



## THE STATE OF NEVADA

### PERMIT TO APPROPRIATE WATER

**Name of Permittee:** PATUA PROJECT, LLC  
**Source:** 44-21 (GEOTHERMAL)  
**Basin:** CARSON DESERT  
**Manner of Use:** INDUSTRIAL  
**Period of Use:** JANUARY 1ST TO DECEMBER 31ST  
**Priority Date:** 07/27/2010

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#### APPROVAL OF STATE ENGINEER

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the following limitations and conditions:

This permit is issued subject to existing rights. It is understood that the amount of geothermal fluid herein granted is only a temporary allowance and that the final right obtained under this permit will depend upon the amount actually placed to beneficial use. It is also understood that this right must allow for a reasonable decrease in reservoir pressure and heat. The well shall be constructed and maintained to prevent any waste of the geothermal fluid above or below the surface. Each production and injection well discharge shall be closely monitored and recorded. The amounts of fluid injected back to the reservoir shall also be monitored and recorded to determine the total annual diversion and consumption for beneficial use. A groundwater monitoring program and mitigation plan that specifically addresses potential impacts to both public supply and domestic wells must be approved by the State Engineer before any consumptive use of the geothermal water begins and before the Proof of Completion of Work is filed.

The annulus of any well drilled under this permit is to be cemented from the top of the production or injection interval to surface to prevent waste and to prevent any communication with fresh ground water. Only geothermal waters are to be diverted under this permit and the cooled geothermal fluids are to be returned to the source via the injection well.

This permit does not relieve the operator of the requirements of any other state, local or federal agency. This permit does not extend the permittee the right of ingress or egress on public or private lands.

Monthly records that document the amount of geothermal fluids produced, injected and/or consumed shall be filed under this permit on a quarterly basis within 15 days after the end of each calendar quarter. Any exploration and subsurface information obtained as a result of this project shall be kept confidential pursuant to Chapter 534A.031 of the Nevada Revised Statutes (NRS).

The total combined consumptive duty of permits 80030 and 80039 shall not exceed 3,629 acre-feet per year. The State Engineer reserves the right to make findings regarding the consumptive use of the geothermal fluids under this permit and impose additional conditions thereto.

The point of diversion and place of use are as described on the submitted application to support this permit.

(Continued on Page 2)

The amount of water to be appropriated shall be limited to the amount which can be applied to beneficial use, **and not to exceed 10.0 cubic feet per second or 3,629.0 acre-feet annually.**

Work must be prosecuted with reasonable diligence and proof of completion of work shall be filed on or before:

September 30 2013

Water must be placed to beneficial use and proof of the application of water to beneficial use shall be filed on or before:

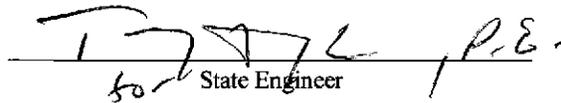
September 30 2016

Map in support of proof of beneficial use shall be filed on or before:

N/A

IN TESTIMONY WHEREOF, I, JASON KING, P.E.,

State Engineer of Nevada, have hereunto set my hand and the seal of my office, this 30th day of **September**, A.D. **2011**

  
\_\_\_\_\_  
50 State Engineer

Completion of work filed \_\_\_\_\_

Proof of beneficial use filed \_\_\_\_\_

Cultural map filed \_\_\_\_\_

Certificate No. \_\_\_\_\_ Issued \_\_\_\_\_

**APPLICATION FOR PERMIT TO APPROPRIATE THE PUBLIC WATERS OF THE STATE OF NEVADA**

THIS SPACE FOR OFFICE USE ONLY

Date of Filing in State Engineer's Office JUL 27 2010

Returned to applicant for correction \_\_\_\_\_

Corrected Application filed \_\_\_\_\_ Map filed JUL 28 2010 under 80028

The applicant Patua Project, LLC  
9670 Gateway Drive, Suite 200 of Reno  
Street Address or P.O. Box City or Town  
NV, 89521  
State and ZIP Code

hereby make(s) application for permission to appropriate the public waters of the State of Nevada, as hereinafter stated. (If applicant is a corporation, give date and place of incorporation; if a copartnership or association, give names of members.)  
February 23, 2007, State of Nevada

1. The source of water is Geothermal Reservoir  
Name of the stream, lake, underground, spring or other sources.
2. The amount of water applied for is 8,300 gallons per minute (18.493 second feet)  
One second foot equals 448.83 gallons per minute.
- (a) If stored in a reservoir give the number of acre-feet \_\_\_\_\_
3. The water is to be used for ~~Other~~ Industrial (Power plant cooling) REL  
Irrigation, power, mining, commercial, domestic or other use. Must be limited to one major use.
4. If use is for:
  - (a) Irrigation, state number of acres to be irrigated \_\_\_\_\_
  - (b) Stockwater, state number and kind of animals \_\_\_\_\_
  - (c) Other use (describe fully in No. 12) See Attachment A
  - (d) Power:
    - (1) Horsepower developed \_\_\_\_\_
    - (2) Point of return of water to stream \_\_\_\_\_

101-CH

5. The water is to be diverted from its source at the following point: (Describe as being within a 40-acre subdivision of public survey, and by course and distance to a found section corner. If on unsurveyed land, it should be so stated.)

