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Secretary for
Environmental Protection

California Regional Water Quality Control Board

Colorado River Basin Region

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Arnold Schwarzenegger
Governor

ORDER NO. R7-2007-0015

The following Discharger is authorized to discharge in accordance with the conditions set forth in this Order:

Discharger	Pacific Gas and Electric Company
Name of Facility	PG&E Topock Compressor Station – Upland In-situ Pilot Test
Facility Address	15 miles Southeast of Needles, CA
	San Bernardino County Assessors Parcel Number 650-161-11 & 650-161-09
	San Bernardino County
Facility Contact and Phone Number	Curt Russell (760) 326-5582
Type of Facility	Industrial
Owner Mailing Address	Pacific Gas and Electric Company
	77 Beale Street
	San Francisco, CA 94105
Owner Contact and Phone Number	Yvonne Meeks (805) 546-5243

The Discharger is authorized to discharge from the following discharge points as set forth below:

Discharge Point	Effluent Quality	Discharge Point Latitude	Discharge Point Longitude	Hydrologic Unit
PTR-1 & PTR-2	Reducing Reagent	34° 43' 0" N	114° 29' 38" W	Piute

This Order was adopted by the Regional Water Board on:	March 21, 2007
This Order shall become effective on:	March 21, 2007

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
REGION 7, COLORADO RIVER BASIN REGION**

ORDER NO. R7-2007-0015

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**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
 REGION 7, COLORADO RIVER BASIN REGION**

WASTE DISCHARGE REQUIREMENTS

ORDER NO. R7-2007-0015

I. FACILITY INFORMATION

The following Discharger is authorized to discharge in accordance with the conditions set forth in this Order:

Discharger	Pacific Gas and Electric Company
Name of Facility	PG&E Topock Compressor Station – Upland In-situ Pilot Test
Facility Address	15 miles Southeast of Needles, CA
	San Bernardino County Assessors Parcel Number 0650-161-12
	San Bernardino County
Facility Contact, Title, and Phone	Curt Russell, Site Manager (760) 326-5582
Mailing Address	Pacific Gas and Electric Company 77 Beale Street San Francisco, CA 94105
Type of Facility	Industrial
Facility Design Flow	38,000 gallons

II. FINDINGS

The California Regional Water Quality Control Board, Colorado River Basin Region (hereinafter Regional Water Board), finds:

A. Background and Description of Existing Board Orders.

1. Pacific Gas and Electric Company (hereinafter, Discharger) submitted a Report of Waste Discharge (ROWD), dated October 13, 2006, applying for a new Board Order to discharge approximately 38,000 gallons of a reagent mixture into two re-circulation wells (PTR-1 and PTR-2) drilled to shallow and deep depths for an in-situ pilot test to be conducted in the Upland area near the Topock Compressor Station. The injection portion of the pilot test is expected to take up to six months and will be conducted within a nine-month calendar period. The application was deemed complete on November 13, 2006.
2. From 1951 to 1964, PG&E discharged untreated wastewater containing hexavalent chromium from the compressor station cooling tower to percolation beds in Bat Cave Wash, an ephemeral stream bed draining into the Colorado River.
3. In 1964, PG&E began treatment of blowdown water by reduction of hexavalent chromium to trivalent chromium prior to discharge to the percolation beds. On August 14, 1969, the Regional Water Board adopted Resolution No. 69-25 prohibiting PG&E from discharging wastewater containing hexavalent chromium. At approximately the same time, PG&E began disposing of the treated blowdown water by subsurface injection at well PGE8.

4. On November 6, 1970, PG&E submitted a ROWD for disposal of 0.030 million gallons per day (mgd) of industrial wastewater from cooling tower operations into one on-site lined basin designed by a California registered civil engineer.
5. On December 10, 1970, the Regional Water Board adopted Resolution No. 70-72 to regulate the proposed discharge of cooling tower wastewater into the one on-site lined basin.
6. On September 11, 1975, the Regional Water Board rescinded Resolution No. 70-72 and adopted Board Order No. 75-52.
7. Board Order No. 75-52 permitted a maximum of 0.030 mgd of industrial wastewater containing chromate to be discharged to four lined evaporative basins. Also, the Board Order prohibited the discharge of wastewater to the Colorado River or to any channel draining to the Colorado River. In addition, the Board Order specified that chemical residues obtained by chemical flocculation or evaporation of process wastewater shall be discharged only at a solid waste disposal site approved to receive these wastes.
8. On October 2, 1985, the Regional Water Board rescinded Board Order No. 75-52 and adopted Board Order No. 85-99.
9. Board Order No. 85-99, allowed the Discharger to replace the hazardous chromate-based cooling tower water treatment process with phosphate-based inhibitors.
10. On January 27, 1988, the Regional Water Board rescinded Board Order No. 85-99 and adopted Board Order No. 88-30, which was revised on March 23, 1988.
11. Revised Board Order No. 88-30 permitted discharge to four new Class II surface impoundments. PG&E closed the four existing lined evaporative basins along with all hazardous waste facilities at the Topock Compressor Station. Closure was done in compliance with closure requirements of 40 CFR Part 265 and Subchapter 15, Chapter 3, Title 23 of the California Code of Regulations.
12. On May 14, 1998, Board Order No. 88-30 was rescinded and Board Order No. 98-050 was adopted. Board Order No. 98-050 allowed discharge of cooling tower blowdown to the Class II surface impoundments.
13. On May 10, 1995, PG&E notified the Regional Water Board that the results of analyses of groundwater samples collected from two abandoned production wells at Topock located approximately 2000 feet northeast of the former percolation ponds and 1700 feet southwest of the Colorado River, indicated concentrations of 2,300 parts per billion (ppb) and 2,850 ppb total chromium and concentrations of 1,480 ppb and 2,340 ppb hexavalent chromium for the two wells respectively. The samples were collected from a depth of approximately 120 feet below ground surface (bgs). The source of pollution is believed to be historical discharges to the Bat Cave Wash and is not associated with the current evaporation basins.
14. The California Department of Health Services has set the Maximum Contaminant Level (MCL) for total chromium in drinking water at 50 ppb.
15. On February 26, 1996, the Department of Toxic Substances Control (DTSC) and PG&E entered into a Corrective Action Consent Agreement (CACA) at the Topock Gas Compressor Station due to hazardous levels of chromium found in the groundwater. DTSC

is the lead agency in the Resource Conservation and Recovery Act (RCRA) Facility investigation under the CACA.

