



**SYSTEM OPERATION, MAINTENANCE, AND MONITORING PLAN  
SOIL VAPOR EXTRACTION AND TREATMENT SYSTEM  
NORTHWEST AREA  
WYLE LABORATORIES, INC.  
1841 HILLSIDE AVENUE  
NORCO, CALIFORNIA**

*Prepared for:*

Wyle Laboratories, Inc.

*Prepared by:*

ENVIRON International Corporation

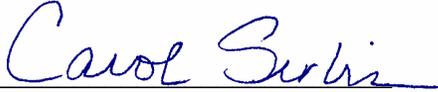
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- Appendix B: National Pollutant Discharge Elimination System (NPDES) Treated Ground Water Discharge Permit
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- Appendix C: Monitoring Forms
- Appendix D: Remediation System Sampling and Analysis Plan dated August 4, 2005
- Appendix E: Soil Vapor Sampling Protocol

### **A T T A C H M E N T S**

- Attachment A: SVE System Manual (Wintek Corporation)
- Attachment B: Carbon Vessel Specifications (U.S. Filter)

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## 1.0 INTRODUCTION

This operation and maintenance (O&M) manual has been prepared as a guideline for the implementation of the Presumptive Remedial Action Workplan (PRAW) dated July 8, 2005, for the Wyle Laboratories, Inc. facility (Wyle) located at 1841 Hillside Avenue, Norco, California (Site; see Figure 8099V-G1). Currently, the California Environmental Protection Agency – Department of Toxic Substances Control (DTSC) is the lead agency at the Site. Investigation and remediation at the Site are being performed under Docket Number HSA-CO 03/04-042.

Subsurface investigations indicated that soil and ground water underlying the Site have been impacted by chlorinated volatile organic compounds (VOCs); however, the PRAW only addresses soil gas contamination. The nature, source, and extent of soil gas contamination in the Northwest Area (NWA), where the PRAW will be implemented, is described in Sections 3.1 and 3.2 of the PRAW and depicted on Figure 4 of the PRAW. Although VOCs in soil gas at the NWA are thought to be present in the interstitial unsaturated pores and generally not adsorbed to soil particles, SVE is appropriate because it will remove soil gas from the unsaturated zone.

Chemicals of concern (COCs) detected at the NWA consist of VOCs, primarily trichloroethylene (TCE), with a maximum detection of  $\geq 10,000$  micrograms per liter ( $\mu\text{g/l}$ ) near the southern end of Golden West Lane. Certain breakdown products of TCE (e.g., cis-1,2-dichloroethene) also have been detected in ground water at lower concentrations than TCE. Other COCs, such as perchlorate and N-nitroso-dimethylamine (NDMA) have been detected in the area, but are not addressed by the PRAW or this O&M manual.

In the PRAW, ENVIRON recommended use of a Soil Vapor Extraction (SVE) system in conjunction with granular activated carbon (GAC) for treatment of VOCs in vapor. On July 22, 2005 DTSC verbally approved the PRAW pending completion of the public comment period.

This O&M manual includes descriptions of the remediation proposed for the Site and the operation and maintenance associated with the extraction and remediation systems. The extraction and treatment compound will be located approximately 300 feet from the Site boundary at the NWA. The compound will contain an SVE system, two 1,000-lb GAC vessels in series to treat extracted vapors, and a 1,000-gallon holding tank. Any condensate water produced will be transferred to one of the existing on-site treatment compounds for treatment

and discharge to the two 5,000-gallon holding tanks at Compound Four. Treated vapors will be discharged to the atmosphere under a South Coast Air Quality Management District (SCAQMD) permit. Treated water will be released near the unnamed ephemeral stream under the existing National Pollution Discharge Elimination System (NPDES) permit.

This manual also summarizes the proposed language for the SCAQMD Permit (Appendix A) and the existing requirements of the NPDES Permit (Treated Ground Water Discharge Permit; Appendix B), as issued by the State Water Resources Control Board—Santa Ana Region (Regional Board) and the Regional Board’s general NPDES permit (Appendix B1). As the SCAQMD permit has not been issued to date, the information in this O&M plan is based on previous interaction with the SCAQMD. Upon receipt of the SCAQMD permit, if necessary, the O&M plan will be revised accordingly. Also, based on the location of electrical supplies and other Site features/obstacles, the piping plan may be revised.

Additional information was provided by: (1) Wintek Corporation (Wintek), Randolph, New Jersey for the SVE skid (Attachment A); and (2) U.S. Filter (U.S. Filter) of Santa Fe Springs, California, for the vapor GAC vessel specifications (Attachment B). A list of contacts for this project is provided on Page iii.

