

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 99-029, REVISION NO. 1  
FOR  
GEYSERS POWER COMPANY, LLC  
CALISTOGA POWER PLANT AND GEOTHERMAL WELLS  
LAKE COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring injection fluids, the watershed, and spills. This MRP is issued pursuant to Water Code section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer.

**A. CONSTRUCTION AND SPILL REPORTING**

**1. Notification, Prior to Construction**

The Discharger shall submit a notice in writing to Board staff at least 14 days prior to any construction associated with well drilling or drilling site preparation, including road construction or construction/modification of a mud sump. The notice shall include:

- a. Proposed construction dates,
- b. Location of the facilities,
- c. Description of the facilities,
- d. Method(s) of construction, and
- e. Proposed location for final drilling mud disposal.

**2. Certification of Construction**

The Discharger shall submit a written certification to Board staff within 14 days of construction or reconstruction of a mud sump and prior to any discharge. The certification shall include the following information:

- a. The permeability of the mud sump lining, and
- b. The thickness of the mud sump lining.

**3. Progress Reports**

The Discharger shall notify Board staff, in writing, no later than five days after the following events:

- a. First waste discharge to a mud sump or tanks,
- b. Completion of the well or wells scheduled to be drilled adjacent to a mud sump and completion of all discharges to the waste sump or tanks, or
- c. Completion of the final sump closing activities and/or removal of cuttings from the site.

**4. Notification and Reporting of Circulation Losses**

The Discharger shall notify Board staff within 24 hours of any circulation loss during the construction of a well at depths less than 300 feet. Within seven days the Discharger shall provide a written report describing:

- a. The location of the well,
- b. The depth of the well,
- c. The estimated amount of drilling mud lost, and
- d. Corrective actions which were implemented.

**5. Spill Notification and Reporting**

The Discharger shall immediately notify the Regional Water Board at (916) 464-3291 of any leak or spill of wastes which is in violation of the WDRs. However, if the spill is less than 100 gallons and is to ground, then the Discharger is not obligated to immediately notify the Board and instead shall include a description of the spill in the monthly monitoring report. If the spill is greater than 100 gallons and/or is to surface waters, the Discharger shall submit a written report within 14 days of the spill. All spill reports, including those included in the monthly monitoring reports, shall contain the following information:

- a. The location of the spill or leak,
- b. The estimated volume of the spill or leak,
- c. Measures taken to cleanup the spill or leak,
- d. Corrective actions which were implemented, and
- e. Results of monitoring conducted in accordance with Section B.2 of this Monitoring and Reporting Program if the spill is to surface waters.

The Discharger shall also notify the California Emergency Management Agency (CALEMA) at (800) 852-7550, and Lake County Department of Environmental Health at (707) 262-2222, or if no answer, (707) 263-2331, as appropriate.

**B. MONITORING**

**1. Injection Fluid Monitoring**

The Discharger shall record the following:

<u>Item</u>	<u>Recording Frequency</u>	<u>Reporting Frequency</u>
Names of active injection wells	Monthly	Monthly
Volume discharged to each well (gallons)	Monthly	Monthly
Source(s) of water injected into each well	Monthly	Monthly

The Discharger shall collect and analyze samples of injection fluid (consisting of geothermal condensate and other wastewaters used in the injection system) on an annual basis between June and September of each year. Samples shall be collected from each injection well which is active on the date of sampling. Samples shall be collected just upstream of the flow control valve from a location in the piping with positive pressure. Samples shall be representative of field activities and injectate used at each active well. The samples shall be analyzed for the following constituents:

<u>Constituents/Parameter</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Electrical Conductivity	mmhos/cm	Grab	Annually	Annually
pH	pH Units	Grab	Annually	Annually
Total Coliform Organisms	MPN/100 mL	Grab	Annually	Annually
Total Dissolved Solids	mg/L	Grab	Annually	Annually
Ammonia	mg/L	Grab	Annually	Annually
Chloride	mg/L	Grab	Annually	Annually
Nitrate	mg/L	Grab	Annually	Annually
Nitrite	mg/L	Grab	Annually	Annually
Arsenic	mg/L	Grab	Annually	Annually
Boron	mg/L	Grab	Annually	Annually
Cadmium	mg/L	Grab	Annually	Annually
Chromium (Total)	mg/L	Grab	Annually	Annually
Mercury	mg/L	Grab	Annually	Annually
Iron	mg/L	Grab	Annually	Annually
Lead	mg/L	Grab	Annually	Annually
Sulfate	mg/L	Grab	Annually	Annually
Silver	mg/L	Grab	Annually	Annually
Thallium	mg/L	Grab	Annually	Annually
Vanadium	mg/L	Grab	Annually	Annually