16. Under the terms of the CACA, PG&E agreed to conduct a RCRA Facility Investigation (RFI), and to implement appropriate corrective action measures. The draft RFI was first submitted in April 2000, a second draft was submitted in February 2004. A third RFI draft was submitted in February 2005. Results of the RFI indicated hexavalent chromium in a groundwater plume at concentrations of up to 12,400 ppb at monitoring well cluster MW-20, which is located approximately 600 feet from the Colorado River.
17. On June 30, 2004, DTSC directed PG&E to prepare and immediately implement Interim Measure No. 3 to expand existing groundwater extraction and management facilities to address hydraulic control of the chromium VI plume at the Topock site.
18. On July 8, 2004, PG&E submitted a Summary of Proposed Project for Interim Measures No. 3 – Revision 1 that provided a general summary of the proposed project. The proposal describes the method of treatment to be used and the means of disposal of treated water and waste products as follows:
 - a. Discharge to Land – Subsurface injection to one or more of three proposed injection well fields. Up to ten injection wells are proposed.
 - b. Discharge to Topock Compressor Station Class II surface impoundments – Reuse of treated groundwater in the Compressor Station cooling tower.
 - c. Discharge to Surface Water – Discharge of treated groundwater to the Colorado River under the National Pollutant Discharge Elimination System (NPDES).
19. On July 29, 2004, PG&E submitted to the Regional Water Board applications and ROWD for permits to discharge treated groundwater by the three methods of disposal described in Finding No. 18. A separate application was submitted for each method.
20. On October 13, 2004, the Regional Water Board adopted Board Orders No. R7-2004-0080, R7-2004-0100, and R7-2004-0103.
 - a. Board Order No. 98-050 was rescinded and R7-2004-0080 was adopted. Board Order No. R7-2004-0080 allows for the reuse of treated groundwater from the IM-3 treatment facility in the Compressor Station cooling tower and disposal of brine to the Class II surface impoundments.
 - b. Board Order No. R7-2004-0100 permits discharge of treated groundwater to the Colorado River under the National Pollutant Discharge Elimination System (NPDES). Prohibitions No. 1 of Board Order No. R7-2004-0100 states: “The Discharger shall not activate the use of this Board Order for discharge to the Colorado River without first obtaining prior written determination from the Executive Officer that sufficient and satisfactory evidence has been submitted demonstrating that other wastewater disposal options are not reasonable and feasible. ...” To date, no discharge has occurred under this Board Order.
 - c. Board Order No. R7-2004-0103 allows for subsurface injection to one or more of three injection well fields. Discharge to groundwater under this Order began July 31, 2005.

21. For each of Board Orders No. R7-2004-0080, R7-2004-0100, and R7-2004-0103, the Regional Water Board determined that it was necessary and desirable to have in place alternative disposal options to accommodate increased extraction and treatment rates (resulting in the need for increased disposal capacity) that may be required to contain the groundwater flow to the river. While the duration of the Interim Measures was not determined at the time the Orders were adopted, the Regional Water Board found that it was appropriate to limit the term of those Orders. Board Order No. R7-2004-0100 expired on January 31, 2007, and the provisions of Board Order No. R7-2004-0080 allowing for the disposal of brine from the IM-3 treatment facility into the Class II surface impoundments prohibited such discharge after January 31, 2007. All other conditions of Board Order R7-2004-0080 pertaining to the Topock Compressor Station operations remain in effect, however.
22. The Discharger currently operates a treatment facility for implementation of Interim Measures No. 3 to address hydraulic control of the contaminated groundwater plume boundaries and prevent contaminated groundwater from entering the Colorado River. The treatment facility has a design capacity of 135 gallons per minute (gpm), and a maximum flow capacity of 150 gpm.
23. On June 21, 2005, PG&E submitted a ROWD applying for a Board Order to discharge 6,000 gallons per injection well of a blended mixture of groundwater and reagent into an injection well cluster of two borings drilled to shallow and deep depths (PTI-1S/D) (12,000 gallons total per injection event) for an in-situ pilot test to be conducted in the Colorado River floodplain. The application was deemed complete on July 21, 2005. An addendum to the ROWD was submitted on December 8, 2005, which proposed refinements and minor modifications to the floodplain in-situ pilot study activities described in the ROWD. In pertinent part, these amendments included increasing the number of injection wells from two to three to enable testing to be conducted at shallow, middle, and deep depths in the injection well cluster (injection well PTI-1S/M/D), allowing up to four injections of a mixture of up to 500 pounds of reagent and 6,000 gallons of groundwater per injection well (18,000 gallons total per injection event) during the pilot test period of six months, and authorizing the Executive Officer to extend the pilot test period for conducting these tests beyond six months, if necessary.
24. On March 23, 2006, The Regional Water Board adopted Board Order No. R7-2006-0008 allowing up to four injections of a mixture of up to 500 pounds of reagent and 6,000 gallons of groundwater per injection well (18,000 gallons total per injection event) for the discharge of treated groundwater blended with a reducing reagent for an In-situ pilot study in the Colorado River floodplain.
25. On June 8, 2006, PG&E submitted a Report of Waste Discharge (ROWD) applying for a renewal of Board Order No. R7-2004-0103. On September 20, 2006, the Regional Water Board rescinded Board Order R7-2004-0103 and adopted Board Order No. R7-2006-0060 permitting continued disposal by underground injection for treated groundwater at the IM-3 facility.
26. The Discharger is currently discharging a maximum of 135 (gpm) of treated groundwater under Board Order R7-2006-0060 into one or more of three injection well fields located on San Bernardino County Assessor's parcel No. 650-151-06. The final effluent is composed of RO permeate that may be blended with Reverse Osmosis (RO) concentrate or microfilter water from the treatment facility. It is discharged to the groundwater on the west side of Parcel 650-151-06.

