

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

ORDER NO. 86-83

**WASTE DISCHARGE REQUIREMENTS
FOR
CHEVRON GEOTHERMAL COMPANY OF CALIFORNIA
PRODUCTION AND INJECTION WELLS
HEBER KNOWN GEOTHERMAL RESOURCE AREA (KGRA)
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 an updated Report of Waste Discharge dated September 29, 1986.
2. The discharger has presently drilled nine (9) geothermal production wells on a 5-acre production island located in the SW $\frac{1}{4}$, Section 34, T16S, R14E, SBB&M. These wells supply geothermal fluid to the 52 megawatt (gross) electric power generating plant operated by the Heber Geothermal Company. All wells have been directionally drilled from a production island immediately adjacent to the power plant, and include the following:

Well	Completion Date	Total Depth (TVD)	Exposed Internal (Fact)
HGU-5	08/11/84	6100 ft	4294-6829 ft
HGU-7	06/13/84	5606 ft	4410-5444 ft
HGU-8	07/01/84	4502 ft	2623-5013 ft
HGU-9	12/19/83	6299 ft	4475-7259ft
HGU-10	02/02/84	4503 ft	2902-4900 ft
HGU-11	03/12/84	6500 ft	4559-7482 ft
HGU-12	09/20/82	4365 ft	2575-4378 ft
HGU-13	11/09/82	10,498 ft	8006-10536 ft
HGU-14	09/03/82	6482 ft	4206-6203 ft
HGU-16 to be drilled in 1986		8200 ft	NA

3. The discharger proposes to drill and operate up to 15 production wells (including those wells listed above) on the production island.
4. The discharger has presently drilled seven (7) injection wells from a 3.5-acre injection island located in the NE $\frac{1}{4}$, Section 34, T16S, R14E, SBB&M. All wells have been directionally drilled from the injection island and include the following:

Changed of name & ownership by Bd. Ord. # 92-015 Jan. 22/92

Superseded by Bd. Ord. # 92-029 5/13/92

Well	Completion Date	Total Depth (TVD)	Exposed Internal (Fact)
HGU-51	11/25/84	6503 ft	4124-6596 ft
HGU-52	01/04/85	4474 ft	2083-4286 ft
HGU-53	10/04/84	4413 ft	2041-4424 ft
HGU-54	01/25/85	6334 ft	4124-6216 ft
HGU-55	10/21/84	6422 ft	4054-6396 ft
HGU-56	12/09/84	4506 ft	2105-4560 ft
HGU-57	10/02/84	9936 ft	7999-10,000 ft
HGU-58 to be drilled in 1986		5300 ft	NA
Saikhon No. 1	12/09/76(Union Oil Co.)	4515 ft	2100-3900 ft

5. The discharger will drill up to three (3) injection wells from a 1.0-acre injection island located in the NW $\frac{1}{4}$, SE $\frac{1}{4}$, Section 27, T16S, R14E, SBB&M. All wells will be directionally drilled from the injection island.
6. The discharger proposes to drill and operate up to a total of 12 injection wells (including those wells listed above) on the two (2) injection islands.
7. The following wastes would be produced during construction and operation of the production and injection wells.
 - a) All existing wells were drilled using a self-contained mud system. This system recirculates drilling mud and retains cuttings produced during drilling operations and no on-site sump is required or necessary for mud and/or cuttings disposal.
 - b) Well cleanout fluid, in the amount of approximately 500 barrels per well, would flow to portable metal tanks and either injected back into the reservoir or transported to a waste management facility.
 - c) During well start-up operations and during periods of testing, the production wells would flow to a well start-up and testing facility which includes a separator stack and a 1500-barrel cement-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 sand pit would be periodically removed and discharged at a waste management facility.
 - d) Production fluids, during normal operations, would flow directly to the power plant and then flow to the injection island for return to the reservoir.
 - e) Any sand-fluid mixture would be removed from the geothermal fluid and discharged to the production island sandpit, with final disposal by injection and/or to a waste management facility.

