

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

ORDER NO. 83-70

WASTE DISCHARGE REQUIREMENTS
FOR
CHEVRON GEOTHERMAL COMPANY OF CALIFORNIA
Heber Geothermal Project - Binary Power Plant
Production and Injection Wells
South of Heber - Imperial County

The California Regional Water Quality Control Board, Colorado River Basin Region, finds that:

1. Chevron Geothermal Company of California (hereinafter also referred to as the discharger), P. O. Box 7147, San Francisco, California 94120-7147, submitted a Report of Waste Discharge, dated September 30, 1983.
2. The discharger proposes to drill production and injection geothermal wells and construct and operate geothermal fluid transportation and treatment facilities, which would provide heat for a 65 MW electric power generating plant operated by San Diego Gas & Electric.
3. The discharger proposes to drill and operate up to 15 production wells which would be drilled on about 5 acres of land (production island) located in the NE $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$, Section 33, T16S, R14E, SBB&M.
4. The discharger proposes to drill and operate up to 15 injection wells which would be drilled on about 3.5 acres of land (injection island) located in the NE $\frac{1}{4}$, SE $\frac{1}{4}$, SE $\frac{1}{4}$, Section 30, T16S, R14E, SBB&M.
5. The following wastes would be produced during construction and operation of the production and injection wells.
 - a. Approximately 42,000 gallons of waste drilling mud and 81,000 gallons of drill cuttings from each production and each injection well, would be discharged to steel tanks or into a mud sump.
 - b. Well cleanout fluid, in the amount of approximately 42,000 gallons per well, would be discharged into a mud sump and/or steel tanks at each site.
 - c. Production fluids, during normal operations, would be transported directly to the power plant and then transported to the injection island for return to the reservoir.

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- d. During well start-up operations and during periods of testing, the production wells would be flowed to a start-up facility consisting of a separator stack, a rock muffler and a 84,000 gallon concrete lined sand pit. The fluid accumulated during these operations would then be pumped to the injection pipeline. Accumulations of sand and unreclaimable fluid in the sandpit would be periodically removed and discharged at a solid waste disposal site approved to receive these wastes.
- e. Wastes produced during reworking of wells would be discharged to either the start-up facility or portable tanks, with final disposal by injection and/or to a solid waste disposal site approved to receive these wastes.
- f. Scale and brine accumulated during pipeline and tank scraping operations would be injected subsurface and/or discharged to a solid waste disposal site approved to receive these wastes.
- g. Sand-fluid mixture removed from the geothermal fluid would be discharged to a concrete-lined sand pit located at the production island, with final disposal by injection and/or to a solid waste disposal site approved to receive these wastes.
- h. Production flow testing fluids would be reinjected into injection wells.

6. The drilling mud components which may be used are:

- | | |
|-----------------------------|-------------------------------------|
| Bentonite clay | Resin sulfonate |
| Sepiolite | Bicarbonate of soda |
| Neutralized Phenolics | Drilling detergent (diethenolamide) |
| Caustic (sodium hydroxide) | Cypan |
| Cypan (sodium polyacrylate) | Cotton seed hulls |
| Lignosulfonate | Wood Fiber |

- 7. Geothermal brines in portions of Imperial County are known to contain certain constituents which are classified as hazardous by the Department of Health Services, Hazardous Materials Management Section, in accordance with California Administrative Code, Title 22, Chapter 30, Article 9, Section 66680.
- 8. The Water Quality Control Plan for the West Colorado River Basin Region was adopted on April 10, 1975. The Basin Plan contains water quality objectives for Imperial Hydrologic Subunit.
- 9. Beneficial uses of water to be protected by this Order are as follows:
 - a. Groundwater

- 1. Shallow groundwaters in two known wells, located in the Heber area at a depth of 145 to 150 feet, have a total dissolved solids content of 9,410 mg/l and 5,410 mg/l, and are not beneficially used.