This O&M manual is organized as follows:

- Description of the extraction system, monitoring wells, treatment systems, and miscellaneous equipment including O&M activities; Section 2.0
- Start-up, shut-down, and sampling procedures; Section 3.0
- Permit requirements; Section 4.0
- Performance evaluation; Section 5.0
- Corrective measures; Section 6.0
- References, Section 7.0

Figures provided are the drawings presented to contractors for bidding purposes only. These figures include: General figures (Figure 8099V-G1: Cover Sheet and Figure 8099V-G2: Plot Plan), Remediation System figures (Figure 8099V-P1: Flow Diagram, and Figure 8099V-P2: Soil Vapor Extraction P&ID), Piping figures (Figure 8099V-M1: Piping Trench Plan, Figure 8099V-M2: Treatment Pad Piping Plan, and Figure 8099V-M3: Well Head and Trench Details), Compound figures (Figure 8099V-C1: Foundation Plan & Section, and Figure 8099V-C2: Structural Notes), and Electrical figures (Figure 8099V-E1: Single Line & General Notes, and Figure 8099V-E2: Electrical Site Plan).

The forms listed below will be used to monitor the system and are included in Appendix C. A figure showing the remediation system schematic and sampling ports is also included in Appendix C. A remediation system sampling and analysis plan (SAP) and Soil Vapor Sampling Protocol are included in Appendices D and E.

<b>Form Number</b>	<b>Title</b>	<b>Description</b>
FORM 1	Field Investigation Daily Log	Record activities conducted at the Site
FORM 2	SVE System Checklist	Record system operating parameters and sample identification numbers
FORM 3	Well Measurements	Record vacuum and depth to water in wells at the Site
FORM 4	Chain-of-Custody	Record of sample possession
FORM 5	Vessel Service Log	Record receipt and replacement of liquid- and vapor-phase GAC
FORM 6	Equipment Calibration Log	Record information collected during calibration of equipment at the Site

## 2.0 SITE COMPONENTS

### 2.1 Ground Water Monitoring and Soil Vapor Extraction Wells

Currently seven ground water wells, Wells MW-14, MW-15, and MW-19, MW-20, MW-21, MW-23, and MW-24 (see Figures 8099V-G1 and G2), and five permanent dual-nested soil vapor probes, VW-1 through VW-5, and 29 temporary nested vapor wells ESG-52 through ESG-68, ESG-73 through ESG-78, ESG-80 through ESG-83, ESG-85, and ESG-87 exist at the NWA. Nine SVE wells are planned to be installed, Wells SVE-1 through SVE-9, as wells as up to six additional vapor probes, VW-6 through VW-12. SVE wells with higher VOC concentrations have higher priority for extraction. Specially designed well caps are installed at the well heads of wells used for soil vapor extraction (see Figure 8099V-M3). In addition to the SVE wells, the existing vapor probes, and the six proposed vapor probes, may also be used to monitor cleanup performance.

As summarized in Table 1, the SVE wells are 2-inch diameter and are anticipated to be installed to a maximum depth of 10 feet. Ground water elevation will be monitored prior to installation of the SVE wells. The screened range may be adjusted due to ground water elevation, but is estimated to range from 5 to 10 feet below ground surface (bgs). The construction details for the SVE and monitoring wells are presented in Table 1. Screen levels may be determined by ground water levels at the time of well installation.

#### 2.1.1 Compound Five and SVE Wells

Compound Five contains an SVE system, two 1,000-gallon GAC vessels in series for the treatment of extracted vapor, and a 1,000-gallon holding tank and transfer pump (see Figures 8099V-P1, P2, M1, M2, C1, C2, E1, and E2). Treated vapors will be discharged to the atmosphere under an SCAQMD permit. Any water generated will be transferred to one of the existing compounds for treatment and discharged to Compound Four for eventual discharge to the unnamed ephemeral stream under the existing NPDES permit.

The SVE system at Compound Five will be connected to nine wells; Wells SVE-1 through SVE-9. Based on the vapor concentration of VOCs in the soil gas, SVE will be conducted in the following order: SVE-4, SVE-5, SVE-7, SVE-3, SVE-6, SVE-8, SVE-9, SVE-1, and SVE-2.

Pending permit receipt and final DTSC approval, Compound Five is scheduled to begin testing in December 2005. If DTSC approval and permit receipt occur earlier, this schedule may be advanced.