Point of diversion is located within the SE1/4 NW1/4 Section 21, T20N, R26E, MDB&M. The found northwest corner of Section 20, T20N, R26E, MDB&M, is located, from the point of diversion, at a bearing of N75deg.10min.09sec. W and a distance of 7642.25 feet.

6. Place of use: (Describe by legal subdivision. If on unsurveyed land, it should be so stated)

Geothermal power generation facility situated in the SE1/4 NW1/4, NE1/4 SW1/4, NW1/4 SW1/4, and SW1/4 NW1/4 Section 21, T20N, R26E, MDB&M.

7. Use will begin about January 1 and end about December 31 of each year.  
Month and Day Month and Day

8. Description of proposed works. (Under the provisions of NRS 535.010 you may be required to submit plans and specifications of your diversion or storage works.) (State manner in which water is to be diverted, i.e. diversion structure, ditches and flumes, drilled well with a pump and motor, etc.)

Geothermal fluid from the geothermal reservoir will be diverted via drilled geothermal production wells, fitted with downhole pumps and motors, and routed to the place of use via a system of above-ground pipelines.

9. Estimated cost of works: \$30,000,000.00

10. Estimated time required to construct works: Two (2) years

(If the well is complete, describe works.)

11. Estimated time required to complete the application of water to beneficial use: Five (5) years

12. Provide a detailed description of the proposed project and its water usage (use attachments if necessary): (Failure to provide a detailed description may cause a delay in processing.)

See Attachments

13. Miscellaneous remarks:

Patua Project, LLC may require up to approximately 8,300 gpm of geothermal fluid, from the geothermal reservoir, for power plant cooling purposes. The required geothermal fluid will be produced from one or a combination of wells within the geothermal well field, which includes the well that is the subject of this application, whose point of diversion is described in 5 above. Fourteen additional wells with unique points of diversion are the subjects of other applications.

kbonin@vulcanpower.com

E-mail Address

(775) 284-8842

Phone No.

APPLICATION MUST BE SIGNED BY THE APPLICANT OR AGENT

Kenneth Bonin, Sr.

*Kenneth Bonin, Sr.*  
Type or print name clearly

Signature, applicant or agent

Patua Project, LLC

Company Name

9670 Gateway Drive, Suite 200

Street Address or PO Box

Reno, NV 89521

City, State, ZIP Code

Revised 07/09 \$300 FILING FEE AND SUPPORTING MAP MUST ACCOMPANY APPLICATION

## ATTACHMENT A

### Description of Proposed Project, Geothermal Fluid Usage, & Public Benefit

Patua Project, LLC is developing a nominal 60 MW net geothermal electrical generation facility known as the Patua Geothermal Project. The location of the project is approximately seven miles east of Fernley, Nevada. The project area straddles the Carson Desert (101) and Fernley (76) groundwater basins. Exploration of the geothermal resource to be utilized by the facility is ongoing, however, it is understood that the resource characteristics are sufficient to support a "binary" geothermal facility. The facility cooling system will utilize geothermal fluids, from the geothermal reservoir, which will be retrieved from one or a combination of wells in the geothermal well field. The geothermal fluid will be directed to the facility through a system of pipe lines, where it will become combined with geothermal fluids produced from other wells for a combined total of up to approximately 8,300 gpm, which will eventually end up in the cooling tower. Attachment B depicts the proposed geothermal well field.

During the cooling process, geothermal fluid from the cooling tower is pumped to the condenser where it is used to condense the working fluid vapor from the turbine exhaust. After passing through the condenser, a portion of the geothermal fluid, known as "blowdown", is reinjected to the reservoir in order to maintain optimal levels of dissolved solids in the circulating cooling fluid flow. The remainder of the cooling fluid will return to the cooling tower where some of it will be evaporated. Blowdown and evaporation represent losses to the total circulating cooling fluid flow that must be supplemented during operation by a continuous supply of "make-up" fluid, equal to the sum of blowdown and evaporation. Currently, the exact quantity of make-up fluid that will be required for the cooling process is unknown and is ultimately a function of many variables, including, but not limited to, resource temperature and pressure, total dissolved solids, and the specific condenser technology employed at the facility, which varies among the various manufacturers of geothermal facilities. Although the exact quantity of make-up fluid cannot be determined at this time, a general rule-of-thumb is that it would not exceed twenty (20) percent of the total production rate of geothermal fluid from the reservoir. Attachment C depicts the cooling process assuming that the geothermal fluid needed for electricity generation and make-up fluid, combined, does not exceed 41,500 gpm.

