

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LAHONTAN REGION**

**BOARD ORDER NO. R6V-2006-0023  
WDID NO. 6B369107001**

**NEW WASTE DISCHARGE REQUIREMENTS**

**FOR**

**PACIFIC GAS AND ELECTRIC COMPANY  
CENTRAL AREA IN-SITU REMEDIATION PILOT STUDY PROJECT**

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region (Lahontan Water Board), finds:

1. Discharger

Pacific Gas and Electric Company (PG&E) submitted a Report of Waste Discharge (RWD) to conduct a Central Area In-situ Remediation Pilot Study Project (Project) at the PG&E Compressor Station, located east of the community of Hinkley in San Bernardino County. The RWD consists of transmittals dated January 6, 2006 and March 1, 2006. The RWD was deemed complete on March 24, 2006. PG&E proposes to conduct a pilot study lasting up to five years that injects food-grade, biological reagents to groundwater. The project is intended to evaluate the effectiveness of in-situ (beneath ground surface) remediation under site-specific conditions for reducing hexavalent chromium [Cr(VI)] pollution in the groundwater. For the purposes of this Order, PG&E is referred to as the "Discharger."

2. Facility

PG&E has proposed to construct and operate an in-situ remediation pilot study in the central area of the chromium plume in groundwater. The pilot study area is approximately 1000 feet long and 1800 feet wide and is located near the intersection of Frontier and Fairview Roads. The compressor station is located at 35863 Fairview Road (APN 0488-112-52) in Hinkley. PG&E owns the land on which the compressor station and pilot study are located. The compressor station began operating in 1952 and discharged untreated cooling tower water containing hexavalent chromium to unlined ponds until 1964. The ponds were taken out of service and replaced with lined ponds. For the purposes of this Order, the pilot study in the central plume area is referred to as the "Facility."

3. Facility Location

The Facility is located southeast of the community of Hinkley in San Bernardino County in the Harper Valley Subarea of the Mojave Hydrologic Unit on County Assessor Parcel Numbers 0494-251-15 and 0494-251-03, as shown on Attachment "A," which is made a part of this Order.

4. Permit History

These are new Waste Discharge Requirements (WDRs) for a prior facility. PG&E had operated a groundwater remediation system at the East Land Treatment Unit (LTU) from 1991 to 2001 under the WDRs set forth in Board Order No. 6-91-917 and revised in Board Order No. 6-97-81. In addition, the Ranch LTU operated from 1997 to 2001 under WDRs set forth in Board Order No. 6-97-81. Also, since August 2004, PG&E has operated a groundwater remediation system at the Desert View Dairy under the WDRs set forth in Board Order No. R6V-2004-034.

5. Enforcement History

On December 29, 1987, the Executive Officer issued Cleanup and Abatement Order (CAO) No. 6-87-160 to the Discharger, ordering the investigation, cleanup and abatement of the effects of chromium in the soil and groundwater, that were discharged at the PG&E Compressor Station. The selected remediation system consisted of extracting groundwater for irrigation of pasture crops on the East and Ranch LTUs. Natural soil properties promoted the reduction of hexavalent chromium in extracted groundwater to trivalent chromium [Cr(III)] that adhered to soil.

In June 2001, the Executive Officer issued CAO 6-01-50 ordering PG&E to eliminate the threatened nuisance condition created at the East and Ranch LTUs due to the spray irrigation of chromium-polluted groundwater to crops. In response to this order, PG&E shut down the groundwater remediation system.

6. Reason for Action

Following termination of the prior remediation method at the East and Ranch LTUs, PG&E proposed a two-fold approach for groundwater remediation. The first part included a temporary measure to limit further movement of the groundwater plume. In July 2004, the Regional Board issued WDRs for a new LTU located at the Desert View Dairy (DVD). The DVD LTU receives the discharge of extracted groundwater associated with a groundwater containment and remediation system designed to protect the beneficial uses of downgradient groundwater. The second part proposed to conduct pilot studies (bench-scale and field-scale) for evaluating the effectiveness of in-situ remediation of chromium in groundwater.

Bench-scale pilot testing was completed in March 2004 and documented in the April 2004 report, *Final Report, In-situ Remediation Bench-scale Testing*. The bench-scale pilot test results were used to propose field-scale pilot testing using food-grade, biological reagents, lactate and emulsified vegetable oil (EVO).

The field-scale pilot test was implemented in two small-scale areas for six-months starting in December 2004, under the WDRs set forth in Board Order No. R6V-2004-041. The results are documented in the July 2005 Final In-situ Remediation Pilot Study Report and the October 17, 2005 Addendum. The pilot test demonstrated that biological reduction of Cr(VI) to Cr(III) occurred under anaerobic conditions created from the injection of carbon substrates, lactate and emulsified vegetable oil, to groundwater.