Prior to the start up of Compound Five, an approximately two week testing period will be held to evaluate the different operating parameters. The SVE system will be equipped with a various-locations SCAQMD permit good for operation up to one year. Once received, a copy of the various-locations SCAQMD permit will be included as Appendix A. Additionally, a few months after start up, a site-specific SCAQMD permit will be applied for.

## **2.2 SVE System and Monitoring Schedule**

The SVE system to operate in the NWA is a Wintek system. A schematic of the SVE system is depicted on Figure 8099V-P2. The SVE system is used to generate high vacuums for the extraction of soil vapors from the formation. The system is designed to extract up to 200 standard cubic feet per minute (SCFM) of vapors at 20 to 22 inches of mercury (in. Hg). Additional details on the SVE system operation are provided in the manufacturer O&M manual (Attachment A).

The major components on the SVE system consist of the following:

- Electrical Control Panel
- Knockout Tank with Demister Pad
- Dilution Air filter
- Oil Reservoir
- Vacuum Blower (200 SCFM @ 22" Hg, 40 Hp, 460V, TEFC motor)
- (Two) Progressive Cavity Transfer Pump (24 gpm @ 50 psig, cast iron with Buna Stator; 1 1/2 HP; 230V, TEFC motor)
- Sealant Circulation Pump (2 HP, 460 V, TEFC motor)
- (Two) Air to Oil Heat Exchanger Fan (1/4 HP, 460V, TEFC motor)

The vacuum blower draws soil vapors into the knockout tank, where water is separated from the vapor stream. The water is transferred from the knockout tank by a progressive cavity pump into a 1,000-gallon holding tank at the treatment compound. The treated water captured in the holding tank will be transported to one of the existing on-site compounds for treatment. The knockout tank on the extraction system is equipped with level switches to control the operation

of the pumps; (High) to trigger the transfer pump/s, (High High) to shut down the system, and (Low) to stop the transfer pump.

Between the vapor discharge line and the vapor treatment system (GAC vessels), a pressure switch shuts down the SVE System, if the discharge pressure exceeds 3 pounds per square inch (psi). An air to oil heat exchanger cools the sealant liquid circulating in the vacuum pump. A temperature switch, located on the discharge line of the heat exchangers, shuts down the system if sealant temperature exceeds 210 degrees Fahrenheit (°F). Extracted soil vapors are directed to the GAC vessels, where they are treated and then discharged to the atmosphere.

The waste oil (sealant from changing the vacuum pump oil every six months or every 3,000 to 6,000 hours) will be drummed and labeled for off-site disposal/recycling.

A Field Investigation Daily Log (Appendix C, Form 1) is used to record field activities during operation, maintenance, and monitoring activities at the Site. At a minimum, on a weekly basis, operating parameters are recorded on the SVE System Checklist (Appendix C, Form 2). This checklist also is used every time a well is connected or disconnected from the SVE System. Additionally, vacuum (measured with a magnehelic gauge or electronic manometer) and depth to water (measured with a Solinst water level indicator) measurements are recorded on Form 3 of Appendix C. A chain-of-custody form (Appendix C, Form 4) will be filled out every time a liquid or vapor sample is collected for laboratory analyses. Vessel Service Logs (Appendix C, Form 5) are used to record vapor phase carbon change out activities. Equipment Calibration Logs (Appendix C, Form 6) are used to record calibration information for instruments used at the Site.

The requirements for system maintenance provided by Wintek (pages 16 and 17, Attachment A) are as follows:

By Time Intervals

Many variables affect the maintenance schedules of the various components of the SVE system. Wintek recommends the following “typical” maintenance schedule. **Note:** For the first six months of operation, or until operation has demonstrated longer service intervals are acceptable, maintenance frequency should be greater than that shown below.

As Necessary

Oil Separator Oil Level Increases:	Drain water and adjust operating temperature.
Liquid Ring Pump:	Change mechanical seals, gaskets, lip seals, and bearings.
Transfer Pumps:	Change stator and seal.
Circulation Pump:	Change mechanical seal and gaskets.
Air Coolers:	Clean interior and/or exterior of units.
Filter Silencer	Change to minimize flow restriction.
Transfer Pump Basket Strainers	Clean to minimize flow restriction.

Weekly

Knockout Pot:	Check water level cycle points. Clean dirt from bottom by venting tank and draining through bottom valve. Flush and clean level glass and level switch housing. Check operating vacuum level.
Transfer Pump:	Check transfer pump flow rate.
Vacuum Pump/Separator Tank:	Check vacuum level. Check oil level in separator tank (Should be at pump centerline). Check operating temperature (160° F). Check for unusual noises. Check oil separator discharge pressure. <b>Note:</b> Observe initial reading on back pressure gauge and replace element when pressure differential exceeds 5 psig.

