

Permit Number: 1900B
Expiration Date: July 15, 2021

**GENERAL PERMIT
WATER POLLUTION CONTROL FACILITIES
CLASS V GEOTHERMAL FLUIDS INJECTION DURING GEOTHERMAL EXPLORATION**

Department of Environmental Quality
811 SW Sixth Avenue
Portland, OR 97204

Issued pursuant to ORS 468B.050

ISSUED TO: **GEN19** **/NWR**
File No.

SOURCES COVERED BY THIS PERMIT:

Geothermal exploration operations temporarily injecting or reinjecting geothermal fluids produced during short-term geothermal exploration well testing into the same or comparable geothermal reservoir.

SOURCES NOT COVERED BY THIS PERMIT:

Reinjection of geothermal fluids associated with long-term reservoir production is not covered under this permit.

Neil Mullane, Administrator
Water Quality Division

October 25, 2011
Effective Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, a permittee is authorized to temporarily inject or reinject geothermal fluids into the same geothermal reservoir it originated from provided the permittee conforms with the requirements, limitations, and conditions described in the following schedules:

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Unless specifically authorized by this permit, by another National Pollutant Discharge Elimination System (NPDES) or Water Pollution Control Facilities (WPCF) permit, or by Oregon Administrative Rule, any other direct or indirect discharge to waters of the state is prohibited, including discharges to infiltration basins.

DEFINITIONS

1. *Agent* means the Oregon Department of Geology and Mineral Industries (DOGAMI) or the Oregon Department of Water Resources (WRD).
2. *Comparable* means a geothermal reservoir with similar mineralization and water-quality characteristics as the source reservoir.
3. *DEQ* means the Oregon Department of Environmental Quality or its agent.
4. *Applicant* means the person or organization who is applying for or who has already received coverage under this permit.

HOW TO APPLY FOR COVERAGE UNDER THIS GENERAL PERMIT

1. **New Injection Activities.** If the applicant seeks coverage under this permit for the first time for an injection activity not previously covered by a permit, the applicant must:
 - a) Submit a completed application form with an Injection Plan to DEQ at least 30 days before applicant plan to inject unless DEQ approves otherwise; and
 - b) Submit all fees with the application.
2. **Permit Renewal for Previously Covered Injection Activity.**
 - a) If already operating under permit coverage, the applicant may temporarily inject or temporarily reinject uncontaminated geothermal fluids until the expiration date listed on the cover page, unless DEQ terminates the applicant's coverage or extend it as described below. If the applicant wants to renew coverage under this permit, the applicant must:
 - i) Submit a completed application form with an Injection Plan to DEQ at least 60 days prior to the expiration date of this permit listed on the cover page; and
 - ii) Submit all fees with the application.
 - b) If DEQ does not receive a renewal application and fees as described above, coverage under this permit is no longer valid and any injection must stop.
3. **Mechanical Integrity Tests.**
 - a) For each well older than five years that the applicant wants to use for injection, the applicant must:
 - i) Submit Mechanical Integrity Test results to DEQ for review along with the applicant's initial or renewal application; and
 - ii) Submit a fee for each Test the applicant wants DEQ to review.
 - b) If an injection well reaches an age greater than five years during the term of this permit, the applicant must:
 - i) Submit Mechanical Integrity Test results to DEQ along with a permit application and fees at least 30 days before the applicant plans to inject unless DEQ approves otherwise; and
 - ii) Submit a fee for each Test the applicant wants DEQ to review.
4. **Public Review Period.** DEQ will provide public notice of the proposed permit or permit renewal and a minimum of 30 days to submit written comments before DEQ approves or disapproves coverage under this permit. The public review period will begin after DEQ has determined that the application is complete, and DEQ will consider all public comments when formulating a final action on the permit.
5. **Approval.** The applicant may not begin any injection activities described in this permit until the applicant receives written confirmation from DEQ approving applicant application, Injection Plan, and Test results.