The Discharger has proposed expanding the pilot study to a larger area of the plume to evaluate a biological treatment zone or "biobarrier" to be implemented cross-gradient to groundwater flow. These WDRs allow the large, field-scale pilot study to proceed in a manner that does not adversely impact water quality.

7. Site Geology

The soils underlying the Facility are comprised of interbedded sands, gravels, silts, and clays. The depth to bedrock is about 700 feet below the Facility. The nearest active fault is the northwest-southeast trending Lenwood fault located about 0.4 mile from the Facility.

8. Site Hydrogeology and Hydrology

The hydrogeology in the vicinity of the Facility consists of an upper unconfined aquifer and a lower confined aquifer separated by up to 25 feet of lacustrine clay that forms a regional aquitard. The upper aquifer is approximately 80 feet thick and extends from 80 feet to 160 feet below ground surface (bgs). The unconsolidated, upper aquifer is comprised of interbedded gravels, silts, and clay and is divided into two major production zones, the "A" zone, and the "B" zone. Groundwater flow in the upper aquifer is primarily to the north with an average gradient of 0.002 feet per foot.

The lower aquifer, or "C" zone, consists of semi-consolidated calcareous sediments, layers of silty sand, and minor amounts of clay. The lower aquifer extends from approximately 180 feet to 230 bgs and is bounded at its base by competent crystalline rock. The closest surface water body is the Mojave River, which is located approximately 1.2 miles southeast of the Facility.

9. Climate

The precipitation in the area of the Facility is less than five inches annually. The evaporation rate is approximately 74 inches annually. The area has hot summers and mild winters.

10. Groundwater Quality

The groundwater below the Facility contains constituents from past agricultural activities in the vicinity, chromium from the PG&E compressor station plume, and naturally occurring constituents. The most significant constituent is chromium. At the Facility, groundwater quality, based on data from monitoring wells, has total chromium [Cr(T)] concentration ranging from 65.8 to 135 micrograms per liter ( $\mu\text{g/L}$ ) and hexavalent chromium concentration ranging from 64.9 to 126  $\mu\text{g/L}$ .

The maximum contaminant level (MCL) for a municipal water source for these constituents is 50  $\mu\text{g/L}$  for Cr(T). Therefore, groundwater at the Facility does not presently support the beneficial use of a municipal and domestic supply. There is no standard for hexavalent chromium.

11. Project Description

The purpose of this project is to evaluate the effectiveness of large-scale in-situ remediation under site-specific conditions for reducing hexavalent chromium in groundwater to trivalent chromium. The results of the proposed project should provide parameters to design a full-scale remediation system for achieving water quality standards. Testing will take place in the groundwaters of the Middle Mojave River Valley Ground Water Basin for an approximate duration of five years.

The project includes two major elements: 1) injection of food-grade, biological reagents to ground water and 2) extraction of ground water to spread the reagents cross-gradient of the injection point. Three reagents, lactate, whey, and EVO, were selected for the pilot study following small-scale pilot testing that concluded in 2005. Large-scale testing will also include a tracer test using potassium bromide (a salt) and distilled water to monitor groundwater flow rates before and possibly during the pilot study.

12. Waste Classification

The chromium-contaminated groundwater is classified as a liquid designated waste under section 20210 of title 27, California Code of Regulations, (CCR).

13. Waste Management Unit Classification

The aquifer soils beneath the test cells are classified as a Class II LTU in accordance with section 20614 of title 27, CCR.

14. Authorized Disposal Sites

The pilot study in the central plume area, shown on Attachment "B", is the only authorized disposal sites (via injection wells).

15. Water Quality Protection Standard

A Water Quality Protection Standard (WQPS) is established in the Order for the Facility, and consists of constituents of concern (including monitoring parameters), concentration limits, monitoring points, and the point of compliance. The WQPS applies over the active life of the Facility, post-closure monitoring period, and the compliance period.

16. Land Uses

The land uses at, and surrounding, the Facility consist of residential, commercial, agricultural, and open desert land. The nearest residence is located 2,000 feet west of the western boundary of the Facility.

17. Receiving Waters

The receiving waters are the groundwaters of the Harper Valley Hydrologic Area of the Mojave Hydrologic Unit. The Department of Water Resources (DWR) designation for the Harper Valley Hydrologic Area is 628.42.

18. Lahontan Basin Plan

The Regional Board adopted a Water Quality Control Plan for the Lahontan Basin (Basin Plan), which became effective on March 31, 1995. This Order implements the Basin Plan.

19. Beneficial Groundwater Uses

The beneficial uses of the groundwater of the Middle Mojave River Valley Groundwater Basin as set forth in the Basin Plan are:

- a. MUN - municipal and domestic supply;
- b. AGR - agricultural supply;
- c. IND - industrial supply;
- d. FRSH - freshwater replenishment; and
- e. AQUA - aquaculture.