Monthly

Vacuum Pump:	Clean sealant Y-strainer.
Knockout Pot:	Clean out basket strainer.
Air Coolers:	Blow off dust/dirt with compressed air.

Bi-Monthly (Every 2 Months)

Knockout Pot:	Perform a full clean-out to remove floating sludge and solids.
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Four Months

Vacuum Pump: Grease bearings.  
Check condition of drive coupling.

Six Months

Vacuum Pump: Change sealant oil (see attached instructions).

Yearly

Vacuum Pump: Change discharge oil eliminator. **Note:** Typical life is 6-12 months depending on the site conditions.

**2.3 Treatment Systems**

The extracted soil vapors will be treated with two 1,000-pound GAC vessels and discharged to the atmosphere under a SCAQMD Permit (see Appendix A). Any water condensate will be contained and transported for treatment at one of the existing treatment compounds with two 500-pound liquid-phase GAC and piped into the two 5,000-gallon holding tanks at Compound Four, and discharged near the unnamed ephemeral stream under the existing NPDES discharge permit (see Appendix B).

**2.3.1 Vapor Treatment – Vapor Phase Granular Activated Carbon (GAC)**

The vapors from the SVE System are passed through two 1,000-pound vapor-phase GAC vessels installed in series for treatment. The treated vapors will be discharged to the atmosphere under a SCAQMD Permit (see Section 4.1 and Appendix A for permit details).

All extracted vapors will be directed through the GAC vessels prior to discharge. On a weekly basis, the exterior of the vessel will be observed and checked for any signs of leakage or deterioration.

When the analytical results from the laboratory indicate change out conditions as specified in the SCAQMD permit, the GAC in the first vessel will be exchanged with fresh carbon. Spent GAC will be picked up by the carbon vendor, U.S. Filter, and will be transported off-site to a carbon recycling facility. The second GAC vessel will replace the first vessel and become the first GAC vessel. The purpose for this replacement is to have fresh carbon for polish as the last vessel at all times. The amount and time of carbon change out will be recorded on the Vessel Service Log (Appendix C, Form 5).

### **2.3.2 Water Treatment – Liquid Phase Granular Activated Carbon (GAC), Holding Tank and Perchlorate Treatment**

Any condensate water from the SVE operation will be stored in a 1,000-gallon holding tank at Compound Five and transported to one of the existing on-site compounds for treatment by the two 500-pound liquid-phase GAC vessels installed in series. The treated water is then pumped to the two 5,000-gallon holding tanks on Compound Four. If necessary, the treated ground water can be routed through the ion exchange resin beds for treatment of perchlorate. Ultimately the treated water will be released to the riprap near the unnamed ephemeral stream under a NPDES discharge permit (see Section 4.2 and Appendices B and B1 for permit details).

Each carbon vessel is equipped with a pressure gauge (0 to 25 psi capacity). Weekly measurements of the pressure gauge will be recorded on the System Checklist (Appendix C, Form 2). On a weekly basis, the exterior of the vessel will be observed and checked for any signs of leakage or deterioration.

If the GAC (or resin) vessels demonstrate back-pressure (pressures exceeding 20 psi) due to hard water deposit buildup, or there is breakthrough of the first GAC (or resin) vessel, the system will be shut down and the GAC (or resin) in the first vessel will be exchanged with fresh carbon (or resin). Spent GAC (or resin) will be picked up by the vendor, U.S. Filter, and will be transported off-site for disposal or recycling. The second GAC (or resin) vessel will replace the first vessel and become the first GAC (or resin) vessel. The purpose for this replacement is to have fresh carbon (or resin) for polish as the last vessel at all times. The amount and time of change out will be recorded on the Vessel Service Log (Appendix C, Form 5). Upon completion of change out the system will be re-started.

## **2.4 Monitoring and Sampling Plan**

The frequency of sampling and methods used to analyze vapor obtained during execution of this O&M plan are described in Tables 2 and 3. These frequencies and analytical methods will not be modified without DTSC approval. Procedures for sample analysis are described in the Remediation System SAP and Soil Vapor Sampling Protocol (Appendices D and E). Generated data will be reviewed using the methods specified in the Quality Assurance Project Plan (QAPP) for the Site presented in the PRAW.

#### **2.4.1 Monitoring and Sampling – Vapor**

General procedures for vapor sample collection, sampling port location, and analytical methods are described in the Remediation System SAP (Appendix D).

