

*Final Workplan*

# Treadwell & Rollo

15 June 1999  
Project No. 2543.01-2000

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To LARRY SETO	From MICHAEL MCG.		
Co/Dept AC DEH	Co TAR		
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Subject: Workplan for  
Phase I Remediation and Additional Subsurface Investigation  
2855 Mandela Parkway Property  
Oakland, California

Dear Mr. Seto:

This workplan to conduct initial remedial activities and perform additional subsurface investigation has been prepared by Treadwell & Rollo, Inc. on behalf of 2855 Mandela Property, the current owner of the subject property (the site) (see Figure 1). The objective of the planned work is to more reliably detect and monitor free product, if present, and to begin extraction of free product.

### BACKGROUND

Previous subsurface investigations conducted at the site have detected the presence of gasoline free product and associated dissolved-phase constituents beneath the site. The most recent investigation was conducted by Treadwell & Rollo in April 1999, and a preliminary report dated 4 June 1999 was transmitted to the Alameda County Environmental Health Department. Final results will be incorporated in the report of activities undertaken for this workplan.

In the four rounds of investigation conducted at the site over the last year, free product was encountered in five of six borings in the 11 November 1998 sampling round, otherwise free product has only been encountered once or not at all in each sampling event. At this time, we surmise that absence of free product may be due to differences in drilling techniques. Although all borings were drilled with direct push equipment, the 11 November 1998 borings utilized a slightly larger core and different pushing equipment.

The distribution of groundwater concentrations do not appear to support the hypothesis that the primary source of free product is the former tank located under the Willow Street sidewalk at the 2607 Mandela Parkway building or from further to the east. However, the source has not been identified. The source may be the gasoline storage tank removed from the site in 1991, or a third unknown tank, located either at the site or under Willow Street.

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In April 1999, groundwater was encountered from 2 to 11 feet below ground surface (bgs), and in previous investigations from 6 to 11 feet bgs. From the site topography, proximity to the San Francisco Bay, and distribution of free product, we anticipate that groundwater flows to west to northwest with a relatively gentle gradient. However, previous groundwater flow direction and gradient calculations using temporary piezometers have yielded a relatively steep gradient of approximately 0.02, and most recently, a flow direction to the west-southwest. The cause of these anomalous results has not yet been resolved. Further evaluation of the groundwater flow direction and gradient can be performed at a later time if site issues warrant it.

### **PURPOSE AND SCOPE OF WORK**

The overall objective of this investigation is to more reliably detect and monitor free product beneath the site, to further delineate free product extent under the site, and to begin extraction of free product as a phased approach to site remediation. To meet these objectives, we propose to:

- utilize larger-bore (4-inch diameter) groundwater monitoring wells installed with auger drilling equipment, two of these wells to be located where free product was detected previously;
- install the third well further to the north, inside the building, to further delineate the extent of product and significant dissolved phase concentrations on the site;
- obtain samples of product for chemical analysis to further the "fingerprint" characterization begun in the previous investigation;
- periodically extract free product, where encountered, for up to a 30-day period to assess product flow and recovery rate; and
- based on the extraction results, install up to 3 additional extraction wells and continue extraction for a second 30-day period.

Proposed well locations for three initial wells are shown on Figure 1. The location rationale follows:

- near SB-18 as a convenient location in the wood storage yard, where a substantial product thickness has been consistently detected;

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- near SB-12, inside the building, which is downgradient of the former tank on site where product was found once but not in a subsequent sample (SB-24); and
- a moderate distance further to the north inside the building to help delineate the extent of product and significant dissolved-phase concentrations in groundwater.

Specifically, we will perform the following tasks:

- contact Underground Services Alert (USA) to establish the approximate location of known subsurface utilities within the area to be explored;
- obtain appropriate drilling permits from Alameda County Department of Public Works;
- update the Health and Safety Plan for field activities;
- advance three soil borings penetrating groundwater at the approximate locations indicated on Figure 1 and as explained above;
- collect soil samples from each boring at five-foot intervals for possible laboratory analysis;
- log boreholes and classify soils following the Unified Soil Classification System (USCS) by an onsite geologist or engineer;
- measure the location and elevation of the three wells by a licensed surveyor; and
- develop wells not containing product, if any, subsequently;
- collect free product samples from the two wells located near where free product was previously detected, and from the third boring if free product is encountered, for laboratory "fingerprint" analysis;
- collect groundwater samples for laboratory analysis from any wells where free product is not detected, including collecting field quality assurance/quality control (QA/QC) samples;
- analyze free product samples for Total Volatile Petroleum Hydrocarbons (TVPH) and Total Extractable Petroleum Hydrocarbons (TEPH) by EPA Method 8015M (including chromatograms for fingerprinting), and benzene, toluene, ethylbenzene, and total

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xylenes (BTEX) and methyl tert butyl ether (MTBE) by EPA Method 8020, and organic lead by the DIIS LUFT method. Select product samples will also be analyzed for specific gravity and dynamic viscosity;

- analyze groundwater samples for TPH as gasoline (TPH-g) by EPA Method 8015M (including chromatograms), and BTEX and MTBE by EPA Method 8020;
- analyze select soil samples, at least one per boring, for TPH as gasoline (TPH-g) by EPA Method 8015M, and BTEX and MTBE by EPA Method 8020; and
- periodically extract free product from the wells for a period up to 30 days, including measuring the product layer thickness and depth to water before and after each extraction event, and recording the volumes removed.

After evaluating the results of 30 days of product extraction, install up to 3 additional product extraction wells, if warranted. The specific tasks associated with the additional three wells are similar to the above tasks. The Alameda County Environmental Health Department will be informed of the proposed locations and rationale prior to installation.

