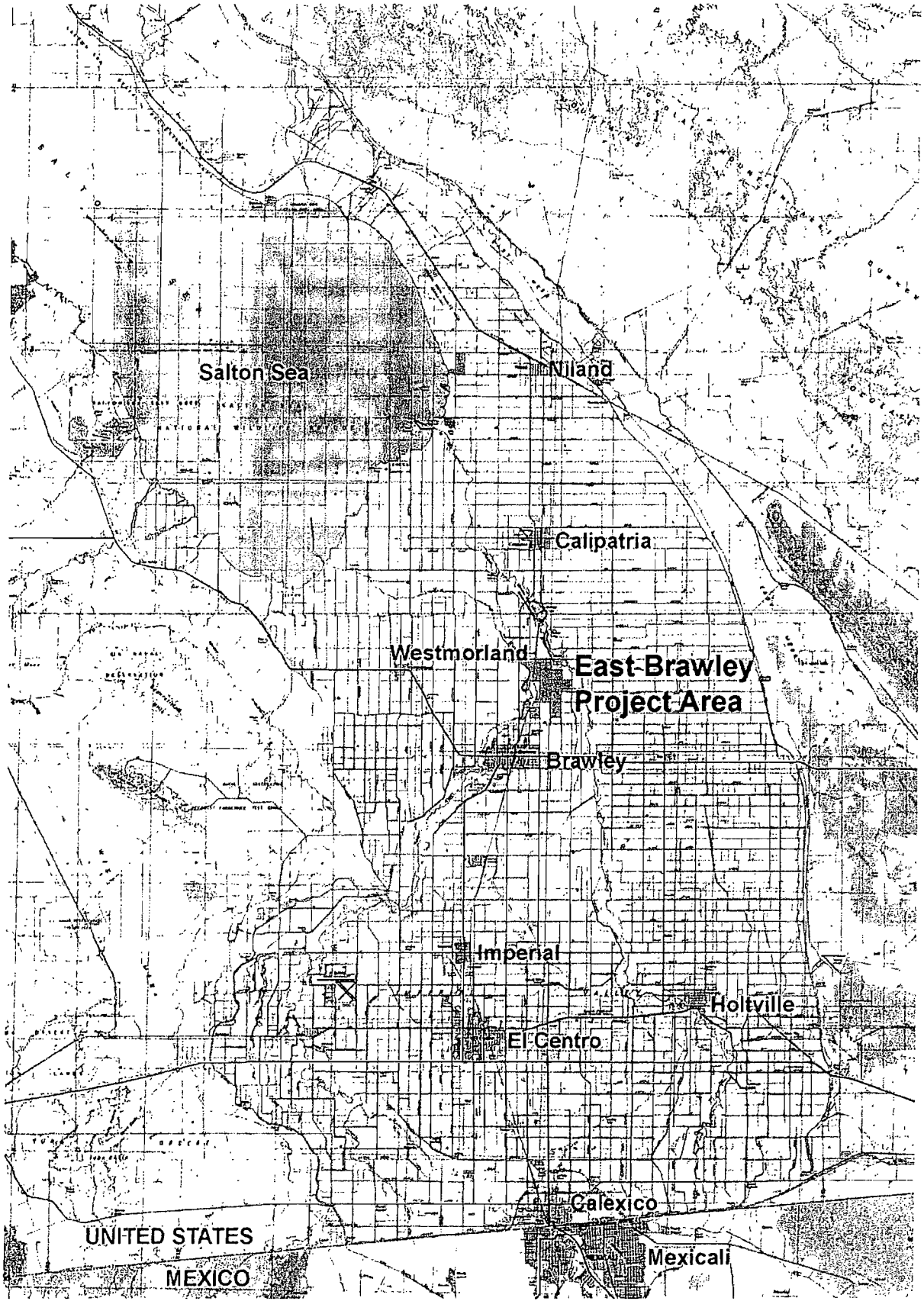


Figure 1: East Brawley Geothermal Development Project Location Map

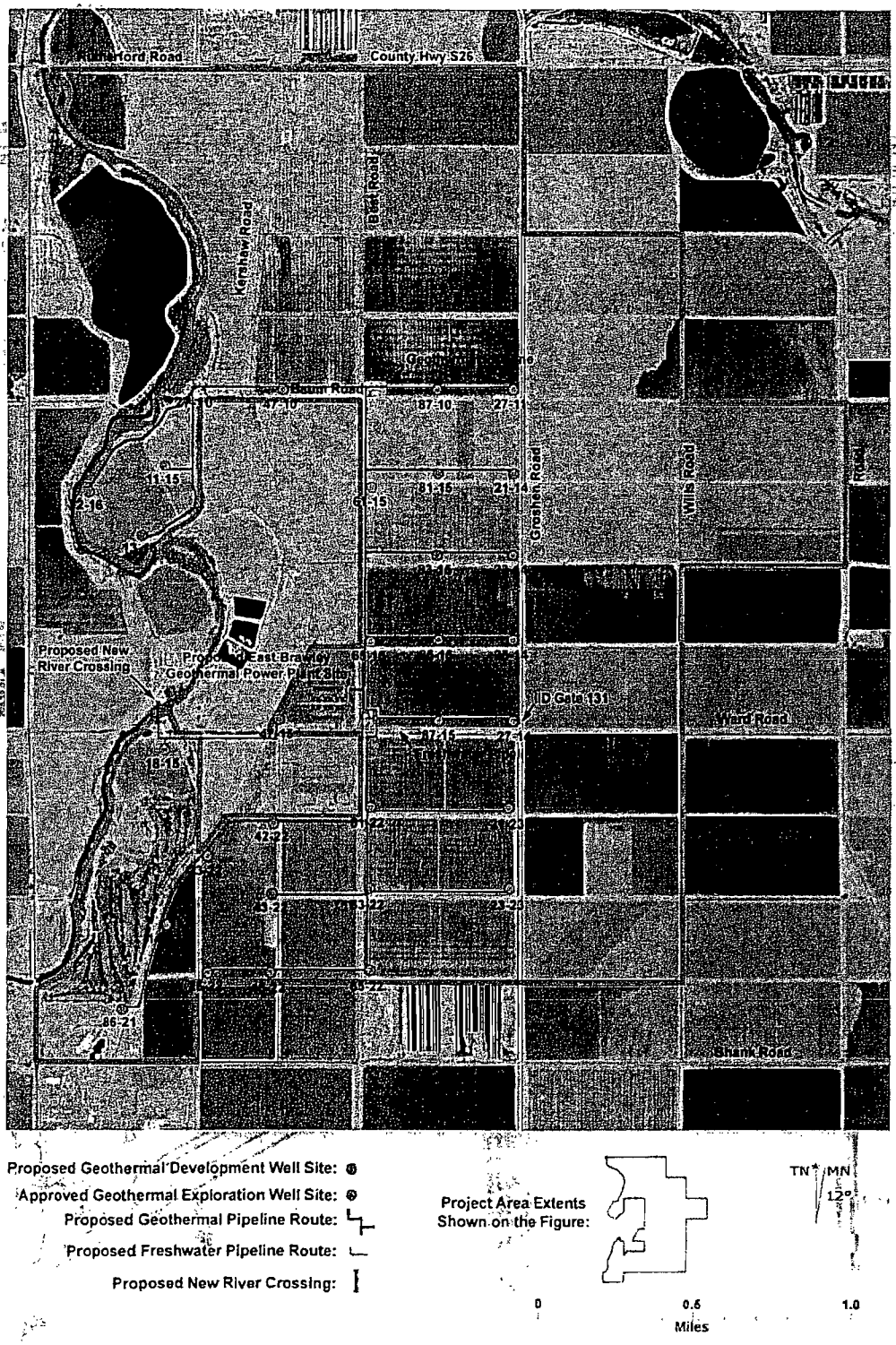


Figure 2: East Brawley Project Power Plant and Wellfield Map

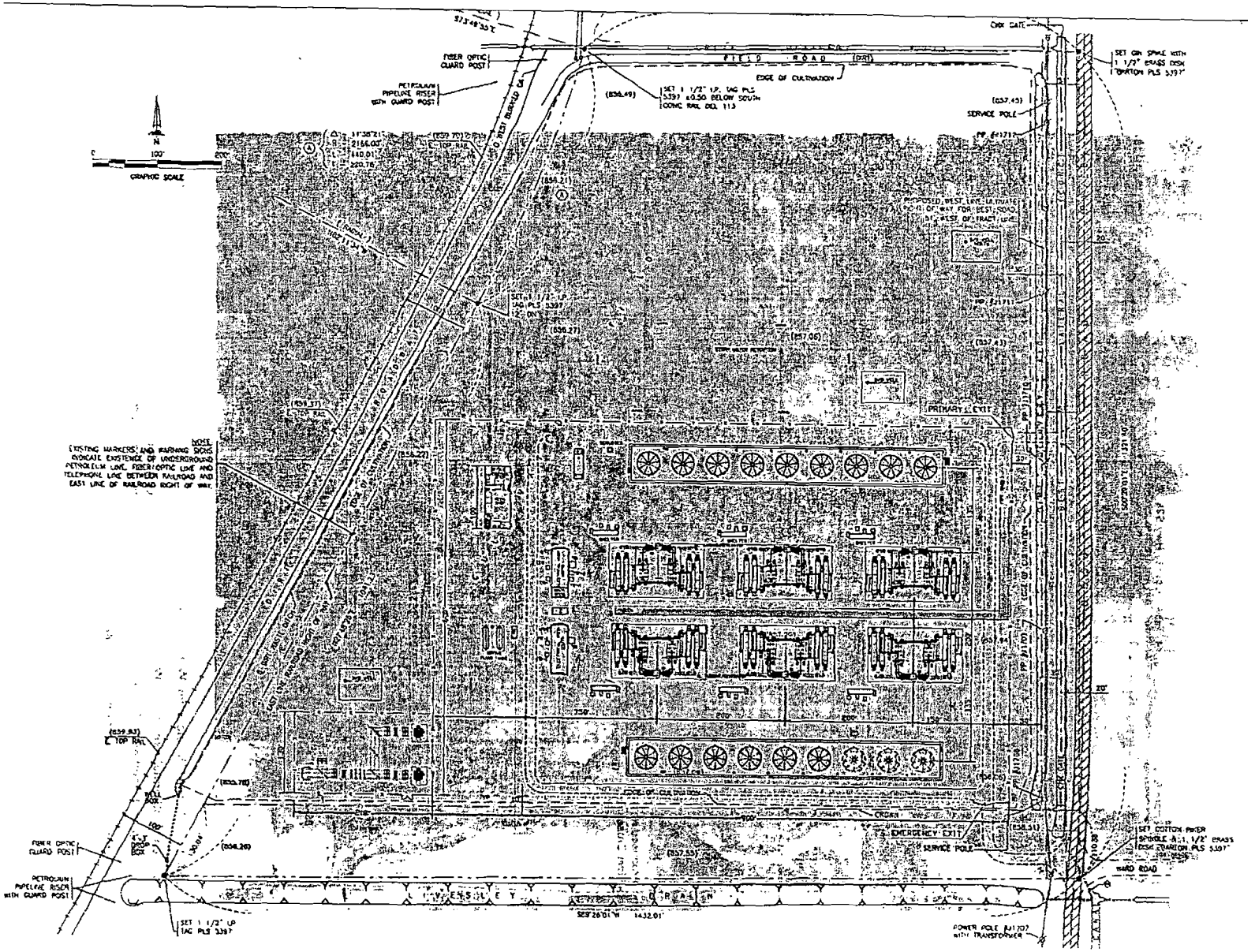


Figure 3: East Brawley Project Power Plant General Arrangement – Map View

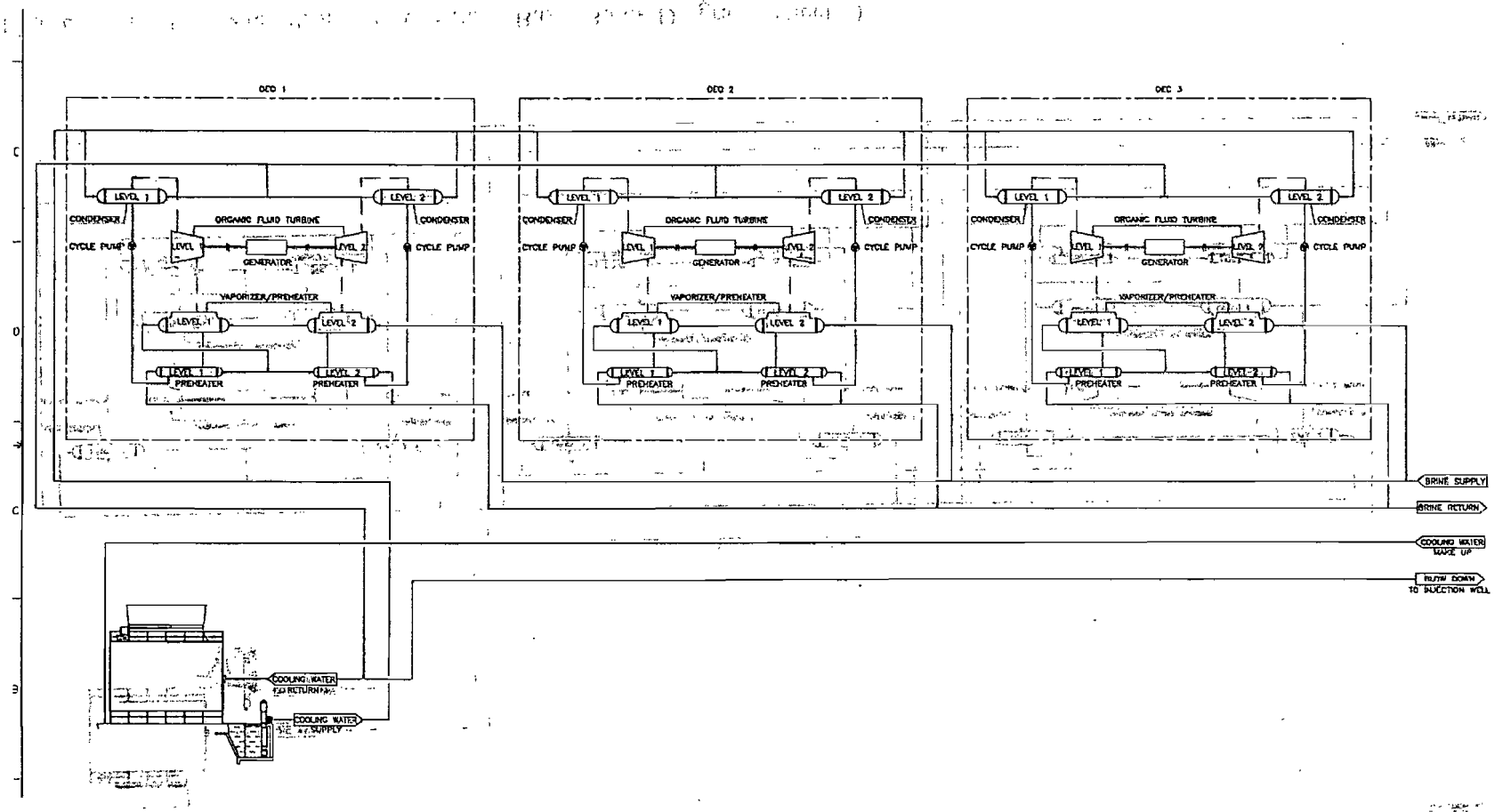


Figure 4: East Brawley Project Power Plant Basic Block Diagram (Sheet 1)

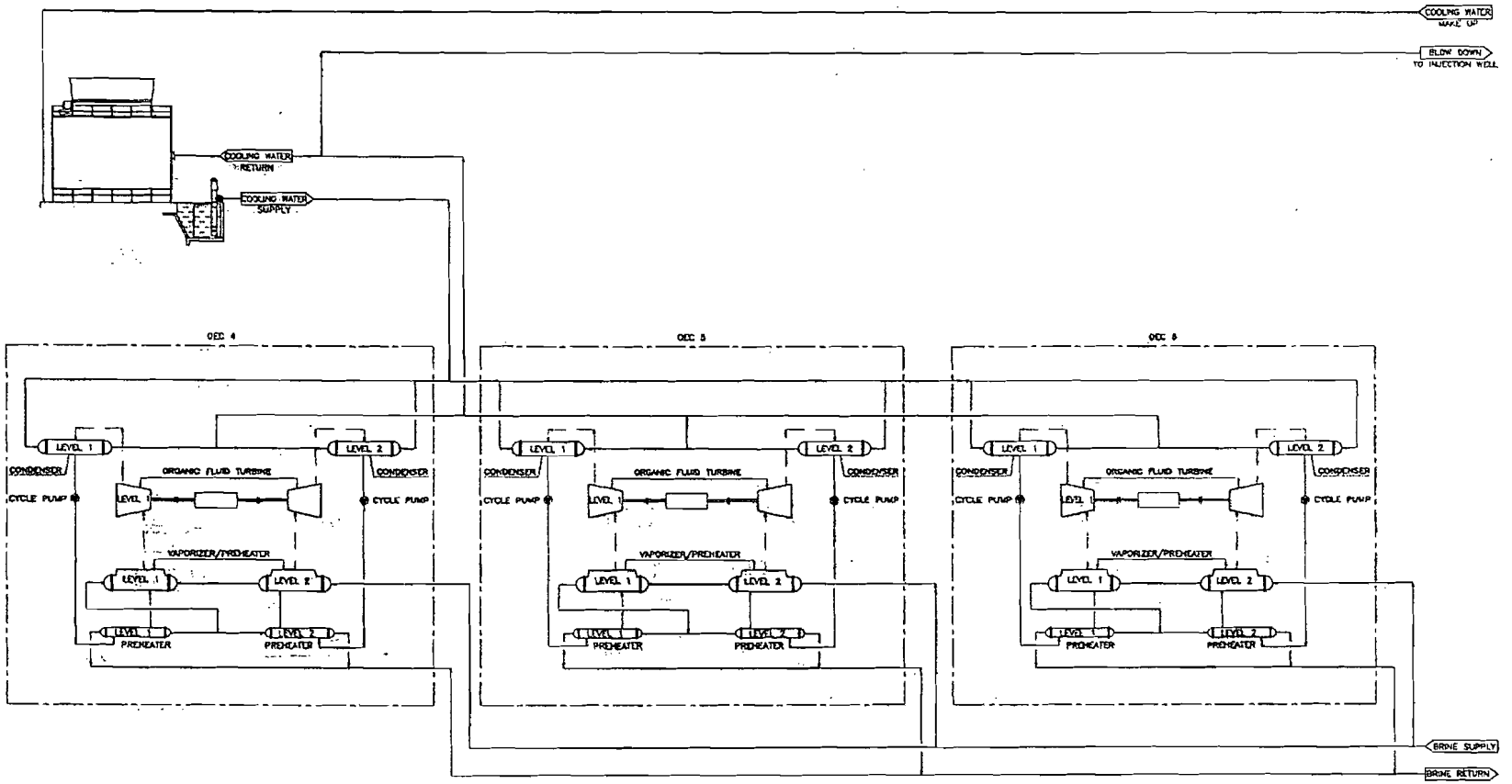


Figure 5: East Brawley Project Power Plant Basic Block Diagram (Sheet 2)

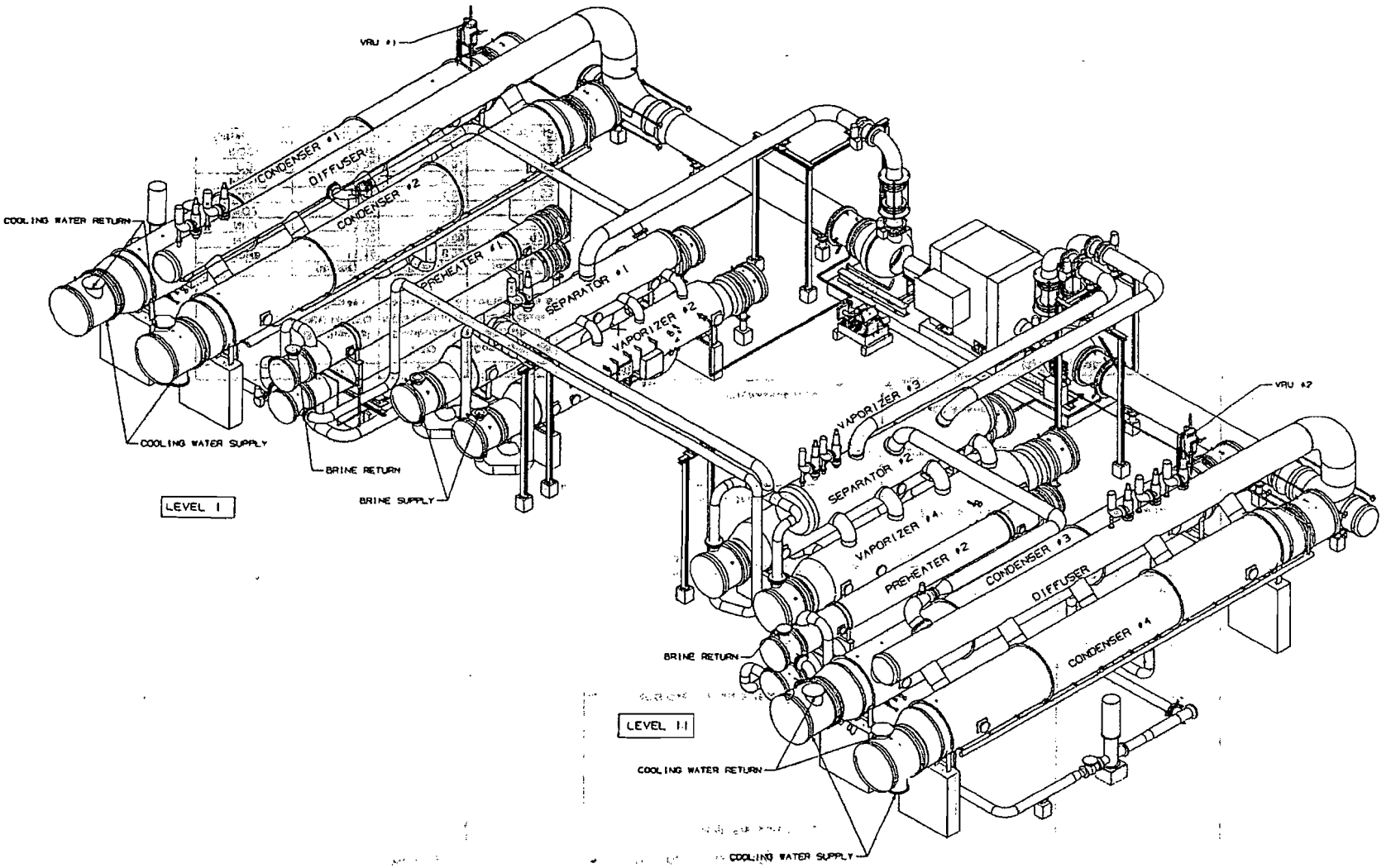
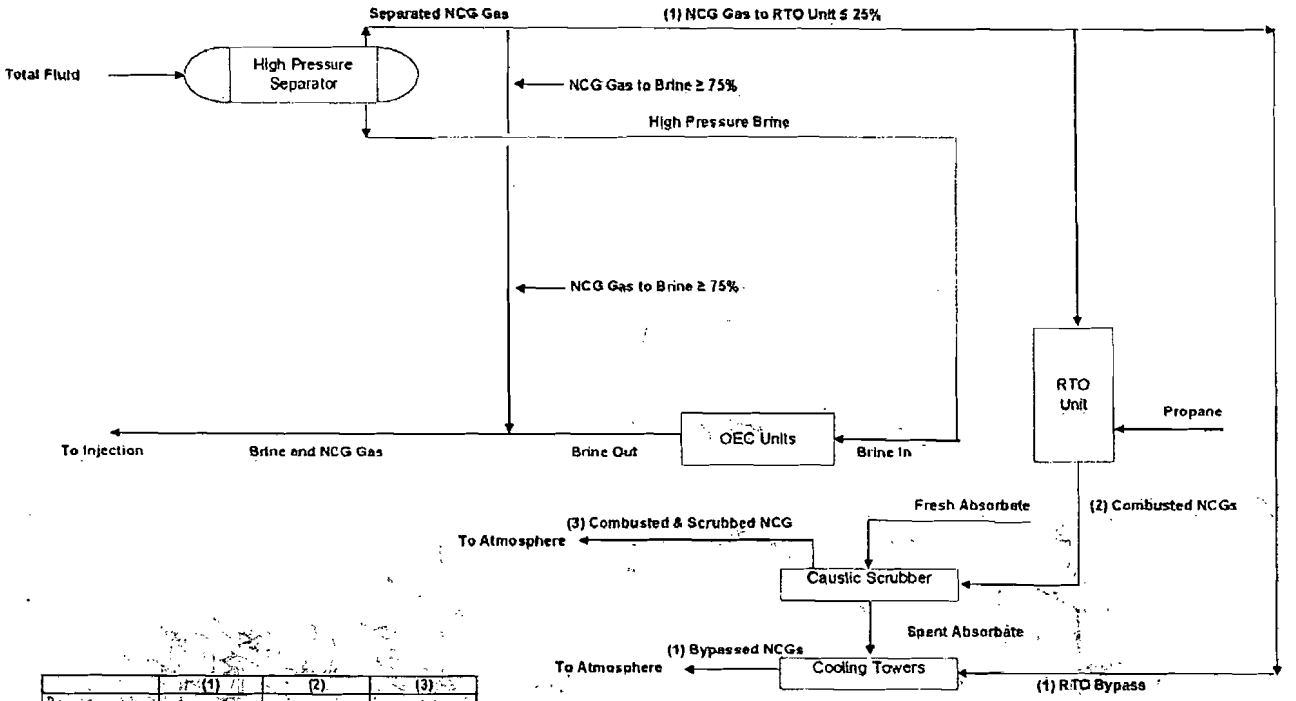


Figure 6: General Arrangement (Perspective View) of Single OEC Unit (One of Six)



	(1)	(2)	(3)
	Geothermal NCG to RTO or Bypass	RTO Combusted NCG (includes combustion & air)	Combusted & Scrubbed NCG (includes combustion & air)
	(lbs/hr)	(lbs/hr)	(lbs/hr)
C6H6	11.16	0.22	0.22
H2S	2.92	0.06	0.06
NH3	0.35	0.00	0.00
SO2	0.00	5.38	0.13
NOx	0.00	1.03	1.03
PM10	0.00	0.00	0.50
CO	0.00	0.01	0.01
ROCs	11.16	0.22	0.22
Other NCG	28,074.32	45,683.63	45,687.49

Figure 7: East Brawley Noncondensible Gas Separation and RTO Unit/Caustic Scrubber System Process Flow Diagram

