

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

REVISED MONITORING AND REPORTING PROGRAM NO. R5-2008-0149-009

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

FORMER GAYLORD CONTAINER CORPORATION FACILITY, EAST MILL
CONTRA COSTA COUNTY

The former Gaylord Container Corporation Facility, East Mill (hereafter "Site") is located at 2603 Wilbur Avenue in Antioch, California (Figure 1). The Gaylord Site is now owned by Forestar (USA) Real estate Group, Inc. (hereafter referred to as Discharger). In certain areas of the Site, the groundwater has been affected by tetrachloroethene (PCE).

This Revised Monitoring and Reporting Program (MRP) describes requirements for monitoring the progress of the sodium permanganate injection to treat volatile organic compounds in 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, except as noted within this MRP.

On 7 November 2014, the Discharger submitted a request to revise the existing Revised MRP No. R5-2008-0149-009, dated 7 May 2013, for full scale in-situ chemical oxidation (ISCO) treatment of groundwater containing PCE. Central Valley Water Board staff concur that the MRP can be revised due to Site conditions. PES Environmental, Inc. on behalf of the Discharger, has indicated their concurrence with this revised MRP.

GROUNDWATER MONITORING

The ISCO treatment of the PCE plume at the site targeted areas of elevated PCE groundwater concentrations in the interior of the site; within the upper zone and lower zones, PCE groundwater concentrations above 50 micrograms per liter ($\mu\text{g/L}$) and 100 $\mu\text{g/L}$, respectively, were treated. ISCO injections were completed using two (2) permanent injection wells and forty-four (44) temporary direct-push injection points. As shown in Figure 2, there are ten (10) monitoring wells associated with the ISCO post-injection monitoring program. Wells monitored within the ISCO treatment area include two (2) upper zone wells MW-19A and MW-33U and three (3) lower zone wells MW-13L, MW-19B1, MW-23L. Two (2) lower zone transition wells MW-33L and MW-35L (located within 100 feet of the treatment area) and three (3) lower zone compliance wells MW-28L, MW-36L, MW-37L located further downgradient of the treatment area are to be monitored. The groundwater monitoring program for these ten (10) wells located within and downgradient of the treatment area and any new monitoring or injection wells installed subsequent to the issuance of this MRP, specifically for purposes of monitoring the ISCO treatment area(s), shall be monitored and sampled according to the schedule listed

in Table 1. Sample collection and analysis shall follow standard EPA protocol and sample analyses shall be completed by California State-certified laboratory. Samples shall be analyzed by the methods listed in Table 2.

Sample collection and analysis shall follow standard EPA protocol or an approved method acceptable to the Central Valley Water Board staff.

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.

Table 1: Sampling Frequency and Monitoring Objectives

Well Number^{1,2}	Frequency	Monitoring Objective
MW-23L	Annual	Treatment Zone ³
MW-13L, MW-19A, MW-19B1	Semiannually	
MW-33L	Annual	Transition Zone ⁴
MW-35L	Semiannually	
MW-36L, MW-28L, MW-33U	Annual	Compliance Zone ⁵
MW-37L	Semiannually	

- 1 Well numbers as shown on Figure 2.
- 2 All new wells shall be sampled for baseline conditions and quarterly for two years after an injection event for the analytes shown in Table 2. After two years if the concentrations show stable to decreasing trends, the monitoring frequency of these analytes may be reduced to semi-annually with Central Valley Water Board staff concurrence. Semi-annual monitoring and sampling shall occur in the first and third quarters.
- 3 Wells sampled to evaluate in-situ remediation progress inside the treatment zone (within a 20-foot radius from an injection site).
- 4 Wells monitored to evaluate migration of pollutants within the transition zone are within a 20 to 100-foot radius from an injection site pending well location evaluation and Central Valley Water Board staff concurrence.
- 5 Wells used to determine compliance with groundwater limitation are greater than 100-foot radius from an injection.