27. In accordance with Board Order R7-2006-0060, prior to injection, the extracted groundwater is treated with chemical reduction, precipitation, and solids removal by gravity or clarifier. Ferrous chloride is used to reduce Cr (VI) to Cr (III). The precipitated solids containing Cr (III) and Fe (III) are removed by gravity settling and microfiltration. RO is used as a polishing step for the treated water to reduce Total Dissolved Solids (TDS). Under Board Order R7-2006-0060, RO concentrate and liquids may be discharged to an appropriate disposal facility. Residual solids will be disposed according to federal and state regulations.
28. On November 30, 2006, the Discharger submitted a request to revise the waste discharge requirements of Board Order R7-2006-0008 to allow for additional injections beyond the previously specified maximum of four injection events that have been conducted to date in PTI-1. Each injection event would apply a reagent mixture of up to 1,500 lbs of sodium lactate, 14 pounds of yeast extract, a non-toxic tracer and 18,000 gallons of groundwater. The Regional Water Board staff has prepared a draft amendment (draft Board Order No. R7-2007-0014) that would allow for the additional injections. Draft Order R7-2007-0014 is currently pending adoption.

B. Project Description.

1. The purpose of the proposed pilot test is to evaluate in-situ treatment of hexavalent chromium [Cr(VI)] in the aquifer. The Discharger proposes to inject a diluted ethanol solution into the groundwater. Microorganisms that use organic carbon as a food source deplete the groundwater of oxygen and other naturally occurring electron acceptors to temporarily create a reducing environment in the aquifer and promote reduction of Cr(VI) to trivalent chromium [Cr(III)]. Cr(III) is a less soluble form of chromium that precipitates and becomes immobile in the aquifer media.
2. The proposed pilot test will be conducted in the Upland area, as shown in Attachment A, in an area located in the vicinity of monitoring well MW-24. The alluvial aquifer in the test area is considered one hydrostratigraphic unit. The groundwater contains concentrations of hexavalent chromium ranging from approximately 3 milligrams per liter (mg/L) to 6 mg/L and is vertically stratified by salinity. Two injection/re-circulation wells PTR-1 and PTR-2 will be installed approximately 150 feet apart from each other. The two wells will be constructed as single borings with two separate screened intervals. The upper screen interval will be approximately 25 feet long and the lower screen interval will be approximately 30 feet long, with approximately 30 feet of spacing between screens. The re-circulation system will be initially designed to create a three dimensional circulation pattern in the aquifer. Groundwater will be drawn into one well from the lower zone in the aquifer, pumped through the well casing and reintroduced into the upper zone of the aquifer. The second well will be designed to operate with a reverse pumping pattern, such that the alternating wells are pumping upward and downward resulting in a conveyor belt circulation pattern between the two wells. The upflow well will operate by drawing in contaminated groundwater into the lower well screen, pumping it upward through a mixer where the reducing reagent is introduced, then pumping the groundwater and reagent back into the aquifer through the upper well screen. The downflow well will draw water through the upper well screen, pump it downward where it is mixed with reducing reagent, then pumped out into the aquifer through the lower well screen. Depending on the results obtained during the test, alternate flow patterns may be employed within the two injection/recirculation wells.
3. Three three-level monitoring well nests, PT-7, PT-8, and PT-9, will be installed around the injection wells in the approximate locations shown in Attachment B. Each monitoring well nest will have three individual well casings screened across 10-foot intervals. One boring will contain two separate well screen intervals corresponding to the shallow and deep zones

(S/D). The second boring will contain a single screen interval corresponding to the middle zone (M). Existing groundwater monitoring wells MW-24A/B, MW-11, and MW-38S/D will be incorporated into the pilot study monitoring well program.

4. A tracer test will be initiated concurrently with the pilot test to better understand the flow conditions in the pilot test area. Each of the injection/recirculation wells will be injected with a distinct non-toxic tracer. PTR-1 will be tested with fluorescein, and PTR-2 will be tested with rhodamine. Both tracers will be injected at approximately 1 mg/L in the reagent solution and will be continuously injected for the first month of circulation. Approximately 12 pounds of each tracer will be injected in the respective well during the circulation test. The results of the tracer test will be used to track groundwater movement at different depth intervals and identify the distribution of substrate between the wells. It is to be expected that the recirculation will vertically move the water in the aquifer during the length of the pilot test.
5. The test area for the pilot project is approximately 375 feet long by 375 feet wide across the fully saturated thickness of the aquifer (about 100 feet). The reagent solution will be pumped into each of two injection/recirculation wells from temporary reagent tanks placed at each well head using in-well packer and in-line reagent mixers. No permanent aboveground equipment will be used for the injection.
6. The Discharger proposes to inject approximately 100 gallons of reagent into each well each day. Approximately 25 gallons will be injected four times per day at a rate of five gallons per minute per well for a total of approximately 38,000 gallons. An automated reagent dosing system will be located within the well head vault to meter the reagent injection at regular intervals during each day of the pilot test.

C. Legal Authorities.

This Order serves as Waste Discharge Requirements (WDRs) pursuant to Division 7, Chapter 4, Article 4, of the California Water Code (CWC) for discharges that are not subject to regulation under Clean Water Act (CWA) Section 402 (33 U.S.C. Section 1342).

D. Background and Rationale for Requirements.

The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and through special studies. Attachments A through C, which contain background information and rationale for Order requirements, are hereby incorporated into this Order and thus, constitute part of the Findings for this Order.