**2. Spill or Leak Monitoring**

In the event of a spill or leak of wastes that enters surface waters, the Discharger shall immediately implement the following monitoring program:

<u>Constituents/Parameter</u>	<u>Sampling Location</u>	<u>Units</u>	<u>Type of Sample</u>
Electrical Conductivity	001, 002, 003	mmhos/cm	Grab
pH	001, 002, 003	pH Units	Grab
Total Dissolved Solids	001, 002, 003	mg/L	Grab
Ammonia	001, 002, 003	mg/L	Grab
Arsenic	001, 002, 003	mg/L	Grab
Boron	001, 002, 003	mg/L	Grab
Chromium (Total)	001, 002, 003	mg/L	Grab
Mercury	001, 002, 003	mg/L	Grab

<u>Constituents/Parameter</u>	<u>Sampling Location</u>	<u>Units</u>	<u>Type of Sample</u>
Chloride	001, 002, 003	mg/L	Grab
Nitrate	001, 002, 003	mg/L	Grab
Sulfate	001, 002, 003	mg/L	Grab
Oil and Grease <sup>1</sup>	001, 002, 003	mg/L	Grab
Turbidity	001, 002, 003	NTU	Grab
Total Coliform	001, 002, 003	MPN/100 mL	Grab
Flow of Receiving Water	002, 003	gal/min	Estimate
Spill Volume	001	gal	Estimate

<sup>1</sup> Petroleum Related Spills Only

**Sampling Location 001** shall be at the source of the spill and shall be representative of the material spilled. It shall be sampled as soon after the spill as possible.

**Sampling Location 002** shall be in the affected surface water stream at a point upstream from the area influenced by the spill and shall be sampled once as soon after the spill as possible.

**Sampling Location 003** shall be in the affected surface water stream within the zone influenced by the spill and shall be relocated as the influenced zone proceeds downstream. It shall be sampled as soon after the spill as possible. Additional sampling may be required by the Executive Officer.

### 3. Watershed Monitoring

The Discharger shall monitor surface waters up and downgradient of geothermal operations at sample locations SP1, SP2, and SP3, as shown on Attachment C of the WDRs. Samples shall be collected and analyzed for at least the following constituents:

<u>Constituents/Parameter</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Electrical Conductivity	mmhos/cm	Grab	Annually	Annually
pH	pH Units	Grab	Annually	Annually
Total Dissolved Solids	mg/L	Grab	Annually	Annually
Arsenic	mg/L	Grab	Annually	Annually
Barium	mg/L	Grab	Annually	Annually
Boron	mg/L	Grab	Annually	Annually
Chromium (Total)	mg/L	Grab	Annually	Annually
Mercury	mg/L	Grab	Annually	Annually
Chloride	mg/L	Grab	Annually	Annually
Sulfate	mg/L	Grab	Annually	Annually
Nitrate	mg/L	Grab	Annually	Annually

## C. REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type, condensate, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Regional Water Board in the next scheduled monitoring report.

### 1. Monthly Reporting

Monthly monitoring reports shall be submitted to the Regional Water Board by the **1<sup>st</sup> day of the second month** following collection of the samples/data. Monthly reports shall include the following:

- a. A record of all transfers of waste from any mud sump or cuttings from the drill pad. The record shall include the type and amount of waste removed and the location of the new disposal site.
- b. Types and volumes of water delivered to each injection well, including approximations of condensate and on-site domestic wastewater contributions.
- c. A discussion of any anomalous events or inspection discrepancies associated with the conveyance or injection systems.
- d. Summary of any unauthorized releases or spills, including spill reporting information for spills of less than 100 gallons to ground.
- e. The results of the spill monitoring when the spill is to surface water.
- f. Discussion of pertinent field activities and problems encountered.

### 2. Annual Reporting

The following monitoring results shall be submitted annually to the Regional Water Board by **1 February** of each year:

- a. Description and dates of significant well drilling, wellpad or sump refurbishment, road construction, sump construction or closure, spills and/or releases or other significant activities which occurred within the monitoring period.
- b. A discussion of compliance and the corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.
- c. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.

- d. Results of the annual injection fluid monitoring.
- e. Results of the watershed monitoring and analysis.
- f. Cumulative time series data presentations of the injectate and watershed monitoring results.
- g. Name (number), location (with map), and injectate volume of all injection wells utilized during the year for the area covered by this Order.

A letter transmitting the self-monitoring reports shall accompany each report. The letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3, which states:

*"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of the those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."*

The Discharger shall implement the above monitoring program as the date of signature.

Original signed by  
Ordered by: \_\_\_\_\_  
PAMELA C. CREEDON, Executive Officer

\_\_\_\_\_  
Date