



California Regional Water Quality Control Board Central Valley Region

Katherine Hart, Chair



Linda S. Adams
Secretary for
Environmental
Protection

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Arnold
Schwarzenegger
Governor

19 October 2010

Ms. Janet Koster
City of Dixon
600 East A Street
Dixon, CA 95620

NOTICE OF APPLICABILITY OF GENERAL ORDER NO. R5-2008-0149, CITY OF DIXON – MUNICIPAL SERVICE CENTER, 285 EAST CHESTNUT STREET, DIXON, SOLANO COUNTY (LUSTIS NO. 480169)

The property owner, the City of Dixon (Hereafter Discharger), and their environmental consultant, Central Valley Environmental, Inc. submitted a Notice of Intent on 17 November 2009 and supplemental information on 22 March 2010, requesting coverage under General Order No. R5-2008-0149, General Waste Discharge Requirements for In-Situ Groundwater Remediation at Sites with Volatile Organic Compounds, Nitrogen Compounds, Perchlorate, Pesticides, Semi-Volatile Compounds and/or Petroleum Compounds. Based on information in the submittals, it is our determination that this project meets the required conditions to be approved under Order R5-2008-0149. You are assigned Order No. R5-2008-0149-016.

Project Location:

The project is in the City of Dixon in Solano County, T7N, R1E, S24, Diablo B&M. The assessor parcel number is 0116-040-020.

Project Description:

Vehicle fueling operations at the City of Dixon's Municipal Service Center has caused a pollution of soil and groundwater by petroleum constituents. The primary constituents are total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tert-butyl ether (MtBE). The petroleum impacts were found during removal of underground storage tanks (UST) at the site in 1992. From 1992 to present a number of soil and groundwater investigations have been completed. Limited remedial measures have been conducted in the past including soil overexcavation, soil vapor extraction, and groundwater pump and treat. Although the previous remedial efforts were moderately successful, it has been determined that additional remedial efforts are required to more expeditiously and cost-effectively clean up the impacts to soil and groundwater.

The Discharger has proposed to conduct a limited pilot study, to be followed by full implementation depending upon the success of the pilot study, for remediating the existing petroleum impacts using in-situ chemical oxidation. The Discharger proposes to inject sodium persulfate, and an approved biocide should biological fouling of the injection wells occur, at various locations within the identified boundary seen in the attached Figure 7.

California Environmental Protection Agency



The Discharger will also be conducting the applicable sampling and reporting. Adequate fail-safe alternates are contained within the Discharger's proposal, should adverse water quality conditions, such as the creation of Cr+6, occur.

No adverse comments were received regarding the subject Order during the 30-day public comment period ending on 31 May 2010.

General Information:

1. The project will be operated in accordance with the requirements contained in the General Order No. R5-2008-0149 and in accordance with the information submitted in the Notice of Intent, and otherwise as specified in this Notice of Applicability.
2. The required annual fee (as specified in the annual billing you will receive from the State Water Resources Control Board) shall be submitted until this Notice of Applicability is officially revoked.
3. Injection of materials other than those specified in the Notice of Intent into the subsurface is prohibited, unless analysis as specified in Order No. R5-2008-0149 of the material is provided and approval is given by Board staff.
4. Failure to abide by the conditions of the General Order and this Notice of Applicability can result in enforcement actions as authorized by provisions of the California Water Code.
5. The Discharger shall comply with the attached Monitoring and Reporting Program, and any revisions thereto as ordered by the Executive Officer or directed by Region staff.

If you have any questions regarding this matter, please call Jim Munch at (916) 464-4618 or he can be reached by e-mail at jmunch@waterboards.ca.gov.