#### **2.4.2 Monitoring and Sampling – Vapor Probes**

General procedures for vapor probe sample collection and sample handling are described in the Soil Vapor Sampling Protocol (Appendix E).

#### **2.4.3 Monitoring and Sampling – Ground Water**

General procedures for ground water sample collection are described in the final Remedial Action Workplan dated May 14, 2004.

### **2.5 Miscellaneous Equipment**

The following equipment will be used to conduct remediation system O&M at the Site (either brought or stored at the Site).

- Manometer – to measure vacuum influence
- Sump pump – for pumping water out of sumps at the treatment compounds
- Air pump (GAST; 115 volts, 4.2 amps, 60 Hz) – to collect air samples in Tedlar bags
- PID, Determinator – for vapor monitoring
- 100 ppm isobutylene tank with pressure gauge, 100 ppm hexane tank with gauge – to calibrate PID
- Heavy-duty pipe wrench – for maintenance use
- Miscellaneous tools in tool box – for maintenance use
- Nitrile gloves – for personal protection during sampling activities
- 1- and 3-liter Tedlar bags for vapor sample collection (common and accepted industry practice to use Tedlar bags for monitoring remediation systems, accepted by SCAQMD)
- SUMMA™ Canisters
- Glassware – for NPDES permit sample collection
- Trash bags – for refuse collection
- PVC fittings and valves – for maintenance use
- Solinst – to measure water levels in the wells

### **3.0 SVE AND TREATMENT SYSTEM PROCEDURES**

The procedures outlined in this section include the start-up and shut-down operations and the procedures to be followed for vapor probe sampling.

#### **3.1 Start-Up Procedure (expected to last from two to four weeks)**

- (1) Review the O&M manuals provided by Wintek (Attachment A) prior to starting the system (and after any shut-down period).
- (2) Verify that the main electrical supply is on and the circuit breaker has not tripped. Record initial operating parameters on the SVE System Checklist (Appendix C, Form 2).
- (3) At the SVE electrical panel, press the reset button and set the vacuum system, transfer pump, and after cooler switch in the "Auto" position.
- (4) Press the "vacuum pump start" button to turn on the SVE System. The valve on the manifold to the wells should be completely closed and the dilution air valve on the system slightly open (system vacuum should read 18 to 25 in. Hg). Partially open the valve on the manifold to the wells and on individual well valve while monitoring the vacuum at the SVE System (which should not go below 15 in. Hg).
- (5) At the SVE well head, verify flow valve is open.
- (6) Open the valves to the wells to be extracted from at the manifold.
- (7) Verify that the vacuum at the blower inlet does not exceed 28 in. Hg and is not lower than 15 in. Hg. Throttle valves on the SVE well manifold/dilution air valve as necessary.

- (8) Monitor vacuum, pressure, vapor flow rate (Vortex meter and the flow meter), water flow rate, pressure gauges, and temperature gauges on the SVE System. Record operating parameters on the SVE System Checklist (Appendix C, Form 2).

### **3.2 Monitoring and Sampling Procedures During Normal Operating Conditions**

- (1) Record operating parameters on the SVE System Checklist (Appendix C, Remediation Schematic and Sampling Points, and Form 2) and follow procedures in the Remediation System SAP (Appendix D).

The water sampling point at Compound Five is:

- Influent to the holding tank

The ground water sampling ports in the combined treatment system (at Compounds One, Two, Three and Four) are:

- Mid-point of the GAC beds (between beds)
- Effluent from GAC beds
- Combined water at the holding tank (two 5,000-gallon tanks)
- Mid-point of the ion exchange perchlorate resin beds (between beds)
- Effluent from ion exchange perchlorate resin beds

The vapor sampling ports located on the treatment system are:

- Influent to the first GAC vessel
- Mid-point of the GAC vessels (between vessels)
- Effluent from the second GAC vessel

- (2) Collect samples per Tables 2 and 3. A summary of sampling frequency is presented in Table 2. A summary of sampling methods is presented in Table 3. All sampling will be conducted in accordance to the procedures outlined in the Remediation System SAP (Appendix D).

### **3.3 Shut-Down Procedure**

When it is necessary to shut down the SVE System while operating under non-emergency conditions, the following procedures should be followed:

- (1) Record operating parameters on the SVE System (Appendix C, Form 2). Collect any water and vapor samples as required (Table 2).
- (2) Turn off all electrical switches on the SVE control panel. Turn off the SVE switch on the electrical supply panel.
- (3) Record the time the SVE System was shut down.