## 20. Non-Degradation

In accordance with State Water Resources Control Board (State Water Resources Control Board) Resolution No. 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*) and the Water Quality Control Plan for the Lahontan Region (Basin Plan), water degradation may be allowed if the following conditions are met: 1) any change in water quality must be consistent with maximum benefit to the people of the State; 2) will not unreasonably affect present and anticipated beneficial uses; and 3) will not result in water quality less than that prescribed in the Basin Plan; and 4) discharges must use the best practicable treatment or control to avoid pollution or nuisance and maintain the highest water quality consistent with maximum benefit to the people of the State.

The injection of potassium bromide at 500 mg/L will become diluted in the aquifer during groundwater recirculation. If bromide migrates beyond the treatment zone, it is expected to reduce in concentration with distance due to dispersion. By the time bromide travels 400 feet to the second sentry monitoring well, the bromide concentration is expected to be less than the only published action level of 2.3 mg/L (Federal Suggested No-Adverse-Response Level (SNARL)). Thus, there will be no adverse impacts to beneficial uses following the tracer test.

The injections of lactate, whey, and EVO will temporarily cause some organic carbon and oily degradation to water quality in the area between the injection and extraction wells. During bioremediation, the reagents will be consumed by naturally occurring microbes, and the concentrations will become diluted in the aquifer during groundwater recirculation. The capture zone of cross-gradient extraction wells will spread the reagents across the treatment zone. The pilot study will evaluate anaerobic reducing conditions used to convert Cr(VI) to Cr(III) to concentrations below the MCL. Any potential by-products of the reaction, such as mobilized metals, will also attenuate with distance following contact with aerobic aquifer conditions in the downgradient portion of the pilot study area. Therefore, any degradation to water quality will be temporary, should improve over time, and will be localized to the pilot study area.

The recirculation process is designed to be the equivalent of the Best Practicable Technology, as required by the State Water Board's Resolution No. 68-16. In addition, reagent injection has been calculated to be the lowest dosage possible for creating anaerobic reducing conditions and should minimize the likelihood of creating conditions that could produce potential by-products. The long-term benefit of the project will result in removal of chromium from groundwater. Therefore, the resulting water quality from this project will be consistent with the State Water Board's Resolution No. 68-16.

21. Constituents of Concern

The Constituents of Concern (COCs) consist of total chromium Cr(T), hexavalent chromium Cr(VI), and Total Organic Carbon (TOC). Potential constituents of concern include bromide from the tracer test, reagents to be analyzed as volatile fatty acids (lactic acid, acetate, pyruvate, propionate, and butyrate), and naturally-occurring reducible metals, such as arsenic, manganese, and iron.

22. Water Quality Data Evaluation

Since the project involves the injection of unregulated, food-grade reagents to groundwater to stimulate bioremediation, a statistical method of monitoring data for detection of a release of waste from the Facility is superfluous. Therefore, a method for statistical analysis is not necessary for this project.

23. Detection Monitoring

For the same reason listed above in Finding No. 22, a detection monitoring program for determining whether there has been a release to groundwater is inapplicable. Therefore, a detection monitoring program is not necessary for this project.

24. Corrective Action

A Corrective Action Program (CAP) to remediate released wastes from the Facility may be required pursuant to sections 20385 and 20430, title 27, CCR, if results of an Evaluation Monitoring Program (EMP) warrant a CAP.

25. California Environmental Quality Act

The Project is a new project under CEQA and is subject to the provisions of the CEQA (Public Resources Code, Section 21000 et seq.) in accordance with title 14, section 15301, CCR. The Lahontan Water Board is the lead agency for this project under the California Environmental Quality Act (Public Resources Code section 21000 et seq.).

An Initial Study describing the project was prepared by CH2M Hill on behalf of the Lahontan Water Board and PG&E. It was circulated under State Clearinghouse No. 2006041005 to satisfy CEQA with the Water Board as Lead Agency. The Initial Study indicates the intent of the Lahontan Board to consider a Mitigated Negative Declaration.

In a public meeting on June 14, 2006, the Lahontan Water Board adopted a resolution certifying the environmental document that states the effects on the environment from the Project are not significant as mitigated, adopting a

Mitigated Negative Declaration and a Mitigation Monitoring and Reporting Plan to satisfy CEQA, and authorizing Lahontan Water Board staff to send a Notice of Determination to the State Clearinghouse.

The discharge described in these WDRs is consistent with the Negative Declaration and no new significant impacts are expected from the discharge allowed by these WDRs.

26. Notification of Interested Parties

The Lahontan Water Board has notified the Discharger and all known interested parties of its intent to adopt new WDRs for the project.

27. Consideration of Interested Parties

The Lahontan Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.