Table 2: Analytical Methods

Constituent	EPA Analytical Method¹	Maximum Practical Quantitation Limit ²
Volatile organic compounds ³	EPA 8260B	0.5 µg/L
Metals, dissolved ⁴	EPA 200.7, 200.8	Various
Dissolved hexavalent chromium	EPA Method 7199	0.5 µg/L

- 1 If necessary, equivalent analytical methods may be used with the concurrence of the 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 Halogenated VOC's only.
- 4 Metals include dissolved manganese, and dissolved sodium for only lower zone wells.

FIELD SAMPLING

In addition to the above sampling and analysis, field sampling and analysis shall be conducted each time a 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	microSiemens/cm	Grab
Dissolved oxygen	mg/L	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 and dissolved oxygen) 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.

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 laboratory data reports electronically on a semi-annual basis, which conform to the requirements of the California Code of Regulations, Title 23, Division 3, Chapter 30. The semi-annual laboratory reports shall be submitted electronically over the internet to the Geotracker database system by the 20th day of the second month following the

end of each six month period (**i.e. 20th August, and 20th February**). An annual report shall be submitted over the internet to Geotracker by the 20th day of the second month following the end of each year (**i.e. 20th February**) until such time as the Executive Officer determines that the reports are no longer necessary.

Each annual 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, by-products of the injectant, and how and when samples were collected;
- (b) field logs that contain, at a minimum, field calibration reports, 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) both tabular and graphical summaries of all data obtained during the year;
- (d) groundwater contour maps and pollutant concentration maps containing all data obtained during the previous year. This requirement can be satisfied by providing these figures from the site-wide groundwater monitoring report as an appendix in the ISCO monitoring report;
- (e) a table showing well construction details such as well number, groundwater zone being monitored, ground surface elevation, top of casing elevation, total well depth, and screened interval (including sand pack);
- (f) cumulative data tables containing the water quality analytical results and depth to groundwater;
- (g) laboratory analytical data report shall be provided in electronic files within the report. The central valley water board staff may request additional data as necessary;
- (h) a description of all remedial activities conducted during the year, their status, operating time, an analysis of their effectiveness in removing the pollutants, and plans to improve the remediation system effectiveness;
- (i) if applicable, 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.
- (j) an identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
- (k) 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.

