

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS)
80028, 80029, 80030, 80031, 80032, 80033,)
80034, 80035, 80036, 80037, 80038, 80039,)
80040, 80041, AND 80042 FILED TO)
APPROPRIATE THE PUBLIC WATERS OF)
A GEOTHERMAL SOURCE WITHIN THE)
FERNLEY AREA (76) AND CARSON)
DESERT (101) HYDROGRAPHIC BASINS,)
LYON AND CHURCHILL COUNTIES,)
NEVADA.)

RULING

6108

GENERAL

I.

APPLICATION SUMMARY

Applications 80028 through 80042, inclusive, were filed on July 27, 2010, by Patua Project, LLC, to appropriate 8,300 gallons per minute (gpm) or 18.493 cubic feet per second (cfs) under each application for industrial (power plant cooling) purposes. The source of water identified under the applications is a geothermal reservoir. The project was originally described as a 60 megawatt geothermal power generation facility, which is expected to draw 41,500 gpm (92.46 cfs) of geothermal fluid in total for the entire plant. The Applicant indicated that 80% of the geothermal fluid will be re-injected to the geothermal reservoir. The other 20% of the appropriation, or 8,300 gpm, will be consumptively used for power plant cooling purposes. The geothermal fluid is to be produced from one or a combination of the wells from the 15 different points of diversion applied for under the applications.¹

The proposed point of diversion for Application 80028 is described as being located within the SW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 17, T.20N., R.26E., M.D.B.&M., within the Fernley Area Hydrographic Basin.

The proposed point of diversion for Application 80029 is described as being located within the SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 17, T.20N., R.26E., M.D.B.&M., within the Fernley Area Hydrographic Basin.

¹ File Nos. 80028 through 80042, official records in the Office of the State Engineer.

The proposed point of diversion for Application 80030, is described as being located within the NW¼ SW¼ of Section 16, T.20N., R.26E., M.D.B.&M., within the Carson Desert Hydrographic Basin.

The proposed point of diversion for Application 80031, is described as being located within the NE¼ NW¼ of Section 19, T.20N., R.26E., M.D.B.&M., within the Fernley Area Hydrographic Basin.

The proposed point of diversion for Application 80032 is described as being located within the NW¼ NE¼ of Section 19, T.20N., R.26E., M.D.B.&M., within the Fernley Area Hydrographic Basin.

The proposed point of diversion for Application 80033 is described as being located within the NE¼ SE¼ of Section 19, T.20N., R.26E., M.D.B.&M., within the Fernley Area Hydrographic Basin.

The proposed point of diversion for Application 80034 is described as being located within the NW¼ NW¼ of Section 20, T.20N., R.26E., M.D.B.&M., within the Fernley Area Hydrographic Basin.

The proposed point of diversion for Application 80035 is described as being located within the NE¼ NE¼ of Section 20, T.20N., R.26E., M.D.B.&M., within the Carson Desert Hydrographic Basin.

The proposed point of diversion for Application 80036 is described as being located within the NW¼ SE¼ of Section 20, T.20N., R.26E., M.D.B.&M., within the Fernley Area Hydrographic Basin.

The proposed point of diversion for Application 80037 is described as being located within the SW¼ SW¼ of Section 20, T.20N., R.26E., M.D.B.&M., within the Carson Desert Hydrographic Basin.

The proposed point of diversion for Application 80038 is described as being located within the SE¼ SE¼ of Section 20, T.20N., R.26E., M.D.B.&M., within the Carson Desert Hydrographic Basin.

The proposed point of diversion for Application 80039, is described as being located within the SE¼ NW¼ of Section 21, T.20N., R.26E., M.D.B.&M., within the Carson Desert Hydrographic Basin.

The proposed point of diversion for Application 80040 is described as being located within the SW¼ SE¼ of Section 21, T.20N., R.26E., M.D.B.&M., within the Carson Desert Hydrographic Basin.

The proposed point of diversion for Application 80041 is described as being located within the NW¼ NW¼ of Section 29, T.20N., R.26E., M.D.B.&M., within the Carson Desert Hydrographic Basin.

The proposed point of diversion for Application 80042 is described as being located within the NE¼ NE¼ of Section 29, T.20N., R.26E., M.D.B.&M., within the Carson Desert Hydrographic Basin.

The proposed place of use for all applications is described as being located within the SE¼ NW¼, NE¼ SW¼, NW¼ SW¼ and SW¼ NW¼ of Section 21, T.20N., R.26E., M.D.B.&M., within the Carson Desert Hydrographic Basin.

II.

APPLICANT'S REQUEST TO AMEND CONSUMPTIVE USE

By letter dated November 2, 2010, the Applicant requested that the consumptive duty of water under the above-mentioned applications be reduced to 150 gpm or 242 acre-feet annually (afa) per application. Under the provision of Nevada Revised Statute (NRS) § 533.375, on December 15, 2010, the Office of the State Engineer requested additional information from the Applicant and Gradient Resources responded to this request in a letter received on January 13, 2011.¹ This letter clarified that the amount of consumptive use under the applications was being amended based on the Applicant's better understanding of the geothermal reservoir characteristics and temperature and confirmed that the Applicant is requesting to amend the total consumptive use of geothermal water to an annual rate 2,250 gpm or 3,629 afa.

