



California Regional Water Quality Control Board Central Valley Region

Katherine Hart, Chair



Linda S. Adams
Secretary for
Environmental
Protection

11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
Phone (916) 464-3291 • FAX (916) 464-4645
<http://www.waterboards.ca.gov/centralvalley>

Arnold
Schwarzenegger
Governor

30 September 2010

Mr. Thomas Tse
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826-3200

NOTICE OF APPLICABILITY OF GENERAL ORDER NO. R5-2008-0149 – ORLAND CLEANERS SITE, 726 FIFTH STREET, ORLAND, IN-SITU REMEDIATION OF TETRACHLORETHYLENE, GLENN COUNTY

URS Corporation submitted, on behalf of the Department of Toxic Substances Control (DTSC), a Notice of Intent, dated 29 June 2009, 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 Notice of Intent, it is our determination that your proposed project meets the required conditions to operate under Order No. 2008-0149. All of the requirements contained in the general order are applicable to your project. You are assigned Order No. R5-2008-0149-013.

Project Location:

The project is in the City of Orland, Glenn County, Latitude 39.753484° N, Longitude 122.194557° W. Assessor's Parcel No. 008-0392-013. In-situ treatment, by injection of emulsified soybean (EOS) oil, will be conducted in the public right-of-way on Fifth Street, Yolo Street and Colusa Street. The injection boring locations are shown on Figure 1.

Project Description:

Dry cleaning operations from the 1940s to 1988 at Orland Dry Cleaners in Orland, Glenn County, caused pollution of groundwater. From 1988 through 1992, the dry-cleaning operations were contracted offsite. Since May 1992, dry-cleaning operations resumed on Site, using fully self-contained dry-cleaning machine. Prior to 1988, spent solvent was discharged into a sump located within the building. The primary pollutant of concern is tetrachlorethylene (PCE). PCE impacts were discovered by the Central Valley Water Board and Glenn County Environmental Health Department in 1991. In 1995, the Central Valley Water Board and DTSC signed a Settlement Agreement and Site Release with the current and previous owners and operators of Orland Cleaners. The agreement identified DTSC as the agency that would oversee site cleanup.

California Environmental Protection Agency

Domestic and public water supply wells were sampled in 1996 and 1998. Results indicated that by 1998, 29 residential wells were impacted by PCE. Several of the properties were subsequently connected to the public water supply or fitted with granular activated carbon treatment. Public water supply wells City Well #1 and #2 are in operation, but not impacted. Sentinel monitoring wells upgradient of these wells are monitored regularly. Groundwater investigations continued from 1999 through 2008.

PCE concentrations in groundwater samples collected in May 2008 exceed the Water Quality Objective of 0.6 µg/L in the vicinity of monitoring wells MW-19, immediately downgradient of Orland Cleaners, and at MW-17, approximately 1400 feet downgradient. The PCE plume extends approximately 2.5 miles downgradient (southeast) of the dry cleaner and is approximately 1600 feet wide. Groundwater is present at a depth of 17 feet below ground surface throughout the area.

A pilot-scale test of in-situ remediation using emulsified soybean (EOS) oil was conducted from October 2005 to February 2006 to determine whether EOS would be effective in enhancing reductive dechlorination of PCE. Groundwater monitoring well MW-1A was sampled to assess conditions before the injection, and at 55 days and 86 days after the EOS was injected. Depth-discrete groundwater sampling downgradient of MW-1A was also conducted. Results of the pilot test indicated that the initial 36 µg/L of PCE in MW-1A was transformed to cis-1,2-DCE five weeks following the injection of EOS. After 1.5 years, groundwater monitoring results indicate that further reduction and chemical breakdown progressed and removed chlorinated VOCs to non-detectable concentrations.

For this project, DTSC proposes installing twenty injection points in two areas of high PCE concentrations, two additional compliance monitoring wells, one additional transition zone well, and one additional permanent upgradient (background) monitoring well. The monitoring well network consists of one upgradient well, two compliance wells, two treatment zone wells, and one transition zone well (see Figure 1). Existing monitoring wells MW-3, MW-10, and MW-13 will not be used to evaluate effectiveness of the treatment. MW-3 is too far downgradient to be used for compliance monitoring; MW-10 monitors a shallower interval than the treatment interval; and MW-13 is cross-gradient to the plume, as evidenced by a lack of detections of PCE throughout its history. Because the project is restricted to public rights-of-way and the southernmost transition zone is occupied by private residences, no transition zone well is planned for the southernmost treatment area.