PAMELA C. CREEDON
Executive Officer

Attachments

cc: Misty Kaltreider, Solano Department of Resource Management, Fairfield
Robert Fagerness, Central Valley Environmental, Inc., Fair Oaks

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2008-0149-016

FOR
IN-SITU GROUNDWATER REMEDIATION AT SITES WITH VOLATILE ORGANIC
COMPOUNDS, NITROGEN COMPOUNDS, PERCHLORATE, PESTICIDES,
SEMI-VOLATILE COMPOUNDS AND/OR PETROLEUM HYDROCARBONS

FOR
CITY OF DIXON
CITY OF DIXON MUNICIPAL SERVICE CENTER
285 EAST CHESTNUT STREET, DIXON
SOLANO COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring an in-situ groundwater treatment system. This MRP is issued pursuant to California Water Code section 13267, and has been prepared based on Attachment C, a part of General Order R5-2008-0149.

No changes to this MRP shall be implemented unless and until a revised MRP is issued by the Executive Officer of the Central Valley Water Board (Board). As appropriate, Board staff shall approve specific sample station locations prior to implementation of sampling activities.

PROJECT

1. **Parties Submitting a Notice of Intent under General Order R5-2008-0149:** The City of Dixon (hereafter Discharger) and their environmental consultant, Central Valley Environmental, Inc.
2. **Project Location:** The project is in the City of Dixon in Solano County, T7N, R1E, S24, Diablo B&M. The assessor parcel number is 0116-040-020.
3. **Project Description:** Vehicle fueling operations at the City of Dixon's Municipal Service Center have caused a pollution of soil and groundwater by petroleum constituents. The primary constituents are total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tert-butyl ether (MtBE). The petroleum impacts were found during removal of underground storage tanks (UST) at the site in 1992. From 1992 to present a number of soil and groundwater investigations have been completed. Limited remedial measures have been conducted in the past that include soil overexcavation, soil vapor extraction, and groundwater pump and treat. Although the previous remedial efforts were moderately successful, it has been determined that additional remedial efforts are required to more expeditiously and cost-effectively needed to clean up the impacts to soil and groundwater.

The Discharger has proposed to conduct a limited pilot study, to be followed by full implementation depending upon the success of the pilot study, for remediating the existing petroleum impacts using in-situ chemical oxidation. The Discharger proposes to inject

sodium persulfate, and an approved biocide should biological fouling of the injection wells occur, at various locations within the identified boundary seen in the attached Figure 7. The Discharger will also be conducting the applicable sampling and reporting. Adequate fail-safe alternates are contained within the Dischargers proposal, should adverse water quality conditions, such as the creation of Cr+6, occur.

LEGAL REQUIREMENTS

4. CWC section 13267 states, in relevant part:

(a) A regional board ... in connection with any action relating to any plan or requirement authorized by this division, may investigate the quality of any waters of the state within its region.

(b)(1) In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region ... shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

The Discharger has submitted a Notice of Intent to the Board indicating that they are responsible for the project subject to Order R5-2008-0149. The reports required herein are necessary to ensure compliance with Order R5-2008-0149.

5. CWC section 13268 states, in relevant part:

(a)(1) Any person failing or refusing to furnish technical or monitoring program reports ... or falsifying any information provided therein, is guilty of a misdemeanor, and may be liable civilly in accordance with subdivision (b).

...

(b)(1) Civil liability may be administratively imposed by a regional board in accordance with Article 2.5 (commencing with Section 13323) of Chapter 5 for a violation of subdivision (a) in an amount which shall not exceed one thousand dollars (\$1,000) for each day in which the violation occurs.

...

(c) Any person discharging hazardous waste, as defined in Section 25117 of the Health and Safety Code, who knowingly fails or refuses to furnish technical or monitoring program reports as required by subdivision (b) of Section 13267, or who knowingly falsifies any information provided in those technical or monitoring program reports, is guilty of a misdemeanor, may be civilly liable in accordance with subdivision (d)...

(d)(1) Civil liability may be administratively imposed by a regional board in accordance with Article 2.5 (commencing with Section 13323) of Chapter 5 for a violation of subdivision (c) in an amount which shall not exceed five thousand dollars (\$5,000) for each day in which the violation occurs.