III.

SUMMARY OF APPLICANT'S SUPPLEMENTAL MATERIALS

Concurrent with the 15 above-referenced applications, the Applicant submitted to the State Engineer a report entitled "Conceptual Ground-Water Flow Model for the Patua Geothermal Project." The model was prepared for the Vulcan Power Company of Bend, Oregon in June 2010 by Aqua Hydrogeologic Consultants of Reno, Nevada.

On November 8, 2010, the Applicant, Patua Project, LLC, under the name of its parent company, Gradient Resources, Inc., submitted additional information to amend the consumptive use amount requested in the applications, as well as empirical data to reinforce the June 2010

conceptual model of the Patua geothermal reservoir.² This information was also offered to the Protestants, contingent upon a non-disclosure agreement, as indicated in the correspondence from Gradient Resources dated and received on November 8, 2010, in the Office of the State Engineer.³

The Applicant was under the impression that these two submittals were to be kept confidential pursuant to NRS § 534A.025. The State Engineer agreed, but informed the Applicant that in order for the State Engineer to utilize the information contained in the reports for making a decision on these applications that the Applicant would need to specifically authorize the release of the information. The Applicant instead submitted a revised non-confidential report, dated March 23, 2011.

IV. STIX/EDMONSTON PROTEST SUMMARY

All the applications were timely protested by David F. Stix, Deena E. Edmonston and Timothy Edmonston (Stix/Edmonston) together on the following grounds as summarized:¹

- A. The use of the water will result in over pumping and mining of the groundwater causing injury to the basin, senior water rights and domestic wells and would result in an unreasonable lowering of the water table.
- B. The State Engineer should order a hydrologic, environmental or other relevant study before approving the applications because (1) the use of groundwater in the Fernley Area has already been restricted to municipal, quasi-municipal, and domestic uses, (2) the proposed manner of use is not a preferred use in a designated area, (3) the use of the groundwater would violate the basin designations found in State Engineer's Order Nos. 699, 1011, 1081 and 1184, and (4) the amount of water requested is not available; therefore, the use would negatively impact the groundwater basin.
- C. The applications are incomplete or deficient in that (1) they do not adequately describe the nature of the geothermal reservoir, (2) the point of reinjection is not described, (3) well construction details are not provided assuring that water from different aquifers will

² See, letter dated November 2, 2010, *Re: Pleadings to the Formal Protest for Applications 80028, 80029, 80030, 80031, 80032, 80033, 80034, 80035, 80036, 80037, 80038, 80039, 80040, 80041, 80042*, received November 8, 2010. File No. 80028, official records in the Office of the State Engineer.

³ File No. 80028, official records in the Office of the State Engineer.

not be co-mingled, (4) the works are not adequately described to determine the overall impact on the environment, (5) the number of acres the well field will occupy is not described, (6) the ownership of the project lands is not identified, and (7) it is unknown if all county and federal permits have been obtained.

D. The applications are speculative as it is unclear if the Applicant has the financial ability to construct the works and apply the water to the intended beneficial use with reasonable diligence.

E. The applications do not state whether the power generated will be used within Nevada or exported, and if the power is to be exported, the applications should be denied under the provisions of NRS § 533.372.

F. The proposed use of the water will result in waste as the applications are requesting an excessive amount of water. *See*, NRS §§ 533.460 and 534.020.

G. The use of the water threatens to prove detrimental to the public interest because (1) the quality of water is not known, (2) it is not known if all Nevada environmental permits have been obtained, (3) the water in the area should be protected for municipal and domestic use, and (4) since domestic wells are likely to be compromised by the lack of recharge from the Fernley canal, protection of groundwater is critical.

H. It is unclear if there has been compliance with NRS § 533.363 (notice to county commissions).

V.

CITY OF FERNLEY PROTEST SUMMARY

Applications 80028 through 80037 and 80041 were timely protested by the City of Fernley (Fernley) on the following grounds as summarized:¹

A. There is no unappropriated water at the source.

B. The use of the water would conflict with existing rights, specifically Fernley's groundwater rights, which are the primary source for municipal supply; therefore, the approval of the applications would threaten to prove detrimental to the public interest.

C. The use of the water would conflict with the protectable interests in existing domestic wells and should be denied pursuant to NRS § 533.024.

D. The applications propose an interbasin transfer of water and the Applicant has not shown (1) the need to import water from the Fernley Area Hydrographic Basin, (2) that the

use of the water is environmentally unsound for the basin of origin, (3) and the use of the water will unduly limit the future growth and development of the basin of origin.