E. California Environmental Quality Act (CEQA).

In accordance with the California Environmental Quality Act (CEQA) (Section 21000 et seq., California Public Resources Code) and implementing Guidelines (Section 15000 et seq., Title 14, California Code of Regulations), DTSC, acting as the lead agency, prepared an Initial Study and Negative Declaration for the Upland in-situ pilot project at Pacific Gas and Electric Company, Topock Compressor Station. DTSC adopted the Negative Declaration and approved the Upland in-situ pilot project on March 20, 2007. DTSC concluded that the proposed project will not have a significant effect on the environment. The Fort Mojave Indian Tribe has indicated that it may challenge DTSC's adoption of the Negative Declaration. However, the Regional Water Board will conclusively presume that DTSC's Negative Declaration complies with CEQA, pursuant to California Public Resources Code section 21167.3(b). The Regional Water Board has considered the Initial Study and the Negative Declaration adopted by DTSC. Compliance

with these Waste Discharge Requirements will prevent any significant adverse impacts to water quality.

F. Water Quality Control Plans.

The Regional Water Board adopted a Water Quality Control Plan for the Colorado River Basin (hereinafter, Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, State Water Resources Control Board (State Water Board) Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. The discharge for the proposed upland in-situ pilot project is located within the Piute hydrologic unit.

The Basin Plan states at page 2-19 that the beneficial uses of ground waters in the Piute hydrologic unit are as follows:

Discharge Point	Hydrologic Unit	Beneficial Use(s)
PTR-1 and PTR-2	Piute	<u>Existing:</u> Municipal and domestic water supply (MUN) Industrial Supply (IND) Agricultural Supply (AGR)

Requirements of this Order specifically implement the Basin Plan.

G. Antidegradation Policy.

The State Water Board established California’s antidegradation policy in State Water Board Resolution 68-16. Resolution 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The permitted discharge is consistent with the antidegradation provision of State Water Board Resolution 68-16. The injection of reagent into the aquifer is intended to change the geochemistry in the treatment zone, and the recirculation system associated with this test is designed to create a three dimensional circulation pattern in the aquifer. These changes do not violate the antidegradation policy. The discharge is necessary to prevent potential water quality impacts on the Colorado River (the main water supply to Southern California) and prevent and mitigate further impacts on groundwater. Further, this water supply is of key economic importance to the State.

H. Monitoring and Reporting.

Section 13267 of the CWC authorizes the Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. This Monitoring and Reporting Program is provided in Attachment C.

I. Notification of Interested Parties.

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations.

J. Consideration of Public Comment.

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

IT IS HEREBY ORDERED, that in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted therein, the Discharger shall comply with the requirements in this Order.

III. DISCHARGE PROHIBITIONS

A. Prohibitions

1. Discharge of waste classified as 'hazardous' under Section 2521, Chapter 15 of Title 23 of the California Code of Regulations, or 'designated', as defined in CWC Section 13173 is prohibited.
2. The direct discharge of any wastewater to any surface waters or surface drainage courses is prohibited.
3. Discharge of treated wastewater at a location or in a manner different from that permitted by this Order, or as otherwise authorized by the Regional Water Board's Executive Officer, is prohibited.
4. Bypass or overflow of untreated or partially treated wastewater is prohibited.
5. The discharge of waste to land not owned by or authorized for such use to the Discharger is prohibited.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Land Discharge Specifications

1. The treatment or disposal of wastes from the facility shall not cause pollution or nuisance as defined in CWC Section 13050(l) – (m).
2. The discharge shall not cause degradation of any water supply, as required by State Water Board Resolution No. 68-16.
3. The Discharger shall not cause the permeability of the aquifer, either inside or outside of the reagent pilot test treatment area, to be affected to such a degree that the Discharger is unable to effectively operate extraction wells for the purpose of containing the reagent or its byproducts.
4. The Discharger shall not cause the groundwater to contain concentrations of chemical constituents, including the injected substance, and any breakdown products or by-products of the in-situ treatment process, in amounts that adversely affect beneficial uses outside of the pilot test treatment area.
5. Any changes in the type or amount of treatment chemicals added to the process water, duration of the pilot test, or other specific design elements as described in this Board Order shall be made with prior written approval of the Regional Water Board's Executive Officer.

6. The Discharger shall prohibit public access to the injection wells through such means as well locks or other alternatives acceptable to the Regional Board's Executive Officer.

V. PROVISIONS

A. Regional Water Board Standard Provisions

1. The Discharger shall comply with the following provisions:
 - a. The Discharger shall comply with all conditions of the Board Order. Noncompliance constitutes a violation of the Porter-Cologne Water Quality Control Act, and is grounds for enforcement action, for Order termination, revocation and reissuance, or modification of Waste Discharge Requirements; or denial of an Order renewal application.
 - b. The Discharger shall ensure that all site-operating personnel are familiar with the contents of this Board Order, and shall maintain a copy of this Board Order on site.
 - c. Consistent with CWC Section 13267(c), the Discharger shall allow the Regional Water Board, or an authorized representative, upon presentation of credentials and other documents as may be required by law to:
 - i. Enter upon the premises regulated by this Board Order, or the place where records must be kept under the conditions of this Board Order;
 - ii. Have access to and copy, at reasonable times, any records that shall be kept under the conditions of this Board Order;
 - iii. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required by this Board Order;
 - iv. Sample or monitor at reasonable times, for the purpose of assuring compliance with this Board Order or as otherwise authorized by the California Water Code, any substances or parameters at this location.
 - d. Prior to any change of ownership or management of this operation, the Discharger shall transmit a copy of this Board Order to the succeeding owner/operator, and forward a copy of the transmittal letter to the Regional Water Board.
 - e. Prior to any modifications in this facility, which would result in material change in the quality or, quantity of wastewater treated or discharged, or any material change in the location of discharge, the Discharger shall report all pertinent information in writing to the Regional Water Board and obtain revised requirements before modifications are implemented.
 - f. Adequate measures shall be taken to assure that flood or surface drainage waters do not erode or otherwise render portions of the facilities inoperable.
 - g. This Board Order does not authorize violation of any federal, state, or local laws or regulations.

