

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0800
CALIFORNIA WATER CODE SECTION 13267

FOR
FORMER OCCIDENTAL CHEMICAL CORPORATION FACILITY, LATHROP
SAN JOAQUIN COUNTY

The former Occidental Chemical Corporation ((OCC, Discharger)) Facility (Site) is located at 16777 South Howland on 341 acres of land, in the town of Lathrop, San Joaquin County, Section 35, Township 1S, Range 6E. The Best Fertilizers Company (Best) developed the Site initially and began manufacturing fertilizers at this location in 1952. OCC acquired Best in 1963 and transferred its assets including the Site to OCC Oxychem Division. OCC operated the Site as a pesticide and fertilizer manufacturing facility from 1953 until the end of 1982. In 1983 the Site and certain assets were conveyed to the J.R. Simplot Company (Simplot). Simplot continues to manufacture fertilizers at the Site and OCC retains responsibility for implementing environmental remediation of groundwater at the Site pursuant to the 1982 Stipulation and Judgment Approving Settlement (No. CIV S-79-989 MLS) with the United States and the State of California. At the Site, soil and groundwater have been impacted with various chemicals, identified below, due to past industrial activities and waste disposal practices. This pollution has impaired the beneficial use of the underlying aquifer.

Site investigation and cleanup activities have been ongoing since the early 1980s. Source removal (soil excavations) has been completed at some areas of the Site. Groundwater remediation (extraction and treatment) system operation commenced in 1982 and is on-going. The groundwater treatment system processes approximately 550 gallons per minute (gpm). Groundwater is currently being extracted from eight wells and treated using granular activated carbon (GAC). The treated water is reinjected into a deeper aquifer through two injection wells under the Waste Discharge Requirements (No. 83-039) issued by the Central Valley Regional Water Quality Control Board. Compliance reporting with these Waste Discharge Requirements is combined in this MRP.

The unconfined aquifer system below the Site is generally classified as a three-production zone system: shallow zone (approximately 31 to 83 feet below ground surface(bgs)), intermediate zone (approximately 84 to 150 ft bgs), and deep zone (approximately 151 feet and 218 ft bgs). A fourth hydrogeologic unit at the Site is the confined injection zone, which is located below the Corcoran clay layer, at a depth greater than approximately 300 feet bgs.

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. The groundwater monitoring network is in place and includes 62 monitoring wells, 8 extraction wells, 2 injection wells and 4 municipal supply wells.

Existing data and information about the site show the presence of pesticides and fumigants, including 1,2-Dibromo-3-chloropropane (DBCP), ethylene dibromide (EDB), solfolane, and inorganic chloride, nitrate, and sulfate in the unconfined groundwater resulting from the Discharger's past operations. 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. 83-039.

Prior to construction of any new groundwater monitoring or extraction wells, and prior to abandonment of any groundwater monitoring or extraction wells, the Discharger shall submit plans and specifications to the Board for review and approval. All well installation and abandonment permits shall be obtained from San Joaquin County Environmental Health Department. Once installed, all new wells (not replacement wells) shall be added to the monitoring program and shall be sampled and analyzed quarterly. The sampling frequency for these new wells may be re-evaluated after one year.

GROUNDWATER TREATMENT SYSTEM MONITORING

The groundwater treatment system is currently in full-scale operation. The groundwater treatment system includes 8 extraction wells, and GAC. The treatment system operation must comply with the Waste Discharge Requirements (WDRs) issued for the Site. The monitoring program for the treatment system shall follow the schedule provided in the attached Tables 1 and 2.

Table 1 lists all extraction wells and the sampling frequency. Table 2 lists the sampling constituents, analytical methods, and the maximum reportable detection limits. Sample collection and analysis shall follow standard EPA protocol.

GROUNDWATER INJECTION SYSTEM MONITORING

All groundwater treated by the GAC system is discharged into a confined aquifer isolated from useable groundwaters through two deep injection wells. Flow distribution of the treated groundwater is not controlled by any means other than the natural receptivity of the injection wells and hydrogeologic characteristics of the confined aquifer. The injection system operation must comply with the WDRs issued for the Site.

