

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2007-0825

CALIFORNIA WATER CODE SECTION 13267  
FOR

**WESTERN FARM SERVICE, INC.  
VERNALIS FACILITY  
SAN JOAQUIN COUNTY**

Western Farm Service, Inc. (Discharger) has been the operator of a retail agricultural chemical business at 35100 South Highway 33 in Vernalis since the site was developed in 1969. Groundwater occurs at about 30 feet below ground surface and contains nitrogen, fumigants, and pesticides. This pollution impaired the beneficial use of this water resource. In 2002, the Discharger implemented a pilot study applying Hydrogen Releasing Compound<sup>®</sup> (HRC) in shallow groundwater to evaluate its remedial potential, and in 2007 Western Farm Service is modifying the pilot study and will add HRC-X<sup>®</sup> to treat site pollutants.

This Monitoring and Reporting Program (MRP) is issued pursuant to Section 13267 of the California Water Code and is necessary to delineate groundwater pollutant plumes and determine whether remediation efforts are effective. Existing data and information about the site show the presence of various chemicals, including nitrate, ammonium, 1,2-dichloropropane, 1,2,3-trichloropropane, and diuron in groundwater resulting from the Discharger's past operation. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. This MRP replaces the requirements listed in MRP No. R5-2003-0815, which was issued on 28 May 2003.

Prior to construction of any new groundwater monitoring or extraction wells, and prior to destruction of any groundwater monitoring or extraction wells, the Discharger shall submit plans and specifications to the Board for review and approval. Once installed, all new wells shall be added to the monitoring program and shall be sampled and analyzed according to the appropriate schedule below.

**GROUNDWATER MONITORING**

As shown on Figure 1, there are seven monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6R, and MW-7). The groundwater monitoring program for the 7 monitoring wells and any wells installed subsequent to the issuance of this MRP, shall follow the schedule below. Sample collection and analysis shall follow standard EPA protocol. This MRP includes a schedule for groundwater plume monitoring as shown in the Groundwater Monitoring Table and a schedule for pilot-scale remediation monitoring as shown in the Remediation Monitoring Table.

The groundwater monitoring program applies to monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6R, and MW-7 and shall be conducted semi-annually in the first quarter (January-March) and in the third quarter (July-September), or annually in the third quarter.

**GROUNDWATER MONITORING TABLE**

Constituents	Method	Maximum Detection Limit <sup>1</sup>	Semi-Annually	Annually
Depth to Groundwater	---	0.01 ft	All listed wells	
Total Oxidizable Nitrogen	SM4500	0.1 mg/l	MW-2, MW-3, MW-5, MW-6R, MW-7	MW-4
Ammonium	SM4500	0.5 mg/l	MW-2, MW-3, MW-5, MW-6R, MW-7	MW-4
Carbamate/Urea Pesticides	EPA 8321A	1 ug/l <sup>2</sup>	MW-2, MW-3, MW-7	MW-5, MW-6R
Fumigants (including 1,2,3-TCP)	EPA 504.1 <sup>3</sup>	0.02 ug/l	MW-2, MW-5 MW-6R, MW-7	MW-4, MW-3
Fumigants (including 1,2,3-TCP)	SRL 524M <sup>3</sup>	0.005 ug/l		
Volatile Organic Compounds (including 1,2-DCP)	EPA 8260B	0.5 ug/l <sup>4</sup>	MW-2, MW-5, MW-6R, MW-7	MW-4, MW-3

<sup>1</sup> For non-detectable results.

<sup>2</sup> Detection limits for Barban, Chlorpropham, Mexacarbate, Propachlor, and Propham are 5 ug/l.

<sup>3</sup> If 1,2,3-trichloropropane is not detected in monitoring wells MW-2, MW-5, MW-6R, or MW-7 by method EPA 504.1, then the subsequent monitoring events shall use Method SRL 524M. If 1,2,3-trichloropropane is not detected in a well with Method SLR 524M for four consecutive events, then EPA Method 504.1 may be used for that well.

<sup>4</sup> Detection limits for bromomethane and dichlorodifluoromethane are 1 ug/l, and for methylene chloride is 5 ug/l.