Implementation will entail injection of a 10% mixture of EOS in water (e.g., 5 gallons of EOS per 50 gallons of water) at depths of 15, 25, 35, and 45 feet below ground surface at each injection point. A total of 500 gallons of undiluted EOS is estimated to be used to treat groundwater, in two separate areas representing about 8.5 million cubic feet of aquifer volume.

DTSC will collect background data for pollutants of concern and secondary water quality constituents, perform a post-treatment efficiency assessment, and submit a report of the preliminary results no later than 150 days after injection of EOS. DTSC

will also be conducting sampling and reporting as described in the attached Groundwater Monitoring and Reporting Program.

A contingency remediation plan shall be implemented as follows:

- Newly installed monitoring wells MW-16 through MW-19, and proposed wells MW-20 and MW-21 will be sampled prior to the introduction of EOS. If groundwater at the compliance wells listed in Table 1 of the Monitoring and Reporting Program attached to the Notice of Applicability, and any revisions thereto, contain concentrations of metals, total dissolved solids, or electrical conductivity that are more than 20% greater than their respective 95% UCL concentrations, for three consecutive monitoring events following introduction of EOS, then the contingency remedial action will be triggered.
- Batch groundwater extraction will be performed at the compliance well or wells where the exceedance occurs, and at the transition well located upgradient of the exceeding compliance well. Approximately 6,000 gallons of water would be pumped from each of the wells over a three-day period.
- Extracted groundwater would be disposed at the Hamilton City Wastewater Treatment plant, at no cost.
- After one week, the compliance well(s) would be sampled to determine whether the water quality parameters are at or below the trigger level. If not, the batch extraction and sampling process would be repeated on a weekly basis until compliance is achieved.
- If monitoring results indicate that elevated levels of dissolved methane are present in groundwater for three consecutive monitoring periods following introduction of EOS, shallow soil gas sampling to a depth of approximately 5 feet bgs will be performed above the treatment area where high methane concentrations are reported, and near any sensitive receptors. If soil gas sampling indicates an unacceptable risk to human health, mitigation measures will be implemented. The trigger level for such measures is the DTSC action level for methane in schools (10% of the Lower Explosive Limit, or 5,000 parts per billion/volume).
- Mitigation measures will include installation of passive soil venting wells, followed by additional soil gas sampling to confirm that methane concentrations have declined to below the trigger level. If necessary, additional batch extractions of groundwater, as described above, will be implemented to reduce methane concentrations in soil vapors.

Central Valley Water Board staff reviewed the California Environmental Quality Act (CEQA) document submitted with the Notice of Intent for this application, and found no additional issues of concern.

General Requirements:

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.

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 emulsified soybean oil and water 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 as part of the Notice of Intent.
6. The Discharger shall comply with the attached Monitoring and Reporting Program, Order No. R5-2008-0149-013, and any revisions thereto as ordered by the Executive Officer.

If you have any questions regarding this matter, please call Kathryn Dominic at (916) 464-1588 or by email at kdominic@waterboards.ca.gov.


PAMELA C. CREEDON
Executive Officer

Attachments:

Figure 1 - Site Map
Monitoring and Reporting Order
Fact Sheet

cc: Della Kramer, Central Valley Water Board, Sacramento
Kevin Backus, Glenn County Environmental Health Department, Willows
Scott Rice, URS Corporation, Sacramento

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING ORDER NO. R5-2008-0149-013

FOR
DEPARTMENT OF TOXIC SUBSTANCES CONTROL
ORLAND DRY CLEANERS SITE
726 FIFTH STREET, ORLAND
IN-SITU REMEDIATION OF TETRACHLORETHYLENE
GLENN COUNTY

This Monitoring and Reporting Order (Order) describes requirements for monitoring the effects of in-situ remedial treatment to reduce concentrations of volatile organic compounds in groundwater, in accordance with General Order No. R5-2008-0149, In-Situ Groundwater Remediation at Sites with Volatile Organic Compounds, Nitrogen Compounds, Perchlorate, Pesticides, Semi-Volatile Compounds and/or Petroleum Compounds. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this Order unless and until a revised MRP is issued by the Executive Officer.