2. Agricultural subsurface drainage water, which enters tile drains and open drains in the Heber area, has a total dissolved solids content of from 2,400 mg/l to 12,200 mg/l, and eventually serves as a source of replenishment for Salton Sea.
3. Deep groundwaters have a total dissolved solids content of 12,000 to 20,000 mg/l and are being investigated for geothermal development.
10. Imperial County Planning Department adopted on December 12, 1979, Environmental Impact Report No. 213-79 for this project. This report indicates that this project would not have a significant effect on water quality.
11. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the proposed discharge.
12. The Board in a public meeting heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, Chevron Geothermal Company of California shall comply with the following:

A. Discharge Specifications

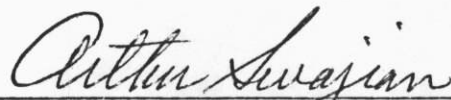
1. Neither the treatment nor the discharge of waste shall create a pollution or a nuisance as defined in Division 7 of the California Water Code.
2. Geothermal fluids and other wastes shall not enter any rivers, canals, drainage channels, or drains (including subsurface drainage systems), which could provide flow or seepage to Salton Sea.
3. Temporary discharge and/or storage of drilling mud, drill cuttings and cleanout fluid other than in mud sumps or other containers having a lining coefficient of permeability of 1×10^{-6} cm/sec., or less, is prohibited, and the fluids contained within shall not penetrate through the lining during the containment period.
4. Long term storage and/or discharge of geothermal wastes for longer than one year, other than in containers having a lining coefficient of permeability of 1×10^{-8} cm/sec., or less, is prohibited, and the fluids contained within shall not penetrate through the lining during the containment period.
5. Adequate protective works and maintenance shall be provided to assure that mud sumps will not become eroded or otherwise damaged during the project period, and/or until all well drilling and well cleanout materials are removed.
6. A minimum freeboard of at least two feet shall be maintained in mud sumps and other containment basins.
7. Permanent disposal of drilling muds or any wastes is prohibited at the well sites.

8. Fluids discharged by subsurface injection shall not be discharged into any subsurface zone which has a total dissolved solids concentration of less than 10,000 mg/l, unless the total dissolved solids concentration of the injection water is less than or equal to that of the receiving water.
9. Saline drilling muds, with extractable water containing a total dissolved solids concentration exceeding 6,000 mg/l, and brine and salt wastes, shall be discharged at a Class I or Class II-1 disposal site approved by the Regional Board to receive said waste.
10. Non-saline drilling muds, with extractable water containing a total dissolved solids concentration which is less than 6,000 mg/l, and not containing hazardous wastes¹ may be disposed at a Class II-2 disposal site approved by the Regional Board to receive said wastes.
11. Final disposal of residual wastes in accordance with Specifications No. 8, 9, and 10 above, and cleanup of all wastes shall be accomplished upon abandonment of operations. Lack of construction or operational activity on the site for a period of one year shall constitute abandonment for the purposes of this Order.
12. The total volume of fluids discharged into the sumps and other containers shall not exceed 42,000 gallons-per-day.

B. Provisions

1. The discharger shall comply with "Monitoring and Reporting Program No. 83-70", and future revisions thereto, as specified by the Executive Officer.
2. At least 5 days prior to the discharge of any materials into a mud sump, or other container, the discharger shall submit to the Regional Board a technical report showing the construction of each sump, or other container, and a certificate signed by a California Registered Civil Engineer stating that the sump, or other container, and attendant facilities are constructed to meet the requirements of this Order.

I, Arthur Swajian, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Colorado River Basin Region, on November 16, 1983.



Executive Officer

1. See Attachment A

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION**

**MONITORING AND REPORTING PROGRAM NO. 83-70
FOR
CHEVRON GEOTHERMAL COMPANY OF CALIFORNIA
Heber Geothermal Project - Binary Power Plant
Production and Injection Wells
South of Heber - Imperial County**

Location of Discharge: NE $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$ of Section 33, and NE $\frac{1}{4}$, SE $\frac{1}{4}$, SE $\frac{1}{4}$ of Section 30,
T16S, R14E, SBB&M

MONITORING

Chevron Geothermal Company of California shall report monitoring data to the Regional Board in accordance with the following schedule:

1. At least 5 days prior to the discharge of any drilling mud or geothermal materials into a mud sump or other container, the discharger shall submit to the Regional Board a technical report on the construction of said container, and a certificate signed by a California Registered Civil Engineer stating that the container and attendant facilities are constructed to meet the requirements contained in Board Order No. 83-70.
2. At least 10 days before the initial discharge of any geothermal fluids from each well, the discharger shall report said plan to discharge to the Board.