**IT IS HEREBY ORDERED** that the Discharger shall comply with the following:

II. DISCHARGE SPECIFICATIONS

A. Discharge Limitations

1. The injection to groundwater at the Facility shall be limited to potassium bromide, lactate, whey, EVO, and groundwater containing chromium extracted on site.
2. The maximum amount of potassium bromide to be injected to groundwater at the Facility shall be 10 pounds.
3. The maximum volume of lactate to be discharged to groundwater at the Facility shall be 225,000 gallons of 60% solution.
4. The maximum volume of whey to be discharged to groundwater at the Facility shall be 800,000 pounds of powder and 2,000,000 gallons in liquid solution.
5. The maximum volume of EVO to be discharged to groundwater at the Facility shall be 55,000 gallons of 100% vegetable oil (soy based).



B. Receiving Water Limitation

The discharge of waste shall not cause a violation of any applicable water quality standards outside the pilot study boundaries, with the exception of chromium, for receiving water adopted by the Lahontan Water Board or the State Water Board. The boundaries are described in Finding No. 3 and shown in Attachment "B." The discharge shall not cause the presence of the following substances or conditions in groundwaters of the Middle Mojave River Valley Groundwater Basin.

The groundwater quality, as a result of the discharge, shall not exceed a Total chromium [Cr(T)] concentration of 96.8 µg/L and hexavalent chromium concentration of 92.1 µg/L outside the pilot study boundaries. These limits are based on the maximum concentration detected in monitoring well samples on the downgradient boundary of the pilot study area taken over a 12-month period in 2005.

1. Chemical Constituents - Groundwaters shall not contain concentrations of chemical constituents (with the exception of chromium) outside the pilot study boundaries in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the following provisions of Title 22 of the CCR (with the exception of TDS and nitrate): Table 64431-A of Section 64431 (Inorganic Chemicals), Table 64431-B of Section 64431 (Fluoride), Table 6444-A of Section 64444 (Organic Chemicals), Table 64449-A of Section 64449 (SMCLs - Consumer Acceptance Limits), and Table 64449-B of Section 64449 (SMCLs - Ranges). This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect. Groundwaters shall not contain concentrations of chemical constituents that adversely affect the water for beneficial uses.
2. Taste and Odors - Groundwaters shall not contain taste or odor-producing substances other than from chromium in concentrations that cause nuisance or that adversely affect beneficial uses. For groundwaters designated as Municipal or Domestic Supply, at a minimum, concentrations shall not exceed adopted SMCLs specified in Table 64449-A of Section 64449 (SMCLs - Ranges), and Table 64449-B of Section 64449 (SMCLs - Ranges) of Title 22 of the CCR, including future changes as the changes take effect.
3. Any presence of toxic substances in concentrations that individually, collectively, or cumulatively cause detrimental physiological response in humans, plants, animals, or aquatic life is prohibited.

4. The migration of hexavalent chromium and total chromium outside the pilot study boundaries in concentrations exceeding the maximum concentration detected during site-wide sampling in 2005 is prohibited.

C. Water Quality Protection Standard

1. Monitoring Parameters

The monitoring parameters within the treatment zone are: total chromium Cr(T), hexavalent chromium Cr(VI), bromide, and TOC. The monitoring parameters for sentry wells located 180 feet and 400 feet downgradient of injection wells are: Cr(T), Cr(VI), bromide, volatile fatty acids (VFAs), and mobilized metals (arsenic, iron, and manganese). At contingency wells located 1,000 feet downgradient from injection wells, monitoring parameters are: Cr(T), Cr(VI), mobilized metals, and, if detected in sentry wells, VFA and bromide.

2. Monitoring Points

The monitoring points at the Facility are monitoring wells in the treatment zone, sentry wells, and contingency wells, as shown on Attachment "B."

3. Point of Compliance

The point of compliance as defined in section 20164, title 27, CCR for the project are the contingency wells located at the pilot study northern boundary, approximately 1,000 feet downgradient of the treatment zone or "biobarrier." The discharge of Cr(T), Cr(VI), VFA, bromide, and by-products, such as arsenic, iron, and manganese, downgradient of the contingency wells cannot exceed the concentration limits established in the Section I.C.4 at the point of compliance.

4. Concentration Limits

The concentration limits for the monitoring parameters located at the monitoring points for the Facility are the following:

Monitoring Parameter	Matrix	Concentration Limit (mg/L)	Reporting Limit (mg/L)	Recommended Analytical Method
Hexavalent Chromium Cr(VI)	Liquid	92.1	0.001	EPA 7199
Total Chromium Cr(T)	Liquid	96.8	0.005	EPA 6010
VFA*	Liquid	10	1.0	EPA 300.M
Bromide†	Liquid	2.3	0.1	EPA 300
Arsenic‡	Liquid	0.01	0.005	EPA 6010
Iron (Fe2+ and Fe3+)§	Liquid	0.3	0.05	EPA 6010
Manganese⁴	Liquid	**	0.01	EPA 6010

D. General Requirements and Prohibitions

1. Surface flow or visible discharge of waste to land surface, surface waters, or surface water drainage courses is prohibited.
2. The discharge shall not cause pollution as defined in section 13050 of the Water Code, or a threatened pollution.
3. Neither the treatment nor the discharge shall cause a nuisance as defined in section 13050 of the Water Code.
4. The discharge of waste except to the authorized disposal site is prohibited.
5. The discharge of waste, as defined in the Water Code, that causes a violation of any narrative water quality objective (WQO) contained in the Basin Plan, including the Nondegradation Objective, is prohibited.
6. The integrity of the LTU shall be maintained throughout the life of Project, and shall not be diminished as a result of any maintenance operation.