GROUNDWATER MONITORING

1. There are 6 monitoring wells and 20 injection locations associated with this project. The groundwater monitoring program for these wells and any wells installed subsequent to the issuance of this Order shall follow the schedule below. The volume of groundwater purged for sampling purposes shall be provided in quarterly reports. Sample collection and analysis shall follow standard EPA protocol.
2. The monitoring 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 Monitoring Objectives

Well Number ¹	Frequency ²	Monitoring Objective
MW-16, MW-21	Quarterly	Compliance ³
MW-17, MW-19	Quarterly	Treatment Zone ⁴
MW-18	Quarterly	Transition Zone
MW-20	Annually	Background ⁵

- 1 Well numbers as shown on Figure 1.
- 2 Prior to startup and stated frequency thereafter
- 3 Wells used to determine compliance with water groundwater limitations
- 4 Wells sampled to evaluate in-situ remediation progress inside the treatment zone
- 5 Well used to develop background concentrations

Table 2: Analytical Methods

Constituent	Method ¹	Maximum Practical Quantitation Limit ²
Volatile Organic Compounds	EPA Method 8260B	0.5 µg/L
Anions	EPA Method E300.1	0.1 – 0.2 mg/L
Sulfide	EPA Method E376.2	0.1 mg/L
Carbon dioxide, methane, ethene, and ethane	EPA Method RSK 176/3810	0.010 mg/L
Total organic carbon	EPA Method 415.2/9060A	1.0 mg/L
Dissolved organic carbon (filtered)	EPA Method 415.2/9060A	1.0 mg/L
Total Dissolved Solids	EPA Method E160.1	50 mg/L
Dissolved CAM 17 metals, sodium and manganese	EPA Method 6010B	0.005 mg/L

¹ Or an equivalent EPA 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 trace.

- All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each sample shall be recorded on the sample chain of custody form and submitted with each monitoring report.

FIELD SAMPLING

- In addition to the above sampling and analysis, field sampling and analysis shall be conducted each time a monitor 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	±0.01 Feet, Mean Sea Level	Measurement
Oxidation/Reduction Potential	millivolts	Grab
Dissolved Ferrous Iron (Fe ²⁺)	0.1 mg/L	Grab
Electrical Conductivity	µmhos/cm	Grab
Oxidation reduction potential	millivolts	Grab
Temperature	°C	Grab
Dissolved Oxygen	mg/L	Grab
pH	pH Units (to 0.1 units)	Grab
Volume Purged	Gallons	Measurement

5. Field test instruments (such as those used to test pH and dissolved oxygen) may be used provided that:
 - a. The operator is trained in proper use and maintenance of the instruments;
 - b. The instruments are calibrated prior to each monitoring event;
 - c. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
 - d. Field instrument calibration reports are submitted as described in item (b) of the
 - e. "Reporting" section of this Order.

Table 4: Discharge Monitoring Requirements

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

ESTABLISHMENT OF BACKGROUND CONCENTRATION VALUES

6. The Discharger shall develop background values for concentrations of anions, sulfide, carbon dioxide, methane, ethene, and ethane, dissolved organic carbon (filtered), Total Dissolved Solids, dissolved CAM 17 metals, sodium and manganese in groundwater by averaging the respective concentrations reported in background well MW-20.

REPORTING

7. 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.
8. 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.
9. 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 1st day of the second month following the end of each calendar

quarter by **1 February, 1 May, 1 August, and 1 November** until such time as the Executive Officer determines that the reports are no longer necessary.

10. Hard copies of quarterly reports shall be submitted to the Regional 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)**. 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 by-products of the injectant 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, 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, 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 flow directions and gradients.
- (g) Cumulative data tables containing 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, including an estimate of the cumulative mass of pollutant removed from the subsurface, operating time, effectiveness of the treatment, and prediction of when water quality objectives will be met.

11. 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 pollutants and by-products of the injectant in the groundwater monitoring wells.

(d) An analysis of whether the pollutant plume is being effectively treated and/or if adverse by-products are being formed.

(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) A n identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.

(g) A proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.

