

For NDOM Use Only

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STATE OF NEVADA
 COMMISSION ON MINERAL RESOURCES
DIVISION OF MINERALS
 400 W. King Street, Suite 106
 Carson City, Nevada 89703
 (775) 684-7040 | Fax (775) 684-7052
 http://minerals.nv.gov

Date Received 05/27/22

API Number 27-031-90317

County Washoe

Permit Number 1529
 FOR DIVISION USE ONLY

GEOHERMAL INJECTION WELL PERMIT APPLICATION

The applicant

USG Nevada LLC (Ormat)

Name (or Corporate/Business Name)

Street Address 6140 Plumas Street

City Reno State NV Zip Code 89519

Telephone (775) 356-9029

Email mhanneman@ormat.com

hereby makes application for a geothermal development permit, State of Nevada, Division of Minerals.

Applicant is: Land Owner Lease Holder

Well Name: 55A-4

Lease Name/No: Alberg MS4036 Pat. Split Estate? Yes No

Land Type: Federal (BLM, USFS, etc.) Private State

Type and Amount of Bond: Statewide Surety \$100,000
 (Exempt for Domestic Class)

Bond Issued by: Befa Travelers Casualty Surety Co. of America

Serial Number: NVB000284 105029232

Well Location: NW $\frac{1}{4}$ of, SE $\frac{1}{4}$, Section 04

Township 29N, Range 23E, County Washoe

UTM Northing 4476103 N; UTM Easting 296048 E (NAD83 Datum)

Operator's:

Name: USG Nevada LLC

Address: 6140 Plumas St

City, St Zip: Reno, NV 89519

Drilling Contractor's:

Name: Hydro Resources

Address: 1575 Delucchi Ln

City, St Zip: Reno, NV 89502

Telephone: (775) 329-2083

Hole Size: 22" Casing Size: 14" Weight/Gauge: HSLA Roscoe Moss

Size of BOP: 2000 psi 3000 psi 5000 psi

Rotary Description:

A rotary reverse-circulation drilling rig with associated equipment will be rigged up and a 30-in. hole drilled to approximately ±60 ft. Casing (24-in.) will be cemented in place to surface. After cementing the casing to surface, a 22-in. hole will be drilled to approximately ±1000 ft and 14-in. casing installed to a total depth of approximately 1000 ft. The well will be completed with a gravel pack.

Identify or locate the sources of the fluids which will be injected:

Production wells for the North Valley geothermal power plant

Estimated average daily volume of fluids injected 1,440,000 gallons.

Maximum daily volume of fluids injected 2,160,000 gallons.

Estimated maximum injected pressure 10-14 psig psi, temperature 140 °F

List proposed metering equipment, pipelines and safety devices that will be used to prevent accidental pollution:

See attached drilling program

Total Depth to be Drilled: 1000'

Drilling will Commence On: June 2022

Is this well location under an Underground Injection Permit?

If so, provide NDEP Permit number UNEV No

I certify this information to be true, correct, and complete and that no pertinent matter inquired about in this application has been omitted.

Signature of Applicant/Agent: Mark Hanneman

Print Name: Mark Hanneman

Date: 3/29/2022

Please attach a detailed drilling program including the following information:

1. Well design schematic; casing and mud programs; potential water supply; drilling rig to be used and pad layout; blow out prevention equipment diagram and testing program; directional drilling information if applicable; map of location and access roads. Additional information may be required upon review.
2. The required fee per NAC 534A 210 or 534A.212.

CONDITIONS OF PERMIT

1. All permittees must comply with appropriate sections of the Geothermal Rules and Regulations of the Division of Minerals and with applicable rules and regulations of other local, state, and federal agencies.
2. During the drilling of geothermal injection wells, all water strata above the geothermal horizon being used must be sealed or separated in order to prevent their contents from passing into other strata.
3. All fresh water and water of value or possible value for other beneficial uses must be confined to their respective strata and be adequately protected by methods approved by the Division. Precautions must be taken in drilling and abandoning wells to guard against any loss of fresh water from the strata in which it occurs, and the contamination of any fresh water by objectionable water.
4. The operator of any well must shut off and exclude all water from any geothermal resource-bearing stratum to the satisfaction of the Division.
5. See attached Conditions of Approval.
6. Please send daily drilling reports to : Cortney Luxford cluxford@minerals.nv.gov
and
Valerie Kneefel vkneefel@minerals.nv.gov
7. Additional Conditions/Comments

A.	
B.	
C.	

This permit does not extend the permittee the right of ingress and egress on public, private or corporate lands.