\* Volatile Fatty Acids; includes lactic acids, acetate, pyruvate, propionate, and butyrate. Standard based on bench-scale study results.

† Federal Suggested No-Adverse-Response Level (SNARL)

‡ Federal Primary MCL for drinking water

§ California Secondary MCL for drinking water

\*\* Concentration limit to be set based upon the maximum background concentration detected in groundwater prior to initial injection of reagents and showing increasing trend of 25 percent or greater

7. The discharge of waste that causes a violation of any numeric WQO contained in the Basin Plan is prohibited.
8. Where any numeric or narrative WQO contained in the Basin Plan is already being violated, the discharge of waste that causes further degradation or pollution is prohibited.
9. The Discharger shall remove and relocate or otherwise mitigate any wastes that are discharged not in accordance with these WDRs.
10. Hazardous waste as defined under article 1, chapter 11, division 4.5 (§66261.3 et seq.) of title 22, CCR shall not be disposed and/or treated at the Facility, outside the scope of these discharge requirements.
11. The discharge to the ground of any chemicals stored in tanks at the Facility is prohibited.
12. Discharge of solid waste to the Facility is prohibited.

### III. PROVISIONS

#### A. Standard Provisions

The Discharger shall comply with the "Standard Provisions for Waste Discharge Requirements," dated September 1, 1994, in Attachment "C," which is made a part of this Order.

#### B. Monitoring and Reporting

Pursuant to Water Code section 13267(b), the Discharger shall comply with Monitoring and Reporting Program No. R6V-2006-(**PROPOSED**) as specified by the Executive Officer. The Monitoring and Reporting Program may be modified by the Executive Officer after the first phase of the Pilot Study is completed and submitted for Water Board staff review.

#### C. Claim of Copyright or Other Protection

Any and all reports and other documents submitted to the Lahontan Water Board pursuant to this request will need to be copied for some or all of the following reasons: 1) normal internal use of the document, including staff copies, record copies, copies for Board members and agenda packets, 2) any further proceedings of the Lahontan Water Board and the State Water Board, 3) any court proceeding that may

involve the document, and 4) any copies requested by members of the public pursuant to the Public Records Act or other legal proceeding.

If the Discharger or its contractor claims any copyright or other protection, the submittal must include a notice, and the notice will accompany all documents copied for the reasons stated above. If copyright protection for a submitted document is claimed, failure to expressly grant permission for the copying stated above will render the document unusable for the Lahontan Water Board's purposes, and will result in the document being returned to the Discharger as if the task had not been completed.

#### IV. TIME SCHEDULE

##### A. Submittal of Technical Reports

1. Beginning **October 30, 2006**, the Discharger shall submit quarterly status report describing pilot study activities. The report shall list the type, volume, and concentrations of discharges to groundwater. The report shall describe instances of violation of the waste discharge requirements, equipment failures, and unexpected environmental impacts. The report shall state whether or not adverse impacts have occurred in groundwater requiring implementation of the Contingency Plan. Lastly, the report shall describe planned activities during the next three months of the pilot study. The report shall be prepared by, or under the supervision of, either a California Registered Geologist or a California Registered Civil Engineer. Subsequent quarterly reports are **due on January 30, April 30, July 30, and October 30 of each year.**
2. **Within 60 days upon completion of the pilot study**, submit to the Lahontan Water Board a final pilot study report. The report shall describe the type, concentration, and volume of all chemical and compounds injected into the subsurface during the pilot test. The report shall contain the results of sampling and laboratory analysis of samples collected during the pilot study. The report must include a map showing the location of pilot test cells, injection wells, monitoring wells, and extraction wells. The results of sample analysis of monitoring parameters from monitoring and extraction wells shall be reported in tabular and graphic form, as well as discussed in the text of the report. The report must state whether any portion of the Contingency Plan was implemented during the pilot study and, if so, provide details. The report shall describe the findings of the tracer test(s) and conclusions about groundwater flow conditions. The report shall also describe the findings and

conclusions of in-situ remediation of hexavalent chromium and other possible by-products.

The final pilot study report must include a discussion of any violations of the WDRs and a description of action(s) taken to correct those violations. If no violations occurred, this shall be so stated. The report shall be signed by a principal executive officer at the level of vice-president, or higher, or their designated representative who is responsible for the overall operation of the facility. The report shall contain a statement that, under penalty of perjury, to the best of their knowledge the report is true, complete, and correct.