- h. This Board Order does 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.
 - i. This Board Order may be modified, rescinded and reissued, for cause. The filing of a request by the Discharger for a Board Order modification, rescission and reissuance, or a notification of planned changes or anticipated noncompliance does not stay any Board Order condition. Causes for modification include the promulgation of new regulations, modifications of land application plans, or modification in sludge use or disposal practices, or adoption of new regulations by the State Water Board or the Regional Water Board, including revisions to the Basin Plan.
 - j. The Discharger shall report any noncompliance that may endanger human health or the environment. The Discharger shall provide a verbal report of the noncompliance to the Regional Water Board office ((760) 346-7491) and the Office of Emergency Services ((800) 852-7550 or (916) 845-8911) as soon as: (1) the Discharger has knowledge of the discharge; (2) notification is possible; and (3) notification can be provided without substantially impeding cleanup or other emergency measures. During non-business hours, the Discharger shall leave a message on the Regional Water Board voice recorder. A written report to the Regional Water Board shall also be provided within five (5) business days of the time the Discharger becomes aware of the incident. The written report shall contain a description of the noncompliance and its cause, the period of noncompliance, the anticipated time to achieve full compliance, and the steps taken or planned, to reduce, eliminate, and prevent recurrence of the noncompliance. The Discharger shall report all intentional or unintentional significant spills occurring within the facility or collection system to the Regional Water Board offices in accordance with the above time limits.
 - k. The Discharger shall provide adequate notice to the Regional Water Board's Executive Officer of the following:
 - i. Any substantial change in the volume or character of pollutants being introduced into any of the treatment facilities described in the Findings of this Board Order by an existing or new source.
 - ii. Any planned physical alterations or additions to the facilities described in this Board Order, or changes planned in the discharger's disposal practices, where such alterations, additions, or changes may justify the application of Board Order conditions that are different or absent in the existing Board Order, including notification of additional disposal sites not reported during the Board Order application process, or not reported pursuant to an approved land application plan.
 - l. The Discharger shall report all instances of noncompliance. Reports of noncompliance shall be submitted with the Discharger's next scheduled Self-Monitoring Report or earlier if requested by the Regional Water Board's Executive Officer.
2. Best Management Practices and Pollution Prevention
- a. Storm water
 - i. Federal regulations for storm water discharges require specific categories of facilities which discharge storm water associated with industrial activity (storm water) to obtain National Pollutant Discharge Elimination System (NPDES) permits and to

implement Best Conventional Pollutant Technology (BCT) and Best Available Technology Economically Achievable (BAT) to reduce or eliminate industrial storm water pollution.

- ii. In the event that there are storm water discharges associated with industrial activities, the Discharger shall submit a Notice of Intent and/or maintain coverage under the General Storm Water Permit.

B. Monitoring and Reporting Program Requirements

1. The Discharger shall comply with Monitoring and Reporting Program R7-2007-0015 (Attachment C of this Order), and future revisions thereto as approved by the Regional Water Board's Executive Officer.
2. The monitoring and reporting requirements in Monitoring and Reporting Program R7-2007-0015 are necessary to determine compliance and to determine the in-situ pilot project's impacts, if any, on groundwater.
3. The Discharger is the responsible party for the waste discharge requirements and the monitoring and reporting program for the in-situ pilot project. The Discharger shall comply with all conditions of these waste discharge requirements. Violations may result in enforcement actions, including Regional Water Board Orders or court orders, requiring corrective action or imposing civil monetary liability, or in modification or revocation of these Waste Discharge Requirements by the Regional Water Board.
4. The Discharger shall furnish, under penalty or perjury, technical monitoring program reports, and such reports shall be submitted in accordance with the specification prepared by the Regional Water Board's Executive Officer. Such specifications are subject to periodic revisions as may be warranted.
5. Pursuant to the CWC Section 13267, samples taken for total chromium shall be analyzed with a method having a method detection limit (MDL) of 1.0 ppb and samples taken for chromium VI shall be analyzed with a method having an MDL of 0.2 ppb. The analytical results shall be reported consistent with actual observations by a California certified laboratory, and shall be reported in terms of the practical quantitation limit (PQL), if the MDL cannot be achieved.

C. Special Provisions

1. A contingency plan detailing mitigation measures in the event of pilot test failure shall be submitted for approval by the Regional Water Board's Executive Officer within 30 days of adoption of this Board Order. The plan shall provide an analysis of potential causes of pilot study failure, the effect of failure, and the proposed course of corrective action.
2. Should the evaluation of the pilot test data reveal adverse effects on groundwater quality beyond the treatment zone due to reagent injection, the Discharger shall notify the Regional Water Board within 24 hours, followed by a written summary within two weeks. The Discharger shall implement the contingency plan. The Discharger shall provide a status summary report within two months detailing activities to implement the contingency plan.
3. The pilot study wells shall be constructed in a manner that will protect them from adverse effects related to inundation. In the event that inundation damage occurs, the discharger

shall promptly restore the wells to their proper operating capacity and submit a summary report of the corrective actions to the Regional Water Board office.

4. To the extent that the pilot project requires more than the maximum nine-month calendar period allowed to complete, the Discharger shall submit to the Regional Water Board office a request for a time extension to complete the project. The request shall specify the nature and circumstances justifying the extension. The extension shall be subject to the approval of the Executive Officer.
5. Special Studies, Technical Reports, and Additional Monitoring Requirements:
 - a. The discharger shall implement a representative groundwater monitoring system, acceptable to the Regional Water Board's Executive Officer, in the vicinity of the pilot study injection wells (approximate locations shown on Attachment B), which shall enable groundwater samples to be collected and analyzed as specified in Monitoring and Reporting Program R7-2007-0015 and revisions thereto prior to the injection of treatment reagent.
6. Other Special Provisions
 - a. The Discharger shall obtain any and all prior approvals required prior to discharge.