The issuance of this permit does not waive the requirements that the permit holder obtain other permits from State, Federal, and local agencies.

PERMIT APPROVAL

Approved 5/27/2022 with the conditions noted above.
Date

Permit Number 1529



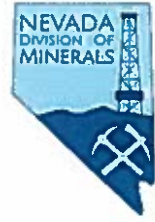
Administrator
Division of Minerals



STEVE SISOLAK
Governor

STATE OF NEVADA
COMMISSION ON MINERAL RESOURCES
DIVISION OF MINERALS
400 W. King Street, Suite 106
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<http://minerals.nv.gov/>

Las Vegas Office: 375 E. Warm Springs Rd, Ste 205, Las Vegas, NV 89119
Phone: (702) 486-4343; Fax: (702) 486-4345



MICHAEL VISHER
Administrator

**GEOHERMAL CONDITIONS OF APPROVAL
FOR INJECTION WELL DRILLING PERMIT 1529**

Submit forms and correspondence to: Nevada Division of Minerals
400 West King Street
Suite 106
Carson City, NV 89703-4212

Operator: USG Nevada LLC (Ormat)
Lease Name: Alberg MS 4036 Pat.
Well: 55A-4
Permit: 1529

**A COPY OF THESE CONDITIONS OF APPROVAL MUST BE FURNISHED
TO YOUR FIELD REPRESENTATIVE TO ENSURE COMPLIANCE**

Communications with the Division shall be directed to:

Cortney Luxford, Fluid Minerals Program Manager

Office 775-684-7045 Email cluxford@minerals.nv.gov
Cell 775-721-1774
Fax 775-684-7052

Michael Visher, Division Administrator

Office 775-684-7044 Email mvisher@minerals.nv.gov
Cell 775-721-7625
Fax 775-684-7052

Dustin Holcomb, Field Specialist - Geologist

Office 775-684-7046 Email dholcomb@minerals.nv.gov
Cell 775-721-2726
Fax 775-684-7052

Voice mail is available on all cell phones and office phones. Please leave a message if you are unable to speak to someone and we will return your call as quickly as possible.

By provision of the current Memorandum of Understanding between NDOM and BLM, you may contact the following individuals for information or approvals. Approvals under the MOU apply to Fee and Federal lease locations.

John Menghini, Fluid Minerals Team, Petroleum Engineer, Reno

Office 775-861-6573 Email jmenghin@blm.gov
Cell 775-223-1359
Fax 775-861-6711

Alex Jensen, Fluid Minerals Team, Acting Branch Chief, Reno

Office 775-861-6564 Email aajensen@blm.gov
Cell 775-560-2191
Fax 775-861-6711

Michael Erickson, PET, Reno

Office 775-861-6641 Email merickson@blm.gov
Fax 775-861-6711

**YOUR APPLICATION TO DRILL THE 55A-4 INJECTION WELL, PERMIT 1529,
IS APPROVED SUBJECT TO THE FOLLOWING PERMIT CONDITIONS**

1. These conditions and the minimum Blow Out Prevention Equipment (BOPE) requirements shall be posted at the well site and read by all company personnel associated with the subject well.
2. The operator shall give notification at least 48 hours prior to spudding, drill stem testing, or production or injection testing operations. 24 Hours notification is required prior to the testing of casing or BOPE. These notifications may be by telephone or email. Please refer to the contacts list on page one of this notice.
3. If the cementing mix for the lead cement in this program includes a 10 lb/sk of Spherelite, a spherical additive for reducing density of cement mix, a high resolution CBL may be required if the cement does not reach surface, or if the cementing of the casing appears to be inadequate. This additive has been found to interfere with normal cement bond logging (CBL). The product manufacturer has stated that good logging may be achieved with a high resolution CBL. This log can be more expensive and difficult to schedule. The operator is here notified that if this mix is used and a CBL is required by the regulatory agencies, a high resolution logging may also be required if the CBL is found to be inadequate in the evaluation of the cement behind casing, unless an alternative satisfactory method of confirming cement bonding is approved by the regulatory agencies.