B. Expiration

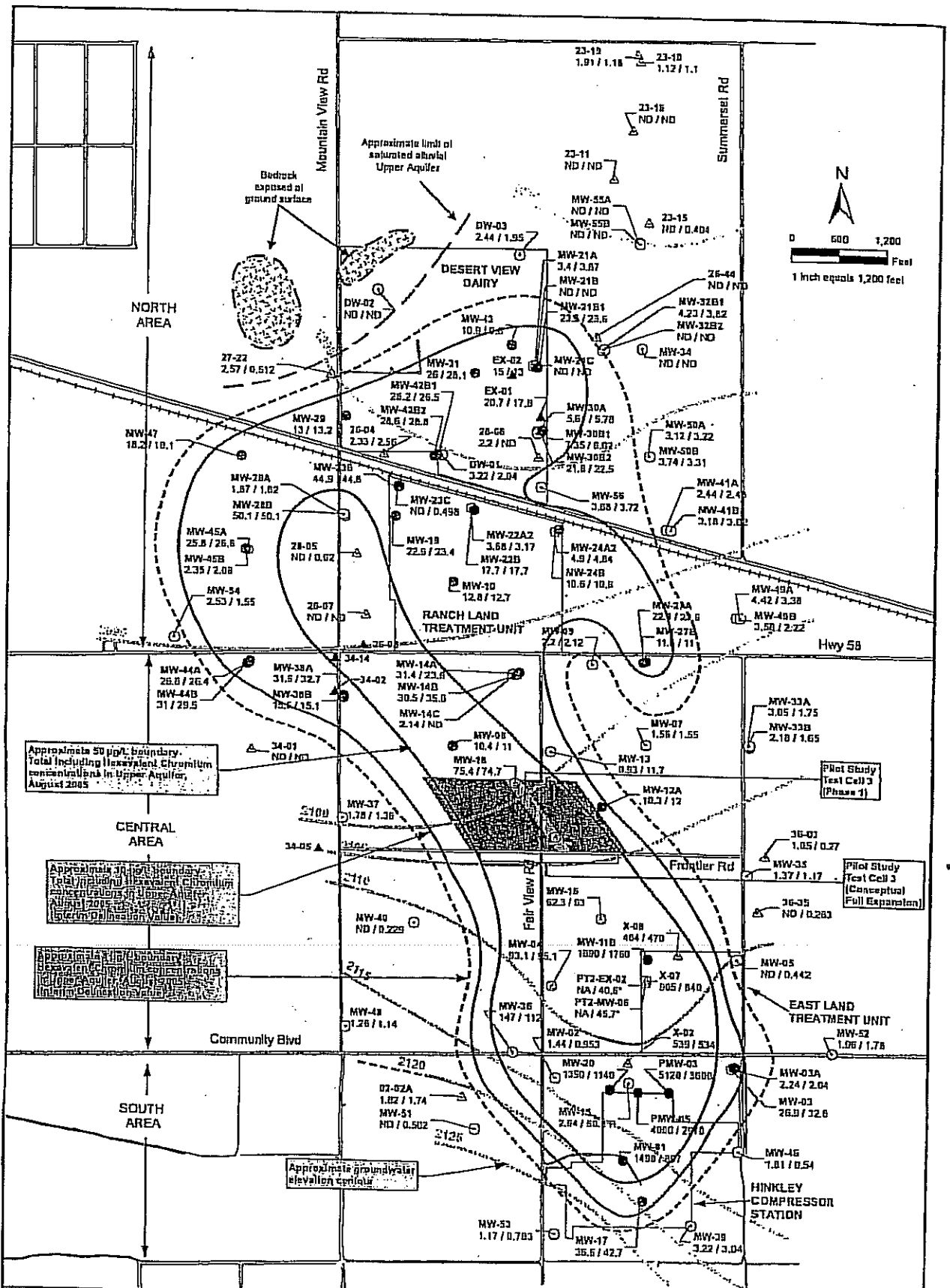
These waste discharge requirements do not expire.

I, Harold J. Singer, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Lahontan Region, on June 14, 2006.



HAROLD J. SINGER  
EXECUTIVE OFFICER

- Attachments:
- A. Location Map
  - B. Map of Pilot Study Area
  - C. Standard Provisions for Waste Discharge Requirements



Approximate 50 µg/L boundary. Total including Hexavalent Chromium concentrations in Upper Aquifer August 2005