It is Hereby Ordered that the Discharger shall comply with the following Monitoring and Reporting Program requirements:

GENERAL REQUIREMENTS

1. All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

GROUNDWATER MONITORING

2. As shown on Figure 7, there are 11 monitoring wells and 4 combined extraction/monitoring wells, associated with this site. The groundwater monitoring program for these wells and any treatment system wells installed subsequent to the issuance of this MRP, shall follow the schedule below. Monitoring wells with free phase petroleum product or visible sheen shall be monitored, at a minimum, for product thickness and depth to water. The volume of extracted groundwater and free phase product, if applicable, shall also be provided in quarterly monitoring reports. Extraction methods to be approved by Region Board staff. Sample collection and analysis shall follow standard EPA protocol.

The monitoring wells, extraction wells and/or injection wells shall be sampled according to the schedule in Table 1 and the samples analyzed by the methods in Table 2, as follows:

Table 1: Sampling Frequency and Constituent Suite

Well Number ¹	Frequency ²	Constituent Suite(s) ³	Monitoring Objective
MW-1 to MW-14 ⁷	Bi-weekly, monthly, quarterly	TPHg, BTEX, MTBE, other oxygenates as determined necessary	Compliance ⁴
MW-1 to MW-14 ⁷	Bi-weekly, monthly, quarterly	TPHg, BTEX, MTBE, other oxygenates as determined necessary	Treatment Zone ⁵
MW-1 to MW-14 ⁷	Bi-weekly, monthly, quarterly	TPHg, BTEX, MTBE, other oxygenates as determined necessary	Transition Zone ⁶

¹ Well numbers as shown on Figure 7.

² i.e., weekly, monthly, quarterly, annually, other – TBD by Regional Board staff based on site remedial needs.

³ Constituent suite components listed in Table 2.

⁴ Wells used to determine compliance with water groundwater limitations.

⁵ Wells sampled to evaluate in-situ bioremediation progress inside the treatment zone.

⁶ Wells sampled to evaluate migration of pollutants within the treatment zone.

⁷ Wells to be determined by Regional Board staff individually for pilot test and, as applicable, for full remediation.

Table 2: Analytical Methods

Constituent	Method ¹	Maximum Practical Quantitation Limit (ug/L) ²
Suite A		
Petroleum Hydrocarbon Compounds (to include TPHg, BTEX, MTBE, TBA)	EPA 8260B	0.5
Sulfate	ICP/6010	
Suite B		
Iron, Total and Dissolved	EPA 200.7	100
Ferrous and Ferric Iron	EPA 200, 6020 or SM3000	100
Hexavalent Chromium	EPA 7199	0.01
Arsenic	ICP/MS	10
Metals, Total and Dissolved ³	EPA 200.7, 200.8	Various

¹ Or an equivalent EPA Method or Standard Method that achieves the maximum Practical Quantitation Limit.

² All concentrations between the Method Detection Limit and the Practical Quantitation Limit shall be reported as an estimated value.

³ Metals include barium cadmium, calcium, total chromium, copper, lead, magnesium, manganese, mercury, molybdenum, nickel and silica.

FIELD SAMPLING

- In addition to the above sampling and analysis, field sampling and analysis shall be conducted each time a monitoring well or extraction well is sampled. The sampling and analysis of field parameters shall be as specified in Table 3.

Table 3: Field Sampling Requirements

Parameters	Units	Type of Sample
Groundwater Elevation	Feet, Mean Sea Level	Measurement
Oxidation-Reduction Potential	Millivolts	Grab
Electrical Conductivity	uhmos/cm	Grab
Dissolved Oxygen	mg/L	Grab
pH	pH Units (to 0.1 units)	Grab

Field test instruments (such as those used to test pH and dissolved oxygen) may be used provided that:

- The operator is trained in proper use and maintenance of the instruments;
- The instruments are calibrated prior to each monitoring event;
- Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
- Field calibration reports are submitted as described in item (b) of the "Reporting" section of this MRP.