E. The proposed use of the water is not one of the preferred uses under State Engineer's Order Nos. 699, 1011 and 1081, which are municipal, quasi-municipal and domestic.

FINDINGS OF FACT

I.

Nevada Revised Statute § 533.365(3) provides that it is within the State Engineer's discretion to determine whether a public administrative hearing is necessary to address the merits of a protest to an application to appropriate the public waters of Nevada. The State Engineer finds that in the case of Applications 80028 through 80042, inclusive, there is sufficient information contained within the records of the Office of the State Engineer to gain a full understanding of the issues and a hearing on this matter is not required.

II.

Both Protestant Stix/Edmonston and Protestant Fernley only focus their protests as to water availability in the Fernley Area Hydrographic Basin as neither protest identifies any issue regarding the Carson Desert Hydrographic Basin.

Protestant David Stix is the owner of water right Permit 52428, Certificate 14828 and has a domestic well for his primary residence located within the Fernley Area Hydrographic Basin. Protestants Deena and Timothy Edmonston have a domestic well for their primary residence also located within the Fernley Area Hydrographic Basin. Protestant Stix/Edmonston also indicate that they own property within 2,500 feet of at least one unidentified proposed point of diversion.

Protestant Stix/Edmonston contend that since groundwater areas near the project have been restricted to the preferred uses of municipal, quasi-municipal and domestic uses, the use proposed under these applications would conflict with the management of the designated area and would negatively impact the state of the groundwater in the designated area. They also contend there is no water for appropriation and this use of the water will create over pumping and mining of the groundwater aquifer causing injury to the basin, senior water rights, and protectable interests in existing domestic wells. Protestant Stix/Edmonston further assert that the use of water under the applications would result in an unreasonable lowering of the groundwater table.

Protestant Fernley asserts that the Fernley Area Hydrographic Basin is fully appropriated and the committed water resources currently equal the perennial yield. Therefore, there is no unappropriated water in the proposed source of supply and to permit these water right applications will conflict with existing rights, specifically Fernley's groundwater rights, which it uses as the primary source for its municipal water supply. As such, it asserts that approval of the applications would be detrimental to the public interest.

Within the Applicant's conceptual groundwater flow model⁴ there are four modeled subsurface layers (comprised of five hydrogeologic units), which are based on empirical data detailed in the report. The model describes the geothermal reservoir as the lower hydrogeologic unit (Layer 4 - about 7,500 feet thick) contained in fractured granodiorite in excess of 7,500 feet beneath land surface. The potable water source used by the Protestants is in the upper layer of the model (Layer 1- starting at the surface varying from 350 to about 2,100 feet thick), which is described as the combination of the two upper hydrogeologic units consisting of unconsolidated alluvial sediments and playa sediments. Between Layer 1 and Layer 4, the model describes two layers of relatively impermeable hydrogeologic units consisting of volcanic rocks (Layer 2 - varying from about 2,650 to about 4,400 feet thick) and much less permeable argillaceous granodiorite (Layer 3 - about 2,750 feet thick) that has been affected by extensive clay alteration. In summary, the Applicant's research indicates that the geothermal reservoir is stratigraphically confined by layers of low permeability rock that are on the order of several thousand feet thick.

The model simulated different scenarios applicable to the initial amount of geothermal water requested under the applications (a withdrawal of 41,500 gpm and re-injecting 80% of the geothermal fluids, resulting in a consumptive use of 8,300 gpm or 13,380 acre-feet annually). Under this scenario, using a hydraulic conductivity in the lower production Layer 4 of 0.57 ft/day, over a 30-year stress period the model showed a maximum decline in the hydraulic head of the upper two model layers (Layers 1 and 2 - land surface to 4,745 feet) of 0.1 and 0.23 feet respectively. A 100-year stress period revealed a 1.2 and 1.5 foot decline in Layers 1 and 2, respectively. When the model was applied using a lower hydraulic conductivity of Layer 4 of 0.2 ft/day, the 30-year stress period still revealed a decline of less than one foot in Layers 1 and 2.

⁴ *Conceptual Ground-Water Flow Model for the Patua Geothermal Project*, (hereinafter "Model"), March 23, 2011, submittal by Gradient Resources to the Office of the State Engineer, File No. 80028, official records in the Office of the State Engineer.

Information received from the Applicant on March 23, 2011, summarized a geothermal reservoir pressure interference test of wells already completed in the field. This test was conducted in December 2010. These test wells were developed under permits obtained for geothermal resource development from the Nevada Division of Minerals and are located at or near the potential production well sites for the subject applications. The pressure response of intermediate-depth (3,500 feet to 6,500 feet) and geothermal-reservoir-depth well pairs were analyzed while one of the other production wells discharged geothermal water at the surface for a period of 30 days whilst injecting into one of the other deep wells. The report details pressure declines coinciding with production in some of the deeper geothermal wells while none of the shallower wells showed any response. The report concluded that geothermal reservoir fluid production and injection will not adversely affect the shallow hydrologic regime in the area.⁵

While the Applicant's model presents a somewhat simplified approach to the simulation of a complex hydrogeologic system, it does rely upon empirical data from drilling logs, drill core samples, aquifer tests, water chemistry analysis, and established reports pertaining to the area. The data developed by the Applicant from drilling and testing the well field has confirmed the depths, thicknesses and relative permeabilities of the hydrogeologic units simulated by the model. In summary, the simulations provide evidence that the proposed withdrawals from a discrete geothermal reservoir will have little to no effect on groundwater levels within the potable water aquifer that the Protestants rely upon for their permitted and domestic wells.