## 4.0 PERMITS

All work proposed as part of the O&M activities will be conducted in accordance with the pertinent regulatory agency permits. The operation of the SVE system will be permitted through the SCAQMD (Appendix A), discussed in Section 4.1 below. The treated ground water will be discharged near the ephemeral stream under the existing NPDES permit from the Regional Board (Appendices B and B1), discussed in Section 4.2 below.

### 4.1 SCAQMD Permit: Sampling and Reporting Requirements

Soil vapors from the extraction system are treated by GAC. The treated soil vapors are discharged from the GAC vessels to the atmosphere under an SCAQMD Permit. A copy of the permit will be posted at the Site. In addition, a contact person name, company, and phone number will be displayed in a permanent and conspicuous position. ENVIRON will follow all conditions and monitoring requirements of the permit (see Table 3). Once the permit is obtained, a copy will be included as Appendix A. Analytical methods and sampling procedures are discussed in the Remediation System SAP (Appendix D).

### 4.2 NPDES Discharge Permit: Sampling and Reporting Requirements

Any condensate water generated will be stored in the holding tank at Compound Five and transferred to one of the existing compounds for treatment by passing through liquid-phase GAC. The treated ground water is discharged near the unnamed ephemeral stream under the existing NPDES permit (discharge authorization number R8-2002-0007-129) from the Regional Board (see Appendix B). ENVIRON will follow all conditions and monitoring requirements of the water discharge permit (see Table 3). It is important to note that the NPDES permit has been issued under Regional Board Order No. R8-2003-085, with established discharge limits for contaminants (Appendix B1).

## 5.0 PERFORMANCE EVALUATION

During the first three months of operation, ENVIRON will submit monthly reports to DTSC to describe the status of the remediation system and to provide a summary of operating conditions at Compound Five. Within thirty days of the end of the first month of full-time operation for the extraction system, a report will be submitted to the SCAQMD summarizing the first month of full-time operation. Additional reporting to the SCAQMD is not required, but records are required to be kept and may be requested by SCAQMD at any time.

After the first three months of operation, the information will be submitted to the DTSC on a quarterly basis at the end of the month following three months of operation as part of the routine quarterly monitoring report. Information in these reports will include:

- Hours of operation during the reporting period;
- Influent and effluent concentration of VOCs in the extracted vapors;
- Influent and effluent concentration of VOCs in the condensate water;
- Date of sampling;
- Mass removal rates and total mass removed;
- Volume of soil vapors removed;
- Summary of the laboratory results from the vapor samples as well as the influent/effluent water samples;
- Laboratory results and chain-of-custody documents;
- Summary of non-routine repairs or modifications, if any; and
- Summary of activities conducted during the performance period (i.e., carbon change outs, major equipment repair/maintenance, etc.).

The following data will be used to evaluate the performance of the system:

- At a minimum, on a weekly basis, vapor readings will be collected from the vapor sampling ports (influent, midpoint, and effluent) with a PID (see Table 3). The collected vapor data will be used to calculate VOC mass removed as well as to satisfy the SCAQMD permit requirements.
- Additionally, as necessary, the vacuum influence and ground water elevations will be measured at the vapor monitoring probes and monitoring wells. This information will be recorded (Appendix C, Form 3), and will be used in assessing the zone of vapor influence and the need for additional soil vapor extraction wells.
- At a minimum, on a monthly basis, samples of extracted vapors will be collected from the influent and effluent of the treatment system for laboratory analysis by EPA Method TO-14 (see Table 3). These samples will be used in assessing the amount of contaminant mass removed in the vapor stream. The collected vapor data will also be used to satisfy the SCAQMD permit requirements. These samples will be collected in accordance with the Remediation System SAP (Appendix D).
- If present, water samples will be collected at the influent to the holding tank according to the Remediation System SAP (Appendix D) and as presented in Tables 2 and 3. Analytical results of these samples will be used to estimate the amount of contaminant removed from the formation in the liquid stream. To comply with the NPDES permit, if a sufficient quantity of condensate water is present, ENVIRON will analyze: on a monthly basis, influent samples for VOCs, perchlorate, NDMA, TPH (C4-C12), TSS, and Title 22 metals. Sampling frequency and analytical methods will not be modified without DTSC's concurrence.

As part of the performance evaluation, VOC concentrations in the nearby vapor probes and ground water monitoring wells will be reviewed to evaluate the remediation system performance.

Per Figure 6 of the PRAW, the schedule projects monthly sampling of the vapor probes.