6. **Updating applicant Injection Plan.** After obtaining our approval, if the applicant needs to make changes to applicant injection activities, the applicant must update the applicant's Injection Plan:
 - a) For major changes to injection activities: provide DEQ with a new application and all fees and Test results, if applicable;
 - b) For minor changes to injection activities: provide DEQ with an updated Plan for our records;
 - c) The decision regarding what is a major or minor change to injection activities is based on our estimate of how long it will take DEQ to review the applicant's proposed changes and on the potential environmental effects of the change. For example, changes that expand the exploration area to include substantially different geology or hydrogeology will be considered a "major" change and will require additional DEQ review time.
7. **Administrative extension.** If DEQ fails to act on the applicant's renewal application by the permit expiration date, applicant coverage under this permit is administratively extended until DEQ is able to act on the renewal. During the administrative extension, the applicant must continue to comply with all conditions of this permit, including any new or revised Injection Plan that applicant submitted with the applicant's renewal application.
8. **Denial.** The applicant may either apply for an Individual Permit or authorization by rule as outlined in Oregon Administrative Rule (OAR) 340-044-0012 if:
 - a) DEQ denies the applicant's application;
 - b) The applicant's injection proposal cannot be covered under this permit; or
 - c) The applicant does not want to be covered under this permit.
9. **Fees.** Any person required to have coverage under a general permit must pay permit fees as required in OAR 340-045-0070 to 340-045-0075 to obtain and maintain coverage under the permit.

SCHEDULE A

Limitations and Controls on Injection Activities

Permittees covered under this permit must not:

1. Discharge fluids to surface waters.
2. Discharge fluids to water-bearing zones other than to the same or comparable geothermal reservoir, including discharge to shallow water-bearing zones via infiltration basins identified in the Plan.
3. Conduct any injection activity that allows the direct or indirect movement of fluids containing contaminants into groundwater if the presence of that contaminant may cause a violation of any primary drinking water regulation under the federal Safe Drinking Water Act (SDWA), or fails to comply with groundwater quality protection requirements specified in OAR 340-040. If such activity occurs, you must:
 - a) Immediately stop the activity, contain, and clean up the unauthorized discharges and correct the problem;
 - b) Within 24 hours after discovering that the prohibited activity, you must notify DEQ verbally, including notification by electronic mail, of the condition or activity that adversely or may adversely affect groundwater or surface water of the environment;
 - c) Within 5 business days after discovery of the violation, submit to DEQ a detailed written report describing the breakdown, the actual quantity and quality of waste discharged, corrective action taken, steps taken to prevent a recurrence, and any other pertinent information;
 - d) Submit an updated Injection Plan to DEQ reflecting the improvements in the applicant's operations;
 - e) If the water-quality impact is significant, develop and implement a Preliminary Assessment Plan in accordance with OAR 340-040-0030(5)(b), describing what the applicant will do to clean up the contaminated groundwater. The Preliminary Assessment Plan, once DEQ approves it, will become an enforceable addendum to the Injection Plan.

4. Inject petroleum-based products, coagulants, flocculants, solvents, acids, or other hazardous substances, except for fluids such as non-hazardous tracers and well testing materials listed in the approved Injection Plan.
5. Extract, convey, and inject in a manner that allows foreign substances or wastes not covered under this permit to be introduced to the applicant's injection fluid.
6. Cause objectionable odors when managing fluids at the site, including but not limited to hydrogen sulfide.
7. Inject above pressures measured at the depth of the highest non-perforated cemented casing that will:
 - a) Initiate new fractures or propagate existing fractures within the geothermal reservoir;
 - b) Fracture the confining formation between the zone for injection and underground sources of drinking water;
 - c) Exceed the pressure calculated by DEQ using the formula $P_m = (0.733 - 0.433 S_g) \times d$, where:
 - i) "P_m" means the pressure of injection at the wellhead in pounds per square inch;
 - ii) "S_g" means specific gravity of the injected fluid (unitless); and
 - iii) "d" means the depth of the injection, in feet, measured from the top of the interval for injection.