<u>Constituents</u>	<u>Units</u>	<u>Reporting Frequency</u>
3. Volume of geothermal wastes contained in each sump.	Gallons	Monthly
4. Volume of saline drilling mud and salt and brine waste hauled to a Class I or Class II-1 waste disposal site, and name of site.	Gallons	Monthly
5. Volume and total dissolved solids concentration of non-saline drilling mud hauled to a Class II-2 waste disposal site, and name of site.	Gallons and mg/l	Monthly
6. Total dissolved solids concentration of waste fluid injected into each injection well.	mg/l	Monthly

<u>Constituents</u>	<u>Units</u>	<u>Reporting Frequency</u>
7. Total dissolved solids concentration of ground-water contained in strata receiving waste fluid injection.	mg/l	At least 10 days prior to commencement of injection.
8. Representative samples of drilling mud, cuttings, and geothermal fluid to be discharged at a Class II-2 waste disposal site shall be analyzed for the following constituents (in accordance with Attachment A of Order No. 83-70), and shall be reported to the Regional Board five days prior to discharge:		

<u>Constituents</u>	<u>Unit</u>
Arsenic and compounds	mg As/kg wet sample weight
Barium (excluding barite) and compounds	mg Ba/kg wet sample weight
Lead compounds, inorganic	mg Pb/kg wet sample weight
Lead compounds, organic	mg Pb/kg wet sample weight
Zinc compounds	mg Zn/kg wet sample weight

9. Immediate reporting of any accidental spillage or release of waste material, and plan for immediate measures being taken to correct same and to limit detrimental effects.
10. Report of completion of removal of all geothermal waste from mud sumps - reported within one week following completion of work.
11. At least 10 days prior to destruction of each sump, the discharger shall request a Regional Board staff inspection and approval of the cleanup procedure.

REPORTING

The above monitoring program shall be implemented immediately upon commencement of discharge at each site.

Monthly reports shall be submitted to the Regional Board by the 15th day of the following month. Reports for Item 9 (above) shall be forwarded immediately and if at all possible shall be preceded by phone communication to the Regional Board's office. Phone No. (619) 346-7491. Copies of the reports submitted to the Board pursuant to this Monitoring and Reporting Program shall be maintained at the operations site, and shall also be made available to staff of the Regional Board upon request.

Mail reports to:

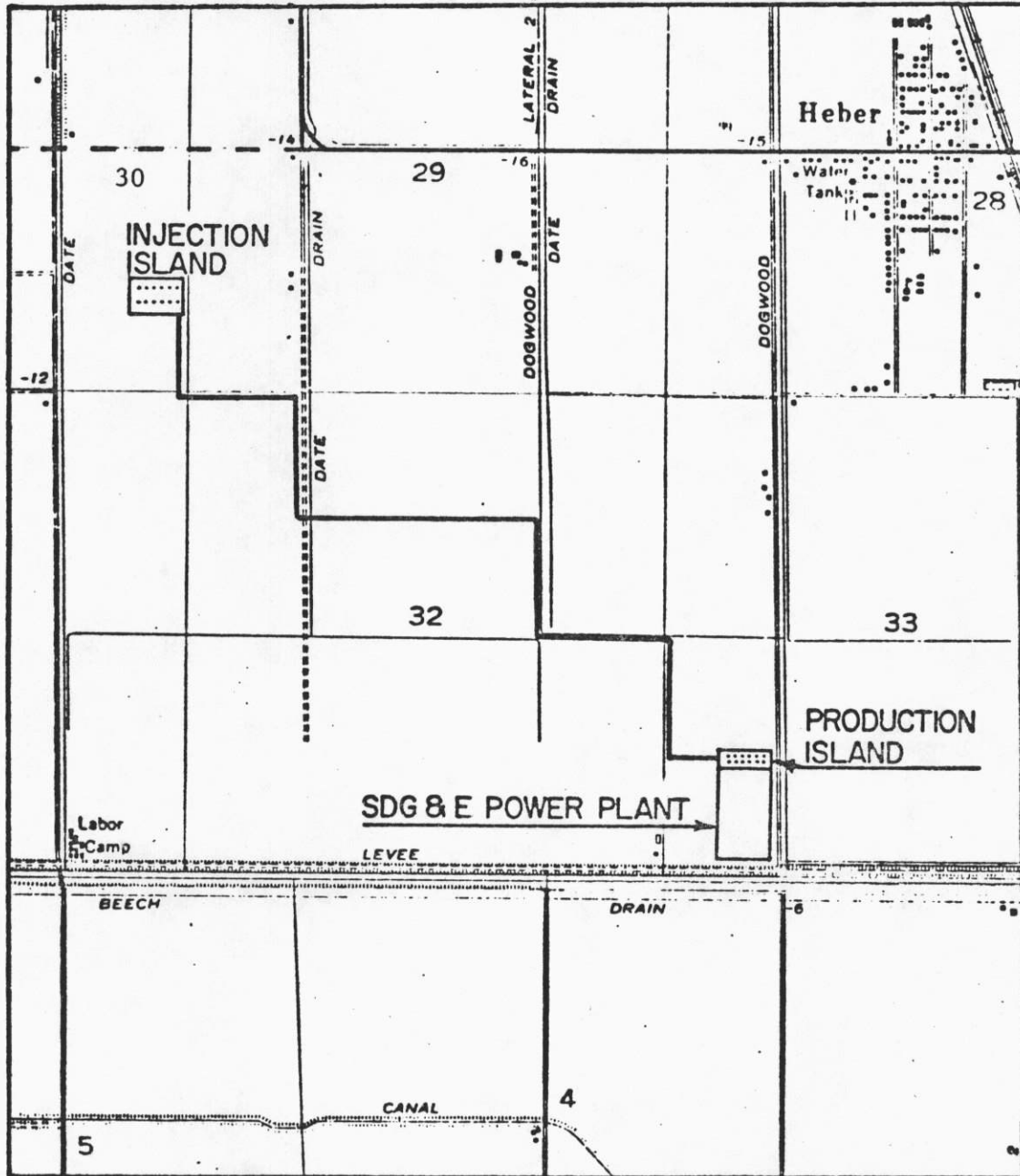
California Regional Water Quality Control Board
Colorado River Basin Region
73-271 Highway 111, Suite 21
Palm Desert, CA 92260