The estimated drawdown from this model simulation is conservative and somewhat of a worst case scenario since the model simulation was based on the fact that the Applicant initially expected to consumptively use three and half times more water from the geothermal reservoir than is now proposed. The revised plan calls for consumption of only 3,629 afa from the geothermal reservoir. Calculations reveal that this is about 7% (as opposed to 20%) of the total average annual proposed rate of diversion of geothermal fluids for power generation purposes of about 34,000 gpm. The remaining 93% of the water will be re-injected into the outer edges of the

⁵ Letter Report dated March 18, 2011, *Re: Shallow Well Pressure Response During Geothermal Reservoir Well Testing – Patua, Nevada Geothermal Field*, (hereinafter “Report”), addressed to Gradient Resources, Inc., from Colin Goranson, Geothermal Reservoir Engineering Consultant, Richmond California, in the March 23, 2011, submittal from Gradient Resources, File No. 80028, official records in the Office of the State Engineer.

geothermal reservoir for pressure support.⁶ Referring to the simulated stresses, the reduced consumption should result in a proportionally smaller impact, if any, to the alluvial fresh water aquifer.

Protestants have expressed concern that the use of the water proposed under these applications will conflict with protectable interests in existing domestic wells. Nevada Revised Statute § 533.370(5) provides that the State Engineer must reject an application if the proposed use of the water conflicts with protectable interests in existing domestic wells as set forth in NRS § 533.024 and it is the policy of this state to recognize the importance of domestic wells as appurtenances to private homes, to create a protectable interest in such wells and to protect their supply of water from unreasonable adverse effects which are caused by municipal, quasi-municipal or industrial uses and which cannot reasonably be mitigated.

A search of Well Driller's Reports on file in the Office of the State Engineer reveals that, of those well logs on file for the Fernley Area Hydrographic Basin, the average domestic well depth is less than 200 feet. The average depth of wells used for municipal purposes is less than 400 feet, with the deepest well (Permit 70290 serving 1.0 cfs for municipal use) at 815 feet. The Protestants are drawing water from the potable groundwater aquifer that is limited by an established perennial yield. The applications that are the subject of this ruling are proposing a consumptive use of non-potable geothermal fluid from a discrete reservoir over 7,000 feet below the deepest domestic well and the two sources are separated by relatively impermeable rock. The conceptual model and associated reservoir stress tests indicate the system is very large and that there will be no significant effect on the level of the local potable water table due to the stratigraphic confinement of the geothermal resource from the potable water aquifer.

The State Engineer finds based upon the results of the testing and modeling of the geothermal reservoir that there is sufficient unappropriated geothermal water to support the beneficial use contemplated in the subject applications. The State Engineer finds based on the initial modeling that pumping from the geothermal reservoir in the amounts requested by the Applicant will not conflict with existing rights or domestic wells, and that granting the applications will result in no significant impact to the potable water aquifer.

⁶ See, letter received January 13, 2011, File No. 80028, official records in the Office of the State Engineer.

While the State Engineer finds that the approach taken by the Applicant to simulate the potential effects of consuming water from the geothermal reservoir is sound, close monitoring of the hydrologic conditions during geothermal reservoir development is warranted. The State Engineer finds that a groundwater monitoring program and mitigation plan that specifically addresses potential impacts to both public supply and domestic wells must be submitted by the Applicant, and approved by the State Engineer, before any consumptive use of the geothermal water begins.

**III.
INTERBASIN TRANSFER
NEED TO IMPORT WATER**

Protestant Fernley contends that the applications are seeking an interbasin transfer of groundwater in that there are proposed points of diversion within the Fernley Area Hydrographic Basin and the proposed place of use is within the Carson Desert Hydrographic Basin and asserts that the Applicant has not satisfied the requirements of NRS § 533.370(6); therefore, the applications should be denied.

Nevada Revised Statute § 533.370(6) provides that in determining whether or not an application for an interbasin transfer of groundwater must be rejected, the State Engineer shall consider: (1) whether the applicant has justified the need to import the water from another basin; (2) if the State Engineer determines a plan for conservation of water is advisable for the basin into which the water is imported, whether the applicant has demonstrated that such a plan has been adopted and is being effectively carried out; (3) whether the proposed action is environmentally sound as it relates to the basin from which the water is exported; (4) whether the proposed action is an appropriate long-term use which will not unduly limit the future growth and development in the basin from which the water is exported; and (5) any other factor the State Engineer determines to be relevant.