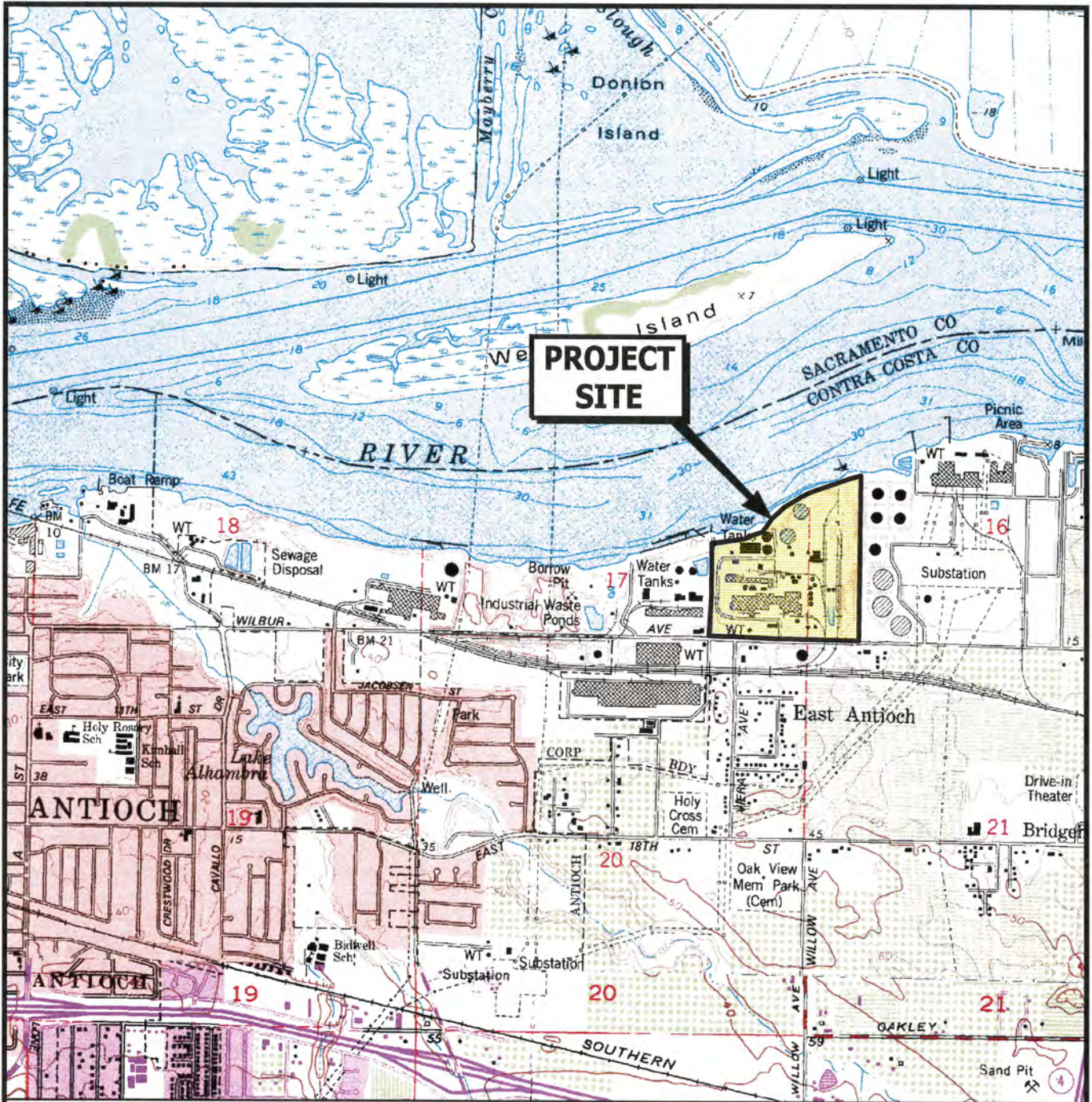
Ordered by:


For PAMELA C. CREEDON, Executive Officer

7/24/15

(Date)

7/20/2015:SS

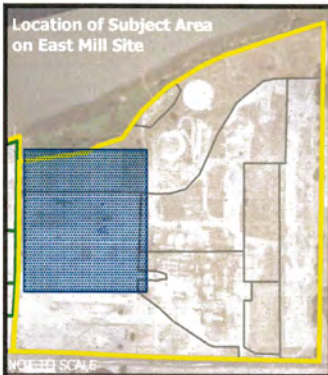


U.S.G.S. Topo Map - Antioch North, California, 7.5-minute quadrangle. 1978.
 U.S.G.S. Topo Map - Antioch South, California, 7.5-minute quadrangle. 1953 photorevised 1980.

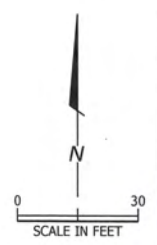
Site Location Map
 Former Gaylord Container Corporation - East Mill
 Antioch, California