## 6.0 CORRECTIVE MEASURES

Corrective measures have been developed to address routine or unexpected events during the PRAW implementation period. Such corrective measures will address equipment operational issues, as well as unexpected contaminant levels or constituents. A list of potential issues and their respective corrective measures are discussed below.

- **High Water Level in Holding Tank:** If the water level in the holding tank continues to increase, the High-High water level indicator in the tank will shut down the SVE System. If the High-High alarm is activated, the telemetry unit will notify ENVIRON of the alarm. Additionally, ENVIRON personnel will conduct visual inspection of the water level in the tanks during the weekly visits. ENVIRON personnel will then visit the Site to address the specific mechanical or electrical issues. Once the issue has been addressed, ENVIRON will re-start the extraction system, largely in accordance with the start-up procedures outlined in Section 3.1.
- **High Temperature on Extraction System:** If the seal oil temperature of the liquid ring pumps exceed 210 °F, a signal will be sent to the control panel to shut off the extraction system. The telemetry system will then be activated, notifying ENVIRON. ENVIRON personnel will then visit the Site to troubleshoot the system.
- **Elevated VOC Concentrations in Soil Vapor:** If VOC concentrations in soil vapors exceed SCAQMD permit limits as measured with a PID, indicating breakthrough, ENVIRON will collect a vapor sample for laboratory analysis, shut down the system, and schedule GAC service and carbon change out. If the PID measurement is close to the permit limit, the extraction unit will be turned off, pending GAC service and carbon out.
- **Elevated Constituent Concentrations in Discharged Treated Water:** If laboratory analytical results of treated water from one of the treatment compounds where condensate water has been treated indicate constituents at concentrations exceeding NDPEs permit limits, ENVIRON will stop discharge of the treated water to Compound Four and the water in the 5,000-gallon holding tanks will be re-sampled. During this testing period, discharge to the ephemeral stream will be stopped. Depending on the constituent and the exceedance, ENVIRON will propose appropriate corrective measures.

Water will not be discharged to the ephemeral stream until adequate treatment is employed.

- **Unexpected Contaminants in Condensate Water:** To date, laboratory analytical data of ground water in the NWA indicate the presence of certain VOCs (excluding vinyl chloride), NDMA, and perchlorate, and no detectable concentrations of hydrazine; however,
  - Although perchlorate and NDMA have been detected in ground water in the NWA, the SVE system at Compound Five is designed to extract vapors only. Therefore, perchlorate or NDMA are not expected in the soil vapors or condensate water. If effluent water at concentrations that would exceed the regulatory limits after condensate water has been treated at any of the existing on-site treatment compounds, the water will be treated using the existing perchlorate resin beds at Compound Four. Water will not be discharged to the ephemeral stream until the concentrations are less than regulatory limits.

## 7.0 REFERENCES

California Regional Water Quality Control Board, Santa Ana Region, 2002. Order R8-2002-0007: General Groundwater Cleanup Permit for Discharges to Surface Waters of Extracted and Treated Groundwater Resulting From the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents and/or Petroleum Hydrocarbons Mixed with Lead and/or Solvents. January 23.

California Regional Water Quality Control Board, Santa Ana Region, 2003. Order R8-2003-0085: Amending Order 2002-0007, General Groundwater Cleanup Permit for Discharges to Surface Waters of Extracted and Treated Groundwater Resulting From the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents and/or Petroleum Hydrocarbons Mixed with Lead and/or Solvents. October 3.

ENVIRON, 2003. Quality Assurance Project Plan for Removal Work Plan, Wyle Laboratories, Inc., 1841 Hillside Avenue, Norco California, November.

ENVIRON, 2004. Sampling and Analysis Plan, Wyle Laboratories, Inc., 1841 Hillside Avenue, Norco, California, February 3.

ENVIRON 2005. Final Presumptive Removal Action Workplan for Soil Gas at the NWA, Wyle Laboratories, Inc., 1841 Hillside Avenue, Norco, California, July 8.