I, Robert Perdue, 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 Region, on March 21, 2007.

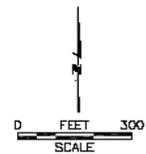


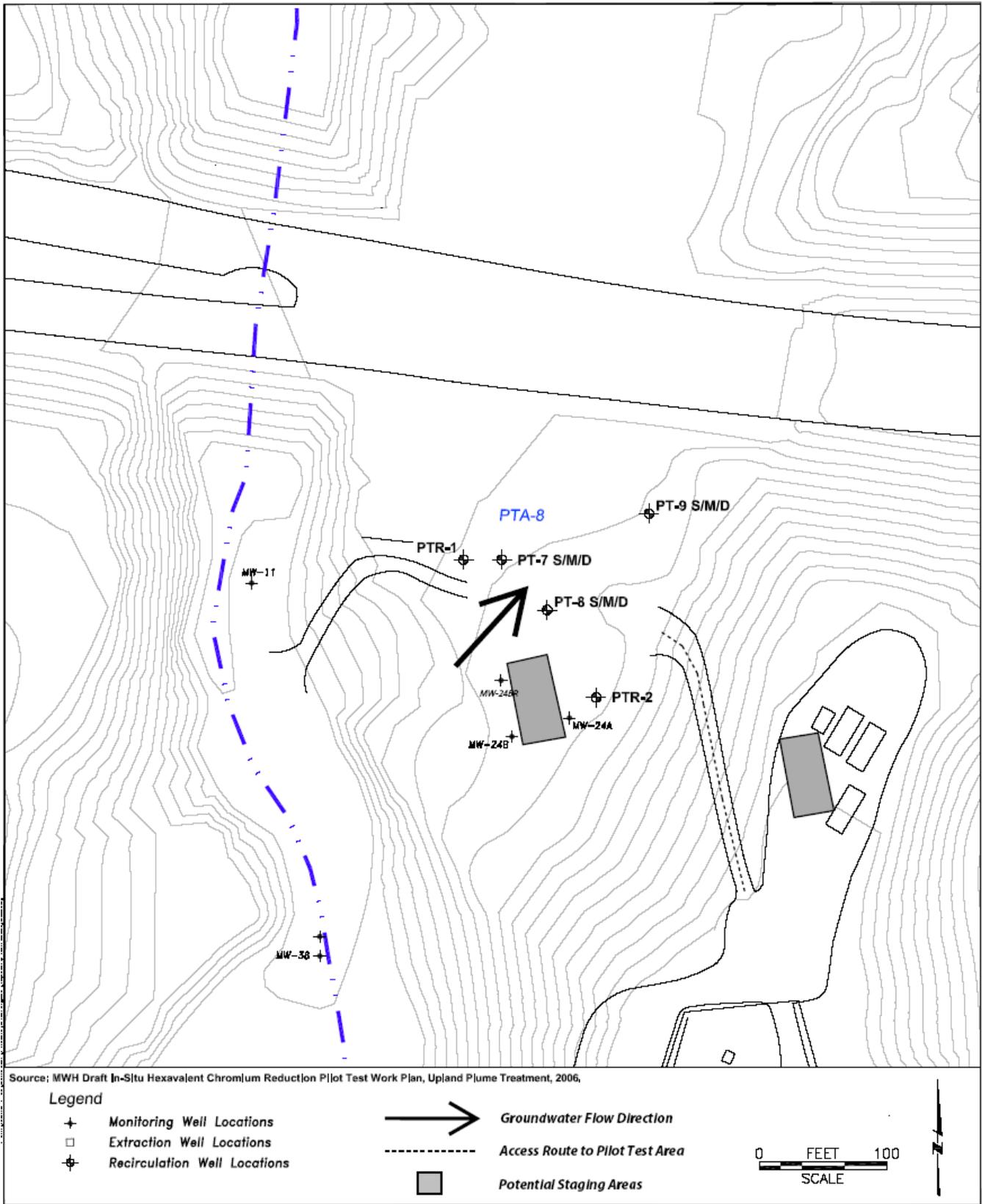
ROBERT PERDUE
Executive Officer



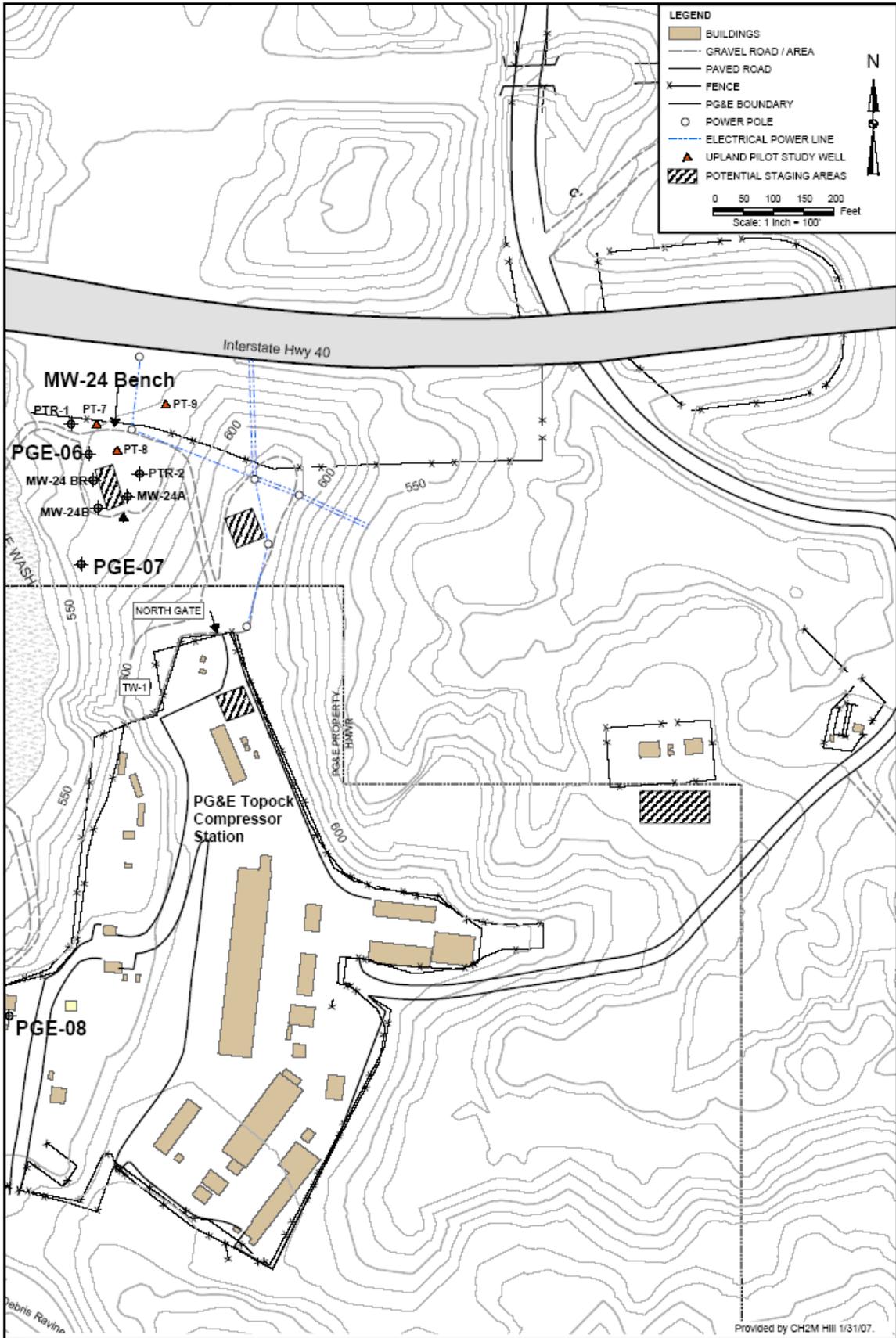
Source: MWH Draft In-Situ Hexavalent Chromium Reduction Pilot Test Work Plan, Upland Plume Treatment, 2006.

- Legend**
- + Monitoring Well Locations
 - Extraction Well Locations
 - ◆ Injection Well Locations





Project Location - 34° 43' 0" N Latitude and 114° 29' 38" W Longitude



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ATTACHMENT C – MONITORING AND REPORTING PROGRAM (MRP)

CWC Sections 13267 and 13383 authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements to implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Monitoring Provisions

1. The Discharger shall notify the Regional Water Board a minimum of two weeks prior to the start of injection of treatment reagent.
2. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the approximate monitoring locations specified below. Monitoring locations shall not be changed without notification to, and having the approval of the Regional Water Board's Executive Officer.
3. Unless otherwise approved by the Regional Water Boards Executive Officer, all analysis shall be conducted at a laboratory certified for such analysis by the State Department of Health Services. All analysis shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants", (40 CFR Part 136) or equivalent methods promulgated by the United States Environmental Protection Agency (USEPA).
4. The collection, preservation and holding times of all samples shall be in accordance with USEPA approved procedures.
5. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated at least once per year to ensure continued accuracy of the devices.
6. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this Monitoring and Reporting Program.
7. The Discharger shall comply with the following:
 - a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
 - b. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Board Order, and records of all data used to complete the application for this Board Order, for a period of at least 5 years from the date of the sample, measurement, report or application.