DISCHARGE MONITORING

4. The Discharger shall monitor daily the discharge of water and amendments that are injected into the groundwater according to the requirements specified in Table 4. Each amendment addition shall be recorded individually, along with information regarding the time period over which the amendment was injected into the aquifer.

Table 4: Discharge Monitoring Requirements

Parameters	Units	Type of Sample
Injected Volume	gallons per day	Meter
Amendment(s) Added	kilograms per day	Measured
Biocide Added	kilograms per day	Measured

AMENDMENT ANALYSIS

5. Prior to use, all amendments proposed, which include sodium persulfate, applicable biocides, and others proposed with approval by Regional Board staff, shall be analyzed for the constituents listed in Table 5. The analysis should be done on the pure amendment and on a mixture of the amendment and deionized water at the estimated concentration that would be injected during the pilot project.

Table 5: Amendment Analytical Requirements

Constituent	Method ¹	Maximum Practical Quantitation Limit (ug/L) ²
General Minerals ³	Various	Various
Metals, Total and Dissolved ⁴	EPA 200.7, 200.8	Various
Total Dissolved Solids	EPA 160.1	10,000

¹ Or an equivalent EPA Method or Standard Method that achieves the maximum Practical Quantitation Limit.

² All concentrations between the Method Detection Limit and the Practical Quantitation Limit shall be reported, and reported as an estimated value.

³ Alkalinity, bicarbonate, potassium, chloride, sulfate, total hardness, nitrate, nitrite, ammonia.

⁴ Metals include arsenic, barium, cadmium, calcium, total chromium, copper, iron, lead, manganese, magnesium, mercury, molybdenum, nickel, selenium and silica.

REPORTING

6. When reporting the data, the Discharger shall arrange the information in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner as to illustrate clearly the compliance with this Order. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall also be reported to the Regional Board.

7. As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, all reports shall be prepared by a registered professional or their subordinate and signed by the registered professional.
8. The Discharger shall submit quarterly electronic data reports, which conform to the requirements of the California Code of Regulations, Title 23, Division 3, Chapter 30. The quarterly reports shall be submitted electronically over the internet to the Geotracker database system by the **30th day of the month** following the end of each calendar quarter by **30 April, 30 July, 30 October, and 30 January** until such time as the Executive Officer determines that the reports are no longer necessary. Hard copies of quarterly reports shall also be submitted to the Regional Board by the 30th day of the month following the end of each calendar quarter. 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, and whether the pollutant plume(s) is delineated;
 - (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) pollutant concentration maps for all groundwater zones, if applicable;
 - (e) 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;
 - (f) a table showing historical lateral and vertical (if applicable) flow directions and gradients;
 - (g) cumulative data tables containing the water quality analytical results and depth to groundwater;
 - (h) a copy of the laboratory analytical data report, which may be submitted in an electronic format;
 - (i) the status of any ongoing remediation, including an estimate of the cumulative mass of pollutant removed from the subsurface, system operating time, the effectiveness of the remediation system, and any field notes pertaining to the operation and maintenance of the system; and
 - (j) if applicable, the reasons for and duration of all interruptions in the operation of any remediation system, and actions planned or taken to correct and prevent interruptions.

- (k) a discussion of the long-term trends in the concentrations of the pollutants in the groundwater monitoring wells;
 - (l) an analysis of whether the pollutant plume is being effectively treated;
 - (m) a description of all remedial activities conducted during the year, an analysis of their effectiveness in removing the pollutants, and plans to improve remediation system effectiveness;
 - (n) an identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
 - (o) if desired, a proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.
9. A letter transmitting the monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Ordered by:

original signed by
PAMELA C. CREEDON Executive Officer

18 October 2010
(Date)