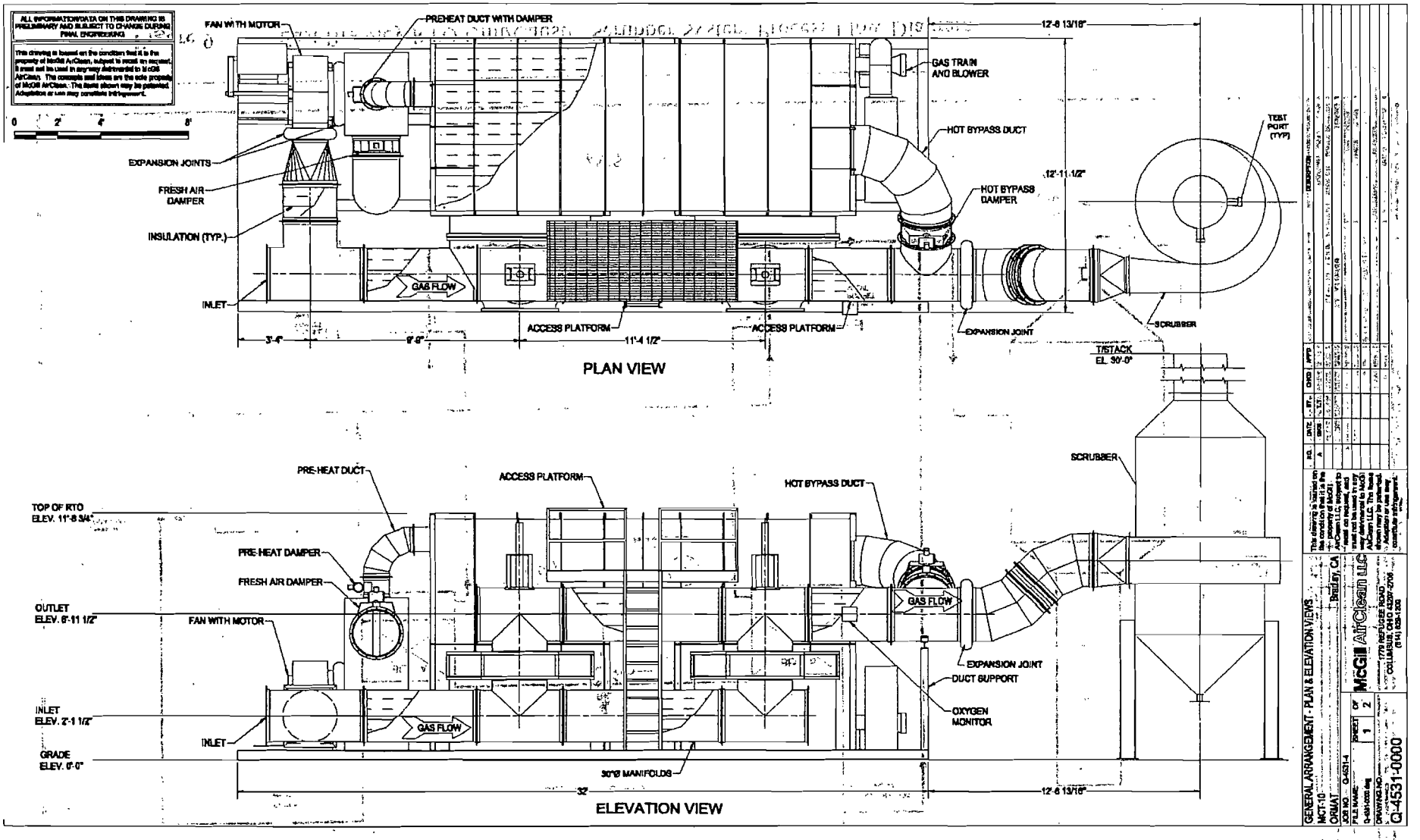


Figure 8: East Brawley RTO Unit/Caustic Scrubber System General Arrangement – Plan and Elevation Views

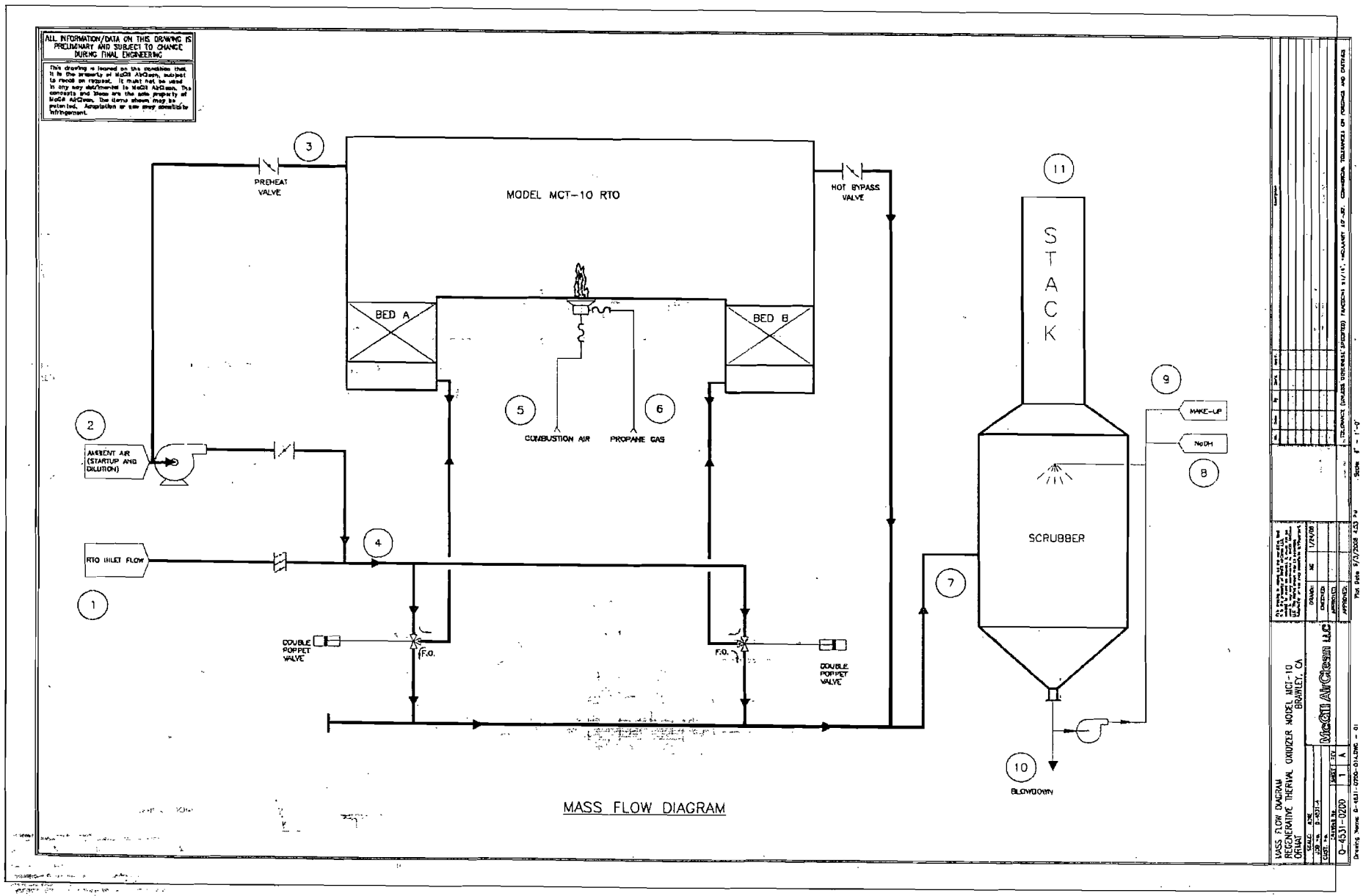


Figure 9: East Brawley RTO Unit/Caustic Scrubber System Process Flow Diagram

E

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May 12, 2008

Mr. Jurg Heuberger, Planning Director
Imperial County Planning & Development Services
801 Main Street
El Centro, CA 92243

Subject: CUP #07-0017, Request for Amendment

Dear Mr. Heuberger:

As provided for by Condition G-14 of this CUP, Ormat Nevada Inc. requests a minor amendment to Condition S-1 (a), (c), (d) and (g) for the North Brawley geothermal development project as a result of the exploration wells that were drilled and the additional leases acquired since the initial CUP application was submitted. An amended Authority to Construct application was also submitted to the Imperial County Air Pollution Control District on March 27, 2008 as a result of the flow testing performed on the exploration wells (enclosed). Ormat believes the land use changes described below are environmentally insignificant as compared to the original project description.

1. The original well field layout was based on the known resource data and the leased area. Based on additional lease acquisition the area proposed for this project is larger but the number of wells, either production or injection, remain the same. It is also planned to use well pads for more than 1 well, thus, potentially reducing the number of well pads for the project too. The well nomenclature has been changed from OB to the Kettleman system commonly used on federal lands. A revised map to the one in the CUP application and a revised Table 1 which shows the landowner information along with the new well names are enclosed. Conditional Use Permit application forms, Owner Affidavits and Indemnification Agreements are enclosed for the lands that were added to the project area.

2. Each production well will have a corrosion inhibitor and scale inhibitor container at their location. The container, size and type to be determined, will have secondary containment.

3. Each production well or well pad will have a gas separator to separate entrained gas from the brine. Approximately 25% of the separated gas will be sent to the power plant in a pipeline that parallels the brine pipeline. The balance of the gas will travel to injection wells in a pipeline that parallels the brine pipeline to be injected along with cooled brine from the power plant.

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4. Each production well will have a geothermal fluid booster pump to pump the fluid to the power plant.

5. Each production well will have a sand separator that operates occasionally to remove sand from geothermal fluid. The sand will be collected in tanks for disposal.

6. Two (2) cooling tower blowdown wells will be drilled within the power plant site, 68-17 and 68A-17.

7. The separated gas will go through a gas scrubber at the power plant. See revised power plant site plan and flow diagram. The separated gases will both vented and combined with the cooling tower blowdown for injection.
   a. The amount of green house gases emitted, methane and carbon dioxide, are less than half of those allowed under AB 32 for new generation in California.
   b. Hydrogen sulfide emissions will be abated in the gas scrubber to 48 lb/day using sodium hydroxide as required by the Imperial County Air Pollution Control District's (ICAPCD) Rule 207.C.1.c.
   c. Benzene emissions will be limited to just under 50 lbs/day by combining the gases for injection with the cooling tower blowdown. We believe this meets the intent of ICAPCD Rule 207.C.1.a. for Best Available Control Technology for a nonattainment pollutants or its precursors. The benzene emissions will increase the plant's emissions of nonattainment pollutants to 187 lbs/day; thus, as required by Rule 207 C.2.a. emission offsets will be required for all emissions greater than 137 lbs/day.

Although there have been changes to the Brawley project since it's inception Ormat has strived to redesign a project that not only meets all rules and regulations but provides environmental benefit to Imperial County. The project is in construction and we hope to be commercial by the end of the year. Thank you for your consideration. Please contact me at 775-336-0155 if you have any questions or need more information.

Sincerely,

Charlene L Wardlow

Charlene L. Wardlow
Environmental/Regulatory Affairs Administrator

Enclosures

ORMAT Nevada
6225 Neil Road, Reno, NV, 89511 • Telephone (775) 356-9029 • Facsimile (775) 356-9039

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cc: Brad Poiriez, Air Pollution Control District
Richard Cabanilla, Planning & Development Services
Mario Martinez, Ormat Nevada Inc.
Skip Matlick, Ormat Nevada Inc.
Bob Sullivan Ormat Nevada Inc.

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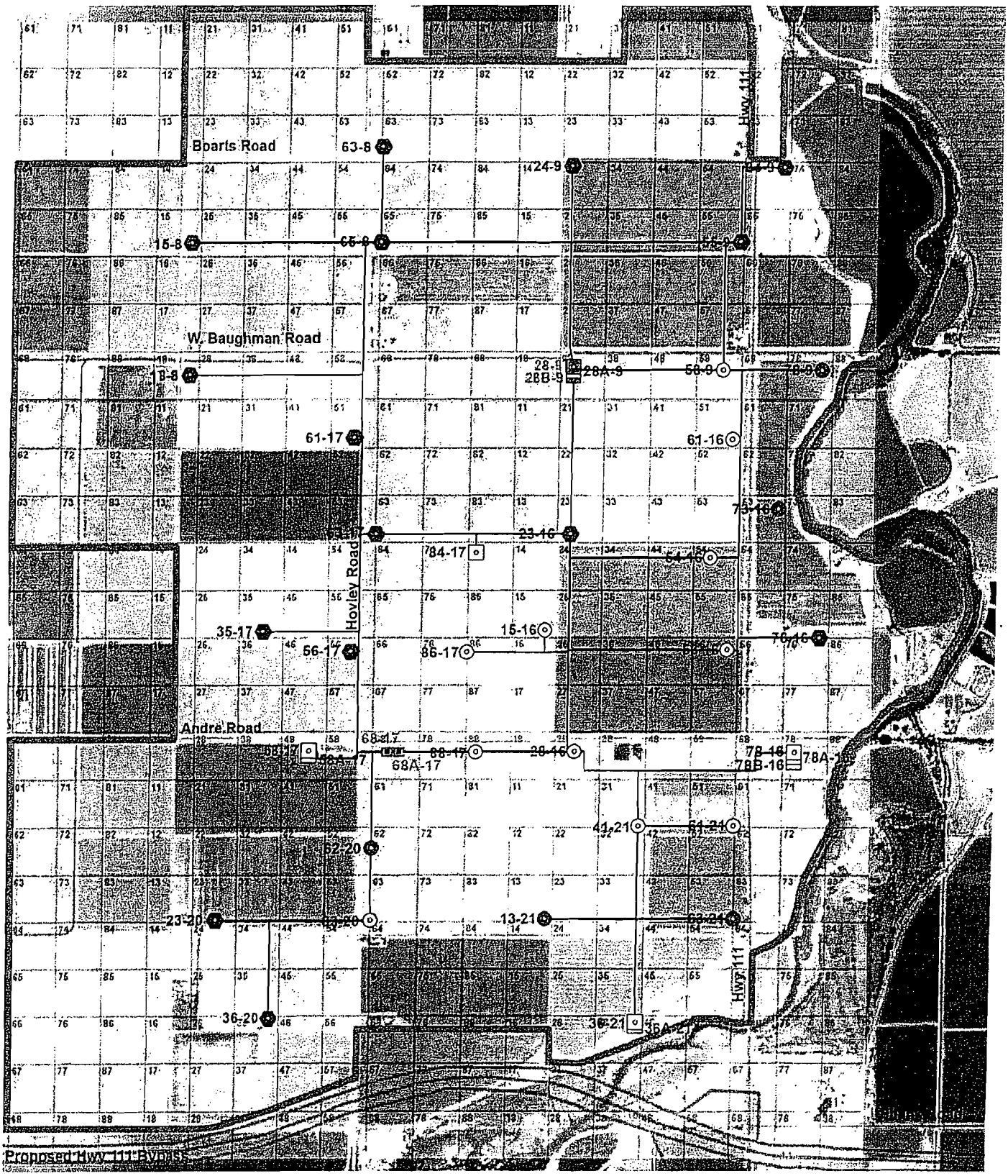
6225 Neil Road, Reno, NV, 89511 • Telephone (775) 356-9029 • Facsimile (775) 356-9039



0 1,000 2,000
Feet

Project Area Extents Shown on Figure

N

LEGEND

Production Well:
Injection Well:
Proposed Production Well:
Proposed Injection Well:
Proposed Production or Injection Well:
Blowdown Well:
Geothermal Pipeline:

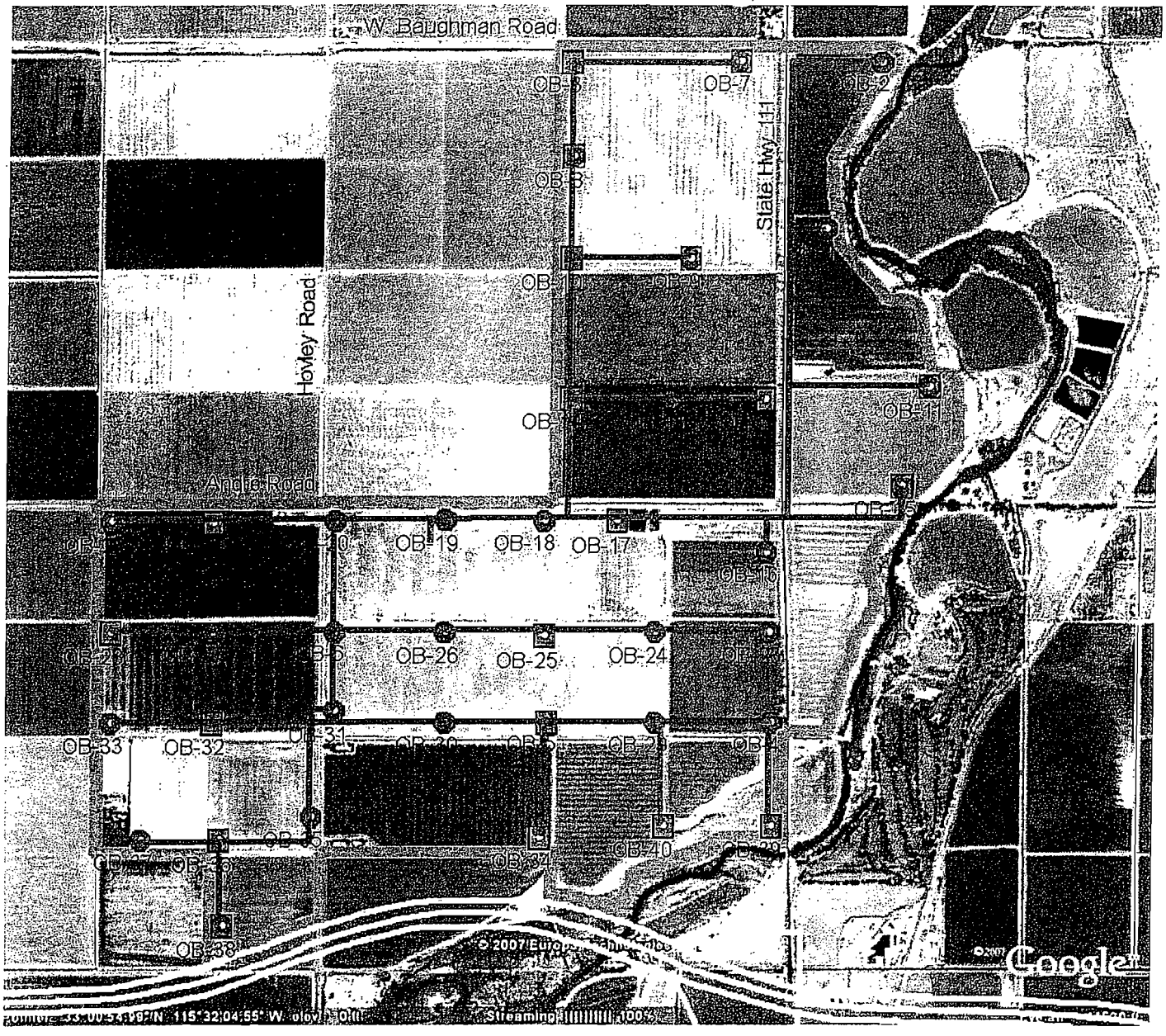


Figure 3: North Brawley Wellfield and Pipeline Systems

F

IMPERIAL COUNTY

PLANNING & DEVELOPMENT SERVICES

PLANNING / BUILDING INSPECTION / ECONOMIC DEVELOPMENT / PLANNING COMMISSION / A.L.U.C.

JURG HEUBERGER, AICP, CEP, CBO
PLANNING & DEVELOPMENT SERVICES DIRECTOR

May 28, 2008

RECEIVED
MAY 29 2008
ORMAT RENO OFFICE

Charlene L. Wardlow
Env. Reg. Affairs Administrator
Ormat Nevada, Inc.
6225 Neil Road
Reno, NV 89511

Subject: ***Request for Minor Amendment to CUP #07-0017***
APN# 037-130-040-000/North Brawley Binary Plant

Dear Charlene:

The County Planning and Development Services Department received on May 14, 2008, your request for a "Minor Amendment" to the above permit. The CUP section ***G-14, Minor Amendments***, permits the Planning Director to approve minor modifications to the permit on the design, construction and operation of the project. This approval is based upon a determination that the proposed minor changes will not result in any additional environmental impacts.

The proposal is to spread out the binary plant's production and injection islands based on the acquisition of additional leases in the project area. The original well field is proposed to be expanded northward and westward and that ORMAT intends "...to use well pads for more than 1 well, thus, potentially reducing the number of well pads for the project..." ORMAT shall comply with all of the environmental mitigation measures within CUP #07-0017 including the S-6 and S-7 conditions for Archaeological/Cultural/Paleontological Resources and Biological Resources and doing a pre-construction survey for the Burrowing Owl on the proposed new well pads.

If you have any questions, please contact Richard Cabanilla, Planner IV, at (760) 482-4236, extension 4313.

Sincerely,

JURG HEUBERGER, AICP, CEP
Planning and Development Services
Department Director

cc: Darrell Gardner, Asst. Planning & Dev. Services Director
Jim Minnick, County Planning Division Manager
Files: CUP #07-0017/10.101/10.102/10.103/10.105

RC/aa/S: APN FILE 037\130\040\MinorAmendmentLetterORMAT

G-14 MINOR AMENDMENTS:

The Planning Director may approve minor modifications to the permit to accommodate minor changes or modifications to the design, construction, and/or operation of the project provided said changes are necessary for the project to meet other laws, regulations, codes, or conditions of the CUP and provided further, that such changes will not result in any additional environmental impacts.

G-15 SPECIFICITY:

The issuance of this permit does not authorizes the Permittee to construct or operate the project in violation of any state, federal, local law nor beyond the specified boundaries of the project as shown the application/project description/permit, nor shall this permit allow any accessory or ancillary use not specified herein. This permit does not provide any prescriptive right or use to the Permittee for future addition and or modifications to the project.

G-16 NON-COMPLIANCE (ENFORCEMENT & TERMINATION):

Should the Permittee violate any condition herein, the County shall give notice of such violation. If Permittee does not act to correct the identified violation and, after having given reasonable notice and opportunity, e.g. typically at least thirty (30) days, the County may revoke the permit.

(a) If the Planning Commission finds and determines that the Permittee or successor-in-interest has not complied with the terms and conditions of the CUP, or cannot comply with the terms and conditions of the CUP, or the Planning Commission determines that the permitted activities constitute a public nuisance, the Planning Director shall provide Permittee with notice and a reasonable opportunity to comply with the enforcement or abatement order;

(b) If after receipt of the order, (1) Permittee fails to comply, and/or (2) Permittee cannot comply with the conditions set forth in the CUP, then the matter shall be referred to the Planning Commission for permit modification suspension, or termination, or to the appropriate prosecuting authority.

G-17 GENERAL WELFARE:

All construction of the project shall be conducted with consistency with all laws, conditions, adopted County policies, plans and the application so that the project will be in harmony with the area and not conflict with the public health, safety, comfort, convenience, and general welfare.

G-18 PERMITS OF OTHER AGENCIES INCORPORATED:

Permits granted by other governmental agencies in connection with the Project are incorporated herein by reference. The County reserves the right to apply conditions of those permits, as the County deems appropriate; provided that enforcement of a permit granted by another agency shall require concurrence by that agency.

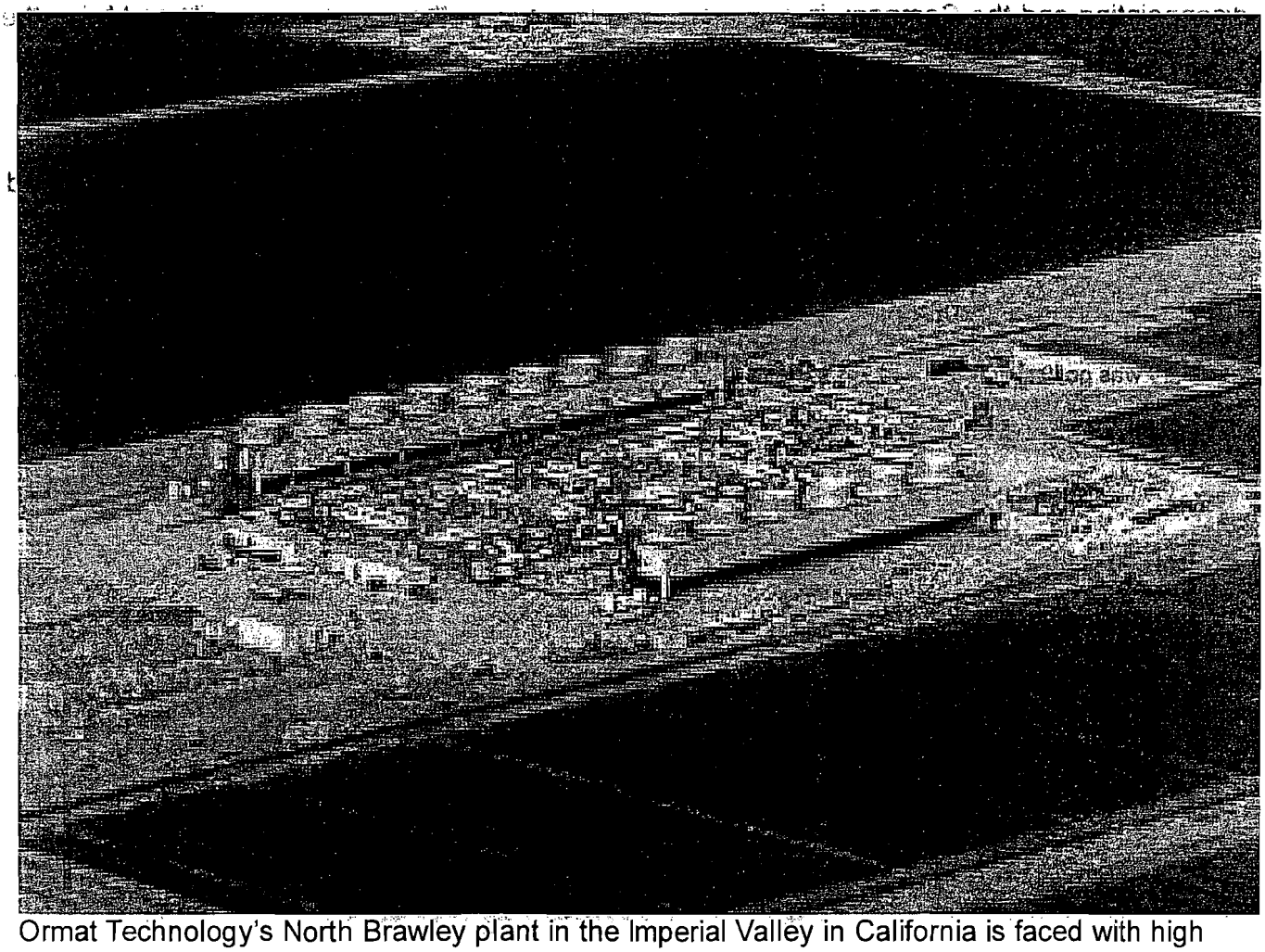
G

Think GeoEnergy – Geothermal Energy News

By Region, By Region,North America, Projects - February 10, 2010

Ormat's North Brawley plant with 17MW short of its 50MW potential

written by: lxrichter



Ormat Technology's North Brawley plant in the Imperial Valley in California is faced with high levels of sand in the geothermal fluid limiting the plant to 17 MW, short of the site's 50 MW potential.

In an article today from the U.S., it is said that "the North Brawley plant in California's Imperial County has encountered delays thanks to high levels of sand in the geothermal fluid. These 'un-dissolved solids' are limiting the plant's capacity; Ormat maintains that the reservoir can support the planned 50MW power plant.

