

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2012-0106

WASTE DISCHARGE REQUIREMENTS

FOR
GLENN SPRINGS HOLDING COMPANY
FORMER OCCIDENTAL CHEMICAL COMPANY
GROUNDWATER REMEDIATION PROJECT
LATHROP FACILITY
SAN JOAQUIN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board), finds that:

1. Occidental Chemical Company (OCC) retains the liability for implementing remedial actions at the Former Best Fertilizers Company site located at 16777 Howland Road in Lathrop, San Joaquin County, California (Site). OCC is managing remediation activities at the Site through Glenn Springs Holdings, Inc. (GSHI, hereafter collectively referred to as Discharger), a wholly-owned subsidiary of Occidental Petroleum Corporation. Attachments A and B show the "Site location" and "Site plan", respectively, and are part of this order.
2. Historically, contaminants of concern (COCs) associated with the Discharger's past operations include pesticides 1,2-dibromo-3-chloropropane (DBCP) and ethylene dibromide (EDB) as well as 2,3,4,5-tetrahydrothiophene-1,1-dioxide, commonly known as sulfolane, which was used as a solvent for cleaning process equipment. Groundwater beneath and in the vicinity of the Site is also contaminated with sulfate, nitrate, chloride, lindane and other isomers of benzene hexachloride (BHC).
3. On 21 November 2011, the Discharger submitted a revised report of waste discharge and a document titled *Proposed Updates to Waste Discharge Requirements (WDR) and Monitoring and Reporting Plan No. R5-2004-0800* in response to a request by Central Valley Water Board staff to update the existing WDR contained in Order No. 83-039.
4. Order No. 83-039 was adopted on 25 March 1983 to regulate discharges from the groundwater remedial system. Discharge was permitted at a maximum rate of approximately 750 gallons per minute to an injection aquifer beneath a thick confining layer of blue clay, the Corcoran Clay, approximately 230 to 300 feet below ground surface (bgs). Monitoring and reporting requirements specified in that Order and in Monitoring and Reporting Program No. R5-2004-0800 included treatment effluent limits, treatment and injection system monitoring, groundwater monitoring, maintenance and repairs as necessary, and semi-annual and annual written reports of work performed. This Order revises Order No. 83-039 to update the discharge specifications, modify the

effluent limits based on the best available technology for treatment, and allow for injections above the Corcoran Clay.

5. The Site is located within the City of Lathrop, San Joaquin County, California near the intersection of Louise Avenue and Howland Road (See Attachments A and B). The Site occupies approximately 340 acres, most of which is paved or covered with buildings. The Site is underlain by relatively flat-lying unconsolidated silts, sands, and clays to a depth of approximately 230 feet bgs.
6. The Site includes Assessor's Parcel No. 198-180-01, 02, 03, 04, 05, 06 and 198-140-03, and 04.
7. Surrounding land uses include agricultural, industrial, and residential.
8. Mean annual precipitation at the Site is 14 inches. Mean annual pan evapotranspiration from the nearby Tracy pumping plant is 97 inches.
9. The City of Lathrop operates a municipal water system with wells located approximately 2,000 feet west and northwest of the Site, and approximately 3,000 feet to the south. These water supply wells are sampled semi-annually by the Discharger and analyzed for Site COCs.

Project Layout and Operation

10. The Site has been owned and occupied by the J.R. Simplot Company (J.R. Simplot) since 1 January 1983. The location and orientation of the Site is shown on Attachment B. J.R. Simplot currently owns all the land comprising the Site, and all the improvements to that land except the groundwater remediation system (including the treatment plant, monitoring wells, extraction wells, injection wells and associated infrastructure) that were installed by the Discharger. The Discharger is responsible for mitigation, cleanup, and abatement of any contamination of groundwater attributable to operations at the Lathrop facility that occurred prior to 1 January 1983.
11. The current groundwater remedial system extracts groundwater from up to ten (10) extraction wells (EW-02, EW-03, EW-04, EW-04A, EW-05, EW-06, EW-07, EW-8A, EW-8B, and EW-09). Extraction well EW-01 was removed from service in 1995 due to low concentrations of COCs. Extracted groundwater is treated using a bioreactor and granular activated carbon (GAC), and then disposed of by injection into two deep wells IW-01 and IW-02 that are completed in the confined aquifer beneath the Corcoran Clay.
12. The Discharger has proposed to add eleven (11) additional extraction wells: EW-10, EW-11, EW-12A, EW-12B/C, EW-13, EW-14A, EW-14B/C, EW-15A, EW-15B/C, EW-16, and EW-17 to accelerate cleanup of sulfolane, DBCP, and EDB in groundwater beneath the Site. Additional extraction wells may be added if needed under subsequent phases of work with written approval from the Central Valley Water Board.

13. The Discharger also proposes to operate four (4) injection wells screened above the Corcoran Clay, after installing two new wells and converting two existing extraction wells to injection wells. Injection into wells INJ-11, INJ-12, INJ-13/EW-03 and INJ-14/EW-04 will accelerate cleanup of sulfolane, DBCP, and EDB in groundwater beneath the Site. Additional injection wells may be added if needed under subsequent phases of work with written approval from the Central Valley Water Board.
14. The Discharger also proposes to extract groundwater from J.R. Simplot's existing backup water supply well and operate a wellhead treatment system to remove sulfolane from extracted groundwater. At times, treated backup supply well water will be injected above the Corcoran Clay to enhance sulfolane remediation. At other times, treated water will be supplied to J.R. Simplot for their use as process water or for irrigation purposes. The average flowrate from the backup supply well is expected to be approximately 250 gallons per minute (gpm) and the maximum flowrate would be 700 gpm.
15. The Discharger has proposed to increase the total extraction rate, including extraction from J.R. Simplot's backup water supply well, to an average flow of 750 to 1,000 gpm, with a potential maximum flow rate of 2,000 gpm. The disposal of the treated groundwater under Order No. 83-039 was below the Corcoran clay. The new disposal will have up to 750 gpm disposed to IW-1 and IW-2 below the Corcoran Clay and up to 1,250 gpm to the proposed injection wells screened above the Corcoran Clay. The current treatment system has a capacity of 750 gpm. The discharger will be installing another remediation system to treat additional water collected from J.R. Simplot's backup supply well. The extraction and injection flow rates will not exceed the demonstrated treatment system capacities.
16. The groundwater remedial system has operated since 1982. In recent years, in addition to routine operation and maintenance of the system, the Discharger has reconditioned the treatment system and optimized pumping from the extraction well network; installed additional extraction wells EW-8A, EW-8B, and EW-9; investigated a suspected source area of sulfolane with high sulfolane soil concentrations; added additional groundwater monitoring wells PW27-40, PW28-40, and PW29-40; and confirmed stable or shrinking pollutant plumes. The Discharger also modified the bioreactor/GAC treatment flow configuration from up-flow parallel to down-flow series, increased the dissolved oxygen concentration added prior to GAC treatment by using an oxygen delivery system in order to improve the aerobic biodegradation of sulfolane. With these modifications, each GAC vessel can now be separately adjusted to improve aerobic biological treatment of sulfolane in the lead vessel and sorption of EDB and DBCP in the lag vessel.
17. Groundwater extraction and treatment has reduced the concentrations and extent of sulfolane, DBCP and EDB. As of August 16, 2012, concentrations of sulfolane, DBCP and EDB in groundwater in the combined influent to the treatment system were 850, 1.2, and 0.0045 micrograms per liter ($\mu\text{g/L}$), respectively. To date, the system has

removed approximately 12,300 pounds (lbs) of sulfolane, 4,000 lbs of DBCP, and 220 lbs of EDB.