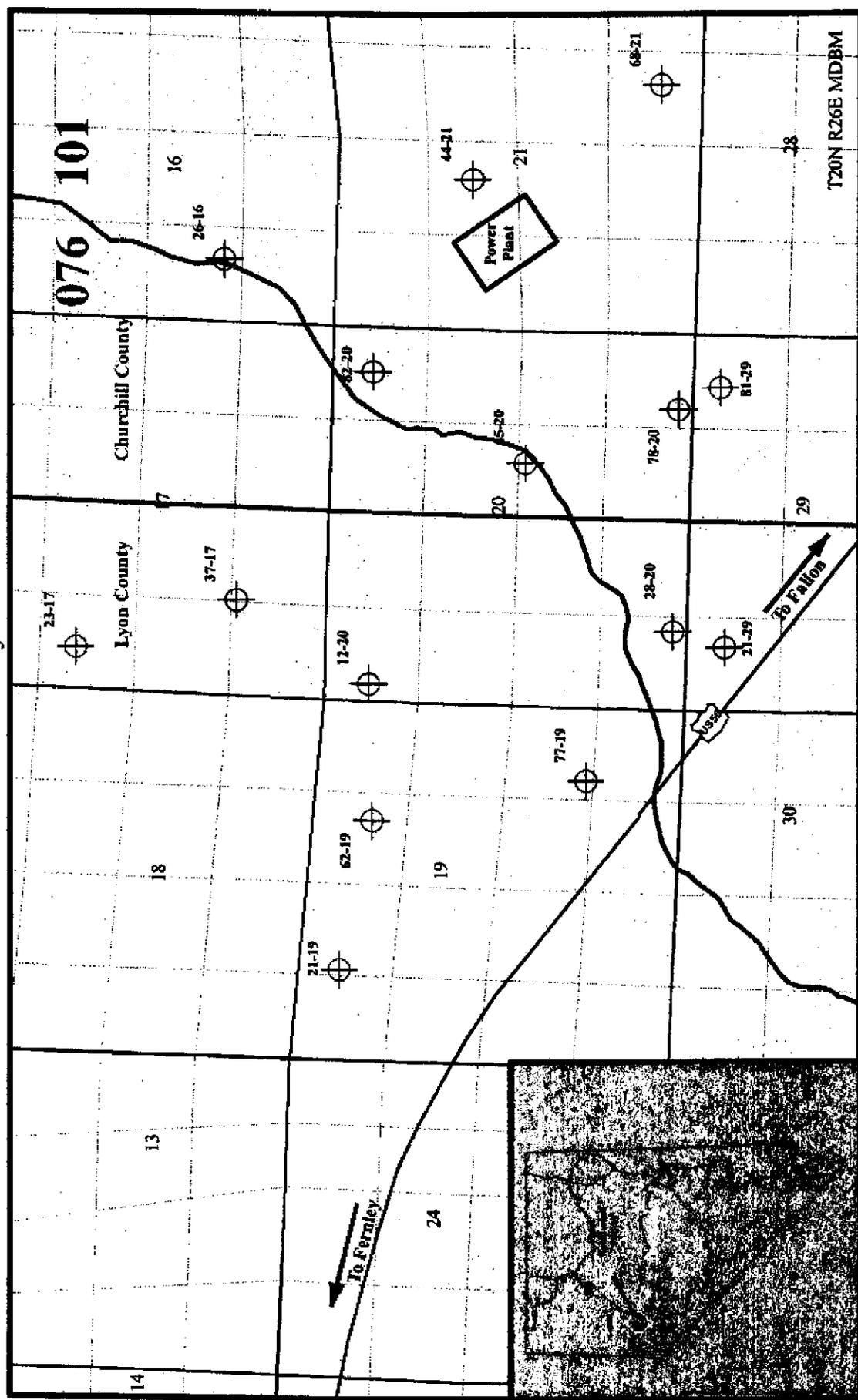
Benefits of geothermal power include increased availability of renewable energy, diversified domestic baseload power generation, low greenhouse gas emissions, increased revenue for State of Nevada, and local governments, potential increased revenue to several types of local businesses, as well as, temporary and permanent employment opportunities for local residents. Temporary employment will include numerous types of construction and construction support positions. The permanent employment opportunities span across a large range of skill levels. Positions will include various types of skilled labor (mechanics, electricians, engineers, plant operators, scientists, etc.), administrative labor (secretarial, accounting and other office work), general labor (technical support, janitorial, etc) as well as managerial and supervisory positions. The expected life of the project is 30 years; however, it is likely that the project will have an even longer useful lifetime.