FIGURE

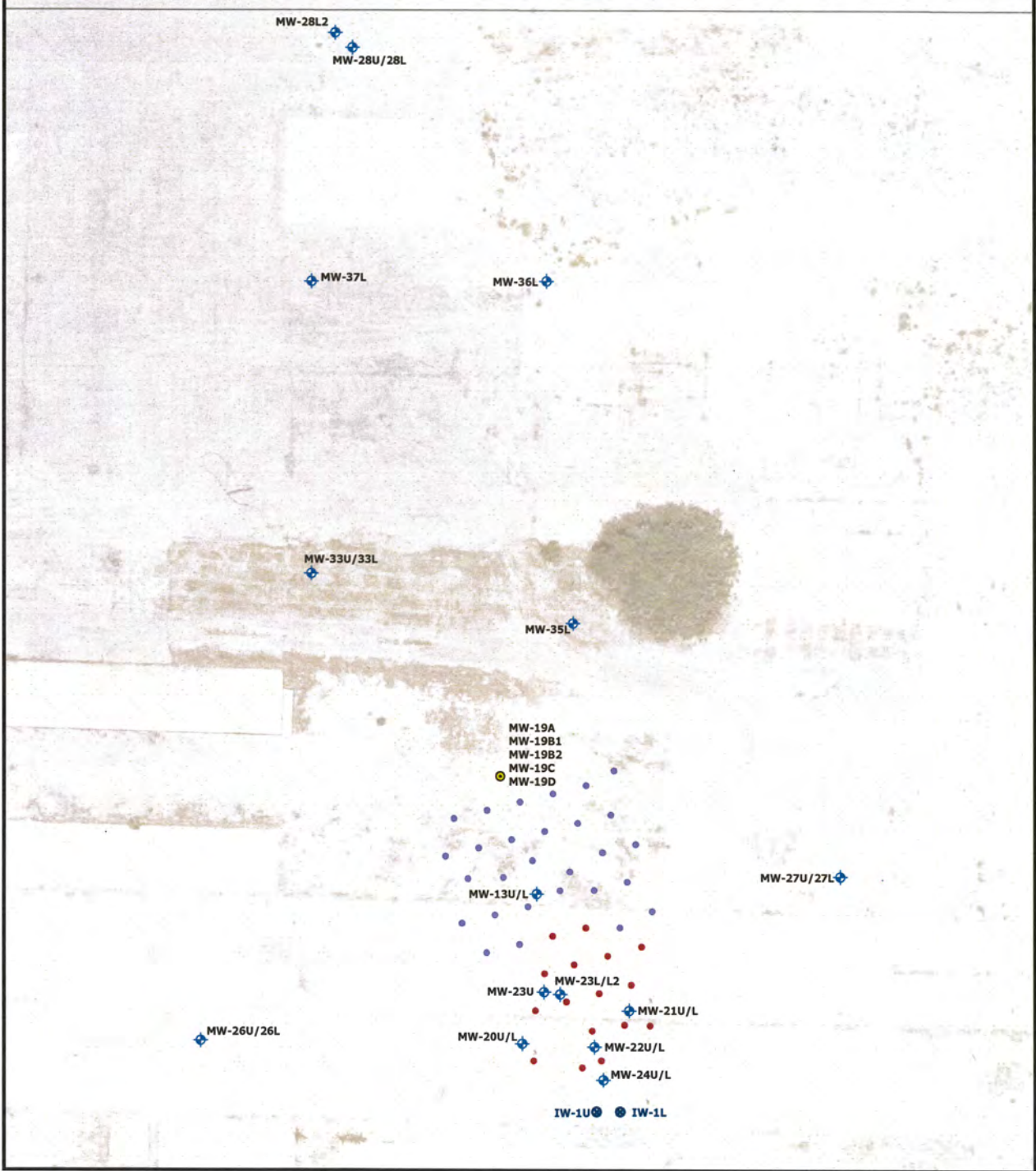
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- Explanation**
- Approximate Property Boundary
 - Areas of Interest
 - MW-25U** Groundwater Monitoring Well (PES)
 - MW-11** Groundwater Monitoring Well (ARCADIS-BBL)
 - GCC-01** Groundwater Monitoring Well (Kemwater)
 - MW-18A1** CMT Groundwater Monitoring Well (ARCADIS-BBL)
 - IW-1U** Injection Well (PES)
 - Upper Zone Injection Point Location (November 28 - December 1, 2011)
 - Upper Zone Injection Point Location (June 18 - 21, 2012)



Imagery Date: June 8, 2009
 Source: Towill Surveying, Mapping and GIS Services



Permanganate Injection Location Map
 Former Gaylord Container Corporation - East Mill
 Antioch, California