 - c. Records of monitoring information shall include:
 - i. The individual(s) who performed the sampling or measurements.
 - ii. The date(s) analyses were performed.
 - iii. The individual(s) who performed the analysis.

- iv. The analytical techniques or methods used; and
 - v. The results of such analysis.
8. If the facility is not in operation, or there is no discharge during a required reporting period, the Discharger shall forward a letter to the Regional Water Board indicating that there has been no activity during the required reporting period.
9. Each report shall contain the following statement:

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

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table C-1: Monitoring Locations

Monitoring Location Name	Monitoring Location Description	Monitoring Location Latitude	Monitoring Location Longitude
PTR-1	Upland Pilot Test Injection/Re-circulation Well	34° 43' 0" N	114° 29' 38" W
PTR-2	Upland Pilot Test Injection/Re-circulation Well	34° 43' 0" N	114° 29' 38" W
PT-7S/M/D	Approximately 30 feet east of PTR-1		
PT-8S/M/D	Equidistant between PTR-1 & PTR-2		
PT-9S/M/D	Downgradient of Pilot Test Area		
MW-24A/B	Upgradient of PTR-2		
MW-11	West of PTR-1		
MW-38S/D	Upgradient of Pilot Test Area		

III. GROUNDWATER MONITORING REQUIREMENTS

A. Monitoring Requirements

1. The discharge rate of reducing reagent injected into the aquifer shall be metered daily (gallons per day) and total monthly.
2. Monitoring Locations identified in Table C-1 shall be monitored twice prior to beginning injection of reducing reagent for Baseline parameters listed in Table C-2. Laboratory analyses, field instruments and test kits will be used to monitor the pilot test monitoring well network. Laboratory analysis shall be performed for all grab sample parameters.
3. Monitoring Locations identified in Table C-1 shall be monitored during pilot test as listed in Table C-2. Laboratory analyses, field instruments and test kits will be used to monitor the pilot test monitoring well network. Laboratory analysis shall be performed for all grab sample parameters.