Protestant Fernley contends that the Applicant has not shown a need to import water from the Fernley Area Hydrographic Basin and argues that many binary geothermal power plants are air cooled when insufficient water is available; thus, there is a less water intensive alternative that should be explored by the Applicant. It asserts that with viable alternatives there is no need to further tax the limited groundwater resource; therefore, it has not demonstrated the need to import water from another hydrographic basin.

The Applicant has reduced its request for the amount of consumptive use of water for cooling based on the geothermal reservoir data. The varying quality of geothermal heat sources available calls for varying types of power plant designs. In this instance, the Applicant has provided information that water is available for a hybrid air/water cooling design that is more efficient and necessary for a successful project.

The proposed project simultaneously spans two different counties (Lyon and Churchill) and two hydrographic basins (Fernley Area and Carson Desert). The site for the actual power generation station is located in Churchill County within the Carson Desert Hydrographic Basin. The majority of the proposed well locations are located within the Carson Desert Hydrographic Basin. The geothermal reservoir straddles the two basins and development requires wells to be drilled in both basins. The power plant, where the water will be consumed for industrial cooling purposes, must lie in one of the basins and therefore, requires an interbasin transfer from the other basin. No other reasonable solution exists. As addressed previously, there is water from the geothermal reservoir that is available for appropriation for this purpose.

The State Engineer finds the interbasin transfer statute found in NRS § 533.370(6) was enacted into the water law in reaction to the filings of a municipal water purveyor for the importation of large quantities of potable water from groundwater basins far outside the service area of the water purveyor. The State Engineer finds the history of NRS § 533.370(6) did not contemplate the development of a geothermal resource such as the one considered in this ruling and its applicability is questionable. The State Engineer finds that there is water available to be put to beneficial use from the non-potable geothermal aquifer. The State Engineer finds the Applicant has demonstrated the need for the importation of water from a neighboring hydrographic basin due to the location of the geothermal reservoir that straddles the two hydrographic basins.

IV. INTERBASIN TRANSFER CONSERVATION PLAN

The State Engineer finds the provision of NRS § 533.370(6) that addresses whether a conservation plan has been adopted and is being effectively carried out makes no sense in the context of considering the use of a non-potable geothermal resource as there is no request to import potable water from a neighboring hydrographic basin as a potable water source.

**V.
INTERBASIN TRANSFER
ENVIRONMENTALLY SOUND FOR BASIN OF ORIGIN**

Protestant Fernley also asserts that the Applicant has not demonstrated that the transfer would be environmentally sound for the basin of origin alleging that the use of the water would constitute an additional consumption of water in a fully appropriated basin. It contends that the withdrawal of water in excess of existing rights will negatively impact environmental resources and that injection back to the source may lead to degraded water quality in the area. Protestant Stix/Edmonston asserts that there are public interest concerns as to the quality of the water used for cooling and that the works are not adequately described to determine the overall impact on humans, animals and the environment.

The concern for the water quality of the geothermal resource is justified. Geothermal resources are commonly thought of as being of finite duration. The best way to preserve the nature of the geothermal resource would be a proactive re-injection scenario which has already been proposed by the Applicant. As with withdrawing non-potable geothermal fluid, re-injection requires that the fluid be kept separate from the colder, potable water aquifer. Contamination of the geothermal resource with colder water at either the inflow or re-injection stage results in reduced efficiency, which is an undesirable operating condition for the Applicant. Maintaining the productivity of the resource for as long as possible is in the Applicant's best interest.

In regards to contamination concerns after re-injections begins, NRS § 445A.465 requires operators of wells of this nature to obtain a permit from the Nevada Division of Environmental Protection to comply with the Underground Injection Control Program. The State Engineer recognizes that the water law reflects the intention of the Legislature to prevent the pollution of the groundwater;⁷ however, in the case of the development of geothermal resources, the Legislature has delegated the authority over re-injection to another agency of State Government. The State Engineer finds that the concerns of over appropriation of the potable water supply have been addressed and that with the protections in place under the permit system administered by the Nevada Division of Environmental Protection, the use of the water is not environmentally unsound for the basin of origin.

⁷ Nevada Revised Statute § 534.020.

VI.
INTERBASIN TRANSFER
LIMIT ON FUTURE GROWTH AND DEVELOPMENT OF BASIN OF ORIGIN

Nevada Revised Statute § 533.370(6)(4) provides that the State Engineer shall determine whether the proposed action is an appropriate long-term use, which will not unduly limit the future growth and development in the basin from which the water is exported. Protestant Fernley asserts that the appropriation would limit the resources available to Fernley for municipal supply, has the potential to impact its existing rights, would unduly limit future growth in a hydrographic basin where the committed rights are in excess of the perennial yield and the export of water is not an appropriate use of the limited resource.