18. EDB and DBCP have not been detected in the injection zone monitoring wells below the Corcoran Clay since at least 1996. The best currently approved analytical methods for DBCP have detection levels of 0.001 µg/L and practical quantitation levels of 0.01 µg/L. The practical quantitation level is above the effluent limitation for DBCP found in this Order. Compliance with the effluent limitation is demonstrated by measuring no detectable concentrations of DBCP when using the method(s) listed on MRP R5-2012-0106 and achieving the specified method detection limit. If new methods are approved that improve on the detection level and practical quantitation level, the MRP will be revised.
19. Based on the most recent data collected in August and September 2011, sulfolane is present in injection zone monitoring wells PW09-338 and PW12-315 at 65 µg/L and 170 µg/L, respectively. There was no treatment goal for sulfolane until 1992, so concentrations of sulfolane in the injection zone reflect the injection of untreated sulfolane from 1982 to 1992 and concentrations in the injectant that were below the previous discharge limit of 57 µg/L established after 1992.
20. Total dissolved solids (TDS) in the injection zone monitoring wells averages 2,479 milligrams per liter (mg/L) with a maximum concentration of 4,860 mg/L. The highest TDS concentrations were measured west of the Site, in PW20-500, where groundwater quality is most affected by saline water from the San Francisco Bay Delta. Chloride accounts for the majority of TDS in PW20-500. TDS concentrations in treatment system effluent average 2,369 mg/L with a maximum concentration of 3,150 mg/L. Sulfate accounts for the majority of TDS in the treatment system effluent. TDS concentrations in the treatment system effluent are expected to stay within the same range after the proposed additional extraction wells begin operation.

SURFACE AND GROUND WATER CONDITIONS

21. The first water-bearing zone (water table zone) beneath the Site occurs at a depth of 10 to 19 bgs. A shallow zone occurs at depths of approximately 50 to 100 feet bgs. An intermediate water-bearing zone occurs at depths of 100 to 150 feet bgs, and a deep aquifer is present at depths of 150 to 200 feet bgs. Water level measurements across the site indicate that there is hydraulic connection between the water-bearing zones above the Corcoran Clay. Saline groundwater occurs in locations west of the Site.

GROUNDWATER MONITORING

22. As part of the groundwater remedial action, the Discharger performs groundwater monitoring pursuant to Monitoring and Reporting Program (MRP) Order No. R5-2004-0800.

23. Under MRP Order No. R5-2004-0800, the Site's groundwater is monitored for sulfolane, DBCP, EDB, BHC isomers, nitrate, chloride and sulfate. Subsets of monitoring wells are sampled quarterly, semi-annually, and annually; groundwater elevations are measured on a quarterly basis.
24. MRP No. R5-2012-0106, a part of this Order, also requires monitoring the injection zones above and below the Corcoran Clay. Data collected for Order No. R5-2006-0800 can also be used to determine compliance with Order No. R5-2012-0106.

GROUNDWATER DEGRADATION

25. In 2012, the maximum concentrations of sulfolane, DBCP, and EDB in groundwater were 180,000 µg/L, 2,400 µg/L and 10 µg/L, respectively. Maximum concentrations of sulfate, nitrate and chloride in groundwater were 9,050 mg/L, 320 mg/L, and 2,210 mg/L, respectively. Concentrations of gamma-BHC, alpha-BHC, beta-BHC, and delta-BHC were 0.34 µg/L, 2.2 µg/L, 1.8 µg/L, and 2.9 µg/L, respectively.

BASIN PLAN, BENEFICIAL USES, AND REGULATORY CONSIDERATIONS

26. *The Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins, Fourth Edition*, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives (WQOs), contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Resources Control Board (State Board). Pursuant to Section 13263(a) of the California Water Code (CWC), waste discharge requirements must implement the Basin Plan.
27. The designated beneficial uses of underlying groundwater include:
 - a. Municipal and domestic water supply (MUN);
 - b. Agricultural water supply (AGR);
 - c. Industrial service supply (IND); and
 - d. Industrial process supply (PRO).
28. The Basin Plan establishes numerical and narrative WQOs for surface and groundwater within the basin, and recognizes that WQOs are achieved primarily through the Central Valley Water Board's adoption of waste discharge requirements and enforcement orders. Where numerical WQOs are listed, these are limits necessary for the reasonable protection of beneficial uses of the water. Where compliance with narrative WQOs is required, the Central Valley Water Board will, on a case-by-case basis, adopt numerical limitations in orders, which will implement the narrative objectives to protect beneficial uses of the waters of the state.
29. The Basin Plan identifies numerical WQOs for waters designated as municipal supply. These are the maximum contaminant levels (MCLs) specified in the following provisions

of Title 22, California Code of Regulations: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Table 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) of Section 64449. The Basin Plan's incorporation of these provisions by reference is prospective, and includes future changes to the incorporated provisions as the changes take effect. The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

30. The Basin Plan contains narrative WQOs for chemical constituents, tastes and odors, and toxicity. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants or animals. The chemical constituent objective requires that groundwater shall not contain chemical constituents in concentrations that adversely affect beneficial uses. The tastes and odors objective requires that groundwater shall not contain tastes or odors producing substances in concentrations that cause nuisance or adversely affect beneficial uses.
31. Section 13241 of the Water Code requires each Regional Board to consider various factors, including economic considerations, when adopting WQOs into its Basin Plan. Water Code Section 13263 requires each Regional Board to address the factors in Section 13241 in adopting waste discharge requirements. The State Board, however, has held that a Regional Board need not specifically address the Section 13241 factors when implementing existing WQOs in waste discharge requirements because the factors were already considered in adopting WQOs. These waste discharge requirements implement adopted WQOs. Therefore, no additional analysis of Section 13241 factors is required.
32. State Board Resolution No. 92-49 (hereafter Resolution No. 92-49) requires each Regional Board to require actions for cleanup and abatement of discharges that cause or threaten to cause pollution or nuisance to conform to the provisions of State Board Resolution No. 68-16 (hereafter Resolution No. 68-16) and the Basin Plan. Pursuant to Resolution No. 92-49, the Regional Board shall ensure that dischargers are required to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality, or if background levels of water quality cannot be restored, the best water quality which is reasonable and which complies with the Basin Plan including applicable WQOs.
33. Resolution No. 68-16 requires the Regional Board in regulating discharges to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and potential beneficial uses, and will not result in water quality less than that described in plans and policies (e.g., quality that exceeds WQOs).

34. These Waste Discharge Requirements pertain to the water quality discharged from treatment systems. The discharge limit for the J.R. Simplot backup supply well wellhead treatment system has been established at water quality objectives (WQOs) for sulfolane. Discharge limits for the Site treatment system have been established at the WQOs for sulfolane, DBCP and EDB. The discharge from the treatment system and the backup supply well wellhead treatment system will be monitored for other potential pollutants of concern at the Site to compare with established background/baseline conditions prior to injection above the Corcoran Clay. Monitoring will be conducted in accordance with the attached Monitoring and Reporting Program, No. R5-2012-0106. The applicable WQOs are the narrative toxicity objective, Primary and Secondary Maximum Contaminant Levels, and the taste and odor objective as found in the Basin Plan. Numerical limits in this Order implement those Objectives. The following are the numerical WQOs for potential pollutants of concern at the Site:

Constituent	WQO	Reference
DBCP	0.0017 µg/L	California Public Health Goal
EDB	0.01 µg/L	California Public Health Goal
Sulfolane	16 µg/L	EPA Tap water Screening Level
Nitrate	10 mg/L	California Public Health Goal
Sulfate	250 mg/L	Secondary Maximum Contaminant Levels
Chloride	250 mg/L	Secondary Maximum Contaminant Levels
Total dissolved solids	450 mg/L	Food and Agricultural Organization-Sensitive Crop Protection
Alpha-BHC	0.015 µg/L	California Notification Levels
Beta-BHC	0.025 µg/L	California Notification Levels
Gamma-BHC (Lindane)	0.032 µg/L	California Public Health Goal

35. The action to adopt these Waste Discharge Requirements for the Site is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.) (CEQA) because it: (1) authorizes activity that will result in a minor modification to land pursuant to Title 14, California Code of Regulations, Section 15304; (2) consists of an action by a regulatory agency authorizing actions for the protection of the environment pursuant to Title 14, California Code of Regulations, Section 15308; and (3) authorizes minor cleanup actions costing \$1.5 million or less that are taken to prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release of a hazardous waste or substance pursuant to Title 14, California Code of Regulations, Section 15330.