## **T A B L E S**

**TABLE 1**  
**Vapor Well Specifications**

Well ID	Total Depth (feet)	Diameter (inches)	Screen Interval (feet)	Type of Well	
				Monitoring	Extraction
SVE-1 <sup>1</sup>	10	2	5-10		X
SVE-2 <sup>1</sup>	10	2	5-10		X
SVE-3 <sup>1</sup>	10	2	5-10		X
SVE-4 <sup>1</sup>	10	2	5-10		X
SVE-5 <sup>1</sup>	10	2	5-10		X
SVE-6 <sup>1</sup>	10	2	5-10		X
SVE-7 <sup>1</sup>	10	2	5-10		X
SVE-8 <sup>1</sup>	10	2	5-10		X
SVE-9 <sup>1</sup>	10	2	5-10		X
VW-1	12	0.75	11.5-12	X	--
VW-2	15	0.75	14.5-15	X	--
VW-3	10	0.75	9.5-10	X	--
VW-4	13	0.75	12.5-13	X	--
VW-5	15	0.75	14.5-15	X	--
VW-6		0.75		X	--
VW-7		0.75		X	--
VW-8		0.75		X	--
VW-9		0.75		X	--
VW-10		0.75		X	--
VW-11		0.75		X	--
MW-14	20	2	10-20	X	--
MW-15	40	2	30-40	X	--
MW-19	25	4	15-25	X	--
MW-23	28	4	18-28	X	--

Note:

<sup>1</sup> SVE wells are not yet installed. This table may be updated when the information is available.

**TABLE 2**  
**Sampling Frequency**

**Start up: (expected to last from two to four weeks)**

Sample Location	Daily	Weekly	Monthly
Water: Flow Rate	Flow meter installed	--	--
Water: Influent to Holding Tank	--	X <sup>1</sup>	X <sup>1</sup>
Vapor: Flow Rate	Flow meter installed	--	--
Vapor: Influent to First GAC Vessel	X	X	--
Vapor: Effluent from Second GAC Vessel	X	X	--

Note: <sup>1</sup> Water samples will be collected as feasible as water is not anticipated to be regularly present.

**Full-time operation:**

Sample Location	Weekly	Bi-Weekly	Monthly
Water: Flow Rate	Flow meter installed	--	--
Water: Influent to Holding Tank	--	--	X <sup>1</sup>
Vapor: Flow Rate	Flow meter installed	--	--
Vapor: Influent to First GAC Vessel	--	X	X
Vapor: Effluent from Second GAC Vessel	--	X	X

Note: Samples used for permit compliance and performance evaluation. Mid-point samples are collected as needed if breakthrough of the first vessel is suspected. Additional sampling may be conducted voluntarily at any time.

<sup>1</sup> Water samples will be collected as feasible as water is not anticipated to be regularly present.

**TABLE 3**  
**Sampling Methods Required by Permits**

**SCAQMD permit summary (estimated):**

Port	Daily	Bi-Weekly	Monthly
Vapor flow into First GAC vessel	Maintain measuring device	--	--
Influent to First GAC vessel	--	PID	TO-14
Mid-point (between GAC vessels)	--	PID	--
Effluent from Second GAC vessel	--	PID	TO-14

**NPDES permit summary:**

<b>Monthly Influent to Holding Tank<sup>1</sup></b>					
Flow	VOCs	Perchlorate	NDMA	TPH (C <sub>4</sub> -C <sub>12</sub> )	Title 22 Metals <sup>2</sup>
Flow meter	8260B full scan	314.0	1625C M	8015 M	200 series

Notes: Sampling frequency and Analytical Methods will not be modified without DTSC's concurrence.

<sup>1</sup> Water samples will be collected as feasible as water is not anticipated to be regularly present.

<sup>2</sup> Metals analyses are not included in the NPDES permit but are included in monitoring per DTSC request in 2/4/04 letter.

## **FIGURES**

**A P P E N D I X A**

**SCAQMD Permit**

**A P P E N D I X B**

**Treated Ground Water Discharge Permit  
(NPDES Permit) from Regional Board**

## **APPENDIX B1**

California Regional Water Quality Control Board, Santa Ana Region Monitoring and Reporting Program No. R8-2002-0007, NPDES No. CAG918001 for Groundwater Cleanup Project

**and**

California Regional Water Quality Control Board, Santa Ana Region, Order No. R8-2003-0085

## **A P P E N D I X C**

### **Monitoring Forms**

**Remediation Schematic and Sampling Points**

**Field Investigation Daily Log (Form 1)**

**SVE System Checklist (Form 2)**

**Well Measurements (Form 3)**

**Chain-of-Custody (Form 4)**

**Vessel Service Log (Form 5)**

**Equipment Calibration Log (Form 6)**

**APPENDIX D**

**Remediation System Sampling and Analysis Plan  
Compound Five**

## **APPENDIX E**

### **Soil Vapor Sampling Protocol**

**A T T A C H M E N T A**

**SVE System Manual  
(Wintek Corporation)**

**A T T A C H M E N T B**

**Carbon Vessel Specifications  
(U.S. Filter)**