



EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIGUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

19 September 2013

Mr. Joseph Niland
Lincoln Center Environmental Remediation Trust
3043 Gold Canal Drive Suite 201
Rancho Cordova, CA 95670.

NOTICE OF APPLICABILITY OF GENERAL ORDER NO. R5-2008-0149—LINCOLN VILLAGE SHOPPING CENTER, NORTH GETTYSBURG PLACE & DOUGLAS RD, STOCKTON, IN-SITU REMEDIATION OF TETRACHLOROETHENE, SAN JOAQUIN COUNTY

The Lincoln Center Environmental Remediation Trust (the Trust) submitted a Notice of Intent, dated 15 May 2013, requested 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 your submittal, it is our determination that this project meets the required conditions to be approved under order No. R5-2008-0149. All of the requirements contained in the General Order are applicable to your project. You are assigned Order No. R5-2008-0149-046.

Project Location:

The project is located in the City of Stockton and San Joaquin County, California. Township 2N; Range 6E; Section 21; Assessor's Parcel No. 097-410-29. Latitude 38°0'29.57"N; Longitude 121°19'19.61"W.

Project Description:

Tetrachloroethene (PCE) was released to the soil and groundwater through breaks in the sanitary sewer lines that serviced historical dry cleaning businesses in the Lincoln Village Shopping Center. Hazardous substances tetrachloroethene (PCE) and PCE degradation products trichloroethene (TCE), 1,2-dichloroethene (cis-1,2-DCE and trans-1,2-DCE) and vinyl chloride are the primary constituents historically reported in the groundwater, soil and soil vapor at the site. Impacts to groundwater associated with these releases extend from Gettysburg Place to Inglewood Avenue in groundwater to a maximum depth of 145 feet below ground surface (ft bgs). To date, five phases of interim remedial activities have been implemented at

the Site to reduce the concentrations of PCE and degradation products in Site soils and groundwater.

In May 2013, the Trust submitted an In Situ Chemical Oxidation Pilot Study Work Plan that proposes conducting a pilot test using in-situ chemical oxidation (ISCO) with aqueous potassium permanganate to treat the PCE-impacted groundwater. The pilot test will target remaining on-Site, shallow groundwater impacts with 4 dual-nested injection well pairs spaced 40 feet apart with each well pair screened at approximate depths of 35 to 45 feet below bgs and 65 to 75 feet bgs. Approximately 12,000 gallons of 2 gram per liter (0.2% by weight) potassium permanganate solution will be injected into each wellhead over an injection period of approximately 40 hours. The Work Plan also proposes installation of 3 dual-nested monitoring wells and 1 single-completion monitoring well down-gradient for inclusion in the Monitoring and Reporting Plan (MRP).

As part of this Order, groundwater monitoring and reporting will be performed in accordance with the attached MRP to confirm the extent of the treatment area and efficacy of the treatment, and to verify that no adverse groundwater impacts occur due to ISCO treatment. The MRP includes 4 dual-nested injection well pairs and 16 groundwater monitoring wells which include treatment zone, transition zone, and compliance zone wells.

The Trust will be conducting sampling and reporting the results as described in the attached MRP. Upon completion of the pilot test, the Trust will additionally prepare and submit a report to document the findings of the ISCO pilot test. If the Discharger desires to conduct longer-term in-situ remediation of the groundwater, a revised Notice of Intent must be submitted and a new Notice of Applicability received prior to proceeding with the additional remediation.

One comment(s) was received and satisfactorily addressed on the Tentative Notice of Applicability and Monitoring and Reporting Program during the 30-day public comment period ending 13 September 2013.