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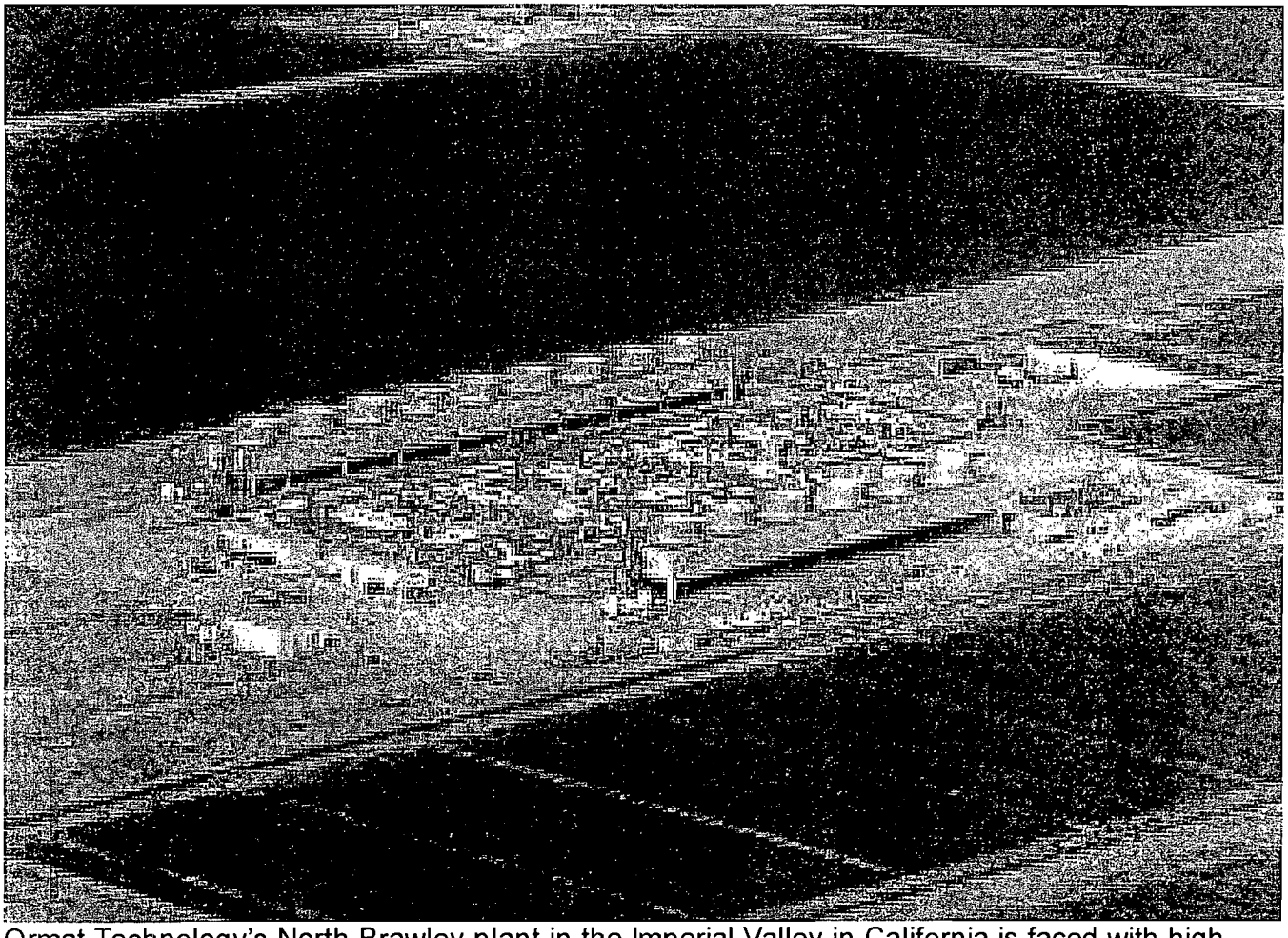

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Over the course of 2009, Ormat executives discussed the challenges they faced that North

Brawley. Finding un-dissolved solids in geothermal fluid is not unique to this site, Ormat chief operating officer Yoram Bronicki told analysts in May, "but I think that the magnitude is probably unique".

While the technology to remove sand from water is not breakthrough, it becomes complicated with high-pressure, high-temperature geothermal fluid. The company has not been able to use off-the-shelf water treatment equipment.

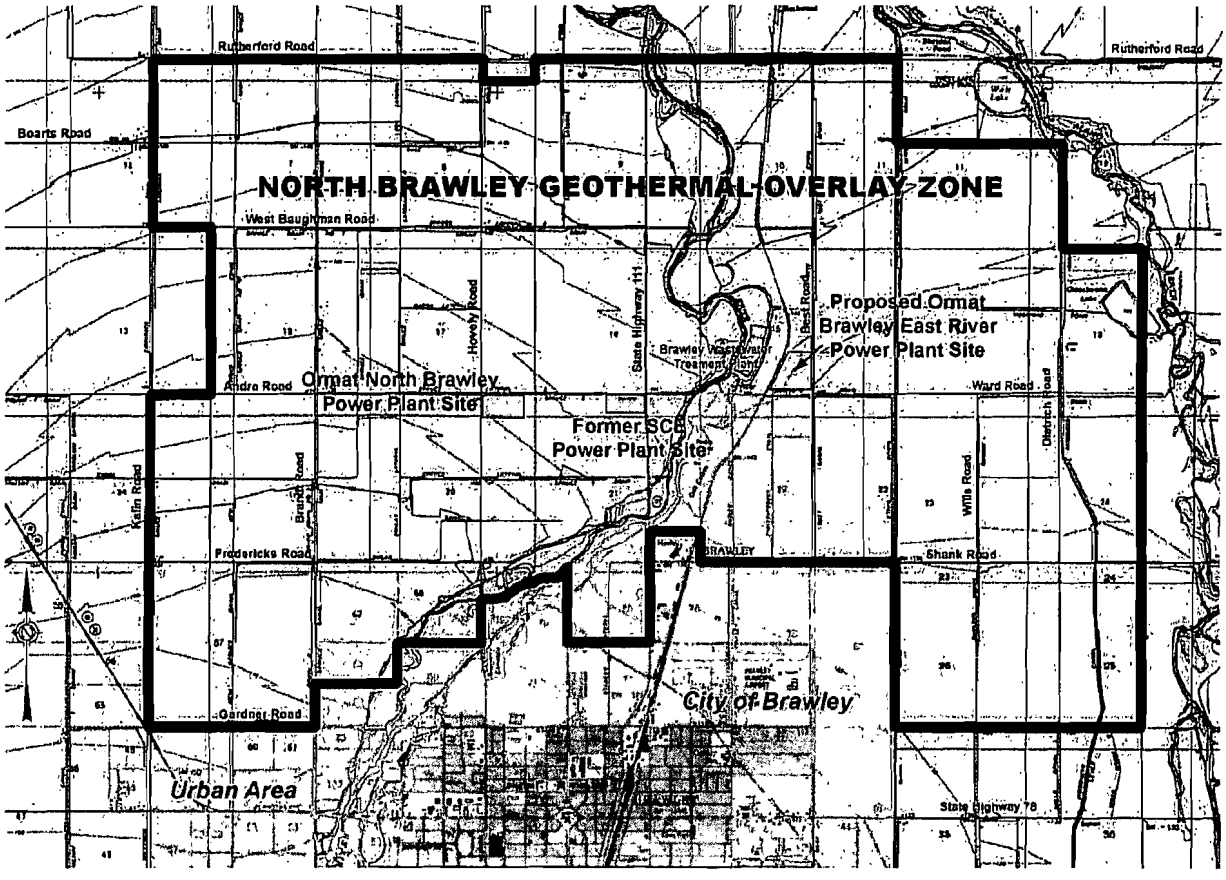
It has made 'substantial progress' using temporary measures to manage the un-dissolved solids and can now maintain the 17MW output level at North Brawley, which was estimated to cost in the range of $300m. Permanent equipment is on order, but even when in place, Ormat may face continued challenges meeting the planned 50MW capacity, in addition to the higher capital costs for fixing the problem.

"[I]t appears that even with the solids in check, the injection capacity of some of the wells is disappointing and the Company is evaluating how to increase the injection capacity and bring the plant to its rated design," Ormat says in a statement. "The Company plans to request the power purchase agreement off taker to extend the firm operation date to the end of the year, which it expects allows sufficient time to bring the power plant to its design capacity of 50MW."

On the bright side, Ormat's approach to removing the sand at North Brawley can be incorporated into the design at the nearby East Brawley site, a 30MW project that is anticipated to face the same problem with un-dissolved solids."

Source: RECharge, Ormat news piece

This entry was posted on Wednesday, February 10th, 2010 at 9:27 am and is filed under By Region, North America, Projects. You can follow any responses to this entry through the RSS 2.0 feed. You can leave a response, or trackback from your own site.



Ormat North Brawley (blue) and East Brawley (pink) power plant sites and Brawley Wastewater Treatment Plant (light blue, west of East Brawley)
(from Draft EIR, Appendix B, Figure 2)

I

IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES
PLANNING / BUILDING INSPECTION / ECONOMIC DEVELOPMENT / PLANNING COMMISSION / A.L.U.C.

JURG HEUBERGER AICP, CEP, CBO
PLANNING & DEVELOPMENT SERVICES DIRECTOR

October 30, 2008

RECEIVED
NOV 03 2008
ORMAT RENO OFFICE

Charlene L. Wardlow
Director Project Development
Ormat Nevada Inc.
6225 Neil Road
Reno, NV 89511

RE: Conditional Use Permit #08-0023 (East Brawley Facility)
APN: 037-140-006-000

Charlene,

The Imperial County Planning & Development Services Department met with the Imperial Irrigation District (IID) today and discussed Ormat's proposed Geothermal Power Plant commonly referred to as the East Brawley Facility. In our discussion with the IID it was made clear that although IID staff has had one in contact with Ormat, said contact was preliminary and that no water availability contract has been drafted, nor is there one proposed in the near future. As you are well aware, availability of water is critical to the proposed Ormat East Brawley Facility and that absent a water contract with the IID this project is not feasible. That said, unless you have an alternative source of water we cannot proceed.

This Department finds that in order to proceed with the proposed Conditional Use Permit #08-0023 the availability of water will need to be resolved. Therefore, without the water issue resolved, in accordance with the Guidelines for California Environmental Quality Act, (California Code of Regulations, Title 14, Chapter 3, Section 15109) an "unreasonable delay" by the applicant has occurred, in the Department (Lead Agency for CEQA in Imperial County) is unable to complete the CEQA process. Therefore the Department hereby puts Conditional Use Permit #08-0023 on hold until such time that an executed water availability contract between the IID and Ormat is submitted to the Imperial County Planning & Development Services Department.

Additionally, all of the studies including the SB 610 Water supply Assessment previously requested by Department will need to be submitted prior to reactivation of the permitting process.

If you have any questions please contact me at (760) 482-4236 extension 4310 or e-mail me at Jurgheuberger@co.imperial.ca.us.

Sincerely,

Jurg Heuberger, AICP
Planning & Development
Services Director

CC: Darrell Gardner, Assistant Planning Director
CUP #08-0023
Files: 10.101, 10.102, 10.105
MS\JH\JM\S:\APN FILES\037\140\006\CUP08-0023 poject on hold lt 10 30 08 Finalized MS.doc

J

EAST BRAWLEY
GEOTHERMAL DEVELOPMENT PROJECT

UPDATED PROJECT DESCRIPTION

January 29, 2010

Submitted to:

County of Imperial
Planning & Development Services
801 Main Street
El Centro, CA 92243-2811

Submitted by:

ORNI 19, LLC
Ormat Nevada Inc.
6225 Neil Road
Reno, NV 89511

CONTENTS

LIST OF FIGURES

(Figures located at the end of this document, not within the text)

EAST BRAWLEY GEOTHERMAL DEVELOPMENT PROJECT UPDATED PROJECT DESCRIPTION

1.0 INTRODUCTION

ORNI 19, LLC, a wholly owned subsidiary of Ormat Nevada Inc. (Ormat), proposes to build the East Brawley Geothermal Development Project in the vicinity of the Brawley 2 Geothermal Exploration Project covered under Conditional Use Permit #07-0029 and the Environmental Impact Report (EIR) for the Geothermal Overlay Zone (g-zone). The project area is north of the City of Brawley in Imperial County, California (see Figure 1).

This Conditional Use Permit application is for the construction of a new 49.9 net megawatt (MW) binary power plant composed of six (6) Ormat Energy Converters (OEC), an expanded geothermal well field beyond the six exploration wells, pipelines to bring the geothermal brine to the power plant, pipelines to take the cooled brine to injection wells, pipelines to distribute noncondensible gases from production wells to power plant area and injection wells, an electric transmission line to interconnect to the substation at the North Brawley 1 Geothermal Power Plant, and a water pipeline to bring water from an Imperial Irrigation District (IID) canal to the power plant for cooling water.

2.0 SUMMARY OF PROPOSED PROJECT

The East Brawley Geothermal Development Project would be located on private agricultural lands just north of the City of Brawley in Sections 10, 11, 14, 15, 16, 21, 22, and 23, Township 13 South, Range 14 East, San Bernardino Base and Meridian (SBM). The project is in the g-zone that was covered by the Final EIR dated April 1979 and approved by the Board of Supervisors. It analyzed up to 800 megawatts in the g-zone (see Figure 2). The proposed project is located east of the New River, approximately 1.75 miles east of the North Brawley 1 Geothermal Power Plant along Best Road.

The southern boundary of the project area is just north of the City of Brawley's boundary within their "sphere of influence" and just north of the in-construction Highway 111 bypass in an area zoned M-1 Light Manufacturing. The southwestern boundary of the project is the Del Rio Country Club bounded by the New River. The land to the north and east is agriculture. The eastern boundary of the project is Dietrich Road and to the north Rutherford Road. The majority of the project is along Best Road from Shank to Rutherford Roads. An at-grade intersection will built at the Highway 111 bypass and Best Road which will provide the best access to the plant site and well field. Well pads may be accessed from the other county roads in the area: Dietrich, Groshen, Rutherford, Ward and Wills. There are also farm and IID canal roads that will be used to access some well locations (see Figure 3).

ORNI 19, LLC/Ormat Nevada Inc. proposes to permit, construct, operate and maintain the East Brawley Geothermal Development Project that would consist of the following facilities:

- A 49.9 net MW geothermal power plant consisting of up to six (6) OEC binary generating units (16 MW gross each) with vaporizers, turbines, generators, condensers, preheaters, pumps and piping, motive fluid (isopentane) storage, a motive fluid vapor recovery system (VRU), a gas scrubber, and possibly a regenerative thermal oxidizer (RTO) and related ancillary equipment;
- Two (2) cooling tower batteries with a total of 14-20 cell counter flow, induced draft with drift eliminators of 0.0005 efficiency;
- A control room, office, maintenance shop, parking, and other facilities located at the power plant site;
- Approximately 34 total wells, approximately half for production and half for injection. The final number of wells will be determined by drilling results. Each well will average 4500 feet in depth. Production wells will have a gas separator and corrosion and scale inhibitor and a geothermal fluid booster pump to pump the fluid to the power plant. Each well will also have a sand separator and/or filtration system;
- Piping from production wells to the power plant and from the power plant to the individual injection wells. Gas pipelines will take the gas contained in the brine from the gas separators to either the injection wells or to the gas scrubber at the power plant;
- Blowdown wells (2-4) at the power plant site to provide for injection of the cooling tower blowdown;
- Pumps, tank, valves, controls, flow monitoring and other necessary equipment to the wells and pipelines;
- Maintenance of the production and injection wells cited above;
- Piping, canals or ditches and pumps to bring water from IID's Rockwood Canal to the power plant;
- A pipeline crossing over New River, that would primarily allow connection of geothermal wells located on both sides of the river. This crossing was included in an amendment to the East Brawley CUP application submitted to the County in March 2009, and in Section 5.7 below; and
- A substation with a 2 mile long double circuit 13.8 and 92 kilovolt (kV) transmission line with 66 high poles to interconnect to the IID at the North Brawley 1 substation at Hovley and Andre Roads.

The major components of the proposed East Brawley Development Project, and their function and location are summarized in Table 1.

Table 1: East Brawley Geothermal Development Facilities Summary

East Brawley Geothermal Development Project Facilities Summary			
Facility	Size	Location	Function
Well pads	Up to 34 well pads (including the four existing exploration well pads) would be about 316 feet by 356 feet in size (~2 acres each). A mud sump/containment basin of about 75 feet x 260 feet x 7 feet deep would be located on each well pad.	Identified well pads from the exploration phase would be utilized to the extent feasible. Additional wells would be drilled as needed to provide adequate production fluid and injection capacity at well sites.	Well pads include all the equipment necessary to operate a well. During development, any additional drilling would occur from the well pads. Well pads also include containment basins for drilling and maintenance of the wells
Production Wells	Inside diameter of the production wells would be approximately 30 inches at the top and would telescope with depth. Wells are expected to average about 4,500 feet deep.	Production wells would be located on the well pads at the well sites shown in. Approximately 17 production wells each on separate well pads are projected.	Production wells flow geothermal fluid to the surface that is then transported via above ground pipelines to the power plant to generate electricity.
Injection Wells	Injection wells would be the same size as production wells.	Injection well locations have not yet been designated but would be among the well sites. Up to 3 injection wells could be located on each pad. A total of 17 injection wells each on separate well pads are projected.	Injection wells are used to inject spent geothermal fluid from the power plant back into the geothermal reservoir. Injection ensures the longevity and renewability of the geothermal resource.
Geothermal Production Fluid Pipeline	The pipeline system would vary in insulated diameter from 8 to 30 inches depending on individual well productivity. Up to about 9 miles of production pipeline could be constructed.	The piping system would connect the wells to the power plant. The production fluid pipeline would be located within the pipeline corridors.	Geothermal fluid would be transported from the production wells to the power plant via the geothermal production fluid pipeline.

East Brawley Geothermal Development Project Facilities Summary			
Facility	Size	Location	Function
Injection Fluid Pipeline	The injection piping system would vary in insulated diameter from 8 to 30 inches. Piping would extend from the power plant to the injection wells. Up to about 9 miles of injection pipeline could be constructed.	The injection pipeline would be located among the pipeline routes.	Cooled geothermal fluid would be transported from the power plant to the injection wells via the injection fluid pipeline where it would be injected into the geothermal injection reservoir.
Access Roads	Access roads would be no less than 10 feet wide.	Access roads would extend from existing County roads to the well pads. Existing farm roads would be used to the extent practical. Access roads developed for exploration would be used for any wells and pads that are used for development. Where new pads are created, new access road would be developed.	Access roads are used during development to construct the production wells and install equipment. During utilization, access roads are used for accessing wells for maintenance.
OEC Units	Six, 16 MW (gross) OEC units (manufactured by Ormat Turbines, Ltd.) comprised of vaporizers, turbines, generators, condensers, preheaters, pumps, and piping.	The modular OEC units would be located on the power plant site.	The OEC units are the proprietary modular binary geothermal power generation equipment used on the power plant site.
Motive Fluid Pressure Vessels	The motive fluid would be stored in two, 11,880-gallon pressure vessels.	The motive fluid pressure vessels would be located on the power plant site.	The motive fluid pressure vessels would be used to store isopentane for use in the OEC units.
Vapor Recovery Unit	The vapor recovery unit consists of a diaphragm pump, a vacuum pump, and activated carbon canisters.	The vapor recovery unit is located on the power plant site.	The vapor recovery unit would provide a mechanism to minimize emissions of isopentane from the OEC units during maintenance.
Substation	The substation would occupy a site about 150 feet by 150 feet in size (about 0.5 acres).	The substation would be located adjacent to the power plant.	The substation converts power generated from the plant to the proposed line voltage, 92 kV.

East Brawley Geothermal Development Project Facilities Summary			
Facility	Size	Location	Function
Interconnection Transmission Line	There would be a new two-mile long double circuit 13.8- and 92-kilovolt (kV) interconnection transmission line with 66-foot high poles.	The interconnection transmission line would connect to the IID grid at the North Brawley 1 substation at Hovley and Andre Roads. The new line would span the New River. One proposed route and one alternative route are under consideration.	The interconnection transmission line would transfer the electricity generated by project to the existing power grid for distribution.
Noncondensible Gas Distribution Line	The noncondensible gas distribution line would range from 4-8 inches in diameter. Up to about 4.3 miles of pipe could be constructed.	Noncondensible gas distribution lines would run from well pad separators and power plant site separators to the injection wells.	Noncondensible gases from separators and other equipment would be compressed and injected into the subsurface reservoir.
Regenerative Thermal Oxidizer (RTO) and Caustic Scrubber	The top of the scrubber would be about 30 feet high.	The RTO/scrubber is located adjacent to the power plant.	The RTO/scrubber unit is BACT for the abatement of potential NCG emissions
Cooling Tower	Two cooling tower units (each with seven to ten cells) would be used (manufactured by Cooling Tower Depot, Inc.). The cooling towers would be the largest and most prominent facility on the power plant site (about 54 feet in height).	The cooling towers would be located on the power plant site.	The cooling towers would provide cooling water to condense the motive fluid vapor in the condensers.
Water Conveyance System	The water conveyance system would be a 10 - 24 inch pipeline, about one mile in length, for water coming from IID source. See text for alternatives to IID water.	Water intake from the IID Rockwood Canal Gate 131 would be either underground or put inside of the Livesley Drain that runs between the canal and the power plant site. See text for alternatives to IID water.	The water conveyance system would provide makeup water for the cooling tower at the power plant site.
Blowdown Wells	Two to four cooling water blowdown injection wells would be constructed similar to the geothermal injection wells.	The blowdown injection wells would be located adjacent to the power plant.	The dedicated blowdown wells are used to inject cooling water blowdown to reduce the concentration of dissolved solids in the cooling water.

East Brawley Geothermal Development Project Facilities Summary			
Facility	Size	Location	Function
Power Plant Site and Common Facilities	The power plant would occupy about 15 acres of the 30-acre parcel on which it would be located.	The power plant would be located on private land owned by ORNI 19, LLC.	The power plant site is the physical location where electricity would be generated using modular OEC binary geothermal power plant technology.
Control Room, Office and Maintenance Shop	The footprint of these facilities is depicted on Figure 5.	Each of the facilities would be located on the power plant site.	These habitable structures would be used to control, manage and maintain the project operations.

Construction would commence soon after the CUP is issued. Construction of the power plant would require approximately 15 months. Construction would require up to 200 workers at peak construction. Well drilling, pipeline construction, interconnection transmission line construction, and construction of the power plant would all be concurrent.

3.0 PROJECT LOCATION AND ACCESS

The project area is located within Imperial County, California, about 12 miles southeast of the Salton Sea and 25 miles north of the U.S. border with Mexico (Figure 1). The project is within the North Brawley Geothermal Overlay Zone and the Brawley KGRA, in the Imperial Valley, California (Figure 2). The geothermal overlay zone is a zoning classification developed by the County of Imperial to facilitate development and utilization of geothermal resources in areas of identified geothermal development potential.

The project area is comprised of multiple geothermal leases overlaying privately owned cultivated properties in Sections 10, 11, 14, 15, 16, 21, 22, and 23, Township 13 South, Range 14 East, San Bernardino Base and Meridian (SBB&M).

The project is comprised of a power plant and a wellfield; the specific locations of each of these are described below.

3.1 Location and Access of Power Plant

The East Brawley Geothermal Power Plant would be located on private agriculture lands in the southeast corner of Section 15, Township 13 South, Range 14 East, SBB&M identified by Assessor's Parcel Number 037-140-06-01. This is located about one mile north of the City of Brawley. The total property size is 32.81 acres and will not be subdivided. The power plant area will be enclosed by a 6 foot wire fence in an area approximately 900 by 600 feet not including the substation or stormwater retention basin. The house that is currently on the property is vacant and will be demolished as part of project construction activities. A house across the street

will be vacated and also demolished during construction and prior to the delivery of isopentane to the new plant.

Access to the power plant will be on Best Road just north of Ward Road from a left hand turn pocket built for this project (see traffic study). Best Road will be widened by about 20 feet in this section to accommodate a northbound left turn lane at the entrance point. The necessary tapers are provided, based on 55 mph design, which represents the Prima Facia speed limit, the design speed for the road and Caltrans design criteria. It will be necessary to cover Best Canal along the property frontage to accommodate widening of the road for the turn pocket.

The emergency access will be from Best Road into the south end of the property on the north side of the Livesley Drain. The emergency access road will be constructed with an all-weather surface and lead to a locked gate that can be opened by any emergency responders.

Both of the entrances into the plant site provide excellent access from the new Highway 111 bypass that will include an exit onto Best Road just south of Shank Road. Traffic will come from Interstate 8, north on Highway 111 to Best Road.

3.2 Location and Access of Well Field

The East Brawley geothermal wellfield is laid out in a grid pattern over much of the project area. The power plant site would be centrally located within the wellfield in Section 15. The well field will be located between Rutherford Road on the north, Dietrich Road on the east, the New River on the west, and just north of Shank Road on the south. Access to the wellpads and pipelines will be from Best, Baum (not a county road), Groshen, Kerhsaw, Rutherford, Ward, and Wills Roads. Additionally, farm and IID roads may be used for access. Encroachment permits for ingress/egress and irrigation canal and drain crossings would be obtained from the Imperial County Public Works Department and IID as applicable.

Access to farm land would be coordinated with the landowners to minimize impacts to the farming operations. The wellpads and pipelines will be along the edges of the fields. New access roads would be constructed or improved only as needed to safely accommodate traffic required for wellpad construction, well drilling and well and road maintenance. Road widths to well pads would typically be no less than ten feet wide.

4.0 DESCRIPTION OF POWER PLANT

The proposed power plant can be described as having four interdependent operating systems: (a) the geothermal fluid system; (b) the motive fluid system and fire suppression; (c) the geothermal NCG and RTO/gas scrubber system; and (d) the cooling water system. Each of the OEC units would be able to operate independently but would share common ancillary components such as isopentane storage, geothermal brine supply and injection equipment, cooling towers, substation, etc. Each of the power plant systems are described below.

4.1 Geothermal Fluid System

Geothermal fluid from the geothermal reservoir at about 4,500 feet below the surface would be pumped to the surface from the geothermal production wells. At the surface the geothermal fluid would be transported from the well field via a pipeline system to the power plant site. At the power plant site the produced geothermal fluid would be directed to flow through the six proposed OEC units. The geothermal fluid system is a closed loop system. The geothermal fluids from the production wells would be transported to the power plant site and would flow through the level 1 and level 2 vaporizers and preheaters of each OEC unit, transferring the heat to the isopentane motive fluid through the OEC's shell and tube heat exchangers. The cooled or spent geothermal brine would then be sent to the geothermal brine injection system without coming into contact with the atmosphere.

4.2 Motive Fluid System and Fire Suppression

The OEC is a power generation unit which converts low and medium temperature heat energy into electrical energy. Each OEC unit is an integrated closed cycle vapor turbo-generator system that recycles an organic motive fluid in a fully closed loop with no discharges to the environment. The OEC unit operates in a standard power generation cycle (Rankine cycle) similar to the power generation cycle used in a steam turbine.

The motive fluid selected for the East Brawley Project is isopentane. Isopentane is a flammable, but nontoxic, petroleum hydrocarbon that vaporizes at relatively low temperatures under most atmospheric conditions. The isopentane is circulated through the OEC unit. Heat from the geothermal fluid would be transferred via heat exchangers to vaporize the isopentane in a two-level series of preheaters and vaporizers. The vaporized isopentane would be directed through turbines which rotate generators converting mechanical energy into electricity.

On the backside of the turbine-generators the isopentane vapor would be cooled and condensed back to liquid form in water-cooled condensers. The liquid isopentane would then be returned to a storage tank where it would be cycled back to the OEC units again for reuse. The spent geothermal fluid would be transported on the surface via pipelines to injection wells in the well field where it would be pumped back into the subsurface geothermal reservoir.

The generated electricity would be transformed into line voltage and delivered via an interconnection transmission line to a local utility power grid for distribution. ORNI 19, LLC is negotiating a power purchase agreement (PPA) for sale of the energy generated by the project with a major California utility.