Patua Geothermal Project  
State of Nevada  
Water Appropriation Application

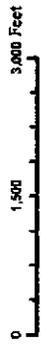
# ATTACHMENT B

## Patua Geothermal Project Overview

7/20/10



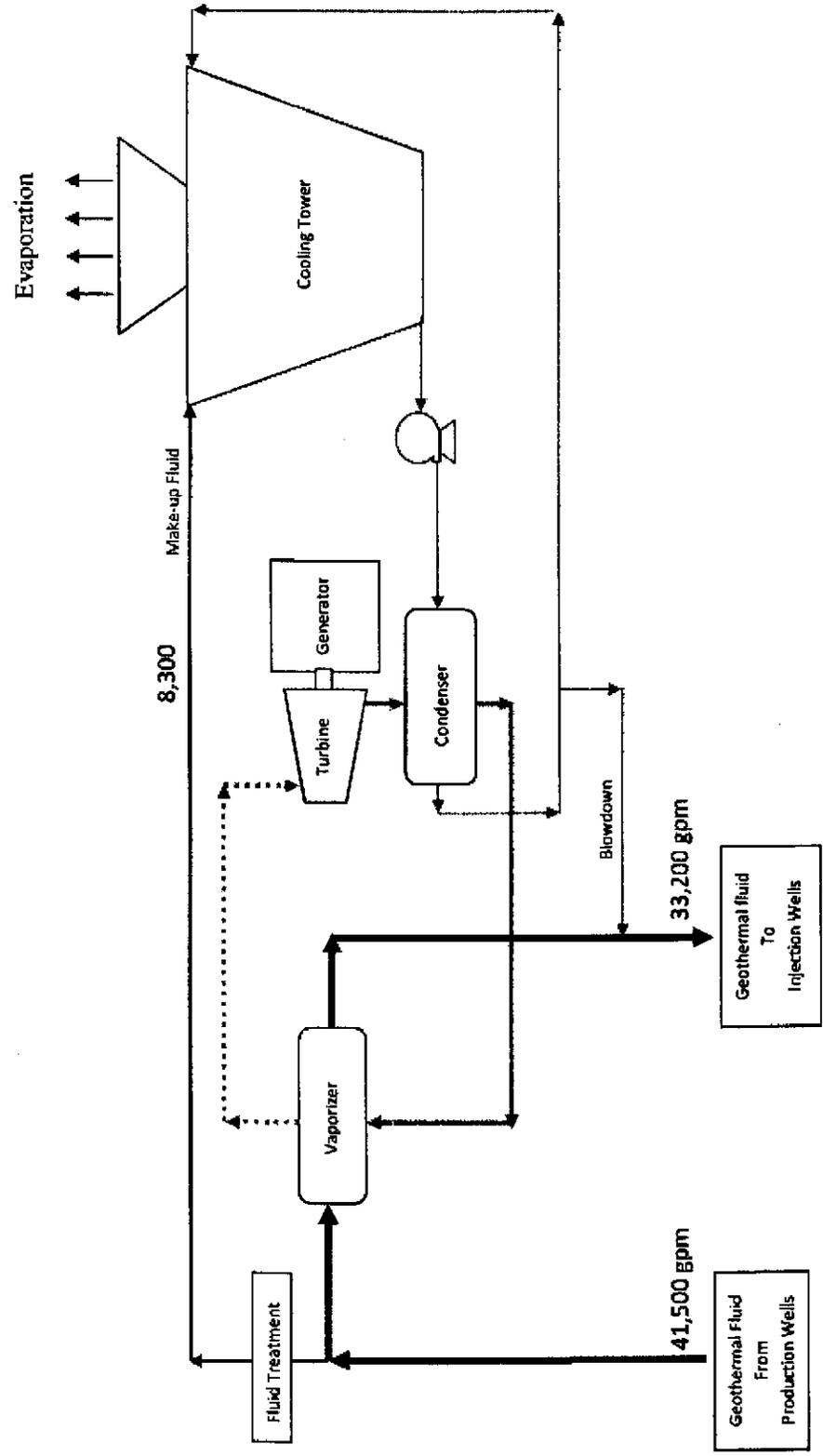
- Legend**
- Approximate Quarter/Quarter Sections
  - Section Lines
  - County Lines
  - Nevada Groundwater Basin Boundary
  - ⊕ Well Locations
  - Power Plant Location



Aerial Photo from My Aerial Library are used for reference only. Section boundaries, UTM 124R PLUS, and well locations are provided. All other information on this map are approximate and subject to change.

Patua Geothermal Project  
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# ATTACHMENT C



**Binary Geothermal Fluid Cooled**  
**Nominal 60 MW net**

\* Geothermal Fluids used as cooling fluid diverted before power plant heat exchange.

Geothermal Fluids  
 Isopentane  
 Cooling fluid