The State Engineer finds again that the provision of NRS § 533.370(6) that addresses whether the use of the water will not unduly limit the future growth and development of the basin of origin makes no sense in the context of considering the use of a non-potable geothermal resource as this is economic development in the general area and the non-potable geothermal resource would not be used for municipal development. The geothermal resource the Applicant is proposing to utilize is a non-potable source that is separated from the upper level potable water aquifer by several thousand feet of impermeable rock. The geothermal waters are unusable for municipal purposes. The supply of fresh water in the Fernley Area will remain unchanged if these applications are granted. Rather, the development of non-potable geothermal water for a geothermal power plant will promote growth and development in both the Fernley Area and Carson Desert hydrographic basins. Reviewing the analysis presented above concerning the depths of municipal and domestic wells within the basin and the depths at which the Applicant proposes to remove water for consumption, the State Engineer finds that the Patua Project will not limit future growth and development in the Fernley Area Hydrographic Basin.

VII.
VIOLATES PREFERRED USE DESIGNATIONS IN FERNLEY AREA

Both Protestants assert that to grant the applications would violate State Engineer's Order Nos. 699, 1011, 1081 and 1184.

State Engineer's Order No. 699 designated a portion of the Fernley Area Hydrographic Basin.⁸ A basin designation order is merely the first step that allows the State Engineer to further

⁸ State Engineer's Order No. 699, December 30, 1977, official records in the Office of the State Engineer.

regulate a basin. Nevada Revised Statute § 534.120 provides that within an area that has been designated, where in the judgment of the State Engineer the groundwater is being depleted, the State Engineer may make such additional rules, regulations and orders as are deemed essential for the welfare of the area involved. This provision allows the State Engineer to designate preferred uses of water within a designated area. The State Engineer finds that Order No. 699 is a necessary predecessor to other orders cited by the Protestants.

State Engineer's Order No. 1011 designated municipal, quasi-municipal and domestic uses as the preferred uses within specifically described areas, which coincided with the Fernley Town Utilities water and wastewater service area at that time.⁹ State Engineer's Order No. 1081 noted that the Fernley Town Board expanded the boundaries of the Fernley Town Utilities water and wastewater service area and expanded the preferred use area to coincide with the new service area. The area under Order No. 1081 includes the area of the Patua Project.¹⁰

Eight of the 15 proposed wells lie within the Carson Desert Hydrographic Basin, which is administered through the more restrictive State Engineer's Order No. 1116. However, despite its restrictive nature, one of the exceptions contained in Order No. 1116 allows appropriations from the geothermal reservoir. The reason for the exception is that the quality of water withdrawn for geothermal purposes is not of a quality that would be presently useful in situations requiring potable water. It would follow that the State Engineer would grant the same allowance elsewhere. The State Engineer finds that the proposed consumptive use is from a discrete geothermal reservoir separated from the potable water resource by impermeable stratigraphic layers several thousand feet thick, and thus, the restrictions presented in Order No. 1011 are not applicable.

State Engineer's Order No. 1184 provided for what is known as a domestic well credit program, which is a program that allows a public water system to receive credits when a domestic well owner voluntarily ceases to draw water from the well or an owner of a lot with the ability to drill a domestic well forgoes that opportunity and hooks up to the public water system.¹¹ The State

⁹ State Engineer's Order No. 1011, November 21, 1989, official records in the Office of the State Engineer.

¹⁰ State Engineer's Order No. 1081, dated August 20, 1993, official records in the Office of the State Engineer.

¹¹ State Engineer's Order No. 1184, dated April 19, 2007, official records in the Office of the State Engineer.

Engineer finds the provisions of Order No. 1184 are irrelevant to the applications under consideration in this ruling.

VIII. APPLICATIONS INCOMPLETE

Protestant Stix/Edmonston asserts that the applications are incomplete or deficient in that (1) they do not adequately describe the nature of the geothermal reservoir, (2) the point of re-injection is not described, (3) well construction details are not provided assuring that water from different aquifers will not be co-mingled, (4) the works are not adequately described to determine the overall impact to the environment, (5) the number of acres the well field will occupy is not described, (6) the ownership of the project lands is not identified, and (7) it is unknown if all county and federal permits have been obtained.

Nevada Revised Statute §§ 533.335, 533.340 and 533.350 specifically provides for what information must be included in or with a water right application. The State Engineer finds those provisions of the water law do not require the level of detail the Protestant wants to find in an application. The Applicant did provide additional information regarding the capacity of the geothermal reservoir to support the beneficial use contemplated in the subject applications. The proposed points of diversion are specifically described in the applications, as well as being illustrated on the map, which is required to accompany the applications. The ownership of land, whether public or private, is not required to be on an application and can be determined by looking at a map and assessor's records. If any water right permits are granted, they are granted with the condition that the permit holder must obtain all other permits required by State, Federal or local agencies. The State Engineer finds the well field is readily identified on the map that was filed with the applications. The State Engineer finds a search of assessor's parcel maps of both Lyon and Churchill Counties indicates the Patua Project well field lies within about six different parcels of land that make up the "checkerboard" areas of both private and federally owned land. The State Engineer finds that the applications and supporting map were reviewed by staff at the Office of the State Engineer and met all statutory requirements. The State Engineer finds the statement that the applications were incomplete or deficient is without merit.