**REMEDIATION PILOT STUDY MONITORING**

The remediation pilot study monitoring program includes monitoring wells MW-2, MW-4, MW-5, MW-6R, and MW-7. The remediation pilot study monitoring program for these five monitoring wells shall follow the schedule below and shall be sampled semi-annually in the first quarter (January-March) and in the third quarter (July-September), or annually in the third quarter (July-September). Some of the analyses for the remediation pilot study monitoring program are duplicative of those required for the groundwater monitoring program and are repeated only for clarity. Two separate analyses are not required. Remediation pilot study monitoring may be discontinued when Regional Water Board staff concurs that the pilot study is concluded.

**REMEDIATION PILOT STUDY MONITORING TABLE**

Constituents	Method(s)	Maximum Detection Limit <sup>1</sup>	Semi-Annually	Annually
Depth to Groundwater	---	0.01 ft	All listed wells	
Dissolved methane	RSK 175M	0.02 mg/l		All listed wells
General Minerals (alkalinity, ammonium, chloride, nitrate plus nitrite, sodium, sulfide, sulfate)	Various	0.1 mg/l <sup>2</sup>		All listed wells
Dissolved Iron	EPA 200.7	0.03 mg/l	MW-2, MW-5, MW-6R, MW-7	MW-4
Dissolved Manganese	EPA 200.7	0.01 mg/l	MW-2, MW-5, MW-6R, MW-7	MW-4
Dissolved Organic Carbon	EPA 415.1	0.01 mg/l	MW-2, MW-5, MW-6R, MW-7	MW-4
Volatile Organic Compounds (including 1,2-DCP)	EPA 8260B	1 ug/l	MW-2, MW-5, MW-6R, MW-7	MW-4

*Footnotes to Remediation Pilot Study Monitoring Table on following page*

Constituents	Method(s)	Maximum Detection Limit <sup>1</sup>	Semi-Annually	Annually
Fumigants (including 1,2,3-TCP)	EPA 504.1 <sup>3</sup>	0.02 ug/l	MW-2, MW-6R, MW-7	MW-4, MW-5

**Footnotes to Remediation Pilot Study Monitoring Table**

<sup>1</sup> For non-detectable results.

<sup>2</sup> Analytical quantitation limit for chloride and sulfate is 1 mg/l, for alkalinity is 10 mg/l.

<sup>3</sup> If 1,2,3-trichloropropane is not detected in a monitoring well by method EPA 504.1, then the subsequent monitoring events shall use Method SRL 524M. If 1,2,3-trichloropropane is not detected in a well by Method SLR 524M for four consecutive events, then EPA Method 504.1 may be used for that well.

**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. In addition, the Discharger shall notify the Board within 48 hours of any unscheduled shutdown of any soil vapor and/or groundwater extraction system.

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.

Semi-annual electronic data reports, which conform to the requirements of the California Code of Regulations, Title 23, Division 3, Chapter 30, 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 respective calendar quarter (i.e., by 1 May, and 1 November)**, until such time as the Executive Officer determines that the reports are no longer necessary.

Semi-annual reports shall be submitted to the Board in hardcopy by the **1st day of the second month following the end of each respective calendar quarter (i.e., by 1 May, and 1 November)** until such time as the Executive Officer determines that the reports are no longer necessary. Each semi-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 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) maps identifying pollutant concentrations for all groundwater zones;

- (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 reports, which may be provided on electronic media; and
- (i) if applicable, the status of any ongoing remediation, including cumulative information on the 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.

An Annual Report shall be submitted to the Board by **1 May** 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 first semi-annual 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 treated or is continuing to spread;
- (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;
- (g) if desired, a proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.