4. **Well Cellars** - For corrosion prevention, the cellar must be engineered, constructed, and/or maintained, to preclude standing water from long-term contact with the casing or wellbore assembly. The top of the surface casing will be a minimum of 24 inches above the cellar floor, or ground level if a cellar is not present. Surface casing will be as high as possible around intermediate casing with excess, tapered cement so water does not pool on top of cement. At the completion of the well, the drilling pad is to be contoured in a manner that drains water away from the cellar, or surface casing if a cellar is not present.
5. **Change in Plans** - NAC 534A.540 (3) (g) specifies the operator will submit a sundry for permission for change of drilling plans. Verbal permission may be granted to a sundry notice due to an urgency of a particular matter.
6. **Cementing** - NAC 534A.260 (3, 4, 5) requires surface and intermediate casing to be cemented to surface. If one hundred percent (100%) returns are not obtained during the cementing operation, or if the cement falls back in the annulus, a top cement job shall be required, unless another cement program has been approved. If unconventional cement formulations are used, there must be a cased-hole logging technique available to determine the adequacy of cement bonding and hydraulic seal for the particular unconventional cement product used.
7. **NAC 534A.270 Prevention of blowout; testing of equipment for prevention of blowout; submission of test data and supporting information to Division; recording of results in daily drilling log. ([NRS 513.063](#), [534A.090](#))**
 1. An operator shall take all precautions which are necessary to keep wells under control and operating safely at all times. Well control and wellhead assemblies used in any geothermal well must meet the minimum specifications for assemblies prescribed by the American Petroleum Institute, or its successor organization, in the most current edition of Standard 53, "Well Control Equipment Systems for Drilling Wells," or as may be otherwise prescribed by the Administrator. The most current edition is available by mail from Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado 80112-5776, by telephone at (800) 854-7179 or at the Internet address <http://global.ihs.com>, for the price of \$160.
 2. Equipment for the prevention of a blowout, capable of shutting in the well during any operation, must be installed on the surface casing and maintained in good operating condition at all times. This equipment must have a rating for pressure greater than the maximum anticipated pressure at the wellhead. Equipment for the prevention of a blowout is required on any well where temperatures may exceed 200°F.
 3. The operator shall submit to the Division the pressure data and supporting information for the equipment for the prevention of a blowout as soon as

practicable after the conclusion of the test conducted pursuant to subsection 3. The operator shall record the results of each test in the daily drilling log of the operator.

8. **Directional Drilling** - NAC 534A.360 requires directional surveys (inclination and azimuth) to be run on any well permitted directionally drilled well. Division conditions of approval further require directional survey (inclination and azimuth) where the inclination exceeds 5 degrees or the projected bottom hole location would be 100 feet or less from the lease boundary, unless otherwise approved by the Division of Minerals. Direction surveys must be performed at least every 250 feet in the directionally drilled portion of the wellbore. The operator is advised that cased-hole logging for the evaluation of cement bonding and hydraulic seal may also be required as part of the well completion. The cased-hole logging technique(s) utilized by the operator must be able to give conclusive results regarding the initial quality of cement bonding and hydraulic seal.
9. **Hydrogen Sulfide** – If hydrogen sulfide is encountered well must be shut-in until measured amounts are determined. Values of hydrogen sulfide encountered must be reported to the Division of Minerals.
10. **Air/Aerated Drilling Operations** – For air/aerated drilling operations, the following equipment shall be utilized: banjo box (or equivalent), and a staked down blooie line directed to the reserve pit with a minimum distance of 100 feet.
11. **Samples** – NAC 534A.310 requires samples of cuttings or splitsof core shall be collected and submitted to the Nevada Bureau of Mines and Geology (NBMG). Division conditions of approval further require a minimum of 30-foot intervals from surface to the total depth, unless otherwise approved in the permit. Core shall be submitted in skeletonized format.
 - a. TWO separate sets of cuttings, and one split of core, are to be sent prepaid to the Great Basin Science Sample and Records Library, Nevada Bureau of Mines and Geology, 2175 Raggio Parkway, Reno, Nevada 89512. For more information phone 775-682-8766 or e-mail [nbmg@unr.edu](mailto:nbmgs@unr.edu).
 - b. EACH SET of cuttings is to consist of at least 15 milliliters of cuttings per sampling interval that must be cleaned, dried, and placed into 3"x5" sample envelopes. The envelopes are to be placed in order by interval into common drill cutting boxes with approximate dimensions of 3"x5"x20". The envelopes are to be identified by the Division permit number, well name/number as noted on the Geothermal Resource Development Permit Application, and interval.