**IX.
SPECULATION**

Protestant Stix/Edmonston contends that the applications are speculative as it is unclear whether the Applicant has the financial ability to construct the works of diversion and place the water to the intended beneficial use with reasonable diligence. Nevada Revised Statute § 533.370(1)(c)(2) provides that an applicant must provide proof satisfactory to the State Engineer of its financial ability and reasonable expectation actually to construct the work and apply the water to the intended beneficial use with reasonable diligence. In the January 13, 2011, correspondence, the Applicant makes statements assuring the State Engineer of its technical resources, financial commitment and assurances of investor involvement in the Patua Project.

The State Engineer finds these statements are enough to provide the State Engineer with assurances that the Applicant laid the groundwork and has the financial ability to undertake and complete the project outlined in the application.

**X.
USE OF POWER OUT OF STATE**

Protestant Stix/Edmonston asserts that if the power generated by the proposed project will be used out of state, then the applications should be denied under the provision of NRS § 533.372. Nevada Revised Statute § 533.372 provides that “[b]ased upon the public interest and the economic welfare of the State of Nevada, the State Engineer may approve or disapprove any application of water to beneficial use or any application which contemplates a change in the place or beneficial use of water to a use involving the industrial purpose of generating energy to be exported out of this state.” This provision of the water law provides that it is completely within the State Engineer’s discretion to determine whether an application for generating energy should be approved or denied. However, the State Engineer notes this provision of the water law may have constitutional implications, such as those in *Sporhase v. Nebraska ex rel. Douglas*, 458 U.S. 941 (1982), which was a case in which the United States Supreme Court decided that a Nebraska statute forbidding commercial exportation of water from Nebraska was unconstitutional in that it violated the dormant commerce clause.

Since generated electric power cannot be effectively stored, it is placed into a grid system that may connect to several electricity wholesalers either within or outside Nevada. The demand for

the then locally distributed electricity may be supplied from one of several generating stations in any number of states and this is a fact of modern power generation. While NRS § 533.372 allows the State Engineer the option to deny applications of this sort, the State Engineer can find no substantial reason for a denial based on the public interest or the economic welfare of the state of Nevada resulting from the potential exportation of electricity generated by this project.

**XI.
WORKS NOT ADEQUATELY DESCRIBED**

Protestant Stix/Edmonston asserts that the works are not adequately described to determine well construction issues with a concern focused on assuring that the water from the geothermal aquifer is not co-mingled with the potable water source used by water right holders and domestic well users. The State Engineer recognizes the concern regarding well construction issues that prevent the co-mingling of the geothermal aquifer with the potable water aquifer from which they obtain water.

Desirable geothermal sources are sought out on the basis of the amount of potential heat production and this heat is used to produce electricity. The design of a geothermal well seeks to utilize the formations that produce the most heat while avoiding the contaminating effects associated with co-mingling of water from the cooler, potable water aquifer. The State Engineer finds that any geothermal well constructed in this state will be in compliance with the standards for wells under his regulation, and will be under the regulation of at least two other public agencies specifically to prevent communication with fresh groundwater.

**XII.
WASTE**

Protestant Stix/Edmonston contends that the use of the water under the applications will result in waste and that the Applicant is applying for an excessive amount of water.

Nevada Revised Statute § 533.035 provides that beneficial use shall be the basis, the measure and the limit of the right to the use of water. Nevada Revised Statute § 533.060 provides that the right to use water must be limited and restricted to as much as may be necessary when reasonably and economically used for a beneficial purpose. Nevada Revised Statute § 533.070 provides that the quantity of water that may be appropriated is limited to such water as shall be reasonably required for the beneficial use to be served.

The Applicant has requested to reduce the consumptive use of water to 3,629 afa as the total for all 15 applications (not the 8,300 acre-feet as originally requested). The Protestant merely asserts that the Applicant has applied for an excessive amount of water and does not state with reasonable certainty why the amount is excessive or how the use of the water will result in waste. While the State Engineer is certainly obligated to prevent the willful waste of water, these applications do not meet the definition of waste in the sense that they have applied for geothermal fluid, not potable water, in the amount the Applicant estimates is needed for this particular project. While the amount requested is large, it is an amount necessary for a power plant of this size. One must also bear in mind that a large portion of this fluid is to be re-injected into the reservoir from which it came.