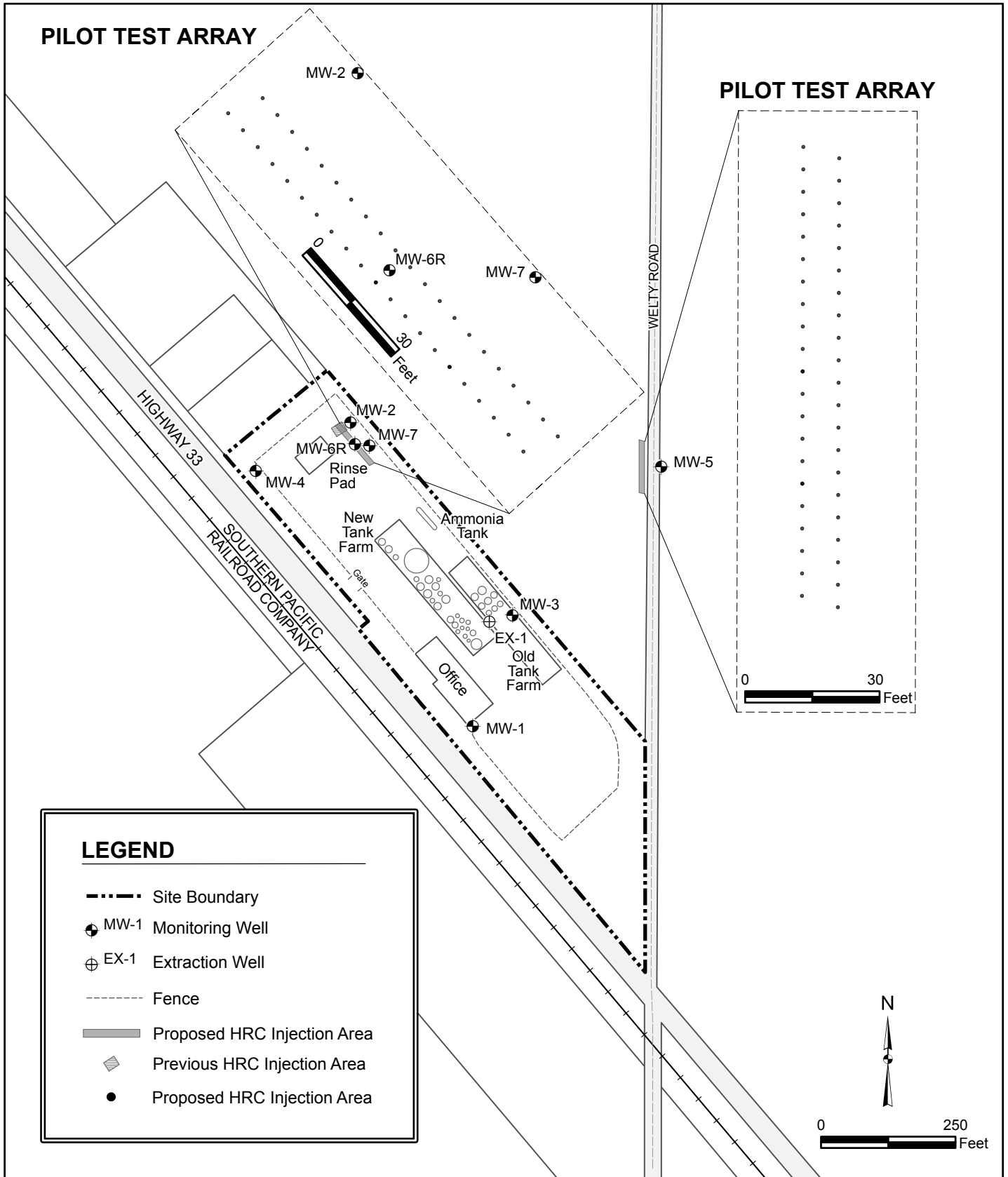
The results of any monitoring done more frequently than required at the locations specified in the MRP also shall be reported to the Board. The Discharger shall implement the above monitoring program as of the date of the Order.

Ordered by: \_\_\_\_\_  
PAMELA C. CREEDON, Executive Officer

\_\_\_\_\_  
29 October 2007  
(Date)

**PILOT TEST ARRAY**

**PILOT TEST ARRAY**



**LEGEND**

- Site Boundary
- MW-1 Monitoring Well
- ⊕ EX-1 Extraction Well
- - - - - Fence
- Proposed HRC Injection Area
- ◊ Previous HRC Injection Area
- Proposed HRC Injection Area

**Geosyntec**  
consultants

**EXPANDED PILOT SCALE FIELD TEST**  
WESTERN FARM SERVICE, INC.  
VERNALIS, CALIFORNIA

FIGURE NO.  
PROJECT NO. WR0949  
DATE: OCTOBER 2007