36. Section 13267(b) of the California Water Code provides that:

“In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste outside of its region that could affect the quality of the waters of the state within its

region shall furnish under penalty of perjury, technical or monitoring program reports which the Regional Board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring these reports, the Regional Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”

The technical reports required by this Order and the attached MRP No. R5-2012-0106 are necessary to assure compliance with these WDRs. The Discharger operates the facility that discharges the waste subject to this Order.

37. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells, as described in *California Well Standards Bulletin No. 74-90* (June 1991) and *Water Well Standards: State of California Bulletin No. 94-81* (December 1981). These standards, and any more stringent standards implemented by the Regional Water Board or adopted by San Joaquin County pursuant to California Water Code Section 13801 apply to all monitoring, extraction and injection wells.
38. Section 3020(b)(2) of the Resource Conservation and Recovery Act (RCRA) states that prior to injection into or above an underground source of drinking water, contaminated groundwater shall be “...treated to substantially reduce hazardous constituents prior to such injection.” In a letter dated 10 December 1999, the United States Environmental Protection Agency, Office of Solid Waste and Emergency Response (OSWER) states, “if extracted groundwater is amended at the surface (i.e., “treated”) before reinjection, and the subsequent in-situ bioremediation achieves a substantial reduction of hazardous constituents, the remedy would satisfy Section 3020(b)(2).” Therefore, the injection of groundwater within the treatment zone at this site, with or without the treatment for VOCs, complies with Section 3020(2) (b) of RCRA.
39. The discharge is exempt from the requirements of *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, set forth in the Title 27, California Code of Regulations (CCR), section 20005 *et seq.* (hereafter Title 27), which allows a conditional exemption from some or all of the provisions of Title 27. The exemption, pursuant to Title 27 CCR Section 20090(b), is based on the following:
 - a. The Regional Water Board is issuing Waste Discharge Requirements.
 - b. The discharge is in compliance with the applicable Basin Plan.
 - c. The wastewater does not need to be managed according to Title 22CCR, Division 4.5 and Chapter 11 as a hazardous waste.

Section 20090(d) allows exemption for a project to cleanup a condition of pollution that resulted from an unauthorized release of waste based on the following:

- a. Wastes removed from the immediate place of release will be discharged according to the Title 27 regulations; and
- b. The remedial actions intended to contain wastes at the place of release shall implement the Title 27 regulations to the extent feasible.

Public Notice

40. All the above and the supplemental data and information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.
41. The Central Valley Water Board has notified the Discharger and interested agencies and persons of its intent to revise the waste discharge requirements for this facility and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
42. Prohibitions, conditions, definitions, and some methods of determining compliance other than those included in this Order are contained in the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated September 1993, a part of this Order.
43. In a public meeting, all comments pertaining to these Waste Discharge Requirements were heard and considered.

IT IS HEREBY ORDERED that Order No. 83-039 be rescinded and OCC, their agents, successors, and assigns, in order to meet provisions of Division 7 of the Water Code and the regulations adopted thereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS:

1. The discharge of any waste or other materials not specifically regulated by this Order is prohibited.
2. Discharge of waste to surface waters or to surface water drainage courses is prohibited.
3. The bypass or overflow of untreated or partially treated waste is prohibited.
4. Creation of pollution, contamination or nuisance, as defined by Section 13050 of the California Water Code (CWC) is prohibited.
5. Treatment system bypass of untreated or partially treated waste is prohibited, except as allowed by Standard provisions E.2 of the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*.

6. Discharge of waste at a location or in a manner different from that described in the Findings is prohibited.

B. DISCHARGE SPECIFICATIONS:

1. The discharges shall remain within the designated disposal areas (injection wells) at all times, as shown on Attachment C, a part of this Order.
2. The Discharger shall not cause degradation or nuisance of any water supply as defined by the California Water Code.
3. The disposal of the treated groundwater into injection wells screened below the Corcoran Clay shall not exceed 750 gpm. The disposal of the treated groundwater above the Corcoran Clay shall not exceed 1,250 gpm. Injection flow rates shall not exceed the demonstrated treatment system capacities.
4. Total discharge from the treatment system shall not exceed 750 gpm until it is demonstrated that the proposed treatment plant capacity is greater than the current capacity.
5. The best currently approved analytical methods for DBCP have detection levels of 0.001 µg/L and practical quantitation levels of 0.01 µg/L. The practical quantification level is above the effluent limitation for DBCP. Compliance with the effluent limitation is demonstrated by measuring no detectable concentrations of DBCP when using the method(s) listed on MRP R5-2012-0106 and achieving the specified method detection limit. If new methods are approved that improve on the detection level and practical quantitation level, the MRP will be revised.
6. The discharge from the Site treatment system to the injection wells shall not contain concentrations of COCs exceeding the following effluent limits:

Constituent	Effluent Limit
DBCP	0.0017 µg/L
EDB	0.01 µg/L
Sulfolane	16 µg/L

7. The discharge from the J.R. Simplot backup supply well wellhead treatment system shall not contain concentrations of sulfolane exceeding 16 µg/L.

C. GROUNDWATER LIMITATIONS

1. The discharge shall not cause concentrations of sulfolane, DBCP or EDB in groundwater at compliance points outside the treatment zone, designated in Table 3 (Attachment D, as part of this order) of Monitoring and Reporting Program No. R5-2012-0106, to exceed WQOs listed in the table under Finding No. 35.
2. The discharge shall not cause concentrations of sulfate, nitrate and chloride in Site groundwater above the Corcoran clay to exceed 20% above background/baseline conditions established for each of the compliance points outside the treatment zone, designated in Table 3 (Attachment D) of Monitoring and Reporting Program No. R5-2012-0106. If concentrations of COCs measured as background/baseline is greater than respective WQO specifications in Finding No. 35 table than no increase is allowed.
3. The discharge shall not cause the groundwater to contain taste and odor producing substances that cause nuisance or adversely affect beneficial uses at the compliance monitoring points outside the treatment zone, designated in Table 3 (Attachment D) of Monitoring and Reporting Program No. R5-2012-0106.