General Information:

1. The project will be operated in accordance with the requirements contained in the General Order and in accordance with the information submitted in the Notice of Intent, and *In Situ Chemical Oxidation Pilot Study Work Plan* dated 15 May 2013.
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 rescinded.
3. Injection of materials other than potassium permanganate into the subsurface is prohibited.
4. Failure to abide by the conditions of the General Order could result in an enforcement action as authorized by provisions of the California Water Code.
5. The project will implement the final contingency plan included with the *In Situ Chemical Oxidation Pilot Study Work Plan* (Section 4.6.4) within 30-days of it being triggered. The General Order requires a contingency plan for corrective actions should water quality exceed the requirements of the Order at the point of compliance. The General

Order prohibits concentrations of metals, TDS, or electrical conductivity 20% greater than their respective background concentrations, or exceedances of limit values at points of compliance. As a contingency plan, the Discharger will cease the potassium permanganate injections, implement more frequent monitoring to confirm results, and if declining trends are not noted, submit a NOI to inject a neutralizing solution or reducing agent. Since the pilot test injections are occurring within the capture zone of the existing groundwater extraction and treatment system (GWETS) and up-gradient of two sets of extraction wells (turned off during the pilot test) the GWETS may also act as a contingency if potassium permanganate and/or secondary breakdown products in exceedance of 20% of background are found in groundwater samples collected in the down-gradient wells.

6. The Discharger shall comply with the attached Monitoring and Reporting Program, Order No. R5-2008-0149-046, and any revisions thereto as ordered by the Executive Officer.

If you have any questions regarding this matter, please call Roberto Cervantes at (916) 464-4682 or contact him at rcervantes@waterboards.ca.gov.


for PAMELA C. CREEDON
Executive Officer

Attachments

c: Della Kramer, Central Valley Water Board, Rancho Cordova

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2008-0149-046

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

LINCOLN CENTER ENVIRONMENTAL REMEDIATION TRUST
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring the progress of potassium permanganate as an in-situ application to remove tetrachloroethene (PCE) from groundwater. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. As appropriate, California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) staff shall approve sample station locations prior to implementation of sampling activities.

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

As shown in Figure 1, there are 4 dual-nested injection well pairs and 16 monitoring wells associated with the in-situ chemical oxidation (ISCO) Pilot Study at 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. Sample collection and analysis shall follow standard EPA protocol and sample analyses shall be completed by California State-certified laboratory.

The monitoring wells shall be sampled according to the schedule in Table 1 and the samples analyzed by the methods in Table 2, as shown below.

Table 1: Sampling Frequency and Objectives

Well Number ¹	Frequency	Constituent Suite(s) ²	Monitoring Objective
All wells	Prior to initial injection	A, B	Background ³
A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, B1, MW-100A, MW-102A	2 weeks and Monthly following initial injection	A	Treatment Zone ⁴
	Quarterly	B	
CHMW-004A, CHMW-005A, MW-101A, GEW-8A, GEW-9A	Quarterly	A, B	Transition Zone ⁵
PT-11, MW-128A	Quarterly	A, B	Compliance ⁶ (Up-gradient & Down-gradient)

¹ Well identification number, as shown on Figure 1.

² Constituent suite components listed in Table 2.

³ Monitoring event used to develop background concentrations.

⁴ Wells sampled to evaluate remediation progress inside the treatment zone.

⁵ Wells sample to evaluate migration of pollutants within the transition zone.

⁶ Wells used to determine compliance with groundwater limitations.

Table 2: Analytical Methods and Constituent Suite

Constituent	Analytical Method ¹	Maximum Practical Quantitation Limit ²
Suite A		
Volatile Organic Compounds	EPA 8260B	0.5 µg/L
Potassium Permanganate	Standard Method 4500-KMnO ₄	5 mg/L
Suite B		
Cations ³	EPA 6010B/300.0	0.5 µg/L
Anions ⁴	EPA 6010B/300.0	200-300 µg/L
Total Dissolved Solids (TDS)	EPA 160.1	50 mg/L
Metals, dissolved ⁵	EPA 200.7, 200.8	Various
Hexavalent chromium ⁶	EPA 7196	0.50 µg/L

¹ Unless stated otherwise, must use USEPA Methods or an equivalent analytical method that achieves the Maximum Practical Quantitation Limit and has been approved by Central Valley Water Board staff.

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

³ Cations include calcium, magnesium, sodium, potassium, and manganese.

⁴ Anions include chloride, sulfate, and fluoride.

⁵ Dissolved metals include arsenic, barium, cadmium, total chromium, copper, lead, iron, manganese, mercury, molybdenum, nickel, silica, and selenium.