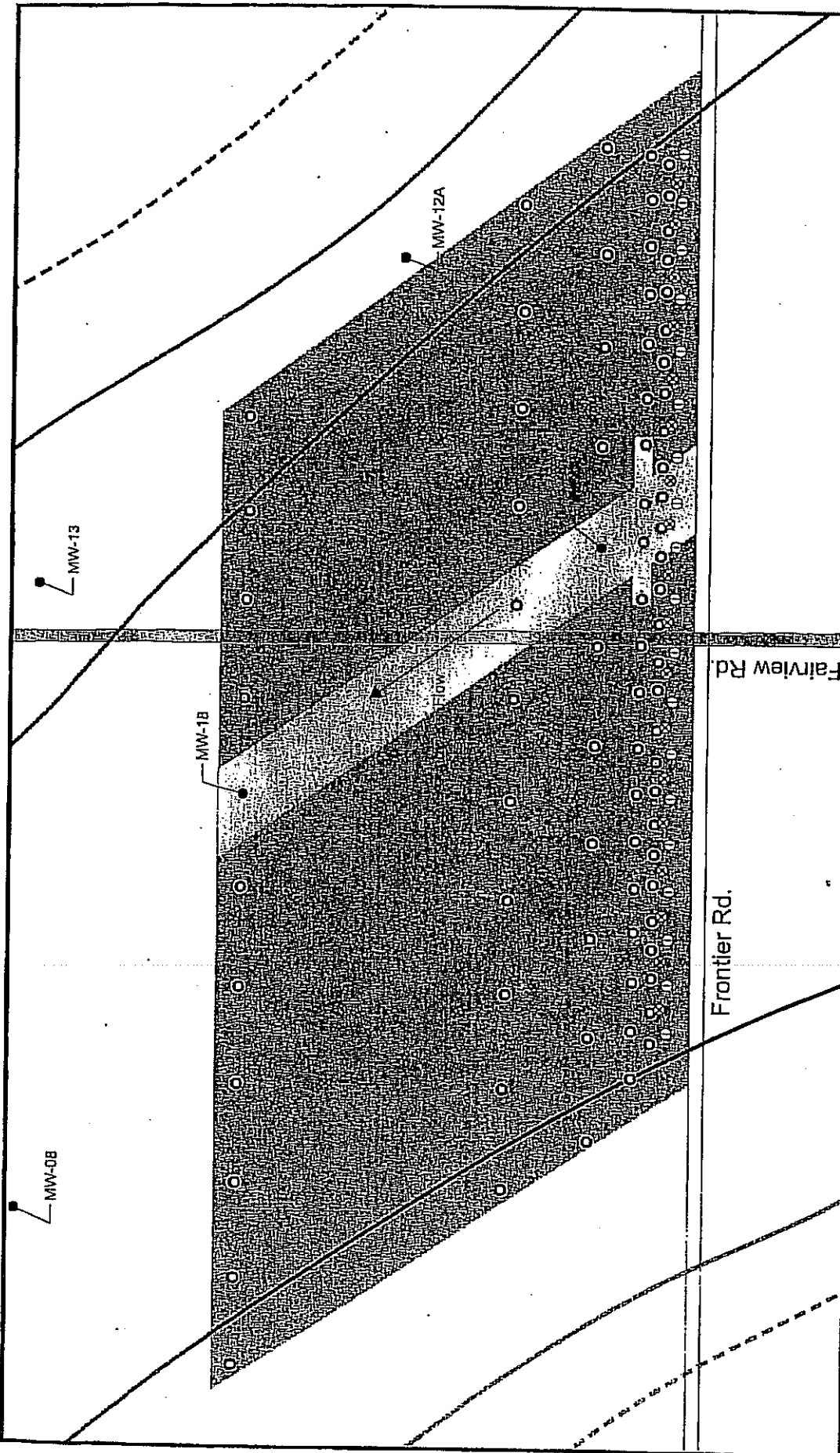
Approximate 50 µg/L boundary. Total including Hexavalent Chromium concentrations in Upper Aquifer August 2005. (Note: The text is partially obscured by a patterned box)

Approximate 50 µg/L boundary. Total including Hexavalent Chromium concentrations in Upper Aquifer August 2005. (Note: The text is partially obscured by a patterned box)

- 10 / 10 Concentration of Total Chromium/Hexavalent Chromium (µg/L) in Groundwater, August 2005
- Notes:
- Groundwater results from August 2005 sampling.
  - Groundwater results from supply wells shown for presentation purposes, and were not used in contouring.
  - Some groundwater results from wells located within the 50 µg/L Total Chromium are less than 50 µg/L.
  - \*NA = Total Chromium was not analyzed and well symbol is not colored.
  5. ND = Not detected above reporting limit

Concentration Cr(T) in micrograms per liter (µg/L)	
Monitoring Well	Supply Well (long screen interval) Not used for Contouring
⊙ < 10 µg/L	△ < 10 µg/L
⊙ 10 - < 50 µg/L	△ 10 - < 50 µg/L
⊙ 50 - < 100 µg/L	△ 50 - < 100 µg/L
⊙ 100 - < 1000 µg/L	△ 100 - < 1000 µg/L
⊙ ≥ 1000 µg/L	△ ≥ 1000 µg/L

**FIGURE 1**  
**SITE LOCATION MAP**  
 IN-SITU REMEDIATION PILOT STUDY,  
 CENTRAL AREA  
 PACIFIC GAS & ELECTRIC CO.  
 COMPRESSOR STATION  
 HINKLEY, CALIFORNIA