D. PROVISIONS

1. The Discharger shall comply with all applicable Standard provisions and Reporting Requirements for Waste Discharge Requirements, dated 1 March 1991, which are attached hereto and by reference are a part of this Order. This attachment and its individual paragraphs are commonly referenced as Standard Provisions.
2. The Discharger may be required to submit technical reports pursuant to California Water Code Section 13267 as directed by the executive Officer. The technical reports required by this Order are necessary to assure compliance with this Order.
3. All technical reports required herein that involve planning, investigation, evaluation, or design or other work requiring interpretation or proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code, sections 6735, 7835 and 7835.1. To demonstrate compliance with Title 16, CCR, Sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.
4. The Discharger shall develop background/baseline conditions for sulfate, nitrate, and chloride above the Corcoran Clay at each of the groundwater compliance

points located outside the treatment zone. The treatment zone is shown in Attachment C. Compliance points are designated in Table 3 (Attachment D) of Monitoring and Reporting Program No. R5-2012-0106. The Discharger shall develop background/baseline conditions for TDS in groundwater wells below the Corcoran Clay following the procedures found in CCR Section 20415(e)(10). The Discharger shall submit a proposal to develop the background concentrations **no later than 60 days prior to commencement of injection system operation above the Corcoran clay**. The Discharger shall submit a report summarizing the development of the background/baseline concentrations and a list of the proposed background/baseline values **no later than 30 days prior to commencement of operation of the new injection wells screened above the Corcoran Clay**.

5. At least 15 days prior to the commencement of injection system operation above the Corcoran clay, the Discharger shall submit an Operation and Maintenance (O&M) Plan for the groundwater treatment facilities. The O&M Plan shall instruct field personnel on how to manage the day-to-day discharge operations to comply with the terms and conditions of this Order and how to make field adjustments, as necessary. A copy of the O&M Plan shall be kept at the facility for reference by operating personnel. Key personnel shall be familiar with its contents. The O&M plan shall be modified as needed to respond to changes in system operations.
6. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2012-0106, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.
7. A copy of this Order shall be maintained at the project site and be available at all times to operating personnel.
8. The Discharger shall maintain in good working order and operate as efficiently as possible any facility or control system installed by the Discharger to achieve compliance with these Waste Discharge Requirements.
9. The Discharger shall promptly report to the Central Valley Water Board any violation of this Order, material change in the character or volume of the discharge. The location of any discharge within the treatment zone (Attachment C) may be changed if needed with written agreement from the Central Valley Water Board.
10. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the following items by letter, in advance of the transfer of ownership or control, and a copy of the notice must be forwarded to the Central Valley Water Board:
 - a. Existence of this Order; and

b. The status of the Discharger's annual fee account

11. This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, nor protect the Discharger from his liability under Federal, State, or Local laws, nor create a vested right for the Discharger to continue the waste discharge.
12. Chemical, bacteriological, and bioassay analyses must be conducted at a laboratory certified for such analyses by the State Department of Health Services.
13. All reports, or other documents required by these WDRs, and other information requested by the Central Valley Board shall be signed by a person described below or by a duly authorized representative of that person:
 - a. For a corporation: by a responsible corporate officer such as: (a) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function; (b) any other person who performs similar policy or decision making functions for the corporation; or (c) the manager of one or more manufacturing, production, or operating facilities if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
 - b. Reports required by this Order, and other information requested by the Central Valley Water Board may be signed by a duly authorized representative provided:
 - i. the authorization is made in writing by a person described in paragraph (a) of this provision;
 - ii. the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company; and
 - iii. the written authorization is submitted to the Central Valley Water Board prior to or together with any reports, information, or applications signed by the authorized representative.
 - c. Any person signing a document under paragraph (a) or (b) of this provision shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified

personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

14. The Discharger shall permit authorized staff of the Central Valley Water Board:

- a. Entry to the project site covered by these Waste Discharge Requirements or in which any required records are kept;
- b. Access to copy any records required to be kept under terms and conditions of this Order;
- c. Inspection of monitoring equipment or records; and
- d. Sampling of any discharge.

15. In the event the Discharger is unable to comply with any of the conditions of this Order due to:

- a. Breakdown of any facility or control system or monitoring equipment installed by the Discharger to achieve compliance with this Order;
- b. Migration or application of substances, pollutants or byproducts outside the specified treatment area;
- c. Accidents caused by human error or negligence; or
- d. Other causes such as acts of nature;
- e. The Discharger shall notify the Central Valley Water Board by telephone within 24 hours as soon as he or his agents have knowledge of the incident and confirm this notification in writing within two weeks of the telephone notification. The written notification shall include pertinent information explaining reasons for the noncompliance and shall indicate the steps taken to correct the problem and the dates thereof, and the steps being taken to prevent the problem from recurring.

16. In the event of any change in control or ownership or responsibility for operation, monitoring, and maintenance of the Lathrop facility, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.

Notification shall be given 180 days prior to the effective date of the change and shall be accompanied by an amended Report of Waste discharge and technical documents that are needed to demonstrate continued compliance with this Order.

17. The Central Valley Water Board may review this Order periodically and may revise requirements when necessary. In addition, the Discharger shall file a report of waste discharge with the Executive Officer at least 120 days before making any material change or proposed change in the character or volume of the discharge. The location of any discharge within the treatment zone (Attachment C) can be changed if needed with written agreement from the Central Valley Water Board.
18. Project coverage under these Waste Discharge Requirements may be terminated, by the Executive Officer at any time upon giving reasonable notice to the Discharger.
19. The Discharger shall maintain a copy of this Order at the Site and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

I, Pamela C. Creedon, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Central Valley Water Quality Control Board, Central Valley Region, on 4 October 2012.

Original Signed By

PAMELA C. CREEDON, Executive Office

10/10/2012 SS

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING ORDER NO. R5-2012-0106

FOR
WASTE DISCHARGE REQUIREMENTS

GLENN SPRINGS HOLDING COMPANY
FORMER OCCIDENTAL CHEMICAL COMPANY
GROUNDWATER REMEDIATION PROJECT
LATHROP FACILITY
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring a groundwater extraction and treatment system. This MRP is issued pursuant to Water Code Section 13267. The Discharger is required to comply with this MRP, which contains the minimum monitoring and reporting requirements necessary to determine compliance with the Waste Discharge Requirements Order (WDR) No. R5-2012-0106. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. Central Valley Water Board staff shall approve specific 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.

TREATMENT SYSTEM MONITORING

The monitoring program for the treatment system shall follow the schedule provided in the attached Tables 1 and analytical methods listed in Table 2.

Table 1 lists all sampling locations and the sampling frequency. Table 2 lists the sampling constituents, analytical methods, and maximum practical quantitation limits. Sample collection and analysis shall follow standard EPA protocol. If necessary, equivalent analytical methods may be used with the concurrence of the Central Valley Water Board staff.

The best currently approved analytical methods for DBCP have detection levels of 0.001 µg/L and practical quantitation levels of 0.01 µg/L. Both of these values are above the effluent limitation for DBCP, Compliance with the effluent limitation is demonstrated by measuring no detectable concentrations of DBCP when using the method(s) listed on MRP R5-2012-0106 and achieving the specified method detection limit. If new methods are approved that improve on the detection level and practical quantitation level, the MRP will be revised.

**Table 1. SAMPLING FREQUENCY AND
 CONSTITUENT SUITE FOR TREATMENT SYSTEMS**

Monitor Point	Units	Frequenc y
Influent Monitoring-Combined Influent		
DBCP	µg/L	Monthly
EDB	µg/L	Monthly
Sulfolane	µg/L	Monthly
Gamma-BHC (Lindane)	µg/L	Monthly
Nitrate	mg/L	Quarterly
Chloride	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Total Dissolved Solids	µg/L	Monthly
Effluent Monitoring (Port B-Lead Vessel Effluent, Port C-Combined Effluent)		
DBCP	µg/L	Monthly
EDB	µg/L	Monthly
Sulfolane	µg/L	Monthly
Nitrate	mg/L	Quarterly
Chloride	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Total dissolved solids	mg/L	Monthly
Dissolved Oxygen ¹	mg/L	Monthly
Total Organic carbon	mg/L	Monthly
Oxidation/Reduction Potential ²	millivolts	Monthly
Electrical Conductivity	µmhos	Monthly
Flow-average	Gallons per minute	Monthly
Flow-cumulative	gallons per minute	Monthly

¹ Field Measurement

² As ORP data is being collected frequently, the range of ORP measurements should be reported.