The applicant must:

8. Submit an Injection Plan that:
 - a) Describes the applicant's proposed injection activities, including how the applicant plans to manage drilling mud and produced fluids to prevent or mitigate any risk of environmental degradation, what pumps and other equipment applicant plans to use, and the methods for preventing excess injection pressures;
 - b) Describes how the applicant's waste management methods will protect groundwater or surface water quality and will prevent foreign substances from being introduced into the injection fluid;
 - c) Describes the geothermal reservoir the applicant plans to inject into, including lithologies, estimated permeabilities, and other geologic or estimated hydrologic parameters of the reservoir;
 - d) Describes the monitoring parameters and methods, in addition to those listed in Schedule B.1, that the applicant will use to demonstrate that injection activities will not degrade water quality, including how the applicant will determine the quality of the receiving geothermal reservoir;
 - e) Describes how the applicant will inform employees of the components and goals of the Injection Plan. The program must address unauthorized discharge prevention and best management practices. A schedule for employee education must be included in the Injection Plan. The education and training must occur within 5 days of an employee beginning work with injection fluids, equipment, or materials;
 - f) Identifies any fluid the applicant plans to inject into the geothermal reservoir, including tracers and non-hazardous well testing materials;
 - g) Describes injection test methods that the applicant plans to use on applicant wells;
 - h) Is prepared and stamped by an Oregon Registered Geologist, Oregon Certified Engineering Geologist, or Oregon Professional Engineer.
9. If applicant operations change after DEQ has approved the applicant for coverage under this permit, the applicant must submit revisions to the Plan to DEQ within 14 days. DEQ will need a new application from applicant if the applicant proposes major changes to the Plan.
10. The applicant must implement the Plan. Failure to implement any part of the Plan constitutes a permit violation.
11. Manage and dispose of all solid, toxic, or hazardous waste in accordance with State and Federal rules and regulations.
12. Report all spills and releases as required by OAR 340, Division 142.

**SCHEDULE B
Monitoring and Reporting Requirements**

1. The applicant must monitor the operation and efficiency of all fluid management and disposal facilities and injection activities. Facility monitoring must include the following items or parameters and be performed and reported at the frequencies listed in the table below:

Parameter	Frequency	Type
Location of well used to inject fluids as outlined in this table		Record; report quarterly
Formation shut-in pressure	After blowout prevention stack has been installed.	Record; report quarterly
Source of geothermal fluids and estimated volumes injected	Daily, when operating	Record; report quarterly
Source of non-geothermal fluids (e.g., tracers) and volumes injected	Daily, when used	Record; report quarterly
Formation closure pressure, fracture initiation pressure, or fracture propagation pressure	When calculated	Record; report quarterly
Injection well location	When injection is discontinued	Record; report quarterly

2. The applicant must retain monitoring records on-site and make them available to DEQ upon request.
3. The applicant must submit a quarterly report detailing the reporting parameters identified in Item 1 in this Schedule. The reports are due the 15th day of every 3rd month after DEQ has approved the applicant’s coverage under this permit.

**SCHEDULE D
Special Conditions**

1. DEQ may revoke this permit if:
 - a) The covered source or activity is a significant contributor of pollution or creates other environmental problems;
 - b) The applicant is not in compliance with the terms and conditions of this permit;
 - c) Conditions or standards have changed so that the source or activity no longer qualifies for this permit;
2. DEQ may authorize DOGAMI and/or WRD to act as its agent in implementing this permit. DEQ’s agent may be authorized to conduct the following activities, including but not limited to: application review and approval, inspections, and monitoring data review.

SCHEDULE F General Conditions

1. Standard Conditions

- a) **Duty to Comply with Permit.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Safe Drinking Water Act and Oregon Revised Statutes (ORS) 468B.025(2), and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.
- b) **Duty to reapply.** If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.
- c) **Duty to mitigate.** The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.
- d) **Duty to provide information.** The permittee shall furnish to DEQ, within a time specified, any information which DEQ may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to DEQ, upon request, copies of records required to be kept by this permit.
- e) **Inspection and entry.** The permittee shall allow DEQ, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
 - (1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
 - (2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 - (3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
 - (4) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the SDWA, any substances or parameters at any location.
- f) **Property Rights and Other Legal Requirements.** Issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, or authorize any injury to persons or property or invasion of any other rights, or any infringement of federal, tribal, state, or local laws or regulations.
- g) **Liability.** The DEQ or its officers, agents, or employees may not sustain any liability on account of the issuance of this permit or on account of the construction or maintenance of facilities or systems because of this permit.
- h) **Permit Actions.** After notice by DEQ, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including but not limited to the following:
 - i) Violation of any term or condition of this permit, any applicable rule or statute, or any order of the Environmental Quality Commission (EQC);
 - ii) Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts.
- i) **Transfer of Permit.** This permit may not be transferred to a third party without prior written approval from DEQ. DEQ may approve transfers where the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of this permit and the rules of the EQC. A transfer application and filing fee must be submitted to DEQ.
- j) **Permit Fees.** The applicant must pay the fees required by Oregon Administrative Rules 340-045-0070, and 340-045-0075.