⁶ If the sample has visual evidence (i.e. pink or purple color) of residual permanganate, hexavalent chromium will instead be analyzed using EPA 7199 due to interference with EPA 7196.

FIELD SAMPLING

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

Table 3: Field Sampling Requirements

Parameters	Units	Sample Type
Groundwater Elevation	Feet, mean sea level (ft msl)	Measurement
Oxidation-reduction potential (ORP)	Millivolts (mV)	Grab
Electrical conductivity (EC)	µmhos/cm	Grab
pH	pH units (to 0.1 units)	Grab
Temperature	°C	Grab
Volume purged	Gallons	Measurement

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

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

DISCHARGE MONITORING

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	Sample Type
Injected volume	Gallons per day (gpd)	Meter
Amendment(s) added	Kilograms per day	Measured

AMENDMENT ANALYSIS

Prior to use, amendments shall be analyzed for the constituents listed in Table 5. The analysis should be done on a mixture of the amendment and deionized water at the estimated concentration that would be injected during the pilot test.

Table 5: Amendment Analytical Requirements

Constituent	Analytical Method ¹	Maximum Practical Quantitation Limit ²
Volatile Organic Compounds	EPA 8260B	0.5 µg/L
General minerals ³	Various	Various
Metals, dissolved ⁴	EPA 200.7, 200.8	Various
Semi-volatile Organic Compounds	EPA 8270	5.0 µg/L
Total Dissolved Solids (TDS)	EPA 160.1	10,000 µg/L
pH	Meter	NA
Electrical Conductivity (EC)	Meter	NA

¹ Unless stated otherwise, must use USEPA Methods or an equivalent analytical method that achieves the Maximum Practical Quantitation Limit and has been approved by Central Valley Water Board staff.

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

³ General minerals include alkalinity, bicarbonate, potassium, chloride, sulfate, total hardness, nitrate, nitrite, and ammonia.

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

ESTABLISHMENT OF BASELINE CONCENTRATION VALUES

The Discharger shall develop baseline values for concentrations of PCE, metals, total dissolved solids and electrical conductivity in groundwater and following the procedures found in CCR Section 20415(e) (10). The Discharger shall complete a baseline monitoring event in accordance with Tables 1 and 2 to establish groundwater quality conditions prior to the implementation of the ISCO pilot test.

REPORTING

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 Central Valley Water Board.

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.

The Discharger shall submit two (2) 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 1st day of the second month following the end of each calendar quarter (i.e., by 1 February, 1 May, 1 August, or 1 November), or a date approved in writing by Central Valley Water Board staff.

Hard copies of quarterly reports shall be submitted to the Central Valley Water Board by the 1st day of the second month following the end of each calendar quarter (i.e., by 1 February, 1 May, 1 August, and 1 November) or a date approved in writing by Central Valley Water Board staff. Each quarterly report shall include the following minimum information:

- (a) description and discussion of the groundwater sampling event and results, including trends in the concentrations of pollutants, by-products of the injectant, how and when samples were collected, and whether the pollutant plumes are 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, and groundwater elevations in the wells, 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 remediation, operating time, effectiveness of the treatment, and prediction of when water quality objectives will be met; and
- (j) a description of amendment analysis and injection activities including quantities of water and amendments injected into the groundwater, along with time period over which the amendments were injected into the aquifer.

An Annual Report shall be submitted to the Central Valley Water Board by 1 February of each year. This report shall contain an evaluation of the effectiveness and progress of the investigation and remediation, and may be substituted for the fourth quarter monitoring report. The Annual Report shall contain the following minimum information:

- a) both tabular and graphical summaries of all data obtained during the year;
- b) groundwater contour maps and pollutant concentration maps containing all data obtained during the previous year;
- c) a discussion of the long-term trends in the concentrations of the pollutants in the groundwater monitoring wells;
- d) an analysis of whether the pollutant plume is being effectively treated;
- e) 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;
- f) an identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
- g) if desired, a proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.

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:


for PAMELA C. CREEDON, Executive Officer

9/18/13

(Date)