The vaporized isopentane motive fluid from the level 1 and level 2 vaporizers would turn the level 1 and level 2 turbines which together turn a common generator that produces the electricity that is delivered to the substation where it is delivered to the transmission lines. The vaporized isopentane is then condensed in a shell and tube condenser and returned to the preheaters and vaporizers to repeat the cycle. The isopentane motive fluid is therefore also circulated within a closed loop system, with no significant, routine release or discharge of isopentane.

The isopentane motive fluid system includes the isopentane side of the OEC Units, two (2) 11,880-gallon isopentane pressure vessels, and an OEC vapor recovery unit (VRU) on each OEC condenser. A vapor recovery unit would be used during major maintenance activities on any of the OEC Units.

Each OEC Unit contains approximately 23,000 gallons of isopentane (in the vaporizers, preheaters, condensers and piping). In each OEC, the motive fluid system is designed as a closed-loop, although there would be minor fugitive leaks from the valves, connections, seals, and tubes. Isopentane from these leaks would be released to the atmosphere or would leak into the geothermal or circulating cooling water lines. Operators would frequently inspect the OEC Units leaks and visual signs of fugitive emissions. Isopentane leak detectors are utilized throughout the facility and continuously monitored.

Any noncondensible gases in the air or water which may leak into the isopentane system would eventually collect in the OEC condenser and reduce the efficiency of the OEC Unit. In order to remove these noncondensible gases, each OEC condenser would have a small (~0.106 scf/hr) OEC VRU. Each OEC VRU would consist of two chambers and a set of isolation valves. Operation of each OEC VRU would be controlled by the power plant computer control system, which would start the OEC VRU noncondensible gas "purge" sequence whenever the efficiency of the OEC Unit fell below a set point. During "purging," nearly all of the isopentane vapors in the OEC VRU would be compressed into liquid isopentane and returned to the OEC Unit, while the noncondensible gases, together with some small quantity of isopentane vapors, are discharged to the atmosphere.

Some major maintenance activities require that at least a portion of an OEC Unit be cleared of isopentane motive fluid liquid and vapors prior to performing the maintenance activities. To control and minimize isopentane emissions during these maintenance activities, the liquid isopentane is drained from the section of the OEC Unit (preheater, vaporizer or condenser) to be maintained or repaired and transferred to another portion of the OEC Unit, the isopentane storage tank, or another OEC Unit. A vacuum pump would then be used to evacuate and compress most of the remaining isopentane vapors, returning the isopentane liquid to the OEC Unit. Those isopentane vapors which do not condense would be released through the isopentane vapor recovery unit, which would adsorb nearly all of the remaining isopentane vapors.

To reduce the risk of fire, isopentane vapor and flame detectors connected to the power plant computer control system are placed at strategic locations around the OEC Units to quickly alert the plant operators to any such hazardous situations. The fire protection system would include an approximately 2,500-gpm diesel firewater pump. Water nozzles/monitors would be placed at the power plant site to be used to minimize the risk of a fire spreading should one start within the power plant. A Risk Management Plan would be prepared for this facility for isopentane.

4.3 Noncondensible Gas and Regenerative Thermal Oxidizer/Gas Scrubber

NCGs are naturally occurring gases in the geothermal fluid that are not easily condensed by cooling. They are predominantly (99.9%) made up of nitrogen, carbon dioxide and methane. The NCG separated from the geothermal production fluid would be compressed and injected back

into the geothermal reservoir with the spent geothermal fluid. Under very high NCG content in the geothermal production fluid conditions, some of the NCG may be treated in a regenerative thermal oxidizer (RTO) and gas scrubber system to remove air pollutants from the NCG before venting the scrubbed NCG to the atmosphere.

Each of the production wells would deliver geothermal fluid to the power plant through production pipelines. The geothermal fluids would first flow from the production wells through closed, high-pressure, well pad separators which would separate most of the geothermal noncondensible gases from the geothermal brine. If the quantity of geothermal noncondensible gases in the geothermal fluid is less than the high end of the possible range, all of these separated geothermal noncondensible gases would flow through other dedicated pipelines to the power plant site, to be dissolved or entrained in the geothermal brine as it is injected into the geothermal fluid injection wells. Small quantities of these separated geothermal noncondensible gases would be discharged to the atmosphere along the dedicated pipelines as condensate created as the gases cool is drained from the pipeline.

However, if the quantity of geothermal noncondensible gases in the geothermal fluid is at the high end of the possible range, up to twenty-five percent of these separated geothermal noncondensible gases would flow through other dedicated pipelines to the RTO unit/caustic scrubber system located at the power plant site. The remaining seventy-five percent of the separated geothermal noncondensible gases would flow through the dedicated pipelines to be dissolved or entrained in the geothermal brine as it is injected into the geothermal fluid injection wells. As described above, small quantities of these separated geothermal noncondensible gases would be discharged to the atmosphere along the dedicated pipelines as condensate created as the gases cool is drained from the pipeline.

Up to twenty-five percent of the geothermal noncondensible gases separated at each of the well pads would be delivered through dedicated noncondensible gas pipelines to the RTO unit/caustic scrubber system located at the power plant site. The proposed RTO units would receive the noncondensible gases from the noncondensible gas pipelines. These gases are expected to contain sufficient hydrocarbons and oxygen (with supplemental air and a small amount of propane) to support complete combustion. Propane would also be used to pre-heat the RTO unit during cold start-ups.

The RTO unit would oxidize the hydrocarbons in the NCGs and supplemental propane to carbon dioxide and water vapor in an exothermic process.

The RTO unit would initially combust, and then abate, at least 97 percent of the benzene, methane and other hydrocarbons in the NCGs it receives. It is considered Best Available Control Technology (BACT) for the abatement of hydrocarbons and volatile organic gases in a wide variety of applications. The RTO unit would also oxidize at least 97 percent of the hydrogen sulfide in the NCGs delivered to the RTO unit. The oxidation of hydrogen sulfide in the RTO unit would produce sulfur dioxide (SO2) and water vapor. The resulting SO2 emissions would be controlled by the caustic scrubber.

The low temperature combustion in the RTO unit is flameless and, thus, would not create appreciable nitrogen oxides (NOX) from the oxidation of atmospheric nitrogen.

The proposed caustic scrubber would receive the carbon dioxide, water vapor, sulfur dioxide, nitrogen oxides and other gases produced from the oxidation process in the RTO unit (as well as the gases passing through the RTO unit unoxidized). Before entering the caustic scrubber, the hot gases would be cooled through a direct contact quenching process. The quenched gases would then proceed to the caustic scrubber, where they would be subjected to counter-flows of caustic absorbate (water and sodium hydroxide). The caustic absorbate reacts with the sulfur oxides in the quenched gases to produce sodium sulfates and sulfites, both water-soluble compounds that are dissolved in the caustic scrubber water and piped to a storage sump at the bottom of the scrubber. The remaining gases from the RTO unit are vented out the top of the caustic scrubber through a 30-foot tall stack. The small quantity of spent absorbate would be drained from the storage sump and piped to one of the cooling towers. Fresh absorbate would be added as needed to make up for the loss of exhausted absorbate. The caustic scrubber would remove at least 97.5 percent of the sulfur oxides in the gases it receives. It is considered Best Available Control Technology (BACT) for the control of sulfur dioxide.

A control panel with a programmable logic controller would be used to provide monitoring and control of the RTO unit/caustic scrubber system. RTO unit/caustic scrubber system scheduled maintenance would be coordinated with the maintenance schedule for the East Brawley power plant. The RTO unit/caustic scrubber system would operate at least 95.9 percent of the hours the power plant is operating (equivalent to operating 8,400 hours per year if the power plant operates 8,760 hours per year). When the RTO unit/caustic scrubber system is undergoing unscheduled maintenance or otherwise not operating, the geothermal NCGs would bypass the RTO unit/caustic scrubber system and would be delivered to the cooling towers for release to the atmosphere unabated.

4.4 Cooling Water System

The cooling water system would consist of cooling towers using standard wet cooling tower technology. Cooling water would be used to cool the motive fluid in the condensers and would cycle back to a cooling tower where the water would be cooled, stored and made available for reuse as system process water.

A simplistic diagram of the geothermal system processes minus the NCG and air emission abatement system is schematically represented in Figure 4.

The isopentane vapor condensate is cooled by water circulating from the cooling tower through the condensers. Evaporative cooling in the cooling tower cools the circulating water. A small portion of the circulating water would be injected into the geothermal reservoir via dedicated cooling tower blowdown wells adjacent to the power plant site. The cooling tower blowdown removes the dissolved solids from the water that are concentrated as the water is cycled or reused in the cooling tower.

4.5 Water Conservation and Water Supply

4.5.1 Estimate of Quantity of Make-Up Water

The cooling towers would circulate an average of approximately 195,000 gallons per minute (gpm), total of cooling water to the OEC Units. An average of approximately 2,600 gpm of circulating cooling water would be evaporated from both cooling towers, and both would also blowdown (discharge) an average of approximately 800 gpm. To maintain water balance, the cooling towers would require an average of approximately 3,400 gpm or 5,500 acre-feet per year (total) of cooling tower makeup water.

Binary power plants such as the one proposed are closed loop systems such that geothermal brine produced from the geothermal reservoir is injected in whole back into the geothermal reservoir. Therefore, only a brackish water supply is needed for the cooling system. This is different from a geothermal flash plant where the condensed geothermal steam is used for the cooling water. Flash plants are used on higher temperature geothermal resources than is the case with the East Brawley resource.

Sodium hypochlorite (bleach) would be used for bacterial control in the towers as well as other chemicals for pH control and corrosion inhibition.

4.5.2 Water Saved by Conservation Measures

The estimated amount of water required for the East Brawley power plant is about 5,500 acre-feet. This is 27% proportionally less than that initially requested for Ormat's nearby North Brawley power plant and a 9% further reduction from North Brawley's final design quantity. This is the result of plant design and water optimization changes that were also implemented for the East Brawley power plant, thus a decreased amount than originally stated in the East Brawley CUP application.

The East Brawley Project area occupies approximately 100 acres so the water required for this project equates to about 67 acre-feet/acre. By comparison, farmland consumes about 5.5 acre-feet/acre. However, the project would supply electricity to 50,000 people, or about the entire population of Brawley, and would generate revenue of $6,500/acre-foot of water compared to $164/ac-ft for alfalfa based on data from the Summit Blue Consulting, LLC *Renewable Energy Feasibility Study* prepared for Imperial County in 2008.

4.5.3 Water Supply from IID

Ormat plans to obtain its water for cooling tower make-up from the Imperial Irrigation District (IID). Therefore, water losses (via evaporation and blowdown) from the cooling tower would be made up by irrigation water obtained under contract from the IID. Although the Best Canal is closest to the power plant, IID has indicated it does not have the capacity to deliver the water from this canal due to changes in that canal south of the City of Brawley. Makeup water would be obtained from IID Gate 131 on the Rockwood Canal located about one-half mile east of the power plant site. The water from the Rockwood Canal would be gravity fed or pumped in a 10-24 inch pipeline that would be either underground or put within the Livesley Drain that runs east to west between the canal and the power plant (Figure 3).

The project's water consumption would be met by the IID through their current resources, transfers from other sources or would be offset through water conservation projects identified and approved by IID. Water taken from IID would be subject to the approved Equitable Distribution program during years of water supply demand imbalances. The IID is currently developing an Integrated Water Resources Management Plan to address the water supplies for new non-agricultural projects. In the immediate term the IID has completed an *Interim Water Supply Policy for New Non-Agricultural Projects* (IID 2009) which was recently approved by the IID Board of Directors approval. The IID is expected to execute the pending contract agreement with Ormat for Project water supply upon approval of the interim policy.

4.5.4 Water Supply Alternative: From City of Brawley Wastewater Treatment Plant

As described above, Ormat plans to obtain its water for cooling tower make-up from IID. However, as an alternative and/or supplemental source of water supply, Ormat is currently working with the City of Brawley to obtain treated, or recycled, water from their wastewater treatment plant located immediately west of the power plant site (Figure 2). Ormat and the City of Brawley have entered into a Memorandum of Understanding to facilitate exclusive negotiations for the reclaimed wastewater which includes the construction of a tertiary system to the City's secondary system which is currently being upgraded by the City. The additional agreements include an operations and maintenance (O&M) agreement for operation of the tertiary facility. The City would ultimately own and operate the tertiary facility when it is completed.

This source of water would not be available until 2013 when the tertiary treatment plant would be expected to be completed. Therefore, in the interim period, water from the IID and/or other alternative sources (as described below) would still be needed for the project.

Under this alternative, the City would deliver reclaimed water to the East Brawley Project which is approximately ¼-mile east of the treatment plant adjacent to the New River where it currently discharges treated wastewater under an NPDES permit. The City currently generates approximately 4,400 acre-feet (3.9 mgd) of wastewater per year. As stated above, the estimate of the water requirement for the East Brawley Power Plant would be 5,500 acre-feet per year. Assuming that the effluent from the WWTP will average 4,400 acre-feet a year, ORNI 19, LLP would be capable of utilizing all (100 percent) of the recycled water for cooling water makeup. However, as noted below, an additional source of water would be required during the hot summer months.

As noted, the new tertiary treatment facility is currently scheduled to be operational in early 2013. Thus, water from the Imperial Irrigation District and/or other alternative sources (as described below) would be needed for the project in the interim period. A summary of the conceptual design of the City of Brawley tertiary treatment and delivery system is provided below. The design of this project is currently only in conceptual design phase, so the final design may change somewhat from that described below.

Description of Current WWTP and Planned Expansion

This treatment plant utilizes a lagoon system to treat 3.9 mgd of domestic sewage (2008 average daily flow). The City of Brawley is currently upgrading the existing WWTP to increase its average daily flow capacity to 5.9 mgd, and to meet more stringent NPDES permit requirements for ammonia removal. Construction of the plant upgrade is expected to being in early 2010 and be completed by late 2012. Although the upgraded and expanded plant will produce a higher quality secondary effluent, this effluent will not be of the quality required to meet the California Title 22 criteria for direct use of recycled water in open recirculating cooling water systems. Additional tertiary treatment facilities will be required in order to meet these requirements, as well as water quality requirements specific to cooling water system operation.

Water Supply Objectives from Brawley WWTP

Ormat's objective is to meet 100 percent of the make-up water demand for the cooling towers at the proposed East Brawley power plant with reclaimed water. As noted above, engineering estimates are that for a 50 MW plant, the make-up requirement would be up to 5,500 acre-feet per year, which means that Ormat will use 100 percent of the recycled water from the WWTP and will need an additional water supply. Additional water sources are described in Section 4.5.5 below.

Tertiary Treatment Objectives

Tertiary treatment consisting of coagulation, filtration and disinfection will be required to meet or exceed the performance objectives of the California Recycled Water Criteria (Disinfected Tertiary Title 22 Recycled Water; California Code of Regulations (CCR), Title 22) for direct use in open recirculating cooling water systems. This level of treatment will produce effluent that is low in turbidity, BOD, and microorganisms. Title 22 disinfected tertiary recycled water means a filtered and subsequently disinfected wastewater that meets the following criteria from the CDPH Purple Book Update. The requirements for filtered wastewater are at 22 CCR 60301.320, and the disinfection requirements at 22 CCR 60301.230.

Tertiary Treatment Processes

Secondary treatment involves oxidation and clarification, which are already provided by existing plant. In order to provide tertiary treatment, three components are traditionally necessary according to 22 CCR. These processes include flocculation, filtration and disinfection. The tertiary system will be based on either the addition of flocculation tanks and filtration systems, or the use of membrane bioreactors, and upgrading the disinfection process in order to assure meeting the applicable requirements. As stated above, a conceptual plan for the project is currently underway but not yet finalized. Per an internal draft of the conceptual plan, possible treatment methods to be included in the tertiary treatment plant include the following:

- Pretreatment
  - May include some form of phosphate reduction/removal, including chemical precipitation with lime, alum, polyaluminum chloride, or ferric chloride – if phosphate reduction is not low enough from the City's upgraded secondary treatment system. Minimum phosphate levels are required to protect the cooling tower system from corrosion.

- Solids Processing, which would include pumping coagulated, settled solids/sludge from the sedimentation basins into a 100,000 gallon concrete storage sump, and from there the solids would be pumped to solids processing. The options for solids processing include recycling tertiary solids to WWTP (pumping the solids to the WWTP's activated sludge thickeners, or centrifuges), pumping the solids to the WWTP lagoons, or dewatering the solids with new centrifuges.

- Filtration. The following three alternatives for filtration/removal of suspended organic and inorganic solids from water have been considered:
  - Multi-media (such as use of silica sand, crushed anthracite coal, and garnet or ilmenite, alone or in dual and triple combinations) filters (gravity filters and pressure filters)
  - Cloth disk media filters (use of a cloth membrane as the filter medium)
  - Immersed membrane filters (including use of micro-filtration (MF) and/or ultra-filtration (UF) membranes)

- Disinfection: The tertiary treated water must be disinfected in order to meet the Title 22 criteria for recycled water use within open recirculating cooling water systems. In addition, disinfection of water controls biological activities in the cooling water systems as part of the chemical treatment program. Disinfection options include the following:
  - Ultraviolet light (UV) disinfection (either by using the WWTP's new UV system or a new system)
  - Chlorination disinfection, using either by dissolving chlorine gas in water or by adding hypochlorite salts or solution, all of which lead to the formation of hypochlorous acid (HOCL).

Water Storage

The effluent from the tertiary treatment system will be directed to a storage unit before it is conveyed to the East Brawley plant. Three options are being considered:

- Conversion of the current Lagoon #4 at the WWTP to a storage pond. This pond can store about 5 million gallons of water (currently preferred option)
- Construction of a water storage tank, about 5 million gallons, to be located on the property of the Brawley WWTP
- Construction of a water storage tank, about 5 million gallons, to be located on Ormat's East Brawley power plant property, immediately adjacent to the WWTP

Conveyance/Pipeline

The City of Brawley WWTP is within ½ mile of the East Brawley Power Plant, making conveyance of water relatively simple. The water would be conveyed via a pipeline, approximately 2,000 feet in length from the WWTP to the to East Brawley cooling towers. The pipe would be manufactured from HDPE, and would be about 20 inch diameter. It would be buried about three (3) feet below ground, except being deeper below the railroad bed. The pipeline route is shown on Figure 8. The only property other than the City's and Ormat's would be the railroad, of which Ormat would obtain permits to place the pipe under the railroad right of way.

Need for Additional Water Supply During Summer Heat Conditions:
After 2013 when the tertiary treatment system would be complete, Ormat's engineering calculations show that during summer heat conditions, the water from the WWTP may not be enough in itself for cooling tower make up and additional water may be required from another source. It is estimated that on average the additional amount of water that will be required would be approximately 700 gpm (1,100 acre-ft/yr). The possible sources of additional water are described below.

1. Future Growth of Brawley. With estimated growth rates of the City of Brawley, there should be year-round adequate supply of water from the WWTP in about 10 years. After this, Ormat would not need any additional water source.
2. Water Supply from IID: In the even that Ormat relies entirely on WWTP recycled water, a smaller water contract with the IID will be considered for the secondary water source. This is the primary option until Ormat can obtain enough water from WWTP after further growth of Brawley. As described above, water will be obtained from IID Gate 131 on the Rockwood Canal and piped to the plant. If canal water is used 1,100 acre-ft a year would be required to supplement the amount from the WWTP.
3. Use of Blowdown Water: Treatment of the cooling tower blowdown water (from both this plant and possibly North Brawley plant) is being investigated so that the water can be reused in the cooling tower instead of injected into the geothermal reservoir.
4. Water from Shallow Groundwater Wells: Using "ground water" as a back-up water source during peak periods. The groundwater would need to be treated, either with reverse osmosis membranes or with a nano-filtration membrane. This is a desirable water source as it is currently not used and unusable for most other applications (the total dissolved solids is too high for use in agriculture), and the only impact we can see brought up as an issue being subsidence, but mitigation measures will be incorporated into the project for this (as described below).

Description of Possible Groundwater System: As a backup water source during peak periods, it is estimated that there would be about two groundwater wells that will be drilled and used to supply this water, with each well will being about 400-700 feet in depth. The wells would be approximately 24 inches in diameter at the top and telescope with depth. Each well pad will be up to 5 x 6 feet (30 ft^2). The total production capacity of the wells will be up to about 1,500 gpm if used only as a backup source. In order to pump the water from the wells, on each well a centrifugal vertical production pump will be installed. The water will be pumped through carbon steel pipes to a water desalination system for purification for use in the cooling tower. The system would be based on salt rejection membranes (nanofiltration and reverse osmosis). The water desalination system will be installed in a 40 foot shipping container adjacent to the cooling tower.

The system would be comprised of various components including a sand separator, chemical dosing system (anti-scalant and acid), a series of micron filters and membranes, two booster pumps, and a control system (PLC controlled). The desalination system is

expected to have 40% to 60% recovery ratio (40%-60% of the feed will be purified and used as cooling water makeup). The water desalination system will have two streams coming out of it: Permeate and Concentrate. The permeate will be used for cooling tower makeup. Because this water will be so clean, it is expected that 5-10 cycles of concentration in the cooling tower will be achieved with this water source. The concentrate will be injected into the geothermal reservoir together with the cooling tower blowdown.

Mitigation Measure Incorporated into Project for Subsidence from Use of Groundwater: The following measures are incorporated into the project to monitor and mitigate for subsidence:

- Adequate subsidence network benchmarks will be placed around the plant site and tied to the County first order network and will be surveyed annually to detect the occurrence of subsidence. This data will be promptly submitted to the Imperial County Department of Public Works (ICPWD). The benchmarks would be installed to conform to County standards. Surveying would be performed to National Geodetic Survey (NGS) standards. The North Brawley 1 project has received approval for the program for the North Brawley Geothermal Overlay Zone which also covers the East Brawley project area.
- Mitigation measures such as increased injection rates, deeper injection wells and/or curtailed production operations are initiated subject to Division approval if a recognizable subsidence bowl forms in the project vicinity, or if unusual aquifer or injection interval pressure changes are observed.

4.5.5 Potential Impacts from Water Usage

Impacts to Water Supply/Utilities/Water Service Systems: Development Design Engineering (DDE) of El Centro prepared a SB610 Water Supply Assessment (WSA) of the proposed project (DDE, 2009). This study was intended for use by the County of Imperial in its evaluation of water supplies for existing and future land uses. The evaluation examined water availability, expected demands of the project, and reasonably foreseeable planned future water demands to be served by IID. DDE, worked extensively over 9 months in close consultation with IID to gather and confirm the accuracy of the data and information presented in the WSA. IID water staff provided significant input to the document and deemed it acceptable before it was submitted to County Planning. A summary of the report is provided below.

The Water Supply Assessment has determined that IID's water supply is sufficient to meet project needs. Water supplies for the Imperial Unit are anticipated to satisfy projected water demands for 20 years given IID's existing agricultural, municipal and industrial uses, water conservation and transfer requirements, rules and regulations, and operational policies. Particular operational policies are the draft Interim Water Supply Policy (IWSP), and the in-process Integrated Water Resources Management Plan (IWRMP).

The WSA stated that water supplies for the Imperial Unit are sufficient to satisfy water demands of IID's current agricultural, municipal and industrial uses, water conservation, and transfer requirements for the term of the QSA. Given IID's rules and regulations, operational policies,

- The agricultural equivalent of land that correlates with ORMAT'S proposed water use equates to approximately 0.23% of IID's irrigated acreage, an insignificant amount.
- Approximately 13% of the total irrigated acreage within the Imperial Unit is irrigated at least twice, which conveys additional water to IID drains and the Salton Sea. When compared to this additional drainage water, the proposed project's reduction to drainage water is insignificant.
- Assuming the total average irrigated acreage of the Imperial Unit uses 5.25 acre-feet per acre per year; ORMAT proposes to use approximately 0.2% of all water used for agriculture in the Imperial Unit, an insignificant amount.
- The proposed project's reduction in drainage water is approximately 0.12% of the total outflow of the Salton Sea through evaporation, an insignificant amount.
- The proposed project's loss of drainage water is approximately 0.2% of the amount of drainage water generated from Imperial Unit's total average irrigated area, an insignificant amount.

Cumulative Impacts from Use of Water: In response to the report described above, IID inquired about an assessment of cumulative impacts considering other industrial facilities whose water use (or potential water use) would reduce the inflow conveyed to IID drains and subsequently, the Salton Sea. Following is a cumulative impact analysis on inflow to IID Drains and the Salton Sea, prepared in concert between Ormat, DDE, and Barrett's Biological Services.

The geothermal projects for which water applications have been submitted to IID and/or where CUP applications have been submitted to Imperial County for new industrial projects total approximately 8700 ac-ft. These include:

- East Brawley at 5500 ac-ft,
- Approximately 800 ac-ft for CHAR's Hudson Ranch I project, and
- Approximately 2400 ac-ft for CalEnergy's Black Rock projects at 800 ac-ft each.

This total combined amount of water from these projects is approximately 1/3 of the 25,000 ac-ft allocated by IID for industrial use under the IWSP for non-agriculture projects. Using the same calculations as those previously done for East Brawley, 8700 ac-ft calculates to 2523 ac-ft less to the drains (8700 * 29% (% of water to tile/drains) which is less than 0.2% of the water evaporated from the Salton Sea. Thus, this cumulative loss of water to the drains and ultimately from proposed projects is also insignificant. Additionally, no one drain will be impacted more than another. As a side note, rather than an adverse cumulative impact, there is actually a positive cumulative impact from these projects, in that this water reduces the amount of salt going to the sea by 8,700 tons.

The approved 25,000 afy for potential non-agricultural projects within the IID's water service area far exceeds the combined water needs of all of the non-agricultural projects currently proposed. As such, sufficient water resources should be available for each of the projects.

Which Drains will be Impacted by Reduction of Water: In the same response to DDE's December 3 report, IID stated that "the project proponent did not address which drains will be impacted by the facility (there may be direct impacts to the drains discharging to the Salton Sea

and that may have pupfish present). Also the assessment lacked proper location of facility; making it difficult to evaluate any other wildlife species issues, such as Yuma Clapper Rail." Following is information to respond to this comment, again prepared in concert between Ormat, DDE, and Barrett's Biological Services.

There are no drains near the proposed East Brawley power plant site that drain directly to the Salton Sea. Biological surveys completed in the area for the East Brawley project found no pup fish or Yuma Clapper Rail habitat. The project site is only 32.75 acres which will equal (32.75 x 5.25 = 172 ac-ft x 29%) 50 ac-ft of water less to the Livesley Drain which is adjacent to the property. The 5500 ac-ft needed for this project and the loss of 1595 ac-ft to the drains that results would not come from that specific area but generically from the entire IID system. Taking "away" 5500 acre-feet of water from agriculture, which is what is implied, would be spread across the IID's district, not in the project area. Thus, 5500 ac-ft x 29% = 1595 ac-ft less to drains across the county. If the same assumption is used for 8700 ac-ft, (8700 ac-ft/2,730,000), 0.32% less water goes to the drains from these proposed industrial projects. This is an insignificant cumulative loss which also would not affect vegetation and/or wildlife found in the drains and/or the Salton Sea.