**FIGURE 2  
SITE PLAN  
PILOT STUDY TEST CELL 3  
IN-SITU REMEDIATION PILOT STUDY,  
CENTRAL AREA  
PACIFIC GAS & ELECTRIC CO.  
COMPRESSOR STATION  
HINKLEY, CALIFORNIA**

- Approximate 4 µg/L boundary Hexavalent Chromium concentrations in Upper Aquifer, August 2005
  - Approximate 10 µg/L boundary Total Including Hexavalent Chromium concentrations in Upper Aquifer, August 2005
  - Approximate 50 µg/L boundary Total Including Hexavalent Chromium concentrations in Upper Aquifer, August 2005
  - ⊗ Proposed Extraction Well
  - ⊖ Proposed Injection Well
  - ⊕ Proposed Monitoring Well
  - Existing Monitoring Well
  - Pilot Study Test Cell 3 (Phase 1)
  - ▨ Pilot Study Test Cell 3 (Conceptual Full Expansion)
- Actual number of monitoring wells will be increased or decreased, based on Phase 1 monitoring data.



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LAHONTAN REGION

**STANDARD PROVISIONS**  
FOR WASTE DISCHARGE REQUIREMENTS

1. Inspection and Entry

The Discharger shall permit Regional Board staff:

- a. to enter upon premises in which an effluent source is located or in which any required records are kept;
- b. to copy any records relating to the discharge or relating to compliance with the Waste Discharge Requirements (WDRs);
- c. to inspect monitoring equipment or records; and
- d. to sample any discharge.

2. Reporting Requirements

- a. Pursuant to California Water Code 13267(b), the Discharger shall immediately notify the Regional Board by telephone whenever an adverse condition occurred as a result of this discharge; written confirmation shall follow within two weeks. An adverse condition includes, but is not limited to, spills of petroleum products or toxic chemicals, or damage to control facilities that could affect compliance.
- b. Pursuant to California Water Code Section 13260 (c), any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the Regional Board at least 120 days in advance of implementation of any such proposal. This shall include, but not be limited to, all significant soil disturbances.
- c. The Owners/Discharger of property subject to WDRs shall be considered to have a continuing responsibility for ensuring compliance with applicable WDRs in the operations or use of the owned property. Pursuant to California Water Code Section 13260(c), any change in the ownership and/or operation of property subject to the WDRs shall be reported to the Regional Board. Notification of applicable WDRs shall be furnished in writing to the new owners and/or operators and a copy of such notification shall be sent to the Regional Board.
- d. If a Discharger becomes aware that any information submitted to the Regional Board is incorrect, the Discharger shall immediately notify the Regional Board, in writing, and correct that information.

- e. Reports required by the WDRs, and other information requested by the Regional Board, must be signed by a duly authorized representative of the Discharger. Under Section 13268 of the California Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation.
- f. If the Discharger becomes aware that their WDRs (or permit) are no longer needed (because the project will not be built or the discharge will cease) the Discharger shall notify the Regional Board in writing and request that their WDRs (or permit) be rescinded.

3. Right to Revise WDRs

The Regional Board reserves the privilege of changing all or any portion of the WDRs upon legal notice to and after opportunity to be heard is given to all concerned parties.

4. Duty to Comply

Failure to comply with the WDRs may constitute a violation of the California Water Code and is grounds for enforcement action or for permit termination, revocation and re-issuance, or modification.

5. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of the WDRs which has a reasonable likelihood of adversely affecting human health or the environment.

6. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the WDRs. Proper operation and maintenance includes adequate laboratory control, where appropriate, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the WDRs.

7. Waste Discharge Requirement Actions

The WDRs may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for waste discharge requirement modification, revocation and re-issuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any of the WDRs conditions.

8. Property Rights

The WDRs do not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

9. Enforcement

The California Water Code provides for civil liability and criminal penalties for violations or threatened violations of the WDRs including imposition of civil liability or referral to the Attorney General.

10. Availability

A copy of the WDRs shall be kept and maintained by the Discharger and be available at all times to operating personnel.

11. Severability

Provisions of the WDRs are severable. If any provision of the requirements is found invalid, the remainder of the requirements shall not be affected.

12. Public Access

General public access shall be effectively excluded from treatment and disposal facilities.

13. Transfers

Providing there is no material change in the operation of the facility, this Order may be transferred to a new owner or operation. The owner/operator must request the transfer in writing and receive written approval from the Regional Board's Executive Officer.

14. Definitions

- a. "Surface waters" as used in this Order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial water courses and natural lakes and artificial impoundments of waters. "Surface waters" does not include artificial water courses or impoundments used exclusively for wastewater disposal.
- b. "Ground waters" as used in this Order, include, but are not limited to, all subsurface waters being above atmospheric pressure and the capillary fringe of these waters.

15. Storm Protection

All facilities used for collection, transport, treatment, storage, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.