- f) Wastes produced during reworking of wells would be discharged to either the start-up and testing facility or portable tanks, with final disposal by injection and/or to a waste management facility.
- g) The 3.5-acre injection island has a well backflow facility which includes a series of metal tanks with a combined capacity of 2,000 barrels and a separator stack. These will be used to receive geothermal fluid during maintenance of the injection pumps. A proposed sand pit could be constructed in the future to receive from 60,000 to 120,000 gallons of fluid and scale per year resulting from interior pipeline cleaning. The operation presently does not warrant the construction of the proposed sand pit. Final disposal of wastes would be by injection and/or to a waste management facility.

The northerly 1.0-acre injection island will not have a backflow facility installed. However, if a backflow system becomes necessary, a temporary facility similar to the one described above would be constructed.

- 8. The facility has been subject to waste discharge requirements adopted in Board Order No. 86-57.
- 9. The Water Quality Control Plan for the Colorado River Basin Region of California was adopted by the Regional Board on November 14, 1984.
- 10. The beneficial uses of the ground water of the Imperial Hydrologic Subunit, as set forth in the above Plan, are for municipal and industrial purposes in some areas. Shallow ground water in two wells in the Heber area at a depth of 145 to 150 feet, have a total dissolved solids concentration of 9,410 mg/l and 5,410 mg/l, and are not beneficially used.
- 11. The Imperial County Planning Department adopted on December 12, 1979, Master Environmental Impact Report No. 213-79 for a 500 megawatt Geothermal Development at Heber. This report indicates that this project would not have a significant effect on water quality.
- 12. The Board has notified the discharger and interested agencies and persons of its intent to revise waste discharge requirements for this facility.
- 13. The Board in a public meeting heard and considered all comments pertaining to this proposed revision.

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 wastes shall create a pollution or a nuisance as defined in Division 7 of the California Water Code.

2. Geothermal cleanout fluid and test fluid shall be discharged for temporary storage into either:

- a) The well start-up and testing facility as described in Finding No. 7c; or
- b) Portable metal or other above ground containers as approved by the Executive Officer.

The well start-up and testing facility and metal containers shall be protected and maintained to ensure their effectiveness.

- 3. Final disposal of reclaimable fluid shall be by subsurface injection via the injection well island and/or to a waste management facility approved by the Regional Board to receive such waste.
- 4. Accumulations of sand and unreclaimable fluid shall be periodically removed and discharged at a waste management facility approved by the Regional Board to receive such waste.
- 5. Fluids discharged by subsurface injection shall be injected below the fracture pressure of the receiving aquifer or of the confining layer immediately above the receiving aquifer.
- 6. Fluids discharged by subsurface injection shall not be injected into any aquifer which has a total dissolved solids (TDS) concentration of less than 10,000 mg/l, unless the TDS concentration of the injection water is less than or equal to that of the receiving water or the discharger can demonstrate to the satisfaction of the Executive Officer that injection into said zone will not pose a threat to water quality.
- 7. Geothermal waste with extractable water containing a TDS concentration exceeding 6,000 mg/l shall be discharged at a Class I or Class II waste management facility approved by the Regional Board to receive such waste.
- 8. Geothermal waste with extractable water containing a TDS concentration less than 6,000 mg/l, and not containing hazardous constituents as defined in Article 11, Title 22 of the California Administrative Code, and future editions, shall be discharged at a waste management facility approved by the Regional Board to receive such waste.
- 9. Final disposal of residual wastes and cleanup of containment facilities shall be accomplished upon abandonment or closure of operations to the satisfaction of the Executive Officer. Lack of construction or operational activity on-site for a period of one year shall constitute abandonment for the purposes of this Order.

B. Provisions

- 1. The discharger shall comply with "Monitoring and Reporting Program No. 86-83", and future revisions thereto, as specified by the Executive Officer.

2. Permanent (longer than one (1) year) on-site storage of geothermal fluid, cleanout fluid, and sand-fluid mixtures is prohibited.
3. The discharger shall submit to the Board, at least 30 days prior to commencement of operation at each well, a written report on the proposed method and estimated costs of cleanup and closure of each well site in accordance with the requirements of this Order.
4. Prior to any change of ownership of these operations, the discharger shall transmit a copy of this Order to the succeeding owner/operator, and forward a copy of the transmittal letter to this Board.
5. This Order does not authorize violation of any federal, state, or local laws or regulations.
6. This Order supersedes Board Order No. 86-57.