Review of IID's draft Integrated Water Resources Management Plan (IWRMP, aka IRP) and Interim Water Supply Policy (IWSP) for Non-Agricultural Projects. Ormat has reviewed the IWRMP, participated in IID meetings and submitted extensive comments. The document contains much incorrect data about existing geothermal projects in the valley in addition to cooling technologies that are not viable in this meteorological environmental. We have submitted similar comments to the California Energy Commission. The use of geothermal steam condensate for cooling water, which is source of water for flash plants, causes depletion of the geothermal resource, subsidence, and release of the noncondensible gases from the geothermal fluid and produces geothermal scales that may be hazardous. Whereas the Ormat binary process which requires "raw" water eliminates these negative environmental impacts. This is viewed as that the Ormat binary process is a much cleaner and environmentally sound method over steam and flash type plants, and certainly an environmental improvement over coal and gas power plants.

Review and Compliance with the IID Water Conservation and Transfer Project Draft Habitat Conservation Plan (HCP): Ormat and its team of consultants reviewed these documents. As shown in the calculations above, the proposed amount of water is insignificant to biological resources and, thus, will not impact either individually or cumulatively the requirements of the IID Water Conservation and Transfer Project draft HCP. In addition, pending the City of Brawley's completion of upgrades to the treatment plant currently scheduled for 2012, tertiary treated water is planned to replace IID's pending water contract. Therefore, this is a temporary use of canal water from IID, about 2-5 years.

5.0 DESCRIPTION OF WELLFIELD, DRILLING, TESTING, PRODUCTION, INJECTION

5.1 Geothermal Wellfield (Revised)

The Brawley geothermal wellfield is laid out in a grid pattern over cultivated fields in the project area. The grid pattern is generally aligned along field roads located adjacent to existing irrigation channels or drains.

A description of the revised/updated well field was included in an amendment to the East Brawley CUP application submitted to the County in March 2009. This information is provided below. A copy of the latest wellfield map is provided in Figure 3.

The well field was revised in March 2009 to reflect addition land that has been leased and the results of the exploration well drilling to date. The total well count has also dropped from 60 to about 34. It will still be split about equal between production and injection wells. The New River pipeline crossing is also reflected on the revised map. The amount of pipeline in the well field will be reduced as a result of less wells and a consolidated well field. Several of the well pads on the south end of the field will be best accessed from Shank Road.

Ormat has obtained an easement from the Imperial Irrigation District (IID) for the transmission line routing along Ward Road to the west of the proposed plant location. They own parcel number 037-160-51-01, a 5.78 acre parcel between the railroad and the Veysey parcel.

Ormat was selected by the City of Brawley to negotiate exclusively for the water from their Waste Water Treatment Plant. Ormat proposes to build the upgrades needed to bring the facility to tertiary treatment and then give the facility to the City and pay for the water via an operations and maintenance agreement. The City will be the CEQA lead agency for this project. The treatment plant will generate enough water for the East Brawley power plant such that canal water from the IID will only need to be a backup once the facility is built. Ormat is requesting that the County and the City work together under a Memorandum of Understanding to prepare a single CEQA document that satisfies both the City and the County because the issues brought up in the EEC hearing would be the same – impacts to water and ecosystems of the IID drains and Salton Sea.

This realignment of the well field will have less impact than the project as originally proposed as it is smaller. Biological and cultural resource surveys will be performed to duplicate those already completed on the other areas of the project.

Access to the well pads and pipelines would be from Andre, Best, Baum (not a County road), Groshen, Kershaw, Rutherford, Ward, and Wills Roads. Additionally, farm roads and IID roads (with permission) may be used for access. Encroachment permits for ingress/egress and irrigation canal and drain crossings would be obtained from the Imperial County Public Works Department and IID as applicable. With the exception of two well sites (14-15 and 15-15), all of the proposed well sites are located east of the New River. Access to farmland would be

coordinated with the landowners to minimize impacts to the farming operations. The well pads and pipelines would be along the edges of the fields. New access roads would be constructed or improved only as needed to safely accommodate traffic required for well pad construction, well drilling, and well and road maintenance. Road widths to well pads would typically be no less than ten feet wide.

5.2 Well Drilling

Geothermal well drilling would be conducted from constructed well pads approximately 316 feet by 356 feet (about 2 acres). A well pad sump/containment basin (nominally 75 feet x 260 feet x 7 feet deep) would be constructed on each well pad to contain drilling mud and rock cuttings from the drilling operations (Figure 6). A Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the geothermal well field and is amended for the construction of each new well pad to prevent stormwater discharges from the well pads during site construction.

Standard geothermal well drilling equipment and well drilling operations would be implemented for the project. The wells would be drilled using a large rotary drilling rig whose diesel engines are permitted under the California Air Resources Board (CARB) Portable Engine Registration Program (PERP). The wells would be drilled with water-based mud to circulate the drill cuttings to the surface. During drilling, the top of the drill rig derrick would be as much as 175 feet above the ground surface, and the rig floor could be 20 to 30 feet above the ground surface. The typical drill rig and associated support equipment (rig floor and stands; draw works; derrick; drill pipe; trailers; mud, fuel and water tanks; diesel generators; air compressors; etc.) would be brought to the prepared site on approximately 40 or more large tractor-trailer trucks. The placement of this equipment within each prepared site would depend on rig-specific requirements and site-specific conditions.

The well bore would be drilled using non-toxic, temperature stable gel-based drilling mud or gel and polymer drilling fluid to circulate the rock cuttings to the surface where they are removed from the drilling mud. The mud is then recirculated. Rock cuttings would be captured in the containment basin. Additives would be added to the drilling mud as needed to prevent corrosion, increase mud weight, and prevent mud loss. The inside diameter of the wells would be approximately 30 inches at the top and would telescope with depth. The typical design depth of both the production and injection wells is projected to be about 4,500 feet. Each geothermal well would be drilled and cased to the design depth or the depth selected by the project geologist. The final determination of well depth and well completion would be based on geological and reservoir information obtained as wells are drilled.

The California Division of Oil, Gas and Geothermal Resources (CDOGGR) regulates geothermal well drilling operations on private lands in California. CDOGGR approves the drilling program for each well including the blow out prevention equipment (BOPE) to ensure the drilling operations are safe, protect the community, and protect land and water resources. Drilling operations would take place for 24 hours per day, 7 days per week. Each geothermal well would take approximately 30 days to complete.

5.3 Well Testing

Wells would be tested while the drill rig is still over the well. The residual drilling mud and cuttings would be flowed from the well bore and discharged into the drilling sump. This cleanout flow test may be followed by one or more short-term flow tests, each lasting from several hours to a day and also conducted while the drill rig is over the well. These tests typically consist of producing the geothermal well into portable steel tanks brought onto the well site while monitoring geothermal fluid temperatures, pressures, flow rates, chemistry and other parameters. Steam from the geothermal fluid would be allowed to discharge to the atmosphere. Produced fluid from the short-term flow test would be pumped back into the well.

An injectivity test could also be conducted by injecting the produced geothermal fluid from the steel tanks back into the well and the geothermal reservoir. The drill rig would likely be moved from the well site following completion of these short-term test(s). Following the short-term test, all equipment would be removed and the well shut in. Temperature profiles of the wellbore would be measured during the shut in period.

After the rig has moved, a longer-term test could be conducted using a test facility consisting of approximately ten, 21,000-gallon steel tanks, injection pumps, coil tubing, nitrogen pumps, filtration units, flow meters, recorders, and sampling apparatus. This test could last for 30 days. Steam from the geothermal fluid would typically be allowed to discharge to the atmosphere. The remaining water would be injected back into either the well from which it was produced or into a second well via temporary pipeline routed along the well site access roads.

Following completion of the short-term geothermal well testing, all of the drilling and testing equipment would be removed from the site. The surface facilities remaining on the site would typically consist of several valves on top of the surface casing, which would be chained and locked and surrounded by an approximately 12-foot by 12-foot by 6-foot high fence to prevent unauthorized access and vandalism.

5.4 Production and Injection Wells

Geothermal resources required to supply the power plant would be supplied from the production wells surrounding the power plant location. Geothermal fluid injection wells would be required to inject the geothermal fluid produced for the project back into the geothermal reservoir. The production and injection wells would be drilled from selected well sites. More than one injection well may be placed on an injection well pad to reduce the use of farmland for the project.

As geothermal production and injection wells age they typically produce less and/or cooler geothermal fluid, or inject less fluid, and may need to be redrilled or worked over. Redrilling or reworking a well requires many of the same activities required to drill a new well. These activities would occur periodically over the life of the project. Any of the geothermal production wells which do not demonstrate sufficient commercial productivity may be converted to an injection well. Any of the wells could also be converted to a monitoring well, or could be abandoned in conformance with the requirements of the CDOGGR.

Dedicated cooling tower blowdown wells (2-4) would be drilled in the same way as an injection well. The only difference is the fluids they take for injection is the water from the cooling tower which is not geothermal brine. These wells would be located adjacent to the power plant.

5.5 Well Site Production and Injection Equipment

Each new production well would be equipped with a pump driven by an electric motor located on top of the well pump discharge head. A small, truck mounted well maintenance rig would install these pumps in the wells. Other small trucks and vehicles would be involved in installing the pump, which is normally conducted only during daylight hours. An electric cable installed along the pipeline from the power plant would provide the electricity to power the well pump motor. Mineral oil is pumped down from the surface at the rate of one to three gallons per day to lubricate the downhole pump lineshaft bearings. This lineshaft bearing lubrication water or mineral oil would be discharged into the produced geothermal fluid and eventually injected into the geothermal fluid injection reservoir. The mineral oil is less than 2 ppm of the volume injected. Production wells would have corrosion and scale inhibitor located on the well pad with secondary containment.

Production wellhead dimensions are not expected to exceed a height of fifteen feet above the ground surface or four feet in diameter. An approximately 8-foot by 15-foot, 10-foot high motor control building may be located within approximately 50 feet of each production well. It would house and protect the auxiliary well systems, motor switchgear controls and sensors, and transmitters for temperature, pressure, and flow rate data. The wellhead, pump motor and motor control building would each be painted an earth tone color to blend with the area and minimize visibility. A gas separator would also be located on each well pad used for production wells. They are 6 feet in diameter, 20 feet long and stand 18 feet tall. Up to about twenty-five percent of the geothermal noncondensible gases separated at each of the well pads may be delivered through dedicated noncondensible gas pipelines to the geothermal noncondensible gas scrubbing system located at the power plant site as described previously.

Each well pad would also include a sand separator for removing sand from the geothermal fluid and a booster pump to increase geothermal fluid pressure. Neither wellhead pumps nor the auxiliary equipment or motor control buildings are required at the injection well sites. Instead, injection pumps located at the power plant site would pump the geothermal injection fluid through the injection pipeline system, providing sufficient pressure to inject the cooled geothermal fluid back into the geothermal reservoir. More than one injection well may be located on an injection wellpad. It is likely that some sort of sand separator and/or filtration system will be located at the injection well pads (in addition to production well pads).

5.6 Geothermal Pipeline Systems

Above ground pipelines will be constructed to deliver the produced hot geothermal fluid from the production wells to the power plant site (aka geothermal production fluid pipelines). Similarly, above ground pipelines will be constructed to return the cooled or spent geothermal fluid from the power plant site to injection wells for subsurface injection of the fluid back into the geothermal reservoir (aka geothermal injection fluid pipelines). The proposed interconnecting production and injection fluid pipeline routes are shown on Figure 3.

Each of the production wells would deliver geothermal fluid to the power plant through new pipelines routed in corridors adjacent to existing farm roads or parallel to, but outside of the rights-of-way of County roads. The total length of new pipeline would depend on which of the production wells were connected to the power plant. Ormat either has geothermal leases with the landowners where the pipelines would be located or would work with the landowners to obtain easements for the placement of the pipelines to minimize impact to farming operations and to stay outside of Imperial County rights-of-way, not only existing but for future expansion.

Similarly, the injection fluid pipelines to the injection wells would be routed in corridors adjacent to existing farm roads or parallel to, but outside of the rights-of-way of County roads. In some sections, the injection pipeline would also parallel the new production pipeline. Here the injection pipeline would either be placed adjacent to, or atop ("piggyback") the production pipeline. The total length of new injection pipeline would also depend on which of the injection wells were connected to the power plants.

The total length of new pipeline would depend on which of the wells were connected to the power plant. If all of the approximately 35 wells were connected, then approximately 9 miles of new production fluid pipeline would be constructed.

The production and injection pipelines would be constructed from steel pipe designed, constructed, tested, and inspected pursuant to current industry standards for high temperature, high pressure piping. The diameter of the steel pipe would vary depending on the type and amount of geothermal fluid to be conveyed. Once covered with about two inches of insulation (one inch for injection pipelines) and a protective metal sheet (appropriately colored to blend with the area), the overall outside diameter of the finished pipe would range from 8 to 36 inches. The pipelines would be constructed near ground level (averaging about one foot off the ground) on pipeline supports installed approximately every 20 to 40 feet along the pipeline routes.

"Expansion loops" would be constructed about every 250 to 500 feet along the production pipeline route so that the pipeline could "flex" as it lengthens and shortens due to heating and cooling. These square bends in the pipeline are typically horizontal, approximately 40 feet in length by 40 feet in width. Some expansion loops are vertical, although these are typically smaller, 15 to 20 feet high. Electrical power and control cables for the production well pump motors and valves, and production and injection wellhead instrumentation would be installed in steel conduit constructed on the pipe supports, buried in a trench dug next to the pipelines or provided by an aboveground electrical distribution line. Injection pipelines have fewer expansion loops.

Some new access roads would be built for pipeline construction or maintenance. Pipeline construction would not require significant grading of the pipeline route. The pipeline would be constructed to cross beneath existing roads to allow continued access. Pipeline crossings of any unpaved roads (including Ward) would typically be constructed by the cut-and-fill method, which minimizes the time during which traffic on the road would be impacted. A trench would be cut through the road and a prefabricated U-shaped section of insulated, wrapped geothermal

fluid pipe, placed inside a larger diameter pipe or otherwise protected so that it is strong enough to support traffic on the road above, would be placed in the trench. The excavated dirt would then be backfilled and compacted around and above the pipeline or pipe sleeve, and the roadbed material would be repaired or replaced. Access would typically be restricted for only a few hours during actual construction. Appropriate traffic controls (including detour signs) would be in place during any construction within the roadbed or adjacent shoulders of each road to warn and control traffic.

For the crossing of Best Road, the pipeline and accompanying power and control cables would be installed by cut and fill technique or with microtunneling procedures. The latter technique does not disrupt traffic and neither technique would cause settlement of the roadbed. Microtunneling would be conducted by specialty contractors using specialized equipment. Oversize steel casing would be installed behind a boring machine that would be advanced under the road by "jacking." Pits would first be excavated and braced at each end of the casing run. The boring machine and casing sections would then be lowered into one pit. The boring machine (with casing behind it) would be "jacked" under the road using specially designed jacks. Casing sections would be welded together as they are moved forward to form a continuous casing under the road. Once the welded casing is in place under the entire road the boring machine would be removed through the other pit. Cement grout under pressure would be used to fill any voids between the casing and the dirt under the road.

The pipeline crossing of the New River would interconnect facilities on the east and west sides of the river. The crossing is discussed in further detail in Section 5.7 below.

Pipeline crossings of the Imperial Irrigation District (IID) canals or drains would be above ground or underground at their request. All River and IID canal and drain crossings would be engineered and constructed in conformance with the applicable IID encroachment permit requirements. Field drains and head ditches would be crossed by the pipelines as agreed to with the individual landowner/geothermal lessor.

Pipeline construction would be conducted concurrent with the construction of the power plant.

5.7 New River Pipeline Crossing

A description of this project was included in an amendment to the East Brawley CUP application submitted to the County in March 2009. This information is provided below. See the March 2009 submittal for draft figures and drawings; however, the plans have been revised/refined somewhat and the latest preliminary draft plans are available from Ormat.

This project involves the installation of piping over the New River north of the City of Brawley, east of Highway 111 and Andre Road and just south of the City of Brawley's Wastewater Treatment Plant (See attached figure). It will located on private land (APN 037-140-02-01) owned by Veysey, Victor V. & Janet D and under lease to ORNI 17, LLC in the southeast corner of Tract 118 (see map). Several pipes from geothermal pads on the east side of New River will be extended across the New River (WGS 84 33°1'01.4"/115 °31'12.1"). The pipes will allow connection of geothermal wells located on both sides of the river. The pipe crossing at the river

will be approximately 18 feet wide and begins at the end of a private road on each side of the river.

The crossing will support the following equipment:

- 2 x 24 inch geothermal brine lines
- 2 x 12 inch noncondensible gas lines (mostly carbon dioxide)
- 1 x 16 inch pipe for canal water for cooling tower make up
- 1 x 12 inch pipe for cooling tower blow down water (possibly from North Brawley to East Brawley)
- A 36 inch cable tray for power and control cables
- A man walkway for maintenance and inspection

The crossing would be a truss structure spanning the river. The footings to support the structure and pipes will be approximately 15-20 foot square on each side of New River. A total of two footings will be placed approximately 10 feet east and west of the bank of New River. The footings are located in an area of sparse vegetation consisting of salt cedar (*Tamarix sp.*). The area necessary for construction activities will be approximately 100 feet and will be located east and west of the bank of New River.

The pipes will be constructed of industrial standard designation of "extra heavy" wall thickness. An automatic injection pump shut-off and check-valve system will immediately stop fluid flow should a leak or break occur in any of the pipes. A system of pressure and flow sensing devices, capable of detecting any leak or spill, would be installed and maintained. Additionally, the pipelines would be inspected on a regular basis. The crossing and pipelines will be designed, engineered, manufactured and assembled to perform and comply with all the relevant county, state and federal regulations such as California Building Code, ASME and OSHA.

The pipe will be positioned through the use of cranes located east and west of the bank of New River. Other construction equipment will include a forklift, water truck, backhoe and loader. The area on each side of the river where the crossing will be anchored is flat and will require minimal grading. No grading permit is anticipated to be required based on the amount of dirt to be moved. The anchors will be away from the river bed. Erosion control measures will be implemented if the final design indicates that protection of the river is needed from potential erosion or run-off during construction. Construction time will be brief; approximately five to six weeks.

Locked gates will be located over the pipelines on each end of the crossing to prevent public access. There will be a walk way area to allow workers to inspect the pipelines, there is no vehicle access. The gates will signed "private property" and "no trespassing" in both English and Spanish.

Potential impacts to biological resources, cultural resources, and other issues were discussed in the March 2009 submittal with a conclusion of no significant impact from the New River Bridge Crossing.

6.0 TRANSMISSION AND INTERCONNECT

ORNI 19, LLC is negotiating a power purchase agreement (PPA) for sale of the energy generated by the project with Southern California Edison (SCE). If these negotiations falter, the project would not stop as ORNI 19 LLC could either contract with other utilities or energy companies or could use an option under the existing North Brawley Geothermal Project PPA with SCE which allows them to sell up to 100 MWs.

A substation would be located on the west side of the power plant site. A new transmission line would interconnect to the IID at the North Brawley 1 substation located near the intersection of Hovley and Andre Roads. The interconnection line would be a 2- to 5-mile long double circuit 13.8- and 92-kilovolt (kV) transmission line with 66-foot high poles. The transmission line pole and turning structure designs have not yet been completed, but the distance between the conductors and the ground wire near the top of poles will exceed 60 inches to prevent the potential electrocution birds that may perch on the poles. Both the new substation and the interconnection transmission line would be part of the East Brawley Project. The new line would span the New River, but no structures would be constructed within the River. Encroachment permits and easements would be obtained from the landowner or agencies as required for permitting and installation of the interconnection transmission line.

The proposed interconnection transmission line route and one alternative route are under consideration as shown in Figure 7. The proposed interconnection line would be routed to the west from the power plant substation, crossing the New River and would be aligned north of André Road to the interconnection point at the North Brawley 1 substation (west route). The alternative interconnection transmission line route would course northerly to an alignment on the south side of Baum/West Baughman Road turning west and crossing the New River to Hovley Road where it would turn to the south to the North Brawley 1 substation interconnection point (north route). The substation and interconnection transmission line construction would be conducted concurrent with the construction of the power plant.

The substation at North Brawley is the point of demarcation between Ormat and the IID. The substation is owned by ORNI 18, LLC. The transmission lines beyond the substation are owned and operated by IID to a point of interconnection with California Independent System Operator's (CAISO) controlled grid.

7.0 ABANDONMENT AND SITE RESTORATION

The projected life of the Project is a nominal 30 years. At the end of the useful life of the Project, equipment and facilities would be properly abandoned. The geothermal wells would be abandoned in conformance with the well abandonment requirements of the CDOGGR. Abandonment of a geothermal well involves plugging the well bore with clean drilling mud and cement sufficient to ensure that fluids would not move across into different aquifers. The wellhead (and any other equipment) would be removed, the casing cut off at least six feet below ground surface, and the well site reclaimed.

At the end of power plant operations, the project would prepare and implement a Site Abandonment Plan in conformance with Imperial County and CDOGGR requirements. The Plan would describe the proposed equipment dismantling and site restoration program in conformance with the wishes of the respective landowners/lessors and requirements in effect at the time of abandonment. Typically, above-ground equipment would be dismantled and removed from the site. Some below ground facilities may be abandoned in place. The surface of the site would then be restored to conform to approximate pre-project land uses.

8.0 ALTERNATIVES CONSIDERED BUT ELIMINATED

An alternative project location for the project was considered, but it was determined that the proposed project was specific to Ormat's geothermal leases in East Brawley. A geothermal project must be sited near the commercial geothermal resource it is utilizing because the geothermal resource cannot be transported long distances without losing its heat and viability as an exploitable energy source. Ormat acquired the proposed power plant location because of its location with respect to the geothermal resource and the availability for purchase. As such, an alternative project location was eliminated from further consideration.

9.0 ENVIRONMENTAL PROTECTION MEASURES

Measures intended to mitigate potential impacts from occurring as a result of the Project construction and operations were listed in the CUP application and applicant's provided Environmental Assessment.

10.0 LIST OF OTHER STUDIES PERFORMED FOR PROJECT

Barrett's Biological Surveys. 2008. *Ormat East Brawley Plant, Preconstruction Survey, Imperial County.* (May 2008). Prepared for Ormat Nevada, Inc.

Barrett's Biological Surveys. 2007. *Biological Technical Report, Ormat Geothermal Plant Site, North Brawley, California.* (May 15, 2007). Prepared for Ormat Nevada, Inc.

Darnell & Associates, 2009. *Traffic Study for East Brawley Geothermal Development Project.* December 1, 2009 (revised)

Development Design & Engineering. 2009. *East Brawley Geothermal Development Project, SB 610 – Water Supply Assessment – FINAL.* (August 11, 2009). Prepared for Ormat Nevada Inc.

Development, Design & Engineering, 2009. *Environmental Assessment of ORMAT's East Brawley Geothermal Development Project's Potential Impact to IID Drains & Salton Sea.* December 3, 2009

Environmental Management Associates, 2008. *Application for Authority to Construct ORNI 19, LLC – Ormat Nevada, Inc., East Brawley Geothermal Development Project.* October.

Tierra Environmental Services. 2008. *A Cultural Resources Survey of 189-Acres Proposed for Geothermal Development near Brawley, Riverside* [sic] *County, California.* (November 2008).

Tierra Environmental Services. 2009. Letter Report: *Additional Cultural Resources Survey for the East Brawley Geothermal Project.* (March 17, 2009).

FIGURES

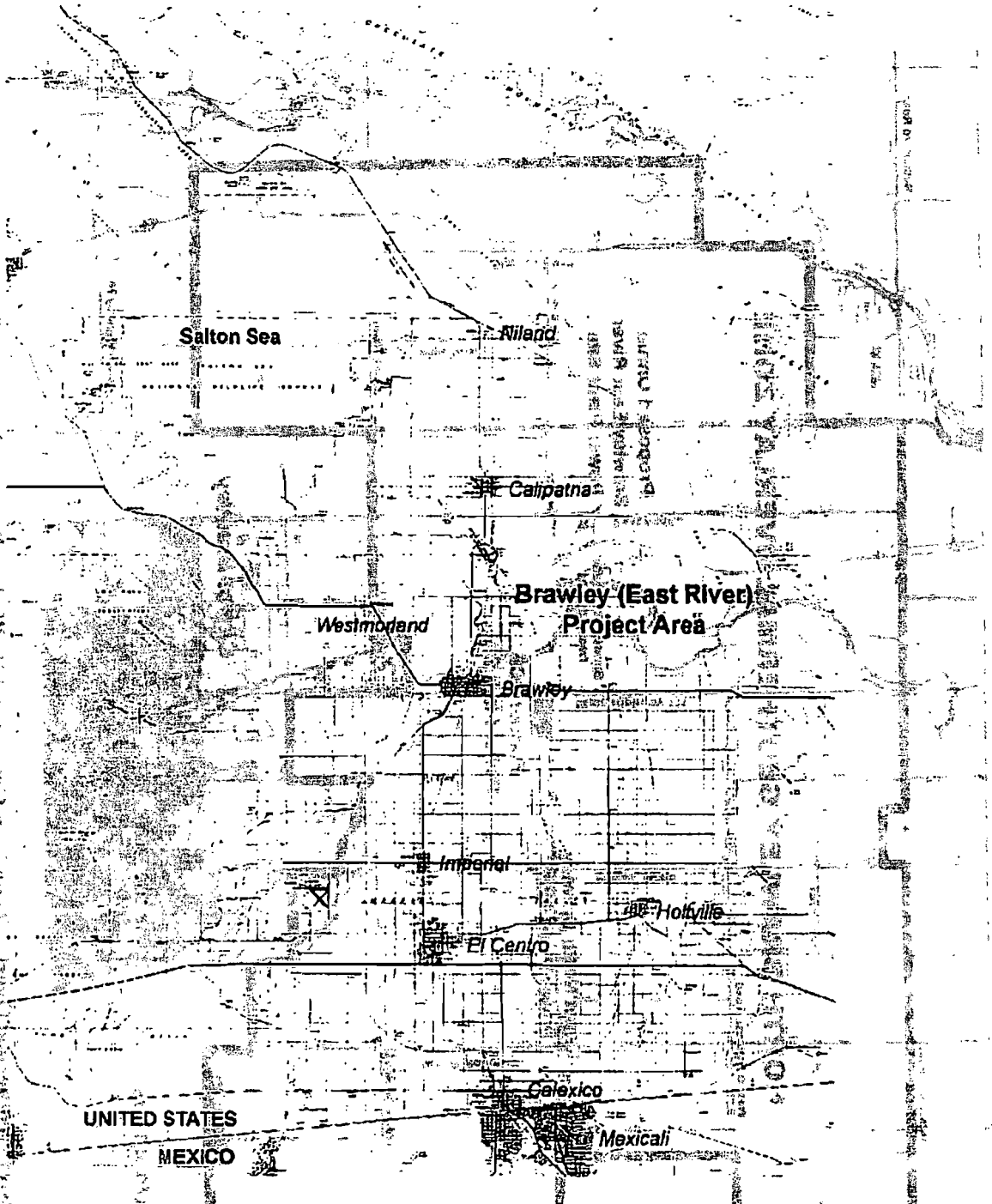


Figure 1: Location Map – Brawley East River Geothermal Development Project

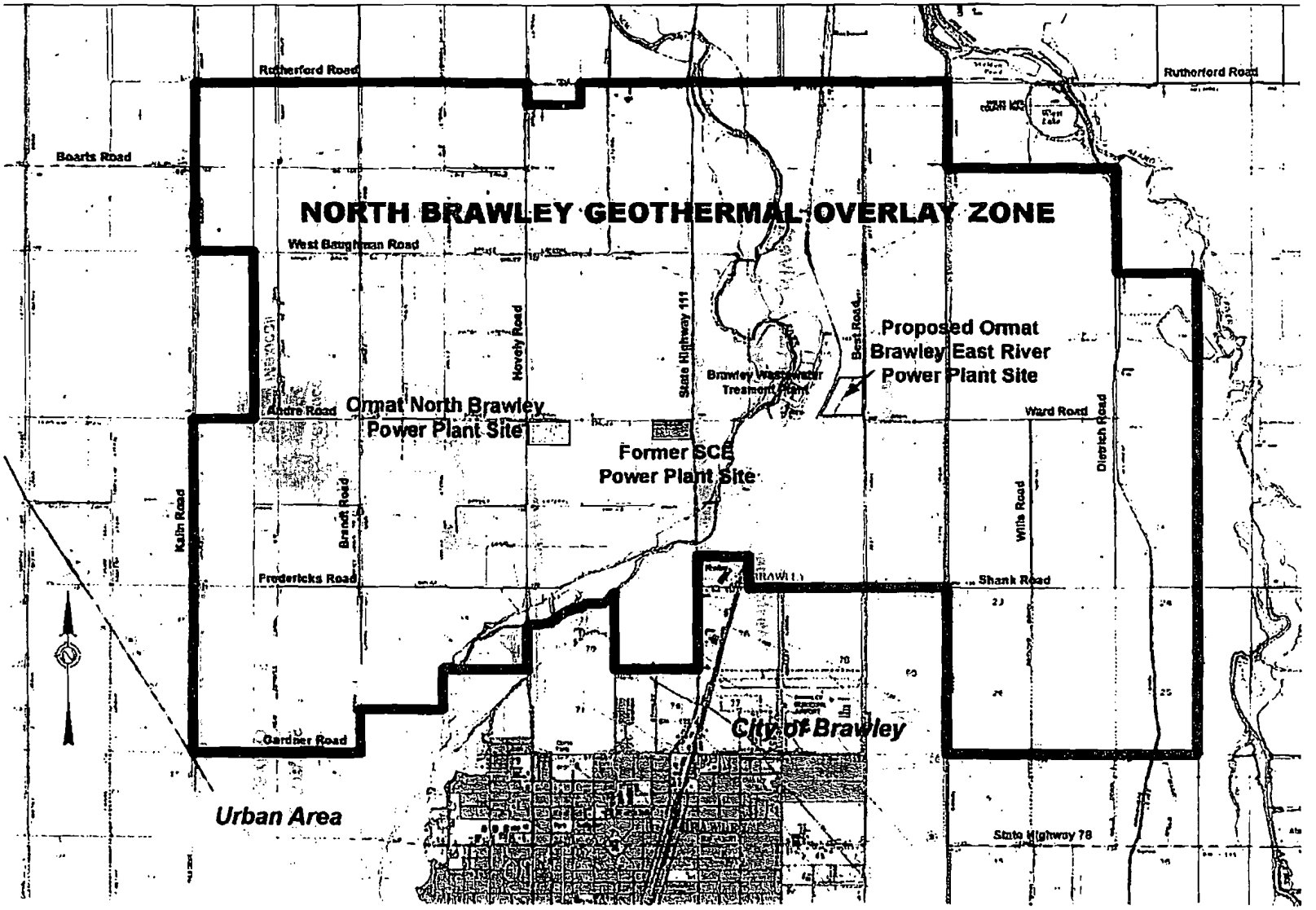


Figure 2: North Brawley Geothermal Overlay Zone Map Geothermal Wellfield – Brawley East River Development Project