Table 2. ANALYTICAL METHODS

Sampling Parameter	Analytical Method¹	Practical Quantitation Limit² (micrograms/liter)³
Depth to groundwater	Not applicable	0.01 feet
Fumigants	EPA Method 8260B	
1,2-Dibromo-3-chloropane (DBCP) ⁵		0.01
Ethylene dibromide (EDB) ⁵		0.01
Organochlorine Pesticides	EPA Method 8081A	
Aldrin		0.05
alpha-BHC		0.05
beta-BHC		0.05
delta-BHC		0.05
gamma-BHC		0.05
Chlordane		0.05
4,4'-Dichlorodiphenyldichloroethane (4,4'-DDD)		0.05
4,4'-Dichlorodiphenyldichloroethylene (4,4'-DDE)		0.05
4,4'-Dichlorodiphenyltrichloroethane (4,4'-DDT)		0.05
Dieldrin		0.05
Heptachlor		0.05
Toxaphene		5
Organophosphorus Pesticides	EPA Method 8141A	
DEF(S,S,S - Tributyltrithio-phosphate)		1.0
Delnav		1.0
Dimethoate		1.0
Ethyl parathion		1.0
Methyl parathion		1.0
Disyston (Disulfoton)		1.0
Herbicides	EPA Method 8151A	
2,4-D (Dichlorophenoxyacetic acid)		0.5
2,4,5-T (Trichlorophenoxyacetic acid)		0.1
Sulfolane	APPL SOP ANASULF ⁴	10
Inorganics	EPA Method 300	
Chloride		1 mg/L
Nitrate		0.1 mg/L
Sulfate		1 mg/L
Total Dissolved Solids	EPA Method 160.1	10 mg/L

¹ If necessary, equivalent analytical methods may be used with Central Valley Water Board staff concurrence.

² For non-detectable results.

³ Except where indicated.

⁴ In accordance with APPL laboratory provided information.

⁵ Water quality requirements for reinjected groundwater for these compounds are 0.01 µg/L EDB, 0.0017 µg/L DBCP and 16 µg/L sulfolane.

GROUNDWATER INJECTION SYSTEM MONITORING

The injection aquifer is overlain by a thick confining layer of relatively impermeable clay (referred to as the Corcoran clay). Treated groundwater by the treatment system is discharged beneath the Site in wells located both above and below the Corcoran clay. 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 WDR issued for the Site.

Attached Table 3 lists the injection wells and the sampling frequency. Table 2 lists the sampling constituents analytical methods, and the maximum practical quantitation limits. Sample collection and analysis shall follow standard EPA protocol.

COMPLIANCE WELL GROUNDWATER MONITORING

Monitoring of the compliance well shall be conducted according to the frequency listed in Table 3, and using methods listed in Table 2, which includes the sampling constituents, analytical methods, and the maximum practical quantitation limits. Sample collection and analysis shall follow standard EPA protocol. If necessary, equivalent analytical methods may be used with Central Valley Water Board staff concurrence.

FIELD SAMPLING

In addition to the above sampling and analysis, field sampling and analysis shall be conducted each time a monitor well or extraction well is sampled. The sampling and analysis of field parameters shall be as specified in Table 4 as follows:

Table 4: FIELD SAMPLING REQUIREMENTS

Parameters	Units
Groundwater Elevation	Feet, Mean Sea Level
Electrical Conductivity	µmhos
Dissolved Oxygen	mg/L
pH	pH Units (to 0.1 units)
Temperature	°C
Extraction Rate ¹	GPM
Purge Rate ²	GPM
Turbidity	NTU
Total Gallons Purged	Gallons
Water Level	ft MSL

1. This applies only to extraction wells.
2. This applies only to monitoring wells.

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 the "Reporting" section of this MRP.
5. Groundwater level sampling is being conducted pursuant to Order No. R5-2004-0800.

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 Central Valley Water Board within 48 hours of any unscheduled shutdown of a groundwater extraction system. 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 semi-annual electronic data reports, which conform to the requirements of the California Code of Regulations, Title 23, Division 3, Chapter 30. The semi-annual 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 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 include the following minimum information:

- (a) a description and discussion of the groundwater treatment system, 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, sampling method, water quality parameters measured during purging (if purging is necessary for the sample method) or sampling, method of purging, depth of water, volume of water purged, etc.;

- (c) groundwater potentiometric contour maps for all groundwater zones, if applicable;
- (d) pollutant concentration maps for all wells included in the semi-annual event 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 laboratory analytical data reports;
- (i) a description of remedial and system optimization activities and the status of ongoing remediation, including influent and effluent concentrations, extraction well and injection well pumping rates, treatment system flow rates, effectiveness of the remediation system, and 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; and
- (j) if applicable, the reasons for and duration of all significant interruptions in the operation of remediation system, and actions planned or taken to correct and prevent interruptions; and
- (k) A log of GAC replacement, if applicable along with transportation date(s) and destination of disposal.

An Annual Report shall be submitted to the Regional Board by **1 February** of each year. The Annual Report shall also serve as the Semi-Annual Report also due on **1 February** of each year. This Annual Report shall contain an evaluation of the effectiveness and progress of the investigation and remediation, and may be substituted for the concurrent 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 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; 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 self-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.