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 19, 1986.



Executive Officer

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

MONITORING AND REPORTING PROGRAM NO. 86-83
FOR
CHEVRON GEOTHERMAL COMPANY OF CALIFORNIA
PRODUCTION AND INJECTION WELLS
HEBER KNOWN GEOTHERMAL RESOURCE AREA (KGRA)
Imperial County

Location of Discharge: SW $\frac{1}{4}$, Section 34, T16S, R14E, SBB&M
NE $\frac{1}{4}$, Section 34, T16S, R14E, SBB&M
NW $\frac{1}{4}$, SE $\frac{1}{4}$, Section 27, 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. The discharger shall submit to the Board, at least 30 days prior to the commencement of operation at each well, a written report on the proposed method and estimated costs of cleanup and closure of each well site in accordance with requirements of Order No. 86-83.
2. The discharger shall submit a monthly report containing the following information:

<u>Parameter</u>	<u>Units</u>	<u>Reporting Frequency</u>
a) Volume and type of geothermal waste contained in each container.	Gallons	Monthly
b) Volume of drilling muds containing greater than 6,000 mg/l TDS concentration discharged at a Class I or Class II waste management facility, and name of facility.	Gallons	Monthly
c) Volume and TDS concentration of drilling mud containing less than 6,000 mg/l TDS discharged at a Class II or Class III waste management facility, and name of facility.	Gallons and mg/l	Monthly
d) Volume and total dissolved solids (TDS) concentration of waste fluid injected into each injection well.	Gallons and mg/l	Monthly

Parameter	Units	Reporting Frequency
e) Total dissolved solids concentration of ground water contained in strata proposed to receive waste fluid injection.	mg/l	At least 10 days prior to commencement of injection
f) A grab sample of the water contained in Strout Drain shall be obtained at the Highway 86 crossing and analyzed for the following constituents and the results reported to the Regional Board:*		Semi-Annually January and July of each year

Constituent	Units
Silica (SiO ₂)	mg/l
Total Dissolved Solids (TDS)	mg/l
Specific Conductance	micromhos/cm
pH	pH units
Temperature (at site)	degrees C
Calcium (Ca)	mg/l
Magnesium (Mg)	mg/l
Manganese (Mn)	mg/l
Sodium (Na)	mg/l
Potassium (K)	mg/l
Iron (Fe)	mg/l
Zinc (Zn)	mg/l
Lead (Pb)	mg/l
Lithium (Li)	mg/l
Strontium (Sr)	mg/l
Ammonia (NH ₃ -N)	mg/l

3. Immediate reporting of any accidental spillage or release of waste material, and immediate measures taken to correct same and to limit detrimental effects.

REPORTING

Except for Item 1, 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. Written reports for Item 3, shall be forwarded immediately and shall be preceded by phone communication to the

*Presently, Heber Geothermal Company, under waste discharge requirements Order No. 84-7, monitors the Strout Drain for constituents prescribed in Effluent Monitoring, Monitoring and Reporting Program No. 84-7. In the event that Heber Geothermal Company discontinues sampling of the Strout Drain, the Regional Board staff shall notify Chevron Geothermal Company of California. Chevron Geothermal Company of California shall then implement sampling of Strout Drain in accordance with this Monitoring and Reporting Program No. 86-83.