**XIII.
RECHARGE FROM CANAL FOR WELLS**

Protestant Stix/Edmonston asserts that domestic wells are likely already compromised by the recharge, or lack thereof, from the Fernley Truckee-Carson Canal making protection of any groundwater recharge in the area more critical. The State Engineer recognizes that the Truckee Canal, which is part of the Newlands Project, is known to recharge groundwater in the area through which it flows and that water resources were developed based on this recharge. State Engineer's Order No. 1116, which was issued for the Carson Desert Hydrographic Basin specifically noted that present recharge from surface-water irrigation and delivery systems was declining and therefore, restricted new appropriations of groundwater in the basin. However, that order specifically exempted applications filed for water from the geothermal aquifers. The State Engineer recognizes the concern of the loss of artificial recharge to the groundwater basin; however, the issue of influence of the recharge from the Truckee Canal is not relevant to the applications under consideration in this ruling.

**XIV.
PUBLIC INTEREST CONCERNS / DETRIMENTAL TO PUBLIC INTEREST**

On the issue of public interest concerns, Protestant Stix/Edmonston contends that it is not known if all Nevada environmental permits have been obtained. The State Engineer finds that water rights permits issued do not waive the requirements that the permit holder obtain other permits from State, Federal and local agencies and that the issuance of the water right permit is not dependent on the completion of permitting from other agencies.

**XV.
COMPLIANCE WITH NRS § 533.363**

Protestant Stix/Edmonston contend that it is unclear if compliance with NRS § 533.363 is complete. The Protestant asserts that this project relates to two counties, Lyon and Churchill, and also asserts that water will likely be withdrawn in one county and re-injected in another county; therefore, it is unclear if the exemption found in NRS § 363(2)(b)(2) applies or whether the Applicant has complied with the statute.

Nevada Revised Statute § 533.363 provides that:

1. Except as otherwise provided in subsection 2, if water for which a permit is requested is to be used in a county other than that county in which it is to be appropriated, or is to be diverted from or used in a different county than that in which it is currently being diverted or used, then the State Engineer shall give notice of the receipt of the request for the permit to:

(a) The board of county commissioners of the county in which the water for which the permit is requested will be appropriated or is currently being diverted or used; and

(b) The board of county commissioners of the county in which the water will be diverted or used.

2. The provisions of subsection 1 do not apply:

(a) To an environmental permit.

(b) If:

(1) The water is to be appropriated and used; or

(2) Both the current and requested place of diversion or use of the water are, within a single, contiguous parcel of real property.

3. A person who requests a permit to which the provisions of subsection 1 apply shall submit to each appropriate board of county commissioners a copy of the application and any information relevant to the request.

4. Each board of county commissioners which is notified of a request for a permit pursuant to this section shall consider the request at the next regular or special meeting of the board held not earlier than 3 weeks after the notice is received. The board shall provide public notice of the meeting for 3 consecutive weeks in a newspaper of general circulation in its county. The notice must state the time, place and purpose of the meeting. At the conclusion of the meeting the board may recommend a course of action to the State Engineer, but the recommendation is not binding on the State Engineer.

Based on the review of the applications and information provided, the State Engineer believes it is highly likely that water will be used in a county other than that county in which it is

to be appropriated. The records of the Office of the State Engineer indicate that on August 3, 2010, the State Engineer provided notice of the applications to both the Lyon County and Churchill County Board of Commissioners. There was no reply from Churchill County. By letter dated September 9, 2010, Lyon County responded; however, no protest was filed. The State Engineer finds that his obligations under this statute were complied with by the letter of August 3, 2010, and he provided copies of the applications to the affected counties on behalf of the Applicant.

CONCLUSIONS

I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.¹²

II.

The State Engineer is prohibited by law from granting an application to appropriate the public waters where:¹³

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectible interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

III.

The State Engineer concludes, based on the fact that the geothermal reservoir is a discrete, non-potable water source separated from the potable water source by several thousand feet of impermeable rock, that there is water available for appropriation and the use of the water will not interfere with the Protestants' existing rights or domestic wells and the use of the water does not threaten to prove detrimental to the public interest.

IV.

The State Engineer concludes that the provisions of NRS § 533.370(6) regarding interbasin transfers of groundwater do not prevent the granting of these applications.

¹² NRS Chapters 533 and 534.

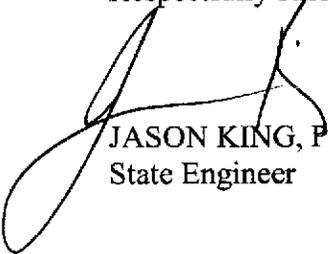
¹³ NRS § 533.370(5).

RULING

The protests to Applications 80028 through 80042, inclusive, are hereby overruled. The applications are approved subject to:

1. Payment of the statutory fees,
2. Existing rights,
3. Approval by the State Engineer of a monitoring and mitigation plan prior to the development and consumptive use of the water, and
4. Obtaining all other permits required by State, Federal or local agencies.

Respectfully submitted,

 P.E.
JASON KING, P.E.
State Engineer

Dated this 28th day of
April, 2011.