Table 1 lists the injection wells and the sampling frequency. Table 2 lists the sampling constituents, analytical methods, and the maximum reportable detection limits. Sample collection and analysis shall follow standard EPA protocol.

GROUNDWATER MONITORING

As shown on Figure 1, there are 62 active groundwater monitoring wells at 21 locations at the Site. In addition, the City of Lathrop water supply wells (LDW-6, LDW-7, LDW-8, and LDW-9) shall be monitored. The groundwater monitoring program for all these wells shall follow the schedule provided in the attached Tables 1 and 2.

Table 1 includes the monitoring wells and the sampling frequency. Table 2 includes the sampling constituents, analytical methods, and the maximum reportable detection limits. Sample collection and analysis shall follow standard EPA protocol.

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 MRP. In addition, the Discharger shall notify the Board within 48 hours of any unscheduled shutdown of the groundwater remediation 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 reports shall be submitted by the **1st day of the second month following the end of a 6 month period (i.e. by 1 August, and 1 February)** until such time as the Executive Officer determines that the reports are no longer necessary. Each semi-annual report shall contain the following minimum information:

- (a) a description and discussion of the groundwater sampling for the groundwater treatment system (if applicable), the City of Lathrop water supply wells, and results, including trends in the concentrations of pollutants and groundwater elevations in the monitoring wells, how and when samples were collected, and whether the pollutant plume(s) is completely 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) a table showing depth to groundwater for all groundwater zones;
- (d) a table showing historical lateral and vertical (if applicable) flow directions and gradients;
- (e) groundwater contour maps for all groundwater zones;
- (f) isocontour pollutant concentration maps for all groundwater zones;
- (g) a copy of the laboratory analytical data report;
- (h) the status of ongoing remediation, including influent and effluent concentrations, 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;
- (i) operation of the injection wells shall (1) be monitored for pesticide and fumigant discharge concentrations, (2) be continuously monitored for total volume injected, rate of volume injected, and injection pressure, and (3) comply with the WDRs issued for the Site;

- (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.