Subsequent to the first phase of well installation and product extraction, a technical report will be submitted with results of the April 1999 investigation, results of this investigation, and product extraction flow rates and observation.

## **PROCEDURES**

### **Field Preparation Activities**

In accordance with OSHA regulations, the existing site-specific Health and Safety Plan (HSP) will be revised, as necessary, for the field investigations described herein. All field personnel will be required to implement the procedures presented in the HSP while conducting onsite field work.

Prior to commencing field activities, subsurface drilling permits will be obtained from the Alameda County Public Works Agency. In addition, Underground Service Alert (USA) will be contacted to clear the proposed drilling locations of subsurface utilities.

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### **Drilling, Monitoring Well Installation and Sampling**

Three borings will be advanced to approximately 20 feet bgs using a hollow stem auger drill rig to penetrate groundwater. The borings will be converted to monitoring wells. An onsite geologist or engineer will log the borings, classify the soils following the USCS, and note observations such as odors or discolored soil. ~~Soil samples will be collected every five feet for possible laboratory analysis.~~ Soil cores will be collected in plastic or metal sleeves, then capped with teflon and plastic caps in the field, labeled, stored in an ice chest, and then shipped under standard chain-of-custody protocol to a state-certified analytical laboratory.

It is planned to install the monitoring wells to a depth of approximately 20 feet bgs. Each well will be constructed with approximately 18 feet of 4-inch, Schedule 40 PVC, 0.010 in. slot screen with #2/16 Monterey sandpack, and 2 feet of casing with bentonite seal and grout. The wells will be left open overnight to allow groundwater to equilibrate, after which the depth to groundwater and the thickness of product (if present) will be measured to the nearest 0.01-foot using an electronic sounding probe. The top of casing location and elevation of each well will be surveyed by a licensed surveyor to at least 0.01-foot.

If free product does not immediately enter the well, the well will be observed for up to five consecutive days for free product. If no free product enters the well, it will be developed prior to groundwater sampling.

Wells for groundwater sampling, i.e., no observable product in the well, will be developed using surge and bail or pumping methods to develop the formation surrounding the filter pack and to remove finer-grained sediments from the well. If possible, a minimum of five well volumes will be pumped or bailed from the wells.

Prior to groundwater sampling, the depth to water will be measured and the well will then be purged to remove a minimum of three well volumes of water. During purging, measurements of temperature, pH, and electrical conductivity will be made on samples of the purge water until the parameters stabilize. Groundwater samples will then be collected following purging, after allowing time for water-level recovery.

Groundwater samples, or free product samples where encountered, will be collected from each well with a disposable bailer. Following retrieval, the groundwater and free product samples will be placed in glass containers provided by the analytical laboratory, labeled, stored in the field in separate ice chests, and shipped under standard chain-of-custody protocol to a state-certified

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analytical laboratory. Free product and groundwater samples will be stored in separate ice chests for shipment to the analytical laboratory.

Non-disposable sampling equipment will be washed in a dilute non-phosphate detergent solution, rinsed in fresh and then distilled water, and air dried. If groundwater sampling is performed, QA/QC field samples will include one blind groundwater sample duplicate and one trip blank for each batch of groundwater samples, and one equipment blank for each day of field sampling.

Soil cuttings and equipment rinsate will be stored onsite in secure containers pending profile results and appropriate final disposal.

### **Laboratory Analysis**

Product samples will be analyzed for TVPH and TEPH by EPA Method 8015M (including chromatograms), and BTEX and MTBE by EPA Method 8020, and organic lead by the DHS LUFF method. Select product samples will also be analyzed for specific gravity for, among other uses, correction of measured groundwater levels. Select product samples will also be analyzed for specific gravity and dynamic viscosity for use in possible later transport evaluations. Groundwater grab samples will be analyzed for TPH-g by EPA method 8015M (including chromatograms) and BTEX and MTBE by EPA method 8020. Select soil samples, at least one per boring, will be analyzed for TPH-g by EPA method and BTEX and MTBE by EPA method 8020.

### **Phase I**

Product extraction will likely consist of hand-bailing the product from the wells periodically, for up to 30 days. However, depending upon the thickness and recovery rate of product encountered in the field, a vacuum-tanker truck may be utilized. The initial and final water levels, product thickness, volume removed, and approximate flow rate will be recorded.

Depending upon extraction results for these initial wells, three additional wells may be installed. The Alameda County Environmental Health Department's approval will be gained as to the locations and rationale prior to installation. Production will be extracted periodically for up to an additional 30 day period.

### **REPORTING**

After completion of the site characterization and product extraction activities described above, a detailed report will be written evaluating the results of the subsurface investigation and pilot

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remediation efforts. The report will include discussion and analysis of the samples obtained from the April 1999 borings and product extraction wells, and conclusions and recommendations. Figures will be prepared summarizing the sampling results, and estimated direction and gradient of groundwater flow. The report will include tables summarizing the analytical results, monitoring well construction diagrams, boring logs, laboratory reports and chromatograms, and procedures and results of the Phase I remediation efforts.

#### **SCHEDULE**

Treadwell & Rollo is prepared to begin this investigation upon approval from Alameda County Environmental Health Department. Upon procurement of all necessary permits, utility clearances, and drilling contractor mobilization, it is estimated that the field well installation and development services described above will require approximately 2 days to perform, and the pilot remediation efforts up to 30 days, for each set of three wells. Receipt of laboratory data typically requires 2 weeks. The technical report will be submitted 4 weeks after completion of the Phase I remediation efforts.

We trust that this workplan is acceptable to you. If you have any questions or comments, please contact Faye Beverett of 2855 Mandela Property at (415) 398-2266 or me at (925) 253-2683.

Sincerely,  
TREADWELL & ROLLO, INC.



Michael P. McGuire, P.E.  
Associate Engineer

Attachment: Figure 1