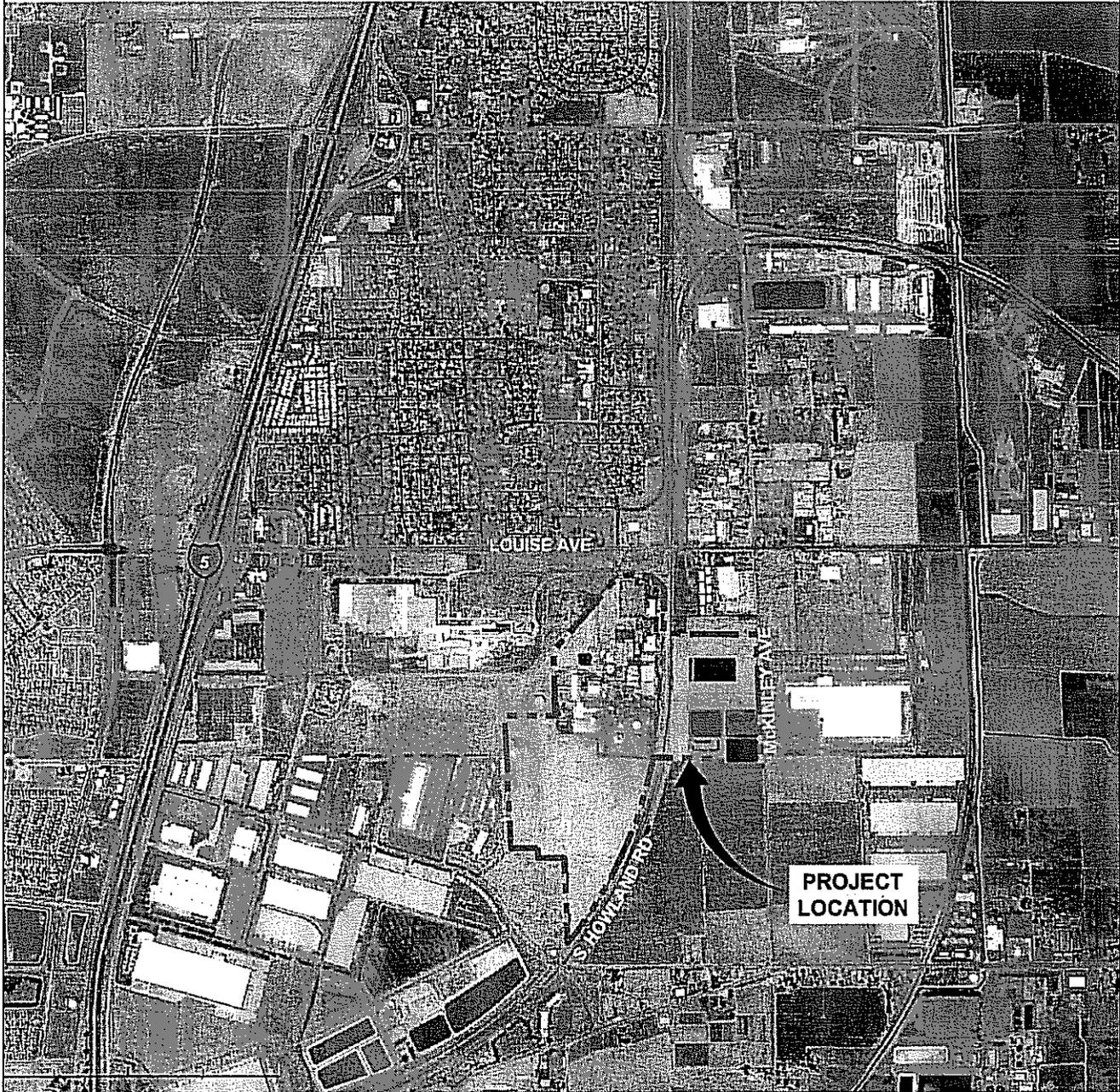
The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Ordered by: _____
Original Signed By
PAMELA C. CREEDON Executive Officer

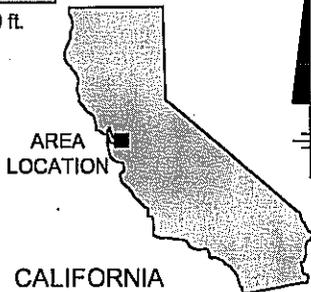
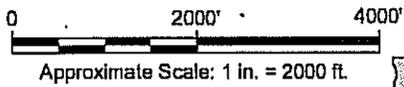
10-04-2012

(Date)

10/10/2012:SS



MAP SOURCE: Google Earth Pro™ 2009, 37°48'25.10"N, 121°16'31.19"W

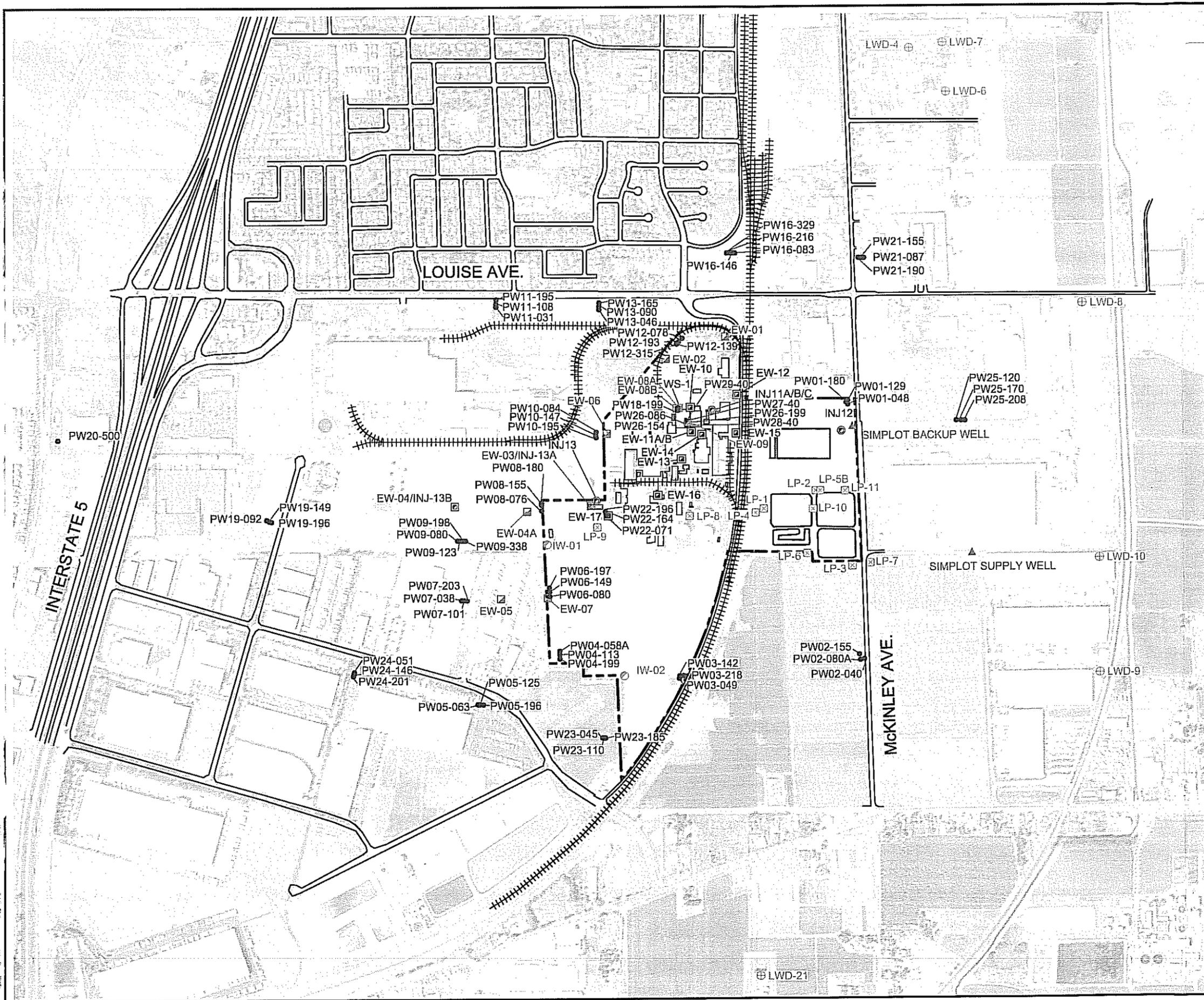


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LATHROP, CALIFORNIA

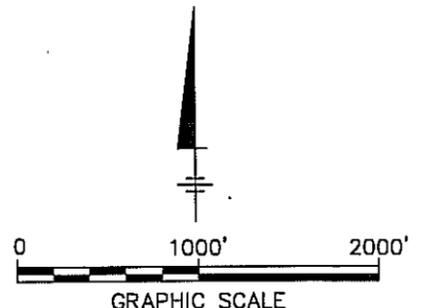
SITE LOCATION MAP

ATTACHMENT A

CITY OF PERRIS, CALIFORNIA, DIVISION OF PUBLIC WORKS, 2009. ALL RIGHTS RESERVED. THIS MAP IS PROVIDED AS A SERVICE TO THE CITY OF PERRIS. THE CITY OF PERRIS, CALIFORNIA, DIVISION OF PUBLIC WORKS, 2009. ALL RIGHTS RESERVED. THIS MAP IS PROVIDED AS A SERVICE TO THE CITY OF PERRIS.