- c. The samples are to be PROPERLY IDENTIFIED as follows: Each box is to have legibly written on one end the name of the operator and well, as noted on the Geothermal Resource Development Permit Application, Division permit number, total interval (missing intervals noted), and set number.
 - d. NOTE: the samples are not to be sent to the Division of Minerals, rather they should be sent directly to the NBMG. **The samples are due within 30 days of completion of the well.** The operator will be responsible for the cost of any further handling of your samples by the NBMG required to meet the standards set out in this permit condition.
12. Drilling Reports - A minimum of one drilling report shall be submitted to the Division of Minerals each day during drilling operations, notifying the Division of the drilling process. These reports may be submitted via email or fax.
 13. Well Completion Report - NAC 534.550 (1) (a) requires a well completion form to be filed with the Division of Minerals within 30 days of the cessation of drilling (rig release date).
 14. Logging - NAC 534A.350 requires two copies of all well logs run, including lithological and electrical, neutron-gamma or similar, to be filed with the Division. Computed results in LAS format must also be submitted to the Division for each electric log run. Electronic files are to be provided on CD Rom. These logs are to be submitted within 60 days of the completion of the well.
 15. Survey Plat - NAC534A.205 requires a certified plat of the location by a professional land surveyor of the well must be filed with the Division of Minerals within 60 days of completion of the construction of the well.
 16. Emergency Notification - In the event of a serious accident, blow out, spill or fire, immediately notify the Division of Minerals (see page one for contact information).
 17. Spills - Spills or accidental discharge of hydrocarbons in excess of 25 gallons must be reported to the Nevada Division of Environmental Protection at 1-888-331-6337.
 18. Plugging - NAC 534A.540 require all plugging and abandonment programs to be approved prior to commencing plugging and abandonment work. Verbal approval

may be given. Subsequent submission of forms is required with 30 days of completion of plugging operations.

19. UIC Requirements – Operators must refer to NDEP Underground Injection Control information publications which can be accessed at http://ndep.nv.gov/bwpc/renewable_uic07.htm These documents will provide you with guidance for collection of data during the drilling progress which will be required for submission with an application for an Underground Injection Permit.
20. Well head protection and cellar design – Cellar design must prohibit soil and water contact with casing and well head components, as well as prevention of standing water around same. If water chemistry indicates corrosion precautions and / or cathodic protection may be necessary. The operator must be prepared to document water chemistry and protective measures taken to permit injection into the well via a UIC permit. For further information contact NDEP Bureau of Water Pollution Control 775-687-9418 or visit the Bureau’s website ndep.nv.gov/water.
21. Injection Testing and Stimulation Programs – Programs must have prior approval from the Division. Completion Reports must be accompanied by the appropriate checklist of information regarding these programs.
22. **The enclosed Abandoned Mines brochure shall be posted at the well site alongside the Conditions of Approval and the Minimum Blowout Prevention Equipment Requirements and read by all company personnel associated with the subject well. The operator shall inform all drilling personnel and contractors associated with the drilling of the well of potential dangers, including bodily injury, associated with the exploration of abandoned mine workings, as well as the disturbance of possible bat habitats.**
23. The Operator shall ensure proper centering of the casing strings for new wells with downhole centralizers as well as centering the top of the casing with the drilling rig during and immediately after cement is put in place. The Operator must also ensure that the number and depths of casing centralizers are recorded in a contemporaneous log during the installation of the casing strings.

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SUNDRY NOTICES
OIL, GAS AND GEOTHERMAL

Verbal approval for the following work may be given by the Division:

1. Any emergency work necessary to prevent or control blow outs or other situations with significant potential to result in injury to the crew or damage to the environment or resource.
2. Any kick-offs necessary to by-pass bad hole or fish left in hole.
3. Changes in casing points due to bad hole.
4. Deepening, attempting to encounter resource.
5. Necessary well work to keep geothermal power plants operating.
6. Drilling equipment failure.
7. Squeeze or plug backs to prevent any injected geothermal or oil field waters from contaminating other water zones.

The operator is required to file a written sundry notice with the Division subsequent to verbal approval if the sundry notice has not already been filed. Verbal approvals will not be given for any work that can be planned in advance, such as acidizing, changes in casing points or completion, etc., reentry of a well, remedial work, production or injection testing.