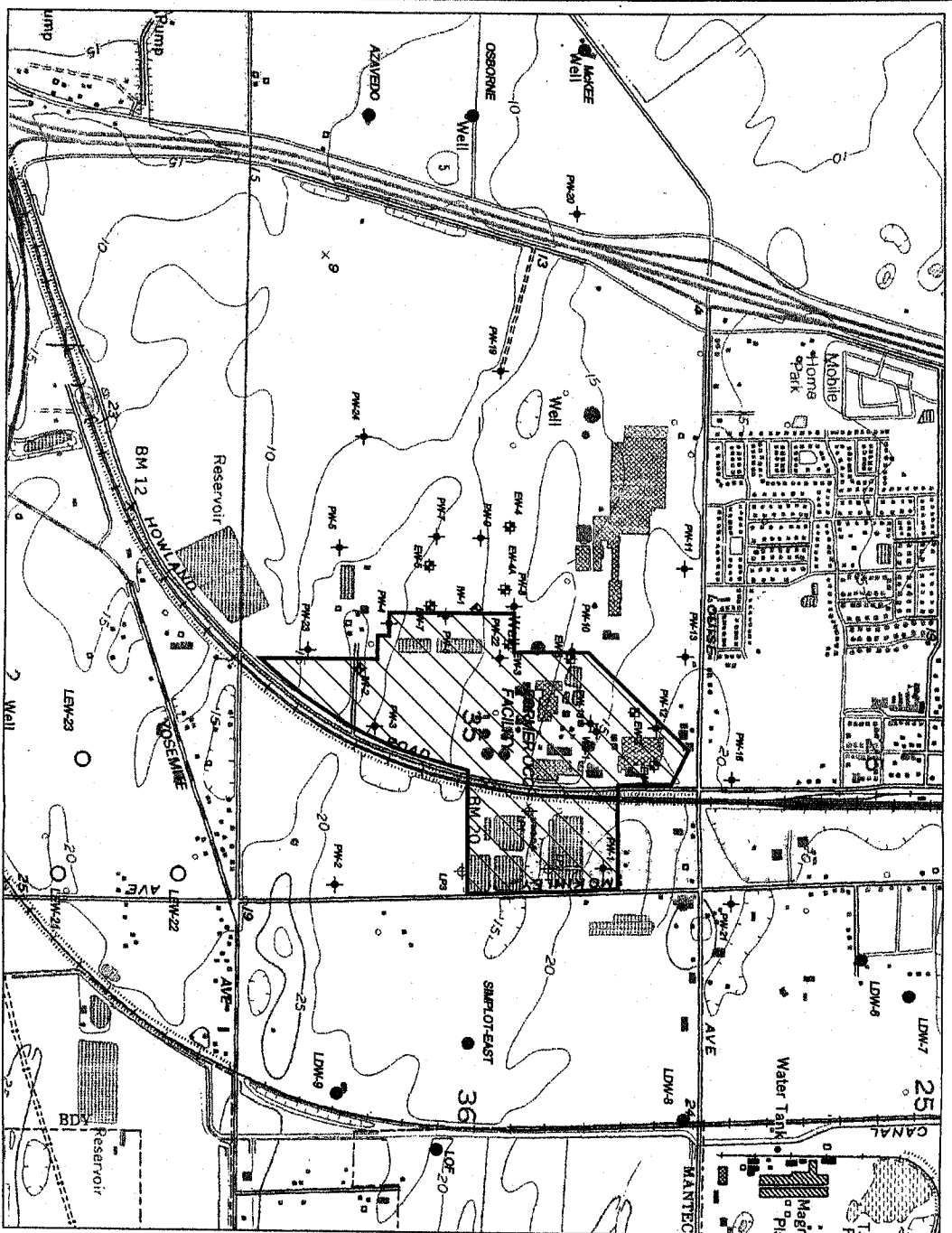
An Annual Report shall be submitted to the Board by **1 February** of each year in the place of the second semi-annual monitoring report. In addition to the minimum information required in the semi-annual reports, the Annual report shall contain an evaluation of the effectiveness and progress of the investigation and remediation. 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 captured by an extraction system 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.

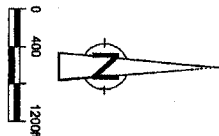
The results of any monitoring done more frequently than required at the locations specified in the MRP also shall be reported to the Board. The Discharger shall implement the above monitoring program as of the date of the Order.

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

(Date)



- LEGEND**
- REGRUAL PUMPING WELL
 - PROPOSED WATER SUPPLY WELLS
 - ⊕ ASPIRIN MONITORING WELL
 - ⊕ EXTRACTION WELL
 - ⊕ REJECTION WELL
 - ⊕ SPLITLOT MONITORING WELL



SOURCE: U.S.G.S. 7.5' QUAD SHEET
 LATHROP, CALIFORNIA
 PHOTOGRAPHED 1987
 ADAPTED FROM THE SOURCE GROUP, INC.
 FIGURE 3, REMEDIAL PUMPING
 OPTIMIZATION WORKPLAN, JULY 2003

WELL LOCATION MAP FOR MONITORING AND REPORTING PROGRAM
 FORMER OCCIDENTAL CHEMICAL CORPORATION FACILITY
 Lathrop, California
 figure 1