- LEGEND**
- MONITORING WELL
 - ⊠ SIMPLOT MONITORING WELL
 - ⊞ EXTRACTION WELL
 - ⊙ INJECTION WELL
 - ⊞ EXTRACTION TO BE CONVERTED TO INJECTION WELL
 - ▲ SIMPLOT SUPPLY WELL
 - ⊕ LATHROP WATER DISTRICT WELL
 - ⊞ PROPOSED EXTRACTION WELL
 - ⊙ PROPOSED INJECTION WELL
 - SITE BOUNDARY



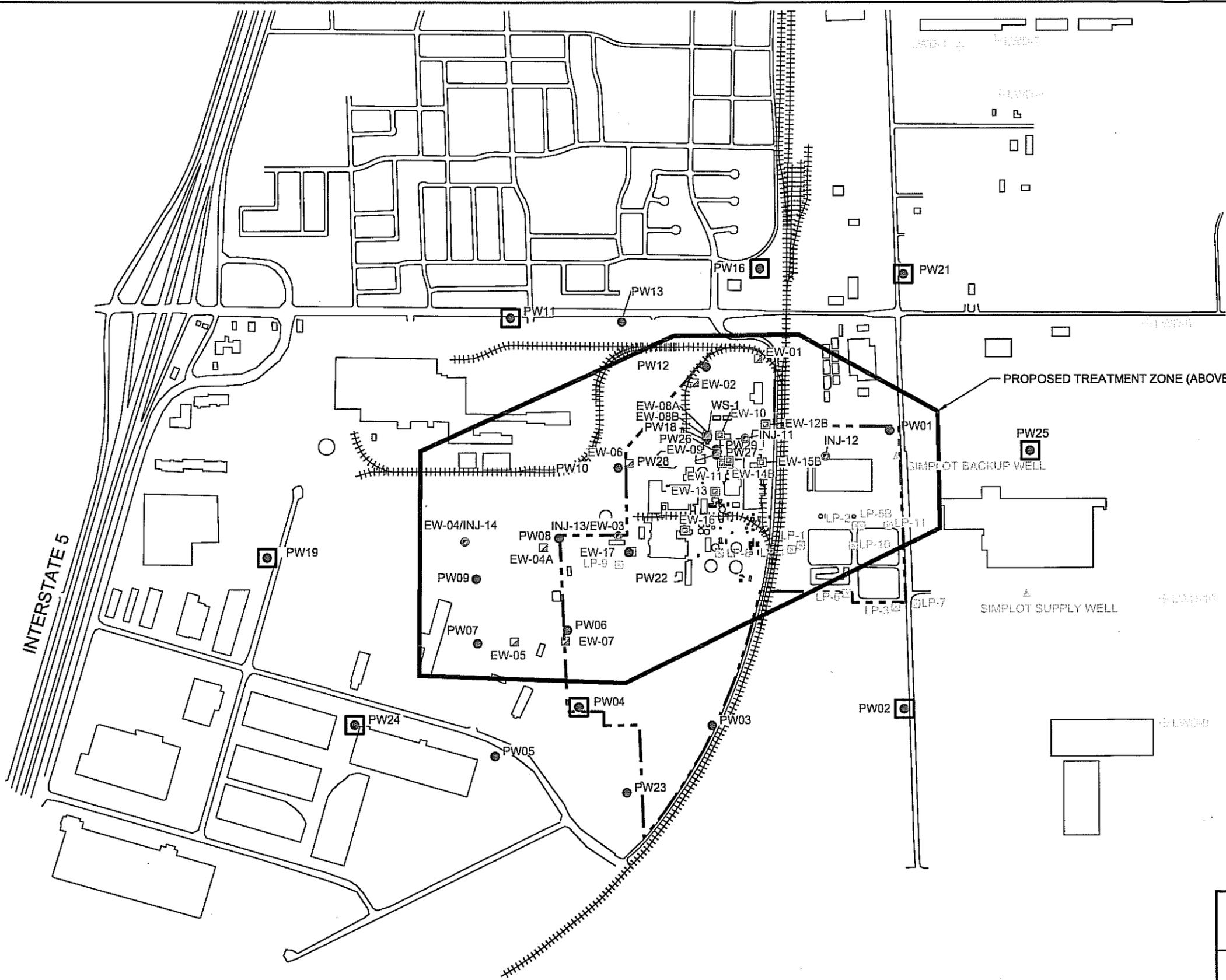
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LATHROP, CALIFORNIA

SITE PLAN

ATTACHMENT B

LEGEND

- MONITORING WELL
- ▣ EXTRACTION WELL
- ▲ SIMPLOT SUPPLY WELL
- ▣ SIMPLOT MONITORING WELL
- ⊕ LATHROP DISTRICT WELL
- ▣ PROPOSED EXTRACTION WELL
- ⊕ PROPOSED INJECTION WELL
- ▣ PROPOSED COMPLIANCE WELL
- - - SITE BOUNDARY



GLENN SPRINGS HOLDINGS, INC.
FORMER OCC - LATHROP FACILITY
LATHROP, CALIFORNIA

PROPOSED TREATMENT ZONE AND COMPLIANCE WELL NETWORK (ABOVE CC)

ATTACHMENT C

ATTACHMENT
C

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

Sampling Location	Purpose ⁴	EDB ⁵	DBCP ⁵	Sulfolane ⁵	OC & OP Pesticides	Total Volume Injected, Rate Injected, Injection Pressure	BHC Isomers ⁵	Herbicides	Total Dissolved Solids	Nitrate, Chloride, Sulfate
EXTRACTION WELLS										
EW-2	R, O	A	A	A	--	--	--	--	--	--
EW-3	R, O	A	A	A	--	--	--	--	--	--
EW-4	R, O	A	A	A	--	--	--	--	--	--
EW-4A	R, O	A	A	A	--	--	--	--	--	--
EW-5	R, O	A	A	A	--	--	--	--	--	--
EW-6	R, O	A	A	A	--	--	--	--	--	--
EW-7	R, O	A	A	A	--	--	--	--	--	--
EW-8A	R, O	A	A	A	--	--	--	--	--	--
EW-8B	R, O	A	A	A	--	--	--	--	--	--
EW-9	R, O	A	A	A	--	--	--	--	--	--
EW-10 ⁶	R, O	Q	Q	Q	Q	--	Q	--	--	Q
EW-11 ⁶	R, O	Q	Q	Q	Q	--	Q	--	--	Q
EW-12A ⁶	R, O	Q	Q	Q	Q	--	Q	--	--	Q
EW-12B ⁶	R, O	Q	Q	Q	Q	--	Q	--	--	Q
EW-13 ⁶	R, O	Q	Q	Q	Q	--	Q	--	--	Q
EW-14A ⁶	R, O	Q	Q	Q	Q	--	Q	--	--	Q
EW-14B ⁶	R, O	Q	Q	Q	Q	--	Q	--	--	Q
EW-15A ⁶	R, O	Q	Q	Q	Q	--	Q	--	--	Q
EW-15B ⁶	R, O	Q	Q	Q	Q	--	Q	--	--	Q
EW-16 ⁶	R, O	Q	Q	Q	Q	--	Q	--	--	Q
EW-17	R, O	Q	Q	Q	Q	--	Q	--	--	Q
New Well(s) ⁶		Q	Q	Q	Q	--	Q	--	--	Q
GROUNDWATER MONITORING WELLS										
Water Table Zone										
PW02-040	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW11-031	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW24-051	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW27-040	R, O	A	A	A	NR ⁵	--	A	--	--	A
PW28-040	R, O	A	A	A	NR ⁵	--	A	--	--	A
PW29-040	R, O	A	A	A	NR ⁵	--	A	--	--	A
New Well(s) ⁶		Q	Q	Q	Q	--	Q	Q	Q	Q
Shallow Zone										
PW02-080A	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW04-058	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW06-080	R, O	NR ⁵	NR ⁵	NR ⁵	NR ⁵	--	A	--	A	A
PW07-101	R, O	A	A	A	NR ⁵	--	A	--	A	A
PW08-076	R, O	A	A	A	NR ⁵	--	A	--	A	A
PW08-155	R, O	NR ⁵	A	A	NR ⁵	--	A	--	A	A
PW09-080	R, O	NR ⁵	A	NR ⁵	NR ⁵	--	NR ⁵	--	A	A
PW10-084	R, O	NR ⁵	A	A	NR ⁵	--	A	--	A	A
PW12-078	R, O	NR ⁵	NR ⁵	A	NR ⁵	--	NR ⁵	--	A	A
PW16-083	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW19-092	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW21-087	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW22-071	R, O	A	A	A	NR ⁵	--	A	--	A	A
PW25-120	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW26-086	R, O	NR ⁵	A	A	NR ⁵	--	NR ⁵	--	A	A
WS-1-1	R, O	NR ⁵	A	A	NR ⁵	--	NR ⁵	--	A	A
WS-1-2	R, O	NR ⁵	A	A	NR ⁵	--	A	--	A	A
New Well(s) ⁶		Q	Q	Q	Q	--	Q	Q	Q	Q