2. Operation and Maintenance of Pollution Controls

- a) **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with permit conditions.
- b) **Standard Operation and Maintenance.** All geothermal fluids collection, control, treatment, and disposal facilities or systems must be operated in a manner consistent with the following:
 - i) At all times, all facilities or systems must be operated as efficiently as possible in a manner that will prevent discharges, health hazards, and nuisance conditions;
 - ii) All screenings, grit, sludge drilling mud, filter pack material, and other materials generated under this permit through well development, pump tests or other means must be disposed of in a manner approved by DEQ to prevent any pollutant from the materials from reaching waters of the state, creating a public health hazard, or causing a nuisance condition.
- c) **Noncompliance and Notification Procedures.** If applicant are unable to comply with any permit conditions because of a release of geothermal fluids; a breakdown of equipment, facilities or systems; an accident caused by human error or negligence; or any other cause such as an act of nature, the applicant must:
 - i) Immediately take action to stop, contain, and clean up the unauthorized discharges and correct the problem.
 - ii) Immediately notify our Underground Injection Control (UIC) staff so that an investigation can be made to evaluate the impact and the corrective actions taken, and to determine any additional action that must be taken.
 - iii) Within 5 days of the time applicant becomes aware of the circumstances, applicant must submit to DEQ a detailed written report describing the breakdown, the actual quantity and quality of waste discharged, corrective action taken, steps taken to prevent a recurrence, and any other pertinent information.

Compliance with these requirements does not relieve applicant from responsibility to maintain continuous compliance with the conditions of this permit or liability for failure to comply.
- d) **Qualified Operating Personnel.** The applicant must provide an adequate operating staff that is duly qualified to carry out the operation, maintenance, and monitoring requirements to assure continuous compliance with the conditions of this permit.

3. Monitoring and Records

- a) **Monitoring.** The permittee shall retain records of all monitoring information, including the following:
 - (i) Calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 10 years from the date of the sample, measurement, report, or application. This period may be extended by request of DEQ at any time; and
 - (ii) The nature and composition of all injected fluids until 10 years after the completion of any plugging and abandonment procedures specified under 40 CFR part 144.52(a)(6), or under Part 146 subpart G as appropriate. DEQ may require the owner or operator to deliver the records to DEQ at the conclusion of the retention period. For EPA administered programs, the owner or

operator shall continue to retain the records after three years unless the owner/operator delivers the records to the Regional Administrator or obtains written approval from the Regional Administrator to discard the records.

b) Monitoring Records

Additional monitoring records shall include the following:

- (i) The date, exact place, and time of sampling or measurements;
- (ii) The individual(s) who performed the sampling or measurements;
- (iii) The date(s) analyses were performed;
- (iv) The individual(s) who performed the analyses;
- (v) The analytical techniques or methods used; and
- (vi) The results of such analyses.
- (vii) Signatory requirement. All applications, reports, or information submitted to DEQ shall be signed and certified. (See 40 CFR Part 144.32.)
- (viii) Reporting requirements (1) Planned changes. The permittee shall give notice to DEQ as soon as possible of any planned physical alterations or additions to the permitted facility.

4. Reporting Requirements

- a) **Plan Submittal.** Pursuant to Oregon Revised Statute 468B.055, unless specifically exempted by rule, construction, installation, or modification of geothermal wells used for injection, treatment works, or waste storage or holding facilities may not commence until plans and specifications are submitted to and approved in writing by DEQ. All construction, installation, or modification shall be in strict conformance with DEQ's written approval of the plans.
- b) **Change in Discharge.** Whenever a facility expansion, production increase, or process modification is expected to result in a change in the character of pollutants to be discharged or in a new or increased discharge that will exceed the conditions of this permit, a new application must be submitted to DEQ together with the necessary reports, plans, and specifications for the proposed changes. A change may not be made until DEQ has approved the plans and a new permit or permit modification has been issued.