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:

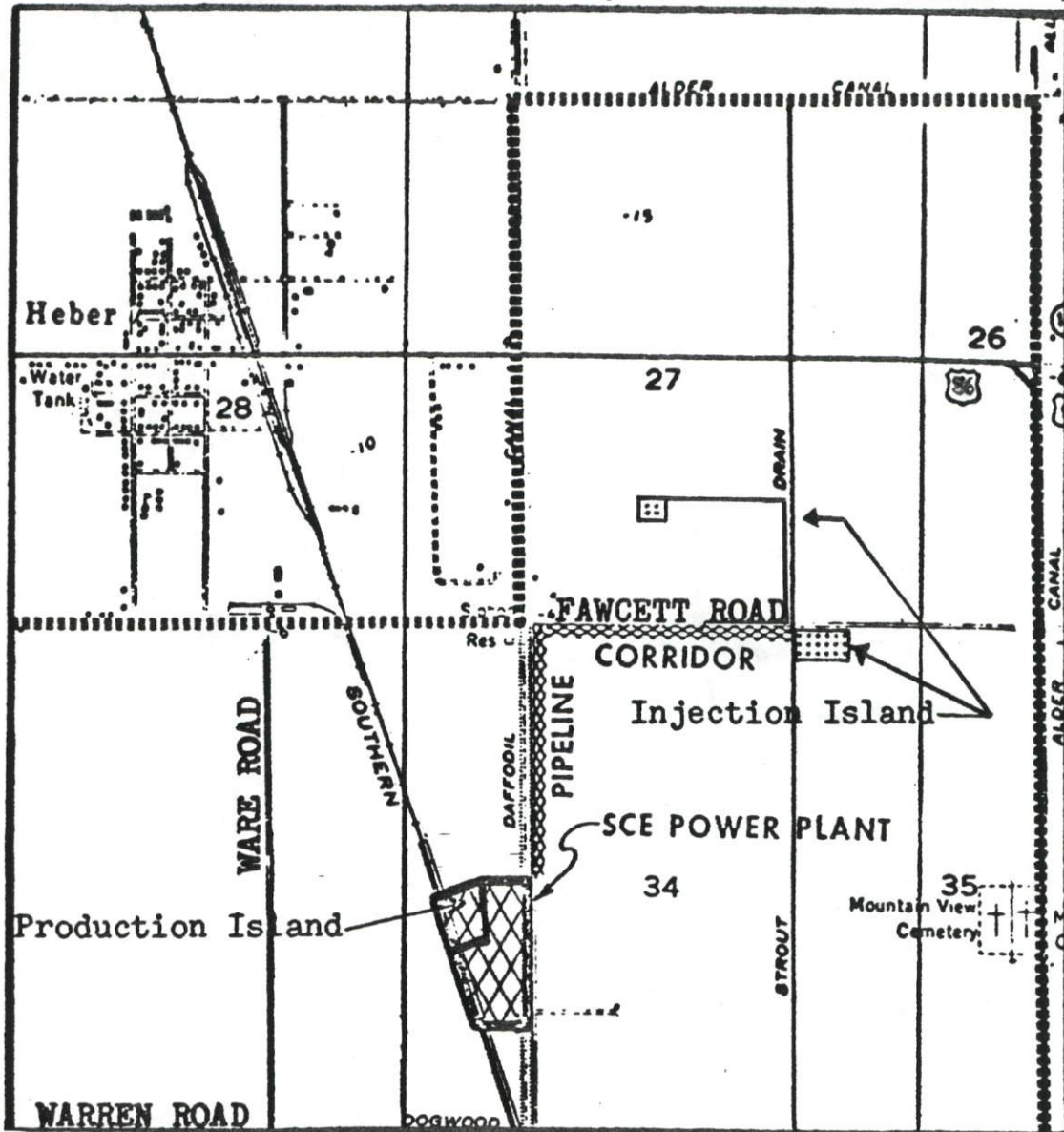
California Regional Water Quality Control Board
Colorado River Basin Region
73-271 Highway 111, Suite 21
Palm Desert, CA 92260

ORDERED BY:

Arthur Swajian
Executive Officer

November 19, 1986

Date



SITE MAP

CHEVRON GEOTHERMAL COMPANY OF CALIFORNIA
 Heber Geothermal Project - Power Plant No. 1
 Production and Injection Wells
 Heber KGRA - Imperial County

Production Wells: SW 1/4, Section 34, T16S, R14E, SBB&M
 Injection Wells: NE 1/4, Section 34, T16S, R14E, SBB&M
 S 1/2, Section 27, T16S, R14E, SBB&M

Order No. 86-83.