Attachment D

Table 3

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

Sampling Location	Purpose ⁴	EDB ⁵	DBCP ⁵	Sulfolane ⁵	OC & OP Pesticides	Total Volume Injected, Rate Injection Pressure	BHC Isomers ⁵	Herbicides	Total Dissolved Solids	Nitrate, Chloride, Sulfate
Intermediate Zone										
PW01-129	R, O	NR ⁵	NR ⁵	S	NR ⁵	--	NR ⁵	--	A	A
PW03-142	R, O	NR ⁵	NR ⁵	NR ⁵	NR ⁵	--	NR ⁵	--	A	A
PW04-113	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW06-149	R, O	NR ⁵	A	A	NR ⁵	--	NR ⁵	--	A	NR ⁵
PW08-155	R, O	NR ⁵	A	A	NR ⁵	--	A	--	A	NR ⁵
PW09-123	R, O	NR ⁵	A	A	NR ⁵	--	NR ⁵	--	A	A
PW10-147	R, O	A	A	A	NR ⁵	--	A	--	A	A
PW11-108	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW12-139	R, O	NR ⁵	NR ⁵	A	NR ⁵	--	NR ⁵	--	A	A
PW16-146	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW19-149	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW21-155	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW24-146	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW25-170	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW26-154	R, O	NR ⁵	A	A	NR ⁵	--	A	--	A	A
WS-1-3	R, O	NR ⁵	A	A	NR ⁵	--	A	--	A	A
WS-1-4	R, O	NR ⁵	A	A	NR ⁵	--	A	--	A	A
WS-1-5	R, O	A	A	A	NR ⁵	--	A	--	A	A
New Well(s) ⁶		Q	Q	Q	Q	--	Q	Q	Q	Q
Deep Zone										
PW01-180	R, O	NR ⁵	NR ⁵	NR ⁵	NR ⁵	--	NR ⁵	--	A	NR ⁵
PW02-155	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW03-218	R, O	NR ⁵	NR ⁵	NR ⁵	NR ⁵	--	NR ⁵	--	A	NR ⁵
PW04-199	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW06-197	R, O	NR ⁵	A	A	NR ⁵	--	NR ⁵	--	A	A
PW08-180	R, O	NR ⁵	NR ⁵	NR ⁵	NR ⁵	--	NR ⁵	--	A	NR ⁵
PW09-198	R, O	A	A	A	NR ⁵	--	A	--	A	A
PW10-195	R, O	NR ⁵	NR ⁵	NR ⁵	NR ⁵	--	NR ⁵	--	A	NR ⁵
PW11-195	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW12-193	R, O	NR ⁵	A	A	NR ⁵	--	NR ⁵	--	A	A
PW16-216	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW18-199	R, O	NR ⁵	A	A	NR ⁵	--	NR ⁵	--	A	A
PW19-196	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW21-190	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW22-164	R, O	NR ⁵	NR ⁵	A	NR ⁵	--	NR ⁵	--	A	A
PW22-196	R, O	NR ⁵	NR ⁵	NR ⁵	NR ⁵	--	NR ⁵	--	A	NR ⁵
PW24-201	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW25-208	C	A	A	A	NR ⁵	--	NR ⁵	--	NR ⁵	A
PW26-199	R, O	NR ⁵	A	A	NR ⁵	--	NR ⁵	--	A	A
WS-1-6	R, O	NR ⁵	A	A	NR ⁵	--	A	--	A	A
WS-1-7	R, O	A	A	A	NR ⁵	--	A	--	A	A
New Well(s) ⁶		Q	Q	Q	Q	--	Q	Q	Q	Q
DEEP INJECTION ZONE/ BELOW CORCORAN CLAY										
PW9-338	C	NR ⁵	NR ⁵	A	NR ⁵	--	NR ⁵	--	A	A
PW12-315	C	NR ⁵	NR ⁵	A	NR ⁵	--	NR ⁵	--	A	A
PW16-329	C	NR ⁵	NR ⁵	A	NR ⁵	--	NR ⁵	--	A	A
PW20-500	C	NR ⁵	NR ⁵	A	NR ⁵	--	NR ⁵	--	A	A
New Well (s) ⁶		Q	Q	Q	Q	--	Q	Q	Q	Q

¹ All wells shall be monitored semi-annually 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 Data will be used for the following purpose(s): C - Compliance well to gauge background/baseline outside of treatment zone; R - Remediation well for gauging long-term progress; O - Operation well providing information needed to optimize remediation system operations

⁵ If BHC isomers, OC and OP pesticides, herbicides, sulfolane, EDB, DBCP, or inorganics (e.g., nitrate, chloride, sulfate) are not detected in the monitoring wells above the water quality standards for four consecutive routine sampling events, these analytical suite may be removed from the schedule for that well with Central Valley Water Board staff concurrence.

Attachment D
Table 3

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

Sampling Location	Purpose ⁴	EDB ⁵	DBCP ⁵	Sulfolane ⁵	OC & OP Pesticides	Total Volume Injected, Rate Injected, Injection Pressure	BHC Isomers ⁵	Herbicides	Total Dissolved Solids	Nitrate, Chloride, Sulfate
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⁶New wells (not replacement wells) shall be sampled and analyzed quarterly. The sampling frequency for these new wells may be re-evaluated after two semi-annual sampling events.

* New injection wells screened below the Corcoran clay will continuously monitor total volume, injection rate, and injection pressure. New injection wells screened above the Corcoran clay will continuously monitor total volume and injection rate, and injection pressure.

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

EDB = Ethylene dibromide

DBCP = 1,2-dibromo-3-chloropropane

OC Pesticides = Organochlorine pesticides (Aldrin, Chlordane, DDD, DDE, DDT, Dieldrin, Heptachlor, Toxaphene)

OP Pesticides = Organophosphorus pesticides (DEF, Delnav, Dimethoate, Ethyl Parathion, Methyl 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)

M = Monthly sampling frequency

NR= Not required

Q = Quarterly sampling frequency

S = Semi-annual sampling frequency

A = Annual sampling frequency

-- = Not applicable