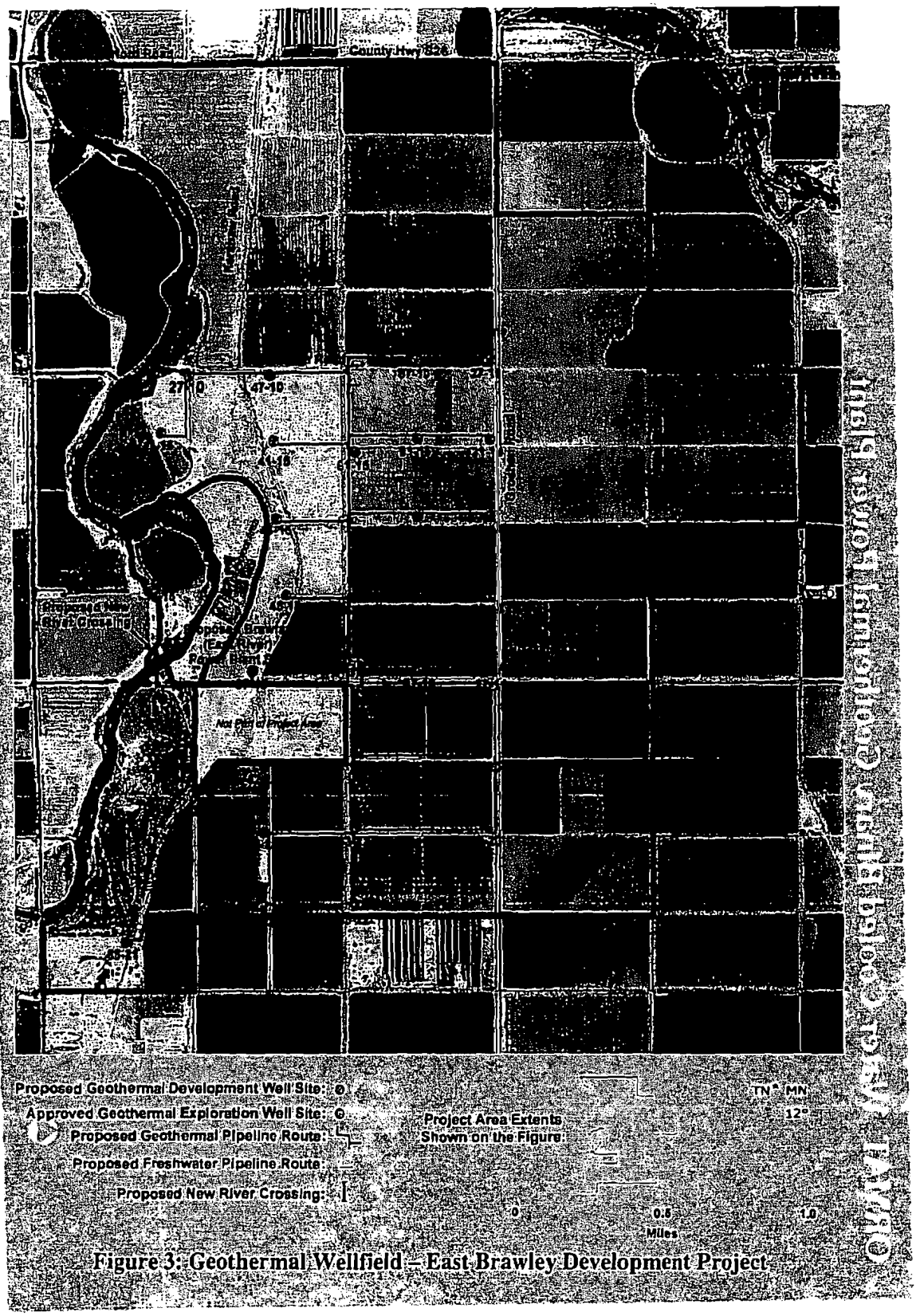


Figure 3: Geothermal Wellfield – East Brawley Development Project

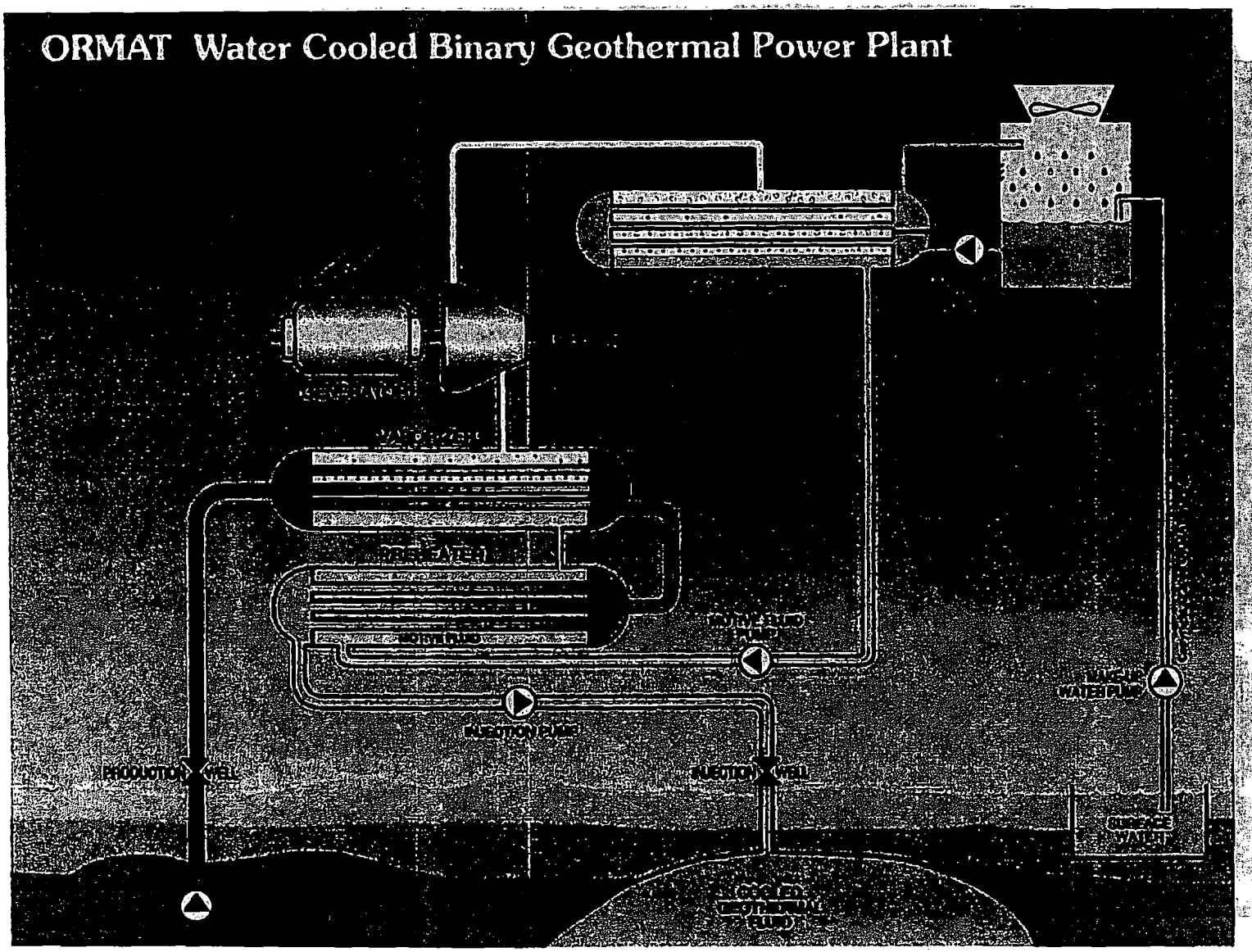


Figure 4: Schematic of Ormat Water Cooled Binary Geothermal Power Plant

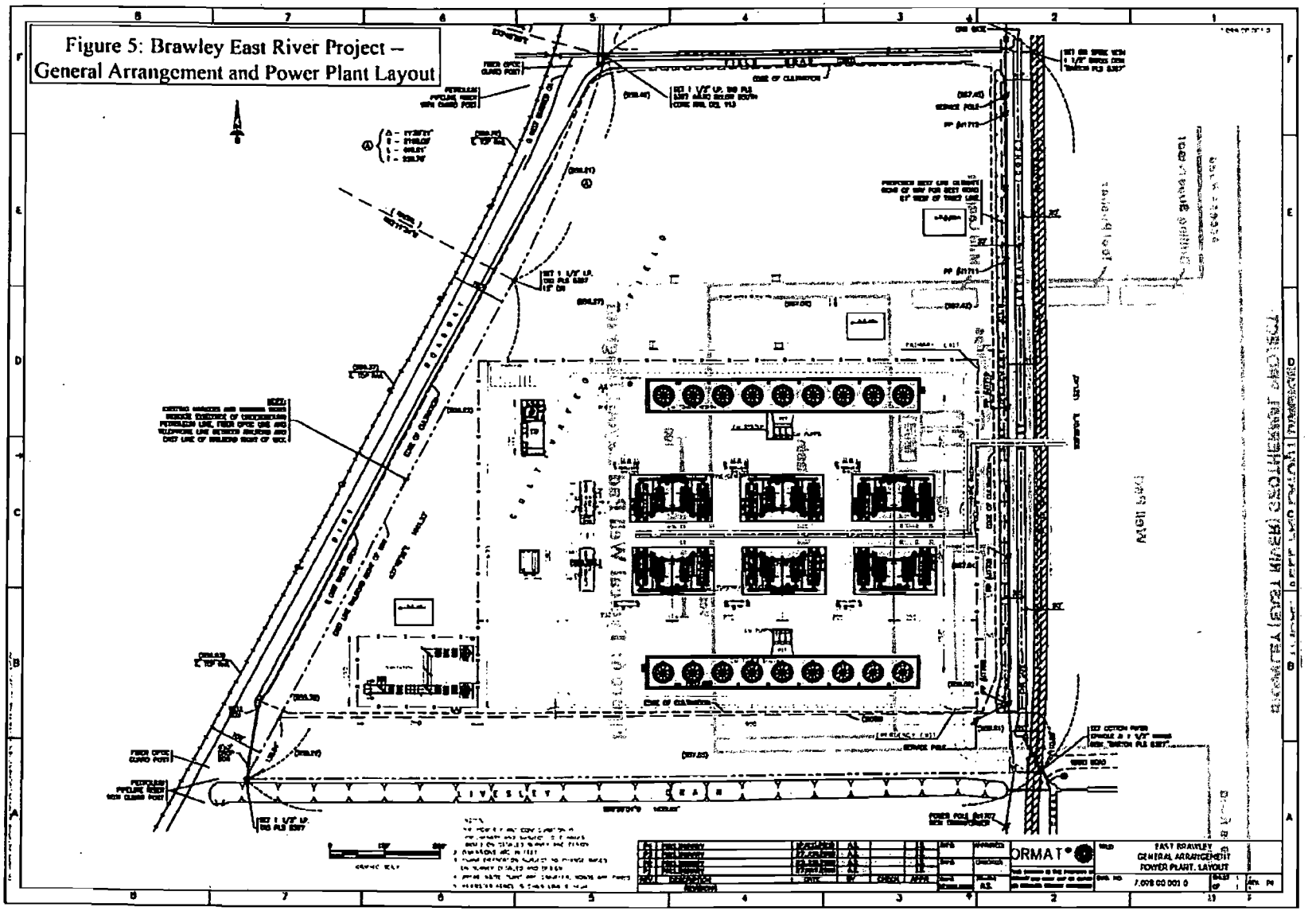


Figure 5: Brawley East River Project –
General Arrangement and Power Plant Layout

TYPICAL WELL PAD LAYOUT DIAGRAM
BRAWLEY (EAST RIVER) GEOTHERMAL PROJECT

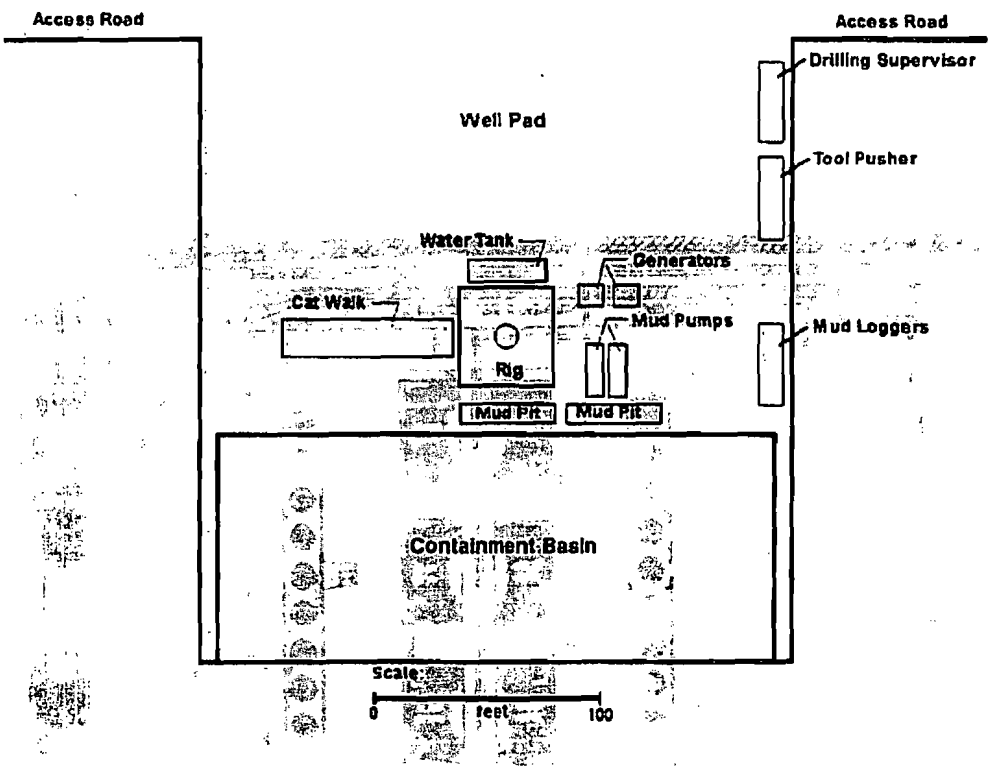


Figure 6: Typical Well Pad Layout Diagram

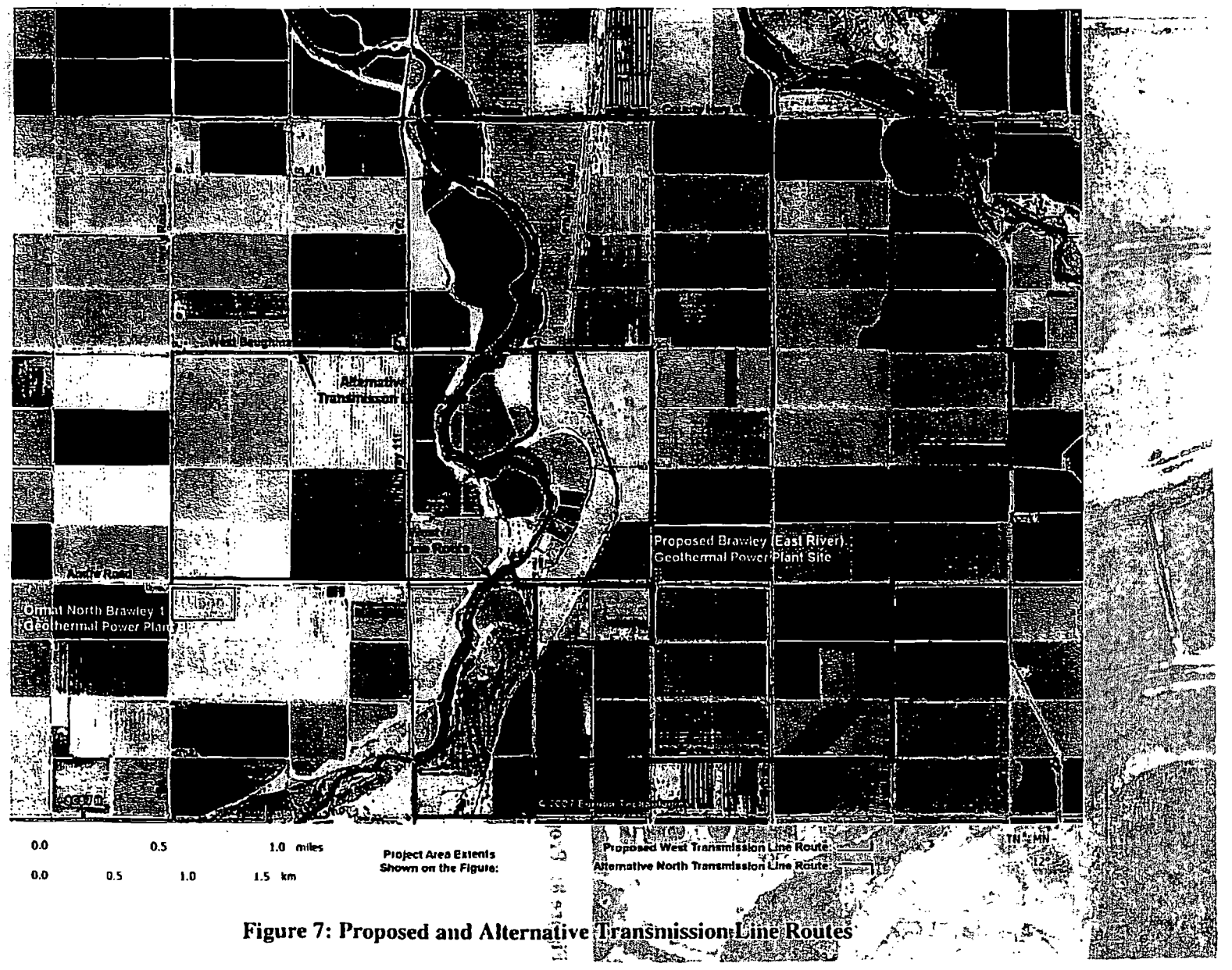


Figure 7: Proposed and Alternative Transmission Line Routes

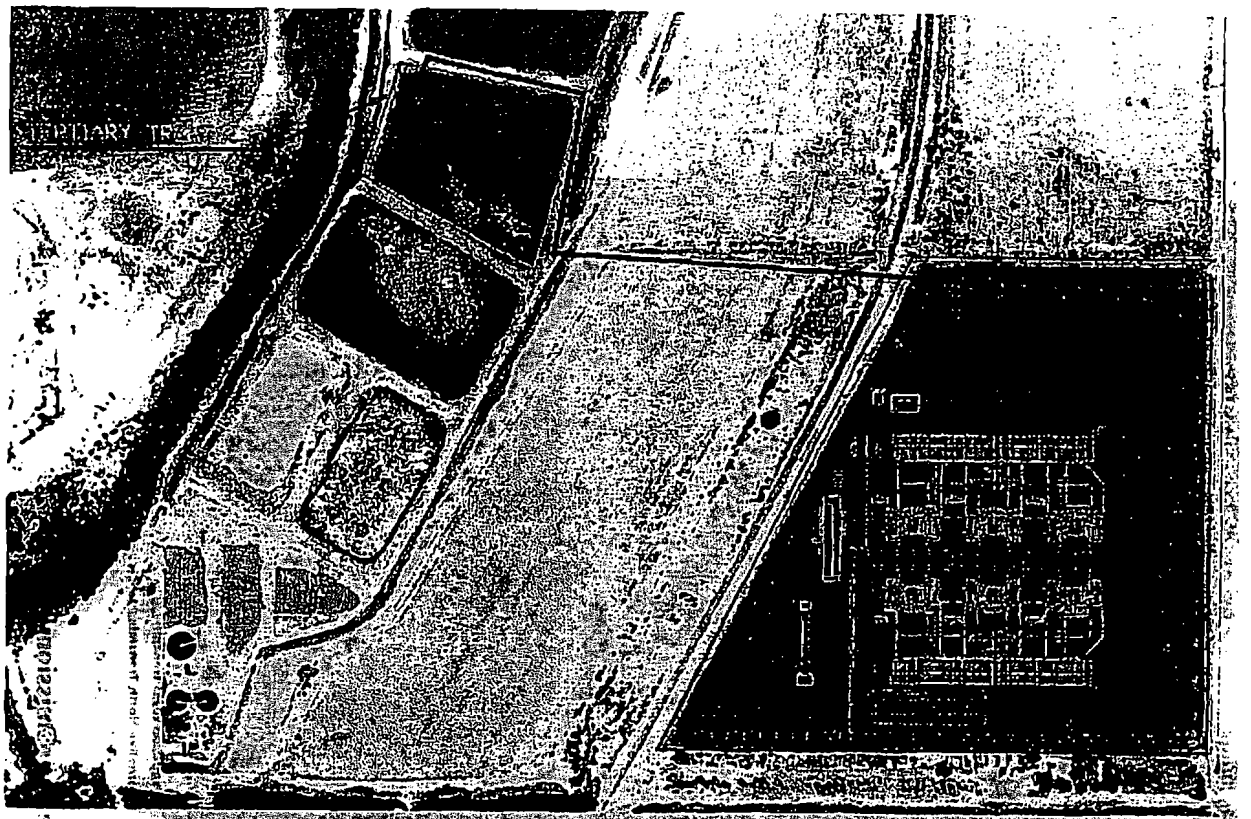


Figure 8: Proposed Tertiary Water Pipeline Route

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ORMAT®

BRAWLEY WASTEWATER TREATMENT PLANT
TERTIARY TREATMENT FACILITY
CONCEPTUAL DESIGN REPORT

1 INTRODUCTION

Ormat Nevada, Inc. (Ormat), currently utilizes canal water from the Imperial Irrigation District to provide make-up water to the cooling towers of the existing geothermal power generation facilities. Ormat is interested in reducing its use of canal water, and has commissioned this report to evaluate the use of effluent from the City of Brawley Wastewater Treatment Plant (WWTP) for use in the cooling tower make-up water at the East Brawley and North Brawley facilities. A tertiary treatment facility will be required to meet the performance objectives of the California Recycled Water Criteria (Disinfected Tertiary Title 22 Recycled Water) for direct use in open recirculating cooling water systems as well as water quality requirements specific to cooling water system operation.

The City of Brawley is currently upgrading the Waste Water Treatment Plant (WWTP) secondary system by replacing the existing lagoons with an extended aeration pond system employing wave oxidation technology that will provide full nitrification and denitrification. The plant upgrade includes new secondary clarifiers, aeration blowers, sludge dewatering and drying, new yard piping, electrical distribution and control systems.

Following is the conceptual design of the tertiary treatment system as developed and proposed by Ormat.

This design is the basis being used for design reviews by consultants and contractors in order to develop a final design. This conceptual design is intended to provide sufficient information for understanding environmental impacts and general parameters of final design with potential to change based on design reviews.

2 PROJECT VICINITY AND LOCATION MAPS

The tertiary treatment facility will be located on the City of Brawley WWTP. The City of Brawley WWTP is located at 1550 Best Road in the City of Brawley as shown Figure #1 – Vicinity and Location Maps.

3 PROJECT DESCRIPTION

The proposed tertiary treatment system will have a capacity of 5.9 mgd. As of 2008, existing Brawley WWTP average dry weather flows were 3.9 mgd. Therefore, the tertiary treatment system will operate at the initial available flow rate of 3.9 mgd but increase over time to 5.9 mgd as dry weather flow increases.

The new tertiary treatment system will receive water from the Secondary Effluent Diversion Structure which is being installed together new secondary system. The Secondary effluent flow will be diverted from the 42-inch pipeline to the Tertiary Influent Pump Station wet well. From the wet well, water would be pumped into a flash mixing chamber for alum addition. Alum or Ferric Chloride will be added using a high-energy direct-vacuum induction or pump diffusion system for near instantaneous and homogenous mixing.

Following flash mixing, the water will overflow into two (2) parallel flocculation and sedimentation trains. Flocculation will be based on a two-stage design. The first stage will provide greater mixing energy to begin particle agglomeration and floc formation. The second stage will impart less energy to avoid shearing and encourage continued growth of large settleable floc. After the flocculation chambers, water will flow into the rectangular sedimentation tanks. The majority of the suspended solids will be removed in the sedimentation basin and the supernatant will be collected via weirs from the top of the sedimentation basin. The supernatant would then flow into the multi-media filter by gravity. A polymer will be added to the water as needed to increase filter performance and minimize filtered effluent turbidity. The gravity multi-media filter would have four filtration cells operating in parallel with sand and anthracite media. The filtered water would be collected in the Filter Effluent Distribution Box.