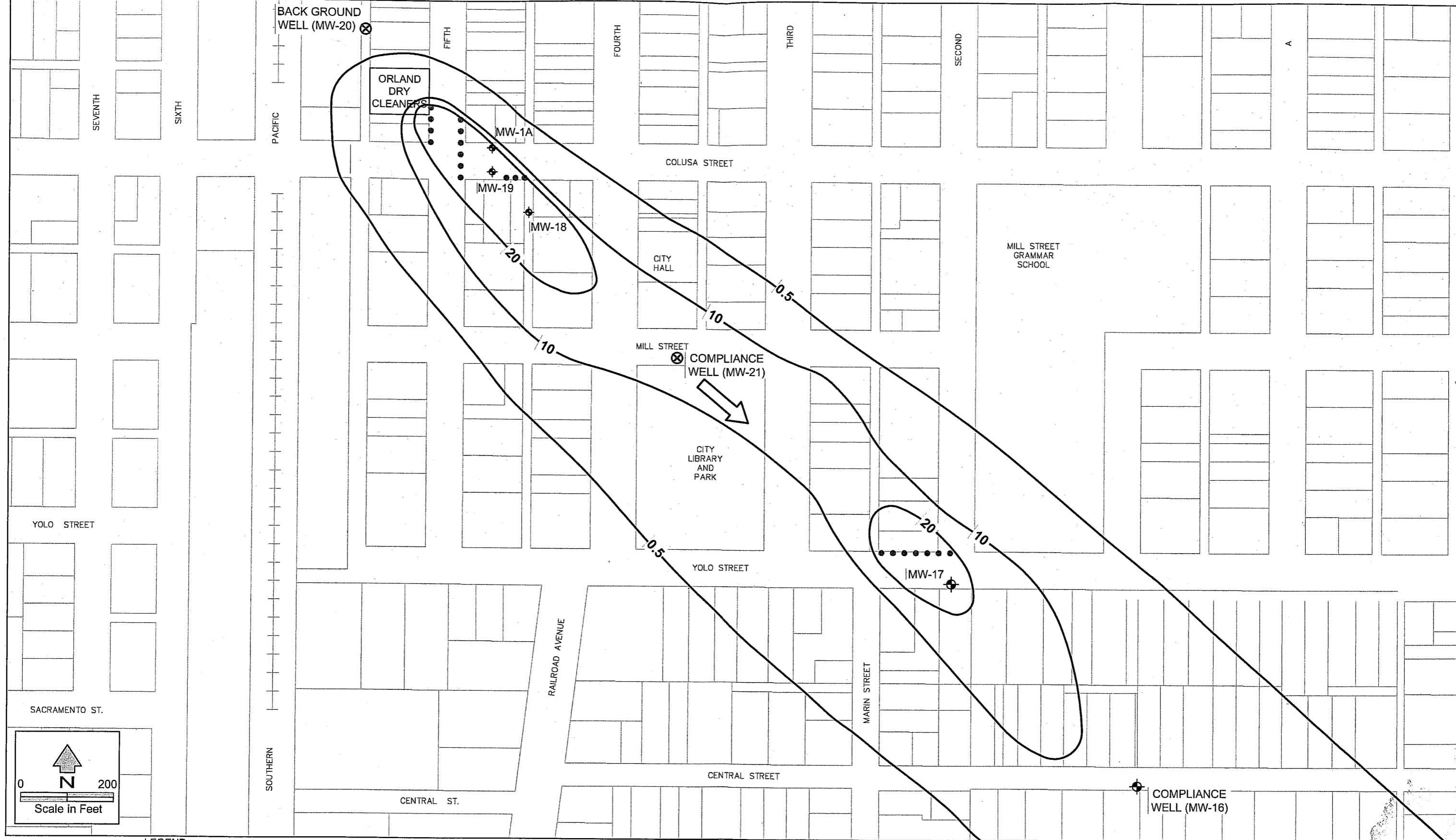
12. A letter transmitting the monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger 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 issuance.

Ordered by: 
for PAMELA C. CREEDON, Executive Officer

9-30-2010

(Date)



- LEGEND**
- ◆ Monitoring Well Location
 - ND PCE was not Detected Above Method Detection Limit
 - Proposed EOS Injection Boring
 - ⊗ Proposed Well Location
 - PCE Isoconcentration in ug/L Samples Collected in May 2010
 - ➔ Groundwater Flow Direction

FIGURE 1
FORMER ORLAND DRY CLEANERS
SITE MAP