Table 1
Sampling Locations, Analytes, and Sampling Frequency^{1,2,3}

Sampling Location	EDB	DBCP	Sulfolane	OC & OP Pesticides	Total Volume Injected, Rate Injected, Injection Pressure	BHC Isomers	Herbicides	Nitrate, Chloride, Sulfate
GROUNDWATER TREATMENT SYSTEM								
Port A (Combined Influent)	M	M	M					
Port B (West Carbon Vessel Effluent)	W	W						
Port F (East Carbon Vessel Effluent)	W	W						
Port C (Combined Effluent)	W	W	W	A		A		
EXTRACTION WELLS								
EW-1	A	A	A					
EW-2	A	A	A					
EW-3	A	A	A					
EW-4	A	A	A					
EW-4A	A	A	A					
EW-5	A	A	A					
EW-6	A	A	A					
EW-7	A	A	A					
New Well (s)	Q	Q	Q	Q		Q		Q
INJECTION WELLS								
IW-1	W ⁴	W ⁴	W ⁴	W ⁴	Continuous			
IW-2	W ⁴	W ⁴	W ⁴	W ⁴	Continuous			
GROUNDWATER MONITORING WELLS								
Shallow Zone								
PW01-040	S	S	S			A		A
PW02-040	S	S	S			A		A
PW03-049	A	A	A			A		A
PW04-058	S	S	S			A		A
PW05-063	S	S	S			A		A
PW06-080	A	A	A			A		A
PW07-038	A	A	A			A		A
PW08-076	A	A	A			A		A
PW09-080	A	A	A			A		A
PW10-083	A	A	A			A		A
PW11-031	S	S	S			A		A

Table 1
Sampling Locations, Analytes, and Sampling Frequency^{1,2,3}

Sampling Location	EDB	DBCP	Sulfolane	OC & OP Pesticides	Total Volume Injected, Rate Injection Pressure	BHC Isomers	Herbicides	Nitrate, Chloride, Sulfate
PW12-073/078	A	A	A			A		A
PW13-046	S	S	S			A		A
PW16-083	S	S	S			A		A
PW19-088/092	A	A	A			A		A
PW21-087	S	S	S			A		A
PW22-071	A	A	A			A		A
PW23-045	S	S	S			A		A
PW24-050/051	S	S	S			A		A
WS-1-1	A	A	A			A		A
WS-1-2	A	A	A			A		A
New Well (s)	Q	Q	Q	Q		Q		Q
Intermediate Zone								
PW01-129	S	S	S			A		A
PW02-080	S	S	S			A		A
PW03-142	A	A	A			A		A
PW04-113	S	S	S			A		A
PW05-125	S	S	S			A		A
PW06-149	A	A	A			A		A
PW07-101	A	A	A			A		A
PW08-150/155	A	A	A			A		A
PW09-123	A	A	A			A		A
PW10-138	A	A	A			A		A
PW11-108	S	S	S			A		A
PW12-139	A	A	A			A		A
PW13-090	S	S	S			A		A
PW16-146	S	S	S			A		A
PW19-149	A	A	A			A		A
PW21-155	S	S	S			A		A
PW22-160/164	A	A	A			A		A
PW23-110	S	S	S			A		A
PW24-148/146	S	S	S			A		A
WS-1-3	A	A	A			A		A
WS-1-4	A	A	A			A		A
New Well (s)	Q	Q	Q	Q		Q		Q

Table 1
Sampling Locations, Analytes, and Sampling Frequency^{1,2,3}

Sampling Location	EDB	DBCP	Sulfolane	OC & OP Pesticides	Total Volume Injected, Rate Injection Pressure	BHC Isomers	Herbicides	Nitrate, Chloride, Sulfate
Deep Zone								
PW01-180	S	S	S			A		A
PW02-155	S	S	S			A		A
PW03-218	A	A	A			A		A
PW04-196/199	S	S	S			A		A
PW05-196	S	S	S			A		A
PW06-197	A	A	A			A		A
PW07-203	A	A	A			A		A
PW08-180	A	A	A			A		A
PW09-198	A	A	A			A		A
PW10-195	A	A	A			A		A
PW11-195	S	S	S			A		A
PW12-193	A	A	A			A		A
PW13-165	S	S	S			A		A
PW16-216	S	S	S			A		A
PW19-196	A	A	A			A		A
PW20-500	A	A	A			A		A
PW21-190	S	S	S			A		A
PW22-196	A	A	A			A		A
PW23-185	S	S	S			A		A
PW24-190/201	S	S	S			A		A
WS-1-5	A	A	A			A		A
WS-1-6	A	A	A			A		A
WS-1-7	A	A	A			A		A
New Well (s)	Q	Q	Q	Q		Q		Q
CITY OF LATHROP WELLS								
LWD-6	S	S	S	S		S	S	S
LDW-7	S	S	S	S		S	S	S
LDW-8	S	S	S	S		S	S	S
LDW-9	S	S	S	S		S	S	S
New Well (s)	Q	Q	Q	Q		Q	Q	Q