Table C-2: Monitoring Parameters and Monitoring Frequency

Parameter	Units	Sample Type	Baseline 2x	Weekly Month 1	Bi-Weekly Months 2-4	Monthly Months 1-9	Quarterly Months 10-Final
pH	s.u.	Field	X	X	X	X	X
Temperature	°F	Field	X	X	X	X	X
Specific Conductance	µmhos/cm	Field	X	X	X	X	X
Oxidation Reduction Potential	mV	Field	X	X	X	X	X
Dissolved Oxygen	mg/L	Field	X				
Flourescien	µg/L ¹	Grab		X	X	X	X
Rhodamine	µg/L	Grab		X	X	X	X
Cr(VI)	µg/L	Grab	X	X	X	X	X
Cr(Total)	µg/L	Grab	X	X	X	X	X
Arsenic	µg/L	Grab	X			X	X
Calcium	mg/L	Grab	X			X	X
Iron (Total)	mg/L	Grab	X	X	X	X	X
Iron (Dissolved)	mg/L	Grab	X	X	X	X	X
Manganese (Total)	µg/L	Grab	X			X	X
Manganese (Dissolved)	µg/L	Grab	X			X	X
Potassium	mg/L	Grab	X			X	X
Sodium	mg/L	Grab	X			X	X
Chloride	mg/L	Grab	X			X	X
Nitrate	mg/L	Grab	X			X	X
Nitrite	mg/L	Grab	X			X	X
Phosphorous (as phosphate)	mg/L	Grab	X			X	X
Sulfate	mg/L	Grab	X	X	X	X	X
Sulfide	mg/L	Grab	X	X	X	X	X
Bicarbonate alkalinity	mg/L	Grab	X			X	X
Total organic carbon	mg/L	Grab	X	X	X	X	X

¹ µg/L – micrograms per liter

IV. ADDITIONAL MONITORING REQUIREMENTS

A. Operation and Maintenance

The Discharger shall report the following:

Table C-4: Operation and Maintenance / Calibration Requirements

Activity		Reporting Frequency
Inspect and document any operation/maintenance problems by inspecting each unit process	Monthly	Monthly during test phase, Quarterly thereafter
Calibration log of field monitoring instruments	Weekly or prior to each use, whichever is less frequent	Monthly during test phase, Quarterly thereafter

V. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The results of any analysis taken more frequently than required at the locations specified in this Monitoring and Reporting Program shall be reported to the Regional Water Board.
2. Within **90 days** after start of injection of pilot study, the Discharger shall submit a report summarizing the results of the first 60 days of the pilot test, including an assessment of reagent injection distribution. At a minimum, the report shall include:
 - a. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring. The narrative report shall be sufficiently detailed to verify compliance with the WDRs, the attached MRPs, and the Standard Provisions and Reporting Requirements. The report narrative shall be supported by documenting flow rates, and total volume of reagent injected, and parameters measured.
 - b. An assessment of reagent discharge to the aquifer, and results of all sampling;
 - c. Copies of all laboratory analytical report(s);
 - d. A calibration log verifying weekly calibration of any field monitoring instruments (e.g., pH, dissolved oxygen meter, etc) used to obtain data;
 - e. An evaluation of the changes in aquifer geochemistry including the extent of hexavalent chromium reduction, assessment of changes in mobility of other metals including arsenic, iron, and;
 - f. An analysis of whether the injected reagent and any breakdown or by products is being captured by the recirculation system or is continuing to spread;
 - g. Cumulative data tables containing the water quality analytical results.
3. The results of daily, weekly, bi-weekly, and monthly monitoring shall be reported monthly. The results of quarterly monitoring shall be reported quarterly.

4. Quarterly reports shall be submitted to the Regional Water Board by the **15th day of the following month following the end of each calendar quarter (i.e., by January 15, April 15, July 15, and October 15)** to assess long-term effects of injected substances on aquifer geochemistry until such time as the Executive Officer determines that the reports are no longer necessary. Each quarterly report shall include the following minimum information:
 - a. A description and discussion of the groundwater sampling event and results, including trends in the concentrations of pollutants and groundwater elevations in the wells, how and when samples were collected;
 - b. Field logs that contain, at a minimum, water quality parameters measured before, during, and after purging, method of purging, depth of water, volume of water purged, etc.;
 - c. Groundwater contour maps for all groundwater zones, if applicable;
 - d. A table showing well construction details such as well number, groundwater zone being monitored, coordinates (longitude and latitude), ground surface elevation, reference elevation, elevation of screen, elevation of bentonite, elevation of filter pack, and elevation of well bottom;
 - e. A copy of the laboratory analytical data report;
5. A Final Report shall be submitted to the Regional Water Board within **90 Days** of completion of Pilot Study. This report shall contain an evaluation of the long-term effects on the aquifer of the injected material, effectiveness and progress of the investigation and remediation. The Final Report shall contain the following minimum information:
 - a. Both tabular and graphical summaries of all data obtained during the pilot study;
 - b. Groundwater contour maps and pollutant concentration maps containing all data obtained;
 - c. A discussion of long-term trends in the concentrations of the pollutants in the groundwater monitoring wells;
 - d. An analysis of whether the injected plume, and any breakdown or byproducts is being captured by an recirculation system or is continuing to spread;
 - e. An identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program and the anticipated date for an effectiveness evaluation of the pilot study;
 - f. If applicable, a proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.

B. Self-Monitoring Reports

1. The Discharger shall submit monthly and quarterly Self-Monitoring Reports (SMRs) including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. Monthly reports shall be due on the 15th day of the month following the end of each calendar month; Quarterly reports shall be due on January 15th, April 15th, July 15th, and October 15th following each calendar quarter.

2. The Discharger shall report with each sample result the applicable Minimum Level (ML) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR Part 136.
3. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with discharge specifications.
4. The Discharger shall attach a cover letter to the SMRs. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.
5. SMRs must be submitted to the Regional Water Board, signed and certified as required by the MRPs (Attachment C), to the address listed below:

Submit monitoring reports to:
California Regional Water Quality Control Board Colorado River Basin Region 73-720 Fred Waring, Suite 100 Palm Desert, CA 92260