The Filter Effluent Distribution Box will be designed with a two-way weir system that will allow the filtered water to flow into the Filter Backwash Supply Storage Sump, or to the Chlorine Contact Basin. Sodium hypochlorite will be injected at the dosage of 5 mg/L and the chlorine contact tank will provide two hours of detention time at 5.9 MGD to achieve the minimum 90 minute modal contact time required by Title 22. Once the water is disinfected by the Chlorine Contact Basin, the water would gravity flow into a storage equalization pond. The equalization pond would hold approximately 6.0 million gallons to provide an operational buffer in case of WWTP or tertiary system interruptions, or Power Plant operational disruptions. An Effluent Pump Station Wet Well would receive the water from the equalization pond and supply the water to Ormat's Power Plant. If required, it would be possible to inject Sodium hypochlorite at a dosage of 2 mg/L into the effluent pump station discharge pipe in order to maintain a residual disinfectant. The free chlorine residual will be monitored and analyzed downstream of the injection point. A flow schematic for the normal operations in dry weather conditions is presented in Figure #2 – Process Flow Schematic.

If the tertiary system operations are disrupted for a brief amount of time, the secondary effluent would be diverted to the existing UV disinfection system and flow into the New River instead of the tertiary treatment process. In this short period the water demand at the East Brawley Plant would be met by utilizing the equalization storage. Any secondary effluent excess flow above 5.9 MGD would also flow to the New River through the existing UV disinfection system.

A flow schematic showing the described temporary wet weather operations is presented in Figure #3 – Wet Weather Flow.

As part of the normal dry weather tertiary operation, the Filter Effluent Distribution Box will allow the filtered effluent to flow into the Filter Backwash Supply Storage Sump. The weir height will be equivalent to the weir height that controls flow to the Chlorine Contact Basin. This would keep the Filter Backwash Supply Storage Sump full at all times. The sump would have the capacity to store water to satisfy two sequential filter backwash cycles without interrupting normal tertiary treatment system operation. The Filter Backwash Supply Pumps would convey the stored backwash supply water to the media filter at a higher rate to provide cleaning, fluidization and restratification of the media. The backwash wastewater would then be collected and conveyed back to the Influent Pump Station Wet Well.

Alum/Ferric sludge will be collected from the sedimentation basin using a chain and flight system and conveyed to a sludge holding tank. The sludge pumps will convey the collected sludge to a new centrifuge system. One new centrifuge will be installed near the existing centrifuge. A new polymer system would be utilized at the new centrifuge system to increase the dewatering efficiency. The filtrate from the centrifuge would then be recirculated to the Tertiary Influent Pump Station wet well and the solids from the centrifuge would be collected and transferred to solids drying beds for further dewatering. Once the water content of the dried solids is reduced below 50%, the solids will be hauled off to a landfill for final disposal.

Chemical storage, feed systems, and electrical distribution and control system will occupy separate areas in a common building. The chemical area will house the following chemical feed and storage systems:

- Alum
- Caustic
- Sulfuric Acid
- Sodium Hypochlorite
- Polymer (Flocculation)
- Polymer (Dewatering)
- Sodium Bisulfite

4 EFFLUENT WATER QUALITY REQUIREMENTS

The total permitted design capacity of the WWTP will be 5.9 mgd. Ormat desires to use tertiary effluent from the Brawley WWTP for the use in evaporative cooling towers. Therefore, the tertiary treatment water must meet the requirements of Title-22 disinfected tertiary recycled water. The cooling tower make-up water requirements and water quality objectives for the East Brawley Power Plant are presented in the following Tables.

Tertiary Effluent Water Quality Objective

Parameter	Unit	Assumed Biolac Effluent Process WQ	Tertiary Effluent Objective
pH	pH Unit	<7.9	6.0 – 8.0
TDS	mg/L	< 1,200	< 1,700
Total Alkalinity	mg/L as $CaCO_3$	<300	< 300
Chloride	mg/L as Cl	450	450
Sulfate	mg/L as SO_4	300	< 600
Total Hardness	mg/L as CaCO3	370	< 500
Calcium Hardness	mg/L as CaCO3	220	<300
Ortho-Phosphate	mg/L as PO_4	11	1.1 – 2.6
Total Phosphate	mg/L as PO_4	12	1.4 – 3.1
Silica	mg/L as SiO2	14	< 40
Total Iron	mg/L as Fe	0.25	< 0.3
Copper	mg/L as Cu	0.016	< 0.14
Aluminum	mg/L as Al	0.2	< 0.4
TSS	mg/L	< 20	<2
Free Chlorine	mg/L as Cl_2	0.0	0.2 – 1.0
Total Coliform	MPN/100ml	TNTC	2.2

5 CONCEPTUAL DESIGN CRITERIA

The conceptual design criteria for the Brawley Tertiary Treatment System are summarized in the following Table.

Process	Design Criteria
Pretreatment	
Flash Mix	HRT: 40-50 seconds Dimensions: 6' (L) x 6' (W) x 12' (D), 3' freeboard Volume: 3200 gallons Flash Mix Pump: 200 gpm Coagulant Dosage: 50-150 mg/L Alum (100% strength) pH adjustment capability: caustic and sulfuric acid
Flocculation	2 parallel trains; 2 stages each HRT at design flow, each stage: 17-18 minutes Volume each stage: 36,000 gallons Dimensions each stage: 20' (L) x 20' (W) x 12' (D), 3' freeboard Mixers: 4- 25 HP, 2-speed motors
Sedimentation	2 parallel basins Overflow Rate: 1 gpm/sf Volume each stage: 180,000 gallons Dimensions: each 100' (L) x 20' (W) x 12' (D), 3' freeboard Effluent Weir Loading: 20,000 gpd/ ft; 150 LF each basin Chain and flight sludge collection
Chemical Feed and Storage Facilities	Alum Storage: 1 x 15,000 gal tank Polymer Storage: 2 x 55 gal tanks Caustic Storage: 1 x 2,000 gal tank Sulfuric Acid Storage: 1 x 100 gallon tank Chlorine (Sodium Hypochlorite) Storage: 2x 3,000 gal tanks Alum Dosing Equip: 1 gpm Building Dimensions (Portion of Combined Chem/Elect Bldg): 50' (W) x 80' (L)
Filtration	
Gravity Multi-Media Filtration System	No. of Filters: 4 Filtration Rate: 4 gpm/ft2 w/1 unit offline Dimensions(each): 18.5' (L) x 18.5' (W) x 17' (H) Max BW rate: 5200 gpm
Backwash Waste Stream	Max. Daily volume: 160,000 gallons Equalization Volume: 120,000 gallons
Backwash Waste Return Capacity	200 gpm
Pumping	
Tertiary Inlet Pump Station	3 vertical centrifuge 480V motors 2 duty with VFD +1 standby (without VFD) Design Flow: 2,100 gpm each
Backwash Supply Pumps	3 vertical centrifuge 480V motors 2 duty with VFD +1 standby (without VFD) Design Flow: 2,500 gpm each
Tertiary Effluent Pump Station	3 vertical centrifuge 480V motors 2 duty with VFD +1 standby (without VFD) Design Flow: 2,100 gpm each

6 PROJECT LAYOUT

The proposed site layout for the preferred project is shown in the Figure #4 – Site Plan Layout, for the centrifuge system in Figure #5 – Centrifuge and Solids Drying Beds Layout and for the disinfected tertiary effluent pump station in Figure #6 – Yard Piping and Pump Station Layout.

The major treatment equipment would be located in Pond S2 (second pond from the north). The new tertiary system centrifuge would be located adjacent to the existing centrifuge for the secondary sludge. The 6.0-MG equalization pond would be located within the existing Pond S3 (the most northern pond) and the tertiary effluent pump station would be located at the southwest corner of this pond. An access road has been designed around the tertiary treatment plant for ease of access and maintenance. The southeast corner of Pond S2 would be filled and the electrical equipment and chemical feed system would be located in this area. Both the electrical equipment and the chemical feed system would be in an air conditioned building. This building is located on the fill at a higher elevation to prevent any flood damage in case of a storm.

The preliminary hydraulic profile of the conceptual design is shown in Figure #7 – Hydraulic Profiles.

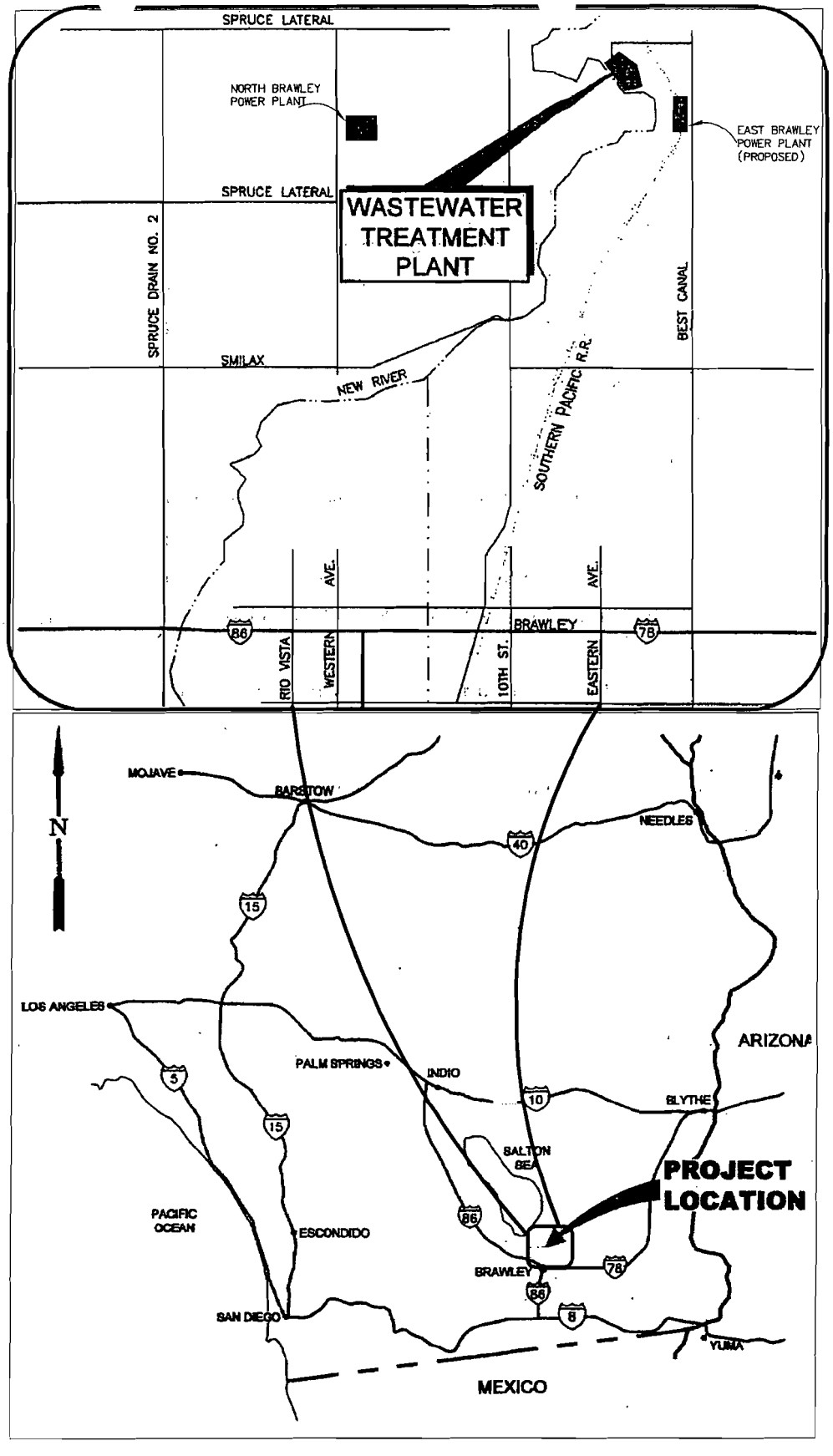
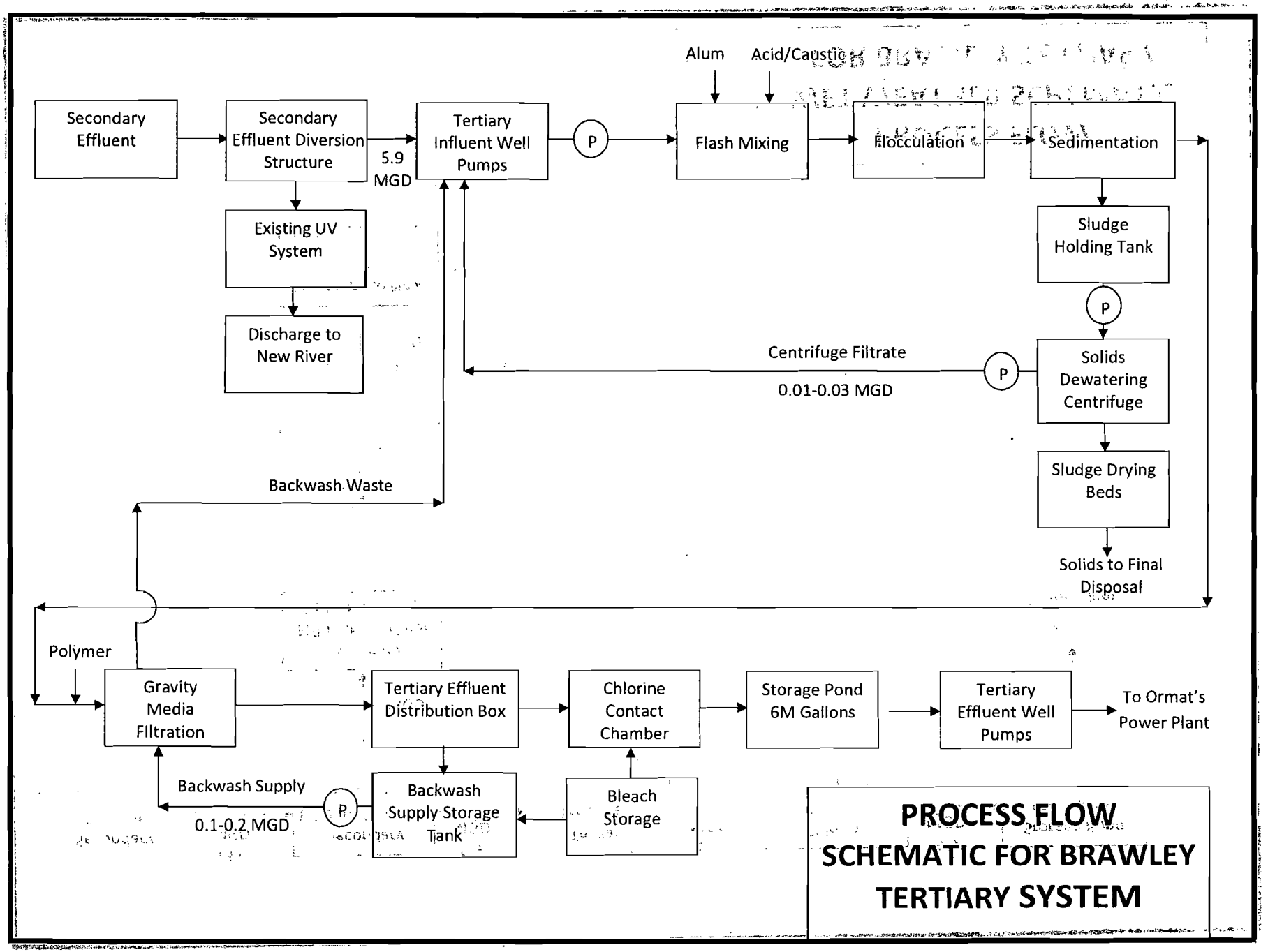
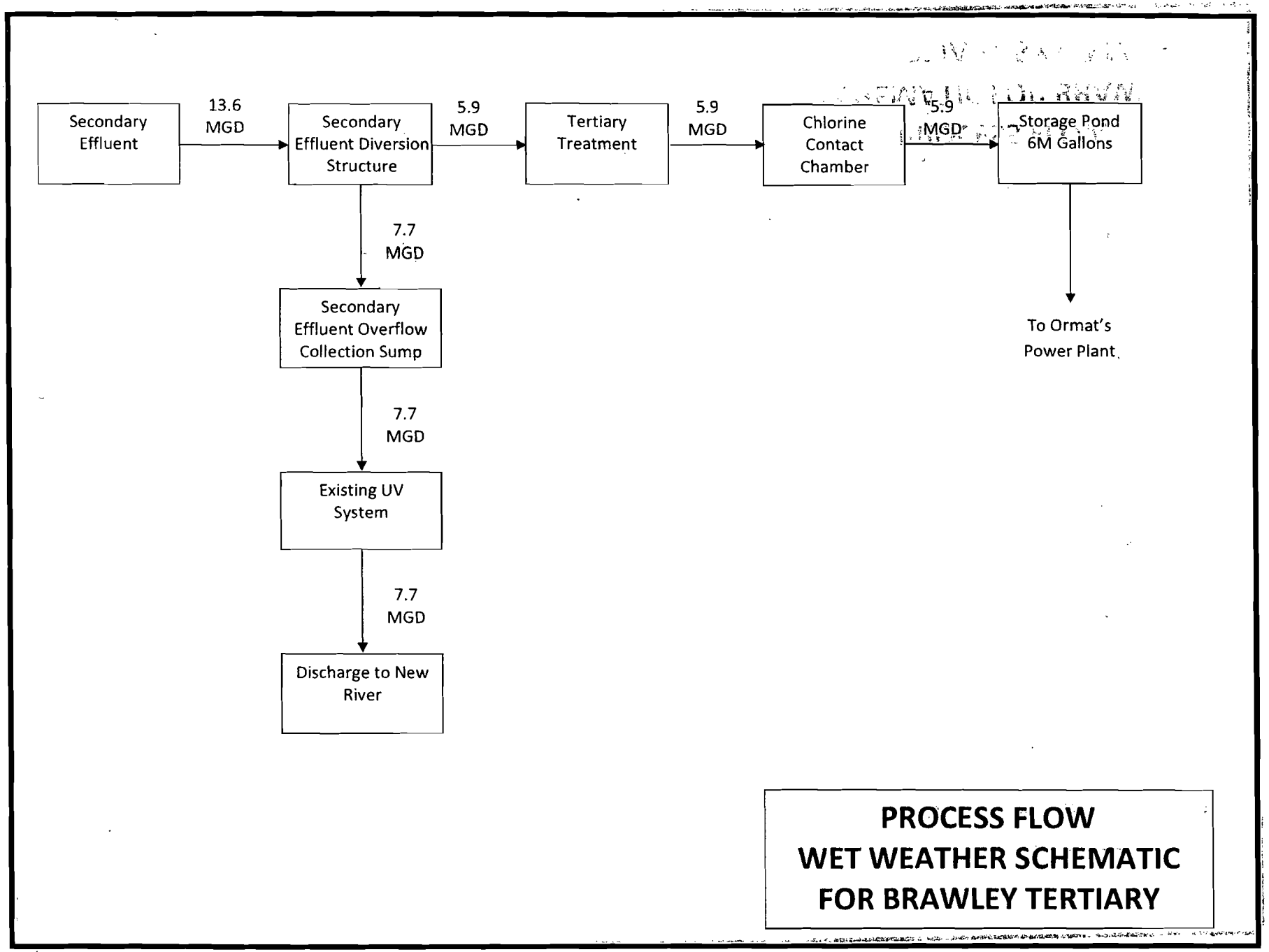
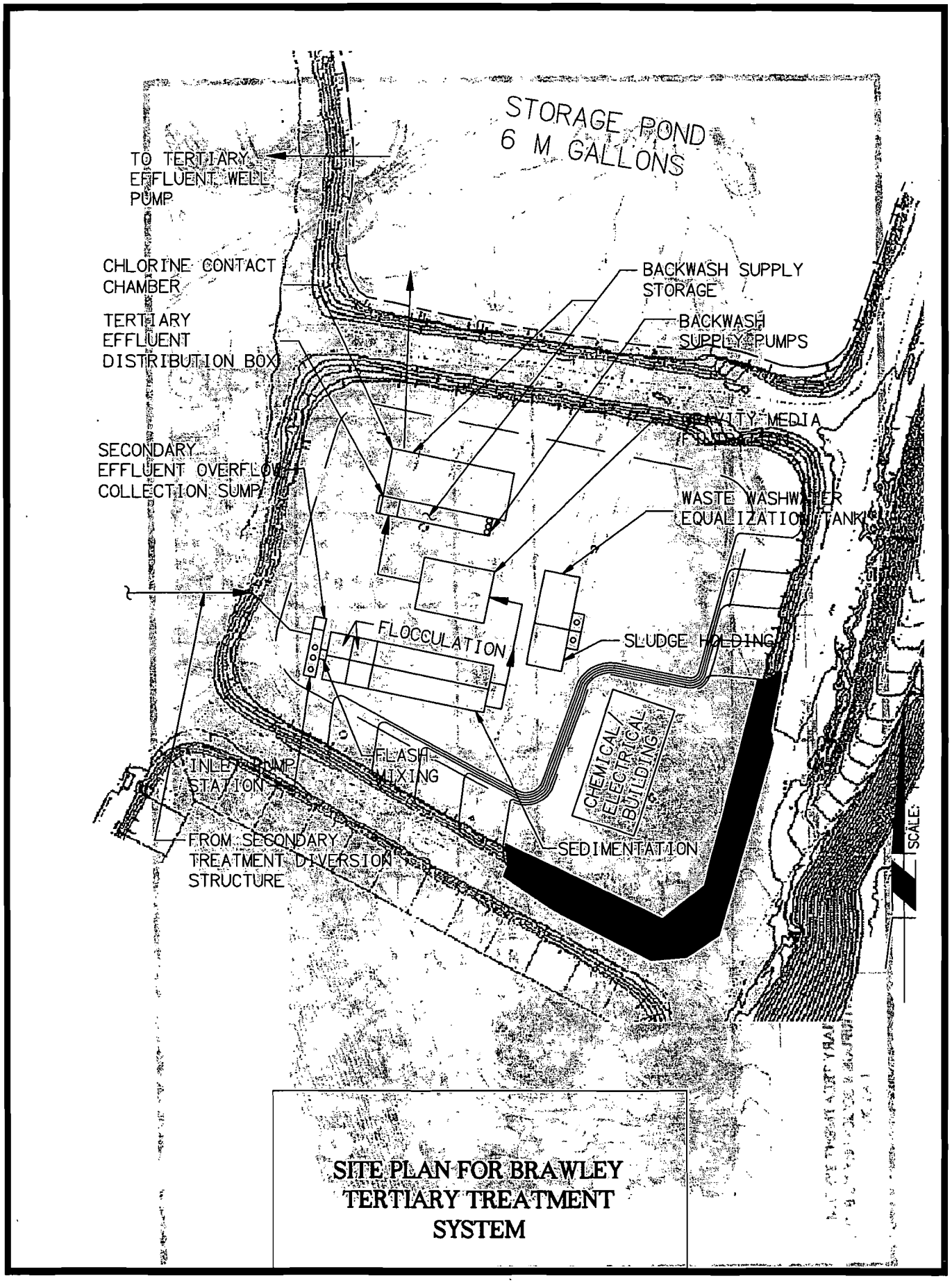


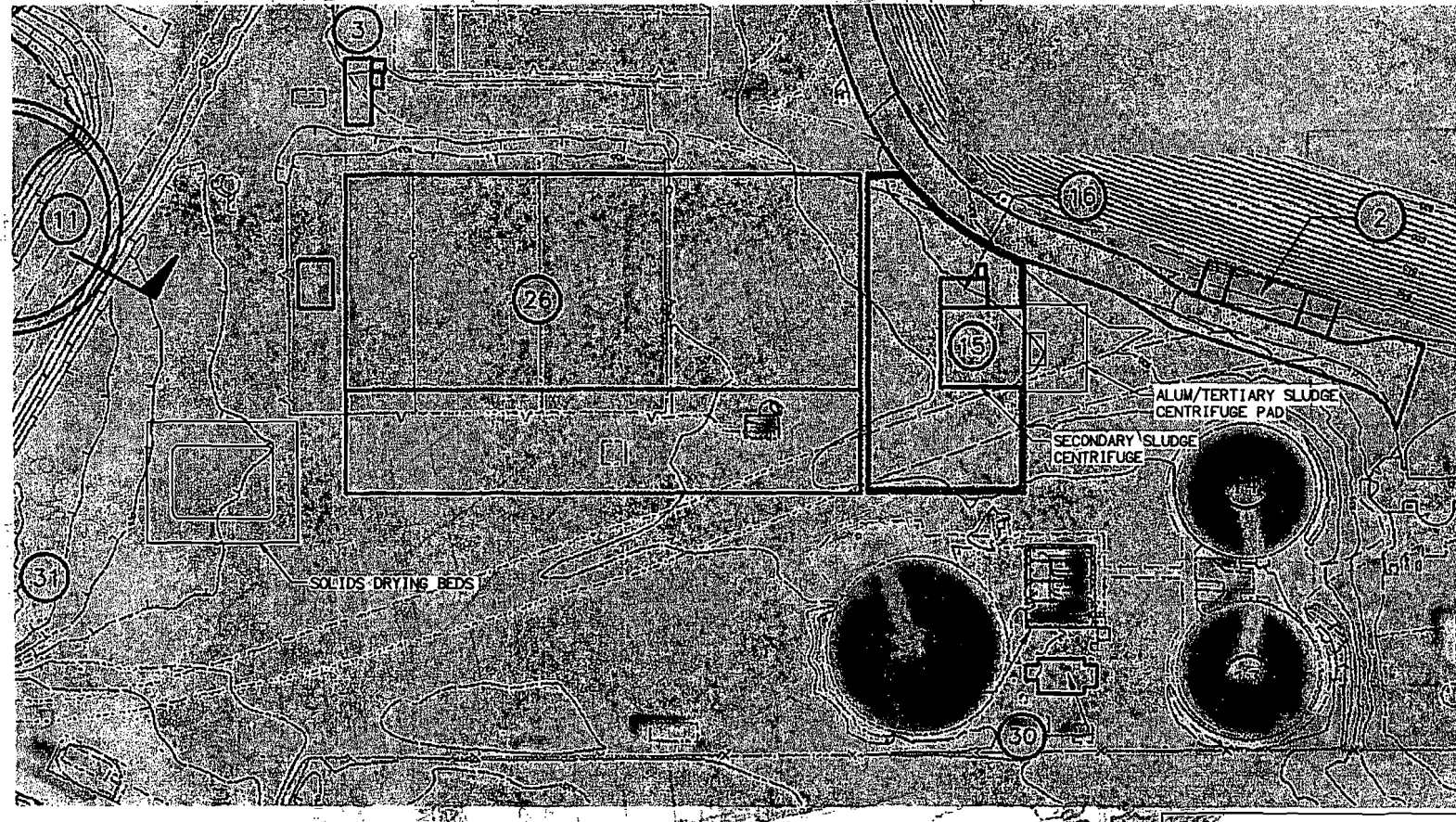
FIGURE 1-1
PROJECT LOCATION


Alum
Acid/Caustic
Secondary Effluent
Secondary Effluent Diversion Structure
5.9 MGD
Tertiary Influent Well Pumps
P
Flash Mixing
Flocculation
Sedimentation
Existing UV System
Discharge to New River
Sludge Holding Tank
P
Centrifuge Filtrate
0.01-0.03 MGD
P
Solids Dewatering Centrifuge
Sludge Drying Beds
Solids to Final Disposal
Backwash Waste
Polymer
Gravity Media FIltration
Tertiary Effluent Distribution Box
Chlorine Contact Chamber
Storage Pond 6M Gallons
Tertiary Effluent Well Pumps
To Ormat's Power Plant
Backwash Supply
0.1-0.2 MGD
P
Backwash Supply Storage Tank
Bleach Storage
PROCESS FLOW SCHEMATIC FOR BRAWLEY TERTIARY SYSTEM