ORDERED BY:

Arthur Sevajian
Executive Officer

December 2, 1983
Date

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - 7



SITE MAP

CHEVRON GEOTHERMAL COMPANY OF CALIFORNIA

Heber Geothermal Project - Binary Power Plant

Production and Injection Wells

South of Heber - Imperial County

NE $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$ of Section 33, and NE $\frac{1}{4}$, SE $\frac{1}{4}$, SE $\frac{1}{4}$ of Section 30, T16S, R14E, SBB&M

USGS Heber 7.5 min. Topographic Map

Order No. 83-70

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION**

**ATTACHMENT A
to Board Order No. 83-70**

**Threshold Limit Concentrations
for
Bioaccumulative Toxic Substances**

A. Limitations

Drilling mud, cuttings, and other geothermal wastes containing the following substances having concentrations equal to or greater than those listed below are designated as hazardous by the State of California Department of Health Services.

	<u>Soluble Threshold Limit Wet weight mg/kg</u>	<u>Total Threshold Limit Wet weight mg/kg</u>
1. Arsenic and compounds	5	50
2. Barium (excluding barite) and compounds	100	1,000
3. Lead compounds, inorganic	5	50
4. Lead compounds, organic	—	13
5. Zinc compounds	20	200

B. Definitions of Limitations

1. The waste is designated hazardous if the wet weight analysis of any of the above constituents exceed the Total Threshold Limits as listed above. The waste would therefore not be acceptable for disposal in a Class II-2 waste disposal site. No further analyses are necessary.
2. The waste is considered to contain non-hazardous levels of the above substances if all of the weight analyses of the above constituents do not exceed the Soluble Threshold Limits as listed above. The waste would therefore be acceptable for disposal in a Class II-2 waste disposal site provided the waste also complies with the other Discharge Specifications and Provisions in this Order. No further analyses of the metal constituents are necessary.

3. If the analyses of the waste do not conform to the conditions described under Definitions 1 or 2, above, extractions of the soluble waste constituents must be made in accordance with a procedure approved by the Executive Officer and analyzed for those constituents in which the wet weight concentrations exceeded the Soluble Threshold Limits as listed above.

(a) If the wet weight analysis of any of the soluble constituents exceeds the Soluble Threshold Limits listed above, the waste is designated hazardous and is not acceptable for disposal in a Class II-2 waste disposal site.

(b) If the wet weight analyses of all of the soluble constituents do not exceed the Soluble Threshold Limits as listed above, the waste is considered to contain non-hazardous concentrations of these constituents. The waste would therefore be acceptable for disposal in a Class II-2 waste disposal site provided the waste also complies with the other Discharge Specifications and Provisions in this Order.