¹ All wells shall be monitored quarterly for water levels

² Wells shall be sampled semi-annually during the first and third quarters

³ Wells shall be sampled annually during the third quarter

⁴ The results of weekly sampling of the combined treatment system effluent may be used to satisfy this requirement as all treated water is discharged through injection wells

pH, Temperature and Conductivity shall be measured whenever a sample is submitted for laboratory analysis

EDB = Ethylene Dibromide

DBCP = 1,2-Dibromo-3-chloropropane

OC Pesticides = Organochlorine Pesticides

Table 1
Sampling Locations, Analytes, and Sampling Frequency^{1,2,3}

Sampling Location	EDB	DBCP	Sulfolane	OC & OP Pesticides	Total Volume Injected, Rate Injected, Injection Pressure	BHC Isomers	Herbicides	Nitrate, Chloride, Sulfate

OP Pesticides = Organophosphorus Pesticides

Organochlorine Pesticides = Aldrin, Chlordane, DDD, DDE, DDT, Dieldrin, Heptachlor, Toxaphene

Organophosphorus Pesticides = DEF, Delnav, Dimethoate, Ethyl Parathion, Methly Parathion, Disyston

BHC Isomers = Benzene Hexachloride (alpha, beta, delta, and gamma isomers)

Herbicides = 2,4-D (Dichlorophenoxyacetic acid) and 2,4,5-T (Trichlorophenoxyacetic acid)

W = weekly sampling frequency

M = monthly sampling frequency

Q = quarterly sampling frequency

S = semi-annual sampling frequency

A = annual sampling frequency

Table 2

Sampling Parameter	Analytical Method¹	Maximum Detection Limit² (micrograms/liter)³
Depth to Groundwater	Not applicable	0.01 feet
Fumigants	EPA Method 8260B	
1,2-Dibromo-3chloropane (DBCP)		0.01
Ethylene Dibromide (EDB)		0.01
Organochlorine Pesticides	EPA Method 8081A	
Aldrin		0.005
alpha-BHC		0.01
beta-BHC		0.005
delta-BHC		0.005
gamma-BHC		0.019
Chlordane		0.05
Dichlorodipenyldichloroethane (DDD)		0.02
Dichlorodipenyldichloroethylene (DDE)		0.01
Dichlorodipenyltrichloroethane (DDT)		0.01
Dieldrin		0.01
Heptachlor		0.01
Toxaphene		0.5
Organophosphorus Pesticides	EPA 8141A	
DEF(S,S,S - Tributyltrithio-phosphate)		0.5
Delnav		0.5
Dimethoate		0.5
Ethyl Parathion		0.5
Mathyl parathion		0.5
Disyston		0.5
Herbicides	EPA Method 8151A	
2,4-D (Dichlorophenoxyacetic acid)		0.5
2,4,5-T (Trichlorophenoxyacetic acid)		0.1
Sulfolane	APPL Method 3510 ⁴	20
Inorganics	EPA Method 300	
Chloride		250 milligrams/liter
Nitrate		10 milligrams/liter
Sulfate		500 milligrams/liter

¹If necessary, equivalent analytical methods may be used. The Discharger shall provide written justification

²For non-detectable results

³Except where indicated

⁴In accordance with APPL laboratory provided information