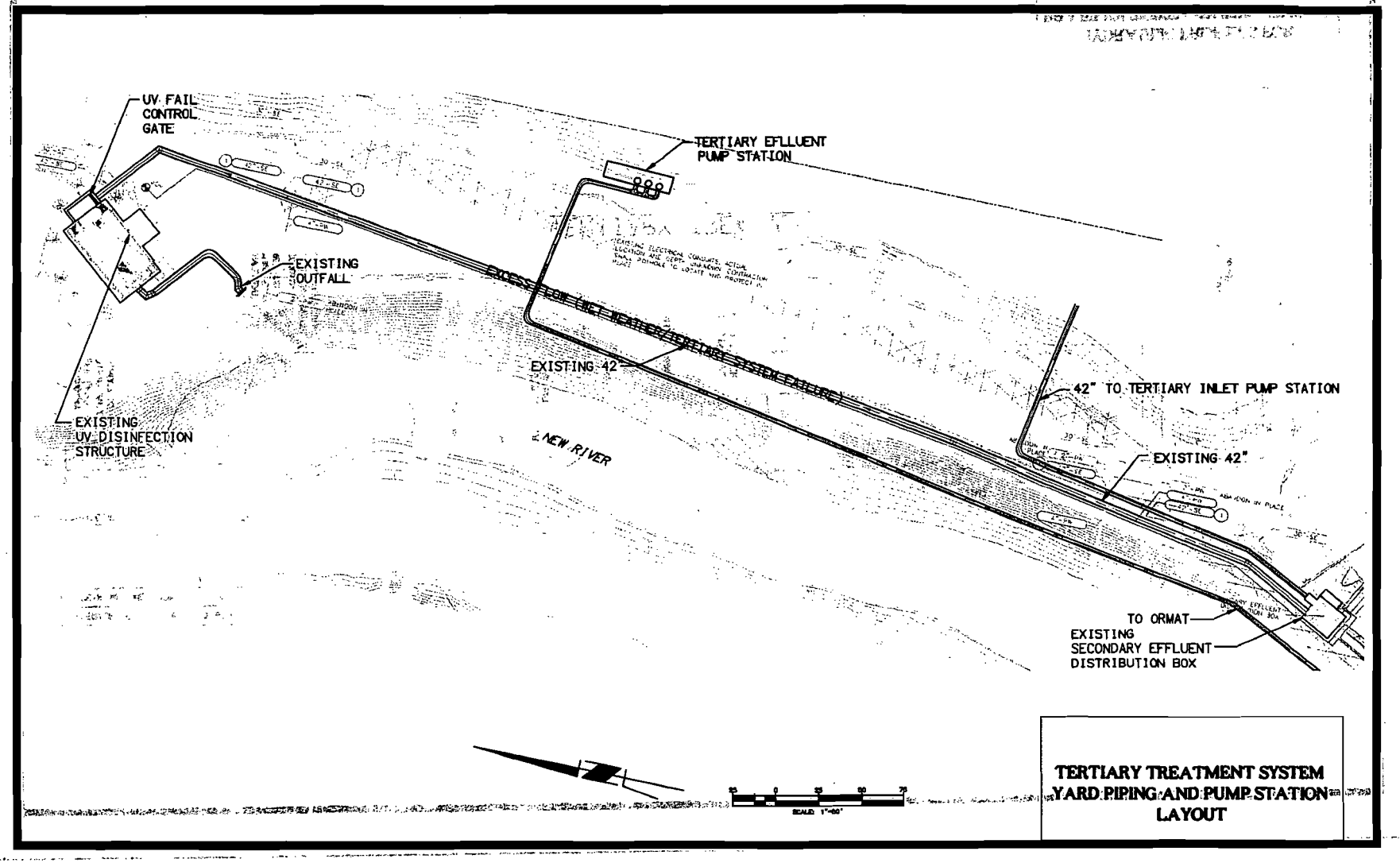

Secondary Effluent
13.6 MGD
Secondary Effluent Diversion Structure
5.9 MGD
Tertiary Treatment
5.9 MGD
Chlorine Contact Chamber
5.9 MGD
Storage Pond 6M Gallons
To Ormat's Power Plant
7.7 MGD
Secondary Effluent Overflow Collection Sump
7.7 MGD
Existing UV System
7.7 MGD
Discharge to New River
PROCESS FLOW
WET WEATHER SCHEMATIC
FOR BRAWLEY TERTIARY

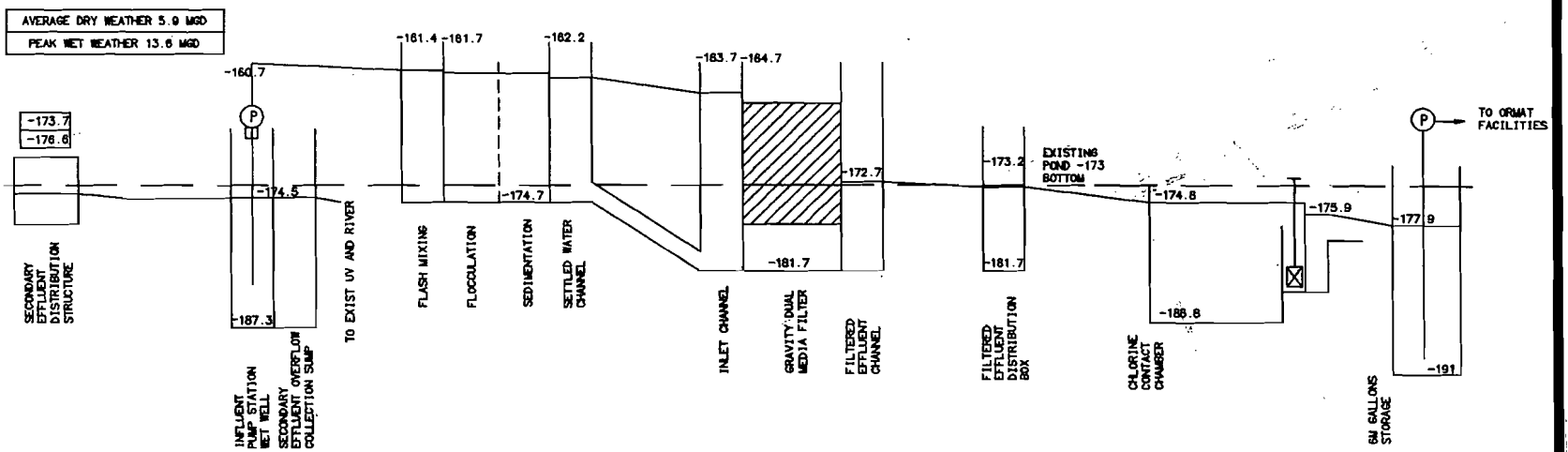


SITE PLAN FOR BRAWLEY TERTIARY TREATMENT SYSTEM



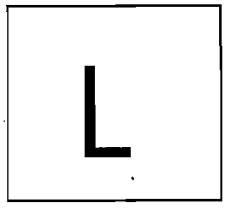
TERTIARY TREATMENT SYSTEM
CENTRIFUGE & SOLIDS DRYING BED
LAYOUT


UV FAIL CONTROL GATE
TERTIARY EFLLUENT PUMP STATION
EXISTING OUTFALL
EXISTING 42
42" TO TERTIARY INLET PUMP STATION
EXISTING UV DISINFECTION STRUCTURE
NEW RIVER
EXISTING 42"
TO ORMAT
EXISTING SECONDARY EFFLUENT DISTRIBUTION BOX
TERTIARY TREATMENT SYSTEM YARD PIPING AND PUMP STATION LAYOUT



TERTIARY TREATMENT

HYDRAULIC PROFILES FOR BRAWLEY TERTIARY TREATMENT SYSTEM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STATE OF CALIFORNIA
STATE ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:

Staff Investigation of Possible Energy Commission Power Facility Siting Jurisdiction over Five 30 Megawatt Units Known as LuzSegs Units III-VII

RESOLUTION PROVIDING DIRECTION TO STAFF

Since the suspension by the California Public Utilities Commission of its interim Standard Offer Nos. 4 and 2, this Commission has experienced a marked increase in its power facility siting workload. Along with this increased siting activity, the Commission has also received comments from utilities and applicants who are seeking licensing under the Warren-Alquist Act suggesting that many projects that would normally come under our jurisdiction are now being pursued in avoidance of the Commission's permit process because of the potential that this Commission may find some of these projects not in conformity with the Commission's electricity demand forecasts and integrated need assessments. See Public Resources Code §§ 25523 (f), 25524. It is clear to the Commission that in order for its jurisdiction over generation facilities to be equitably administered, the Commission must assert its jurisdiction in an even-handed fashion when it appears that there is a reasonable basis for doing so. Thus the staff of the Commission has been conducting a general investigation of projects that claim to be outside the Commission's jurisdiction in order to make recommendations to the Commission as to whether and how to proceed to bring projects that must be licensed under the Warren-Alquist Act into compliance with the law.

As part of this general investigation, the staff has identified a unique installation of solar powered generation equipment in San Bernardino County consisting of five 30 megawatt generation units known as LuzSegs Units III, IV, V, VI, and VII. Staff has determined that these facilities are on contiguous parcels, that the facilities have all been designed and are being installed and operated by the same organization, and that the energy and environmental impact of the facilities is that of a

150 megawatt facility.[1] Staff therefore will recommend that the Commission assert its jurisdiction to license these facilities. The common project proponent, Luz Engineering Corporation (LUZ) questions the jurisdiction of the Commission, pointing out (1) that each of the five projects has been recognized as an individual 30 megawatt unit for purposes of qualifying under the Public Utility Regulatory Policy Act of 1978 (PURPA) as a small power producer, (2) that each unit will be separately owned by a limited partnership (with LUZ as the general partner), (3) that each unit has its own SO 4 contract with Southern California Edison Company, and (4) that substantial amounts of equipment (e.g. generators, supplementary boilers, solar collector fields, cooling towers, etc.) are not commonly shared among units because of the need to qualify as separate projects for purposes of PURPA. LUZ also argues that the nominal accumulated 150 MW of capacity of the facilities must be derated by at least 33 1/3 percent because of the nature of the solar technology, and further, that LUZ's actions are justified because LUZ has not had the benefit of any regulations by the CEC specifically indicating that it has jurisdiction over groups of facilities that separately are all below 50 MW but taken together are 50 MW or more.

While it appears, without full factual inquiry into the matter, that staff may be correct in its conclusions regarding the applicability of the Commission's jurisdiction over these facilities, there are other complicating factors that require careful consideration and potential exercise of prosecutorial discretion by the Commission. First, this Commission has, since its inception in 1975, encouraged the development of increased generation capacity using renewable (non-depleting) fuels. For many years, the Commission has also recognized and emphasized the value in diversifying the state's portfolio of generation sources in order to decrease the state's current over-reliance on oil- and natural gas-fired generation technologies so that the state would be less dependent upon fuels that may become scarce or very expensive in the long term. Additionally, in its most recent Electricity Report, the Commission emphasized the need for generation technologies that could or would follow or match the generation system's loads being more available during system peaks and less available at other times when the needs are lower. Based on representations of LUZ, the LuzSegs project appears to be strong in each of these areas. If these representations are true, then it would be inconsistent with long-standing Commission policy for the Commission to take action that prevents these projects from coming to fruition.

LUZ also represents to the Commission, however, that the financing for its unique project is in jeopardy if the Commission questions the continuing viability of the project by commencing

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[1] A more detailed description of the project and its common proponents is provided in the attached Appendix I.

formal complaint and investigatory procedures to require licensing of the project under the Warren-Alquist Act. Based on the investigation by staff, it appears that construction of the first two of the five units is, at this time, substantially complete, and that substantial construction on the third unit has also occurred. In addition, LUZ has recently commenced on-site construction of the fourth unit in order to meet an October 31, 1986 deadline for commencement of construction in order to qualify the project for solar tax credit treatment in the 1987 tax year. LUZ has represented that it will not commence construction on any other units, including Unit VII, without having obtained either a determination that the Commission has no jurisdiction or an appropriate certification to proceed from the Energy Commission.

The Commission regrets that the project proponent commenced construction without seeking a determination whether a Commission license would be required since it is this unfortunate action that now leaves so little time for the Commission to work on potential solutions to the dilemma faced by LUZ. Nonetheless, while it would have been a more prudent course to inquire in advance of commencing construction as to the Commission's view of its jurisdiction over the project, the Commission has no evidence suggesting that LUZ has intentionally sought to circumvent the statutory requirements of the Warren-Alquist Act. The Commission does not find the arguments made by LUZ as to the Commission's jurisdiction over the project to be compelling. Nonetheless, the Commission believes that LUZ makes these arguments in good faith and that when LUZ commenced construction, it believed, based upon the advice of counsel, that it could legally proceed without obtaining certification under the Warren-Alquist Act.[2]

Given both the apparent lack of intent to violate any

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[2] This conclusion might be most strongly questioned with respect to the relatively recent commencement of construction of Unit VI while the applicant had clear notice that the staff's investigation was in progress. Nevertheless, it appears from the unusual facts in this case that avoidance of CEC jurisdiction was not the motivating factor behind this action. Instead, from LUZ's perspective, the October 31, 1986 deadline for commencement of construction in the income tax laws virtually compelled LUZ to proceed with construction and then assert its defenses if necessary to the question of our jurisdiction since eligibility for the solar tax credit is apparently a major factor in the economic feasibility of developing this new technology. The CEC has long supported the solar tax credit at both the state and federal levels in order to create just this type of incentive so that this kind of project would be able to proceed. Thus in this unique case, it appears to be more important to focus on what environmental damage may have been done and what mitigation is appropriate than to focus on the past actions of the developer.

provision of law and the potentially substantial benefits the project may provide the state, the Commission is inclined to try to find a way to resolve the problems that could result from our jurisdiction over these facilities. Nevertheless, we must find such solutions within the framework of the statutes that we administer. As a matter of law, subject matter jurisdiction either exists or it does not exist. We can neither waive it if it does exist nor create it by stipulation if it does not. Marin Municipal Water District v. North Coast Water Co. (1918) 178 Cal. 324, 173 P. 473, 474. On the other hand, the Warren-Alquist Act does not require us to bring suit to enjoin a potential or alleged violation where the party in question appears before the Commission in good faith and seeks licensing in accordance with the Act. Staff has indicated that with a cooperative applicant, an AFC for a project of this type could probably be processed in 7 to 8 months. The principal issues we would anticipate in the proceeding relate to the environmental impacts of construction in this area which appears to support protected and endangered species.[3] Work needs to be done to determine from data available on site or from surrounding areas what species may have existed on the site before construction began, what environmental mitigation measures would have been recommended based on a projection of the likely species involved, and what appropriate mitigation measures can now be devised to compensate for the damage that has already occurred as a result of construction of the facilities.

The most difficult question for the Commission is what action, if any, to take with respect to the construction which we understand is continuing on the site. From an enforcement perspective, the appropriate action is to order construction to halt until the Commission has completed its licensing proceeding. Unfortunately, this action does nothing to undo the potential environmental harm that is likely to have occurred up to this point, and it may jeopardize the success of a unique project that the Commission, from the perspective of its long-standing energy policy, would like to see succeed. Thus, while ordering a halt to construction at this point would send an appropriate message to similarly situated developers that the Commission will not tolerate avoidance of its jurisdiction, this benefit must be weighed against the high probability, based on representations by LUZ, that ordering a halt to construction would irrevocably

[3] One issue that apparently troubles staff is the indication, from documents it has examined, that LUZ has been less than fully co-operative with San Bernardino County and Department of Fish and Game in following through on mitigation measures that were discussed when the facilities were originally licensed at the local level. Staff and LUZ need to develop further information on this subject, but statements by LUZ under oath at the hearing on October 29, 1986 on this resolution suggest that one of the main problems, payment for land to be set aside as part of a desert tortoise reserve, has now been resolved.

destroy this unique and potentially desirable project's financial integrity. If the project fails as a result of inability to obtain financing or tax credits, the environmental values that might be served through a mitigation plan to be developed in the AFC process would not be furthered. On the other hand, if the Commission exercises its prosecutorial discretion, taking no action to prevent the project from proceeding forward, it may be possible to allow the project to proceed successfully while at the same time obtaining appropriate compensating mitigation for the damage done as a result of premature construction. Without in any way suggesting that this resolution of the issue would be appropriate in a case involving a project with less significance in terms of California energy policy,[4] the Commission is inclined to exercise its prosecutorial discretion as described above if (1) LUZ begins immediately to work with staff to develop and process the necessary AFC for its project, and (2) LUZ satisfies staff within 30 days of this resolution that it has undertaken every action required of it in its previous dealings with the San Bernardino County and the Department of Fish and Game relating to mitigation of biological impacts on the site.

The Commission cannot and does not prejudge any of the issues that may arise during the licensing proceedings contemplated above. Nevertheless, we do note that our judgment not to pursue the full range of potential remedies that might be available if it were determined that LUZ had willfully violated our power facility siting jurisdiction is based in part on several factors that suggest that the LUZ facilities will likely be able to be licensed under the Warren-Alquist Act given

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[4] Indeed, this resolution should not be read to create a broad new remedy for parties who have commenced construction prior to seeking licensing from the Commission. The Commission's decision to exercise prosecutorial discretion in this case is based on all of the unique facts of this particular case including, but not limited to (1) the fact that this is the first major solar thermal installation in California (2) that it appears to match SCE's load almost perfectly, that LUZ has testified that it will save the energy equivalent of approximately 750,000 barrels of oil per year, and that based on testimony received, it appears that there is no known opposition to the project even among the environmental organizations who might be most likely to raise concerns about its impacts and who were consulted when the LUZ project was being reviewed at the county level. While the Commission does not totally foreclose the possibility that it might find grounds to exercise prosecutorial discretion in another case as well, it does firmly indicate that the process of continuing construction during the course of licensing is strongly disfavored as a general principle and should be tolerated only in the most unusual and compelling circumstances.

adequate cooperation by LUZ.[5] First, in most power facility siting cases today, the most difficult issue is need for the power to be generated by the facility. We note that in the fifth Electricity Report (ER V), the Commission set aside 300 megawatts of reserved need for solar powered generation in order to encourage the development of this technology and the diversification of the state's generation system by offering solar projects the easiest of four need tests developed in ER V. The LUZ project is the first to bid for permission to fill that reserved need. Moreover, it appears from testimony by LUZ, that this project is designed to follow or "match" the Southern California Edison Co. peak loads very well, thus suggesting that it would be a logical addition to the Edison system even if the ER V methodology for need determinations is changed in the upcoming adoption of ER VI. Additionally, we note that environmental documentation has already been prepared for San Bernardino county's review and that the county permitted the projects to proceed based on a negative declaration--a finding that the projects would have no significant adverse environmental effects. This Commission is not legally bound to concur with the county's finding, and based upon staff preliminary review, probably would not concur, but the existence of this previous review suggests that the possible environmental concerns can be overcome through appropriate mitigation.

Based on all of the foregoing, the Commission therefore directs its staff as follows:

(1) If an application for certification of LuzSegs Units III, IV, V, VI and VII is filed and deemed adequate on or before January 7, 1987, staff shall endeavor to bring the matter to the full Commission for decision no later than September 9, 1987.

(2) So long as LUZ proceeds to remedy the jurisdictional problems identified by staff in accordance with the procedure set forth herein, the Commission resolves that it will not seek any injunctive relief or in any way attempt to interfere with the construction or operation of LuzSegs Units III, IV, V, and VI. Pursuant to agreements made on the record of the Commission's hearing on this matter, LUZ shall halt construction on Unit VI for a period of 7 days in order to permit the staff to visit the site and observe it prior to any further construction. Ground-breaking for Unit VII shall not commence until the Commission has licensed those facilities since such construction activity could disrupt environmental evaluation and mitigation work necessary to license the facilities.

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[5] Any substantial doubts about the likelihood of success in obtaining certification would obviously militate against the exercise of prosecutorial discretion.

(3) Staff shall report back to the Commission periodically on the progress of work with LUZ to resolve these jurisdictional problems and any problems that develop during the course of licensing work.

DATED: October 29, 1986

Charles R. Imbrecht
Chairman

APPENDIX I

The project proponent, Luz Engineering Corporation (LUZ), utilizes parabolic trough reflectors that focus the sun's rays on evacuated tubes carrying heat transfer fluid. The heat exchange unit is used to generate steam. The steam is then superheated in a supplementary gas-fired boiler. The superheated steam produces electric energy in a steam turbine-generator. The design is represented as unique, even among solar projects, for its ability to generate steam in the supplemental boiler, which allows production of electric energy at any time. Within the 25% fossil fuel limitation imposed on PURPA Small Power Producers, the equipment can generate electricity using natural gas during all winter evening peak hours.

LUZ is a California corporation which designs, finances, and constructs solar electric generating systems (SEGS). In addition to the units (III-VII) under review, LUZ plans six more 30 MW facilities (at unspecified locations). LUZ maintains that it organizes these projects solely for the purpose of selling its solar hardware equipment to the individual partnerships. LUZ is the managing general partner in each limited partnership.

On April 17, 1985, LUZ executed individual power sales agreements (SO4) with SCE on behalf of five limited partnerships.

The land is owned by or under option to LUZ, who will lease to each unit. In September 1985, the existing limited partnerships contracted with Blount Constructors (a division of Blount International Limited) for turn-key work including engineering, procurement, and construction. In October 1985, Blount International Ltd. contracted with Westinghouse for the design and supply of each unit's power block. Luz Industries Israel (a Luz International Limited subsidiary) was individually contracted to

provide solar field design and hardware. Cogeneration National Corporation Southern Division was selected as the engineer for plant integration. Each unit separately appointed Cogeneral National Corporation Northern Division as "owner representative" and overseer of Blount's contract.

On October 15, 1985, LUZ submitted applications for individual site certifications by the County of San Bernardino. On December 3, 1985, the County issued mitigated negative declarations of environmental significance, and approved all applications on December 20, 1985. Individual applications for Authorities to Construct are being currently processed for each unit. However, the developer is participating in a San Bernardino County Air Pollution Control District (SBAPCD) evaluation of the cumulative NOx emissions standard. SBAPCD consultation with the ARB to confirm satisfaction of state modeling and monitoring requirements is planned. The developer will also be meeting with the EPA to confirm compliance with PSD requirements (although cumulative emissions analysis indicates that annual emissions will not exceed EPA threshold values).

Units III-VII are proposed at land owned or under option to LUZ (to be leased for the term of the project to each limited partnership) at Kramer Junction, San Bernardino County:

Unit	Construction Start Date	Owner*	Net Generating Capacity
III	12/85	LuzSegs Partners III	30 MW
IV	12/85	LuzSegs Partners IV	"
V	7/86	LuzSegs Partners V	"
VI	12/86	LuzSegs Partners VI	"
VII	7/87	LuzSegs Partners VII	"

*LUZ is the general partner in each partnership, and will exercise general management and control of all units. The only executed partnership agreement provided for review indicates that for Unit IV, LUZ is entitled to 100% of profits and losses.

All units were conceived and developed simultaneously by LUZ. Because of the ownership arrangements, LUZ will continue participating in each unit as land owner, general partner, and potential central operations manager.

On July 10, 1986, LUZ described these units as follows:

"Luz Engineering Corporation was the solar system supplier for two previous solar electric generating systems known as SEGS I and SEGS II. Both of these projects were constructed on land leased from Southern California Edison Company at Daggett, California. Due to the successful startup of SEGS I in December, 1984 and the commencement of construction of SEGS II in early 1985, Luz proceeded to conceive a plan for five

additional projects in the Mojave Desert Region. Consequently, land at Kramer Junction was purchased (or optioned) and five separate Standard Offer No. 4 contracts were executed with Southern California Edison Company on April 17, 1985. Subsequent Interconnect Facility Agreements were approved and executed between each of Luz Solar Partners Limited, III, IV, V, VI and VII and SCE on February 19, 1986." [Emphasis added.]

According to LUZ, each unit was FERC-certified as a separate project because the 30 MW generating capacity is the maximum size allowed by FERC.

Staff has disregarded the FERC designation of separate QFs as a basis for treating the LUZ units as single projects and maintains that for environmental and energy supply purposes, evaluation of the LUZ projects as a single powerplant is not precluded by federal designations. In the Unit I FERC decision, the Secretary specifically noted:

"Certification as a qualifying facility serves only to establish eligibility for benefits provided by the Public Utility Regulatory Policies Act of 1978, as implemented by the Commission's regulations, 18 CFR Part 292. It does not relieve a facility of any other requirements of local, state or federal law, including those regarding siting, construction, operation, licensing and pollution abatement. Certification does not establish any property rights, resolve competing claims for a site, or authorize construction." (Docket No. QF84-434-000, 2/6/85)

Units III and IV were simultaneously constructed. Units V-VII are planned for sequential construction to be completed within approximately 16 months of Unit III and IV. According to LUZ, the staggered schedule is required to effect a pre-construction financing strategy.

As general partner, LUZ will exercise complete management control over all units. Moreover, Luz and Cogeneration National (as a joint venture) will offer each partnership (of which LUZ is the controlling manager-general partner) an "operations contract" (7/10/86 submittal, p. 8).

All units are identically designed and proposed at a common location which is property owned or controlled by LUZ. Each 160 acre fenced parcel contains a solar field and power block and is physically separated from the other parcels by 125 feet buffer areas (on which utility and access roads are placed).

According to LUZ, the following equipment is not shared:

Turbine/Generator Unit. Condenser and feedwater Heaters. Solar Heat Transfer System/Power Cycle Preheaters, Steam Generators and Steam Superheaters. Supplementary Natural Gas Boiler and all support equipment thereto. Power Cycle Condensate

and Feedwater Pumps. Turbine Lube Oil System. Heat Transfer Fluid system including all pumps, instrumentation, controls and expansion tank. Solar Collector Field of approximately 200,000 square meters. Cooling Tower. Demineralizer Treatment Water System. Instrument Air System. Plant Air System. Control Building and all Plant Control Systems. Plant Lighting System. Plant Electrical System with Motor Control Centers. Plant Transformers. Plant Circuit Breakers. Switchyard. Solar Field Header Piping. Solar Field Roads. Water Storage Tank. Water Transfer Pumps. Fire Protection Pumps. Fire Protection System. Evaporation Pond. Waste Water Neutralization System. Feedwater Chemical Treatment System. Plant Parking Area. Natural Gas Reducing and Metering Station. Electrical Metering Station. Water Metering Station. Emergency Oil Heater System. Emergency Power Diesel Generator. Spare Parts Inventory. Sewage System. Condensate Storage Tanks. Electrical Grounding System. Wastewater Blowdown System and Piping.

Basically, the developer contends that the separate equipment is required to maintain the maximum legal design permissible to retain QF eligibility.

All units share utility services for water (pursuant to a "Cotenancy Agreement" for the construction, maintenance and operation of a water supply pipeline required by the local water district); electrical interconnection (owned, maintained, and operated by SCE); natural gas (installed, owned, maintained and operated by PGandE Company); and road access.

Each unit individually executed (or will execute) contracts for equipment purchases and procurement, engineering, and construction.

As designed, the units are physically separate, but with common operational management and common ownership interests.