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UNION PACIFIC RAILROAD
OAKLAND,CALIFORNIA TOFC YARD
PROPOSED WORK PLAN
for
HYDROCARBON INVESTIGATION
AND REMEDIAL DESIGN

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Prepared for,
Union Pacific Railroad

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HYDROCARBON INVESTIGATION AND REMEDIAL DESIGN AT UNION PACIFIC RAILROAD'S OAKLAND, CALIFORNIA TOFC YARD

INTRODUCTION

This work plan presents a synopsis of the current site conditions at Union Pacific Railroad's Oakland, California TOFC Yard. Union Pacific Railroad has requested USPCI to design this work plan which includes a multi-tasked comprehensive Hydrocarbon Investigation and remedial system action plan. The work plan presented will investigate any free and dissolved contaminant plumes, aquifer characteristics, and recommend an appropriate remedial action plan.

SITE CONDITIONS

The Oakland TOFC Yard is located at 1717 Middle Harbor Road in Oakland California. UPRR operations at this facility consist of loading and unloading over-the-road trailers on flatcars for rail transport. The facility also includes a small refueling rack for locomotives. The site is bounded on the south and west by the Oakland Estuary and on the north by the Navy Supply Center.

Two pollution incidents were observed by the U.S.Coast Guard on February 4, and 7, 1991 at the Oakland Yard. Both incidents resulted in releases of diesel/oil to the estuary. The UPRR took immediate actions to contain and cleanup the releases as well as to prevent addition releases to the Oakland Estuary.

Initial observations at the site revealed diesel product in two catch basins feeding a storm sewer that empties into the estuary at the point of the release. It has been determined that this storm sewer originates underneath the fueling rack but it is not connected to it. Excavation of this sewer line reveals it is badly corroded with numerous holes. The storm sewers leading to the estuary were cleaned out and plugged with concrete to prevent any future release.

Well	Purpose
1	Investigate the groundwater suspected to be upgradient from the fueling area.
2	To provide control as to the migration of any contaminated groundwater to the west.
3	Investigate the groundwater across gradient, east from the fueling area.
4	Located to the north of the fueling area adjacent to the UPRR property boundary.
5,6	(Suspected) downgradient monitoring well locations to determine any groundwater impact to the south.
7,8	To determine refueling area contamination.

Minor variations in well locations may occur due to buried utilities, accessibility problems, or analytical results which suggest a more appropriate location for the boring. All monitoring wells will be used to monitor groundwater elevation and concentration of free and dissolved hydrocarbons.

TASK 1 PREPARE FOR INVESTIGATION

Work Plan

The preparation of this work plan is included under Task 1.

Health and Safety Plan

Prior to drilling, a site-specific Health and Safety Plan will be developed for the site. This plan will be developed using the background information known about the Union Pacific Railroad property. The Health and Safety Plan will: 1) identify and describe potentially hazardous substances that could be expected to be encountered during the field investigation; 2) specify protective equipment to be utilized during on-site activities; and 3) outline emergency measures to be implemented in the event unanticipated and/or potentially hazardous conditions are encountered during field activities. All USPCI personnel and subcontractors will be required to review and sign the Health and Safety Plan prior to commencement of field activities.

Permits

All necessary permits will be acquired prior to beginning work on the site.

TASK 2 FIELD INVESTIGATION

Site Visit

During the site visit the boring locations will be determined and marked. USPCI will contact local utilities to determine if there are any underground utilities in the vicinity of the borings. Also during this stage a records and document review will be performed.

Drilling and Soil Sampling of Borings

All borings will be advanced under the technical supervision of a USPCI geologist. Soil borings will be completed using a truck-mounted drilling rig equipped with 8-inch diameter

hollow-stem augers. During drilling, soil samples will be obtained and screened for organic vapor emissions using a portable Organic Vapor Monitor (OVM). Soil samples collected for possible chemical analysis will be placed in 8-ounce glass sample jars.

The sampling plan for the proposed borings/monitoring wells will be to have two soil samples from each boring analyzed for TPH and BTEX. The selection of the samples may vary with conditions encountered in the field, however, samples from all dominant zones will be collected for laboratory analysis.

Monitoring Well Installation and Water Sampling

Five to eight of the exploratory borings will be completed as shallow groundwater monitoring wells. The well borings will be completed and the monitoring wells installed to the depth of approximately 10 feet below saturated sediments, or 15 feet total depth. The wells will be developed and sampled following USPCI standards as presented in Appendix A.

TASK 3 EVALUATION AND INTERIM REPORT

If hydrocarbon contamination is identified and the extent of contamination is delineated by the Task 1&2 work, an interim report of analytical results will be prepared and submitted. The report will contain an interpretation of the results, a discussion of the conceptual remedial alternatives, and the conceptual remedial action plan. This report may be delayed to allow additional delineation borings, if appropriate.

TASK 4 AQUIFER TEST

Aquifer tests (slug tests) will be conducted if the data collected during Tasks 1 and 2 suggests this information is required for the remedial action plan. The slug tests will consist of changing the volume in a well of known volume and accurately recording the rate at which the groundwater level of the well changes. This data will be used to characterize the aquifer and determine the most efficient method of remediation.

TASK 5 REMEDIAL ACTION RECOMMENDATION

The recommendation for remedial action presented in the interim report will be revised based on the data collected during Task 4 and comments received from UPRR and appropriate regulatory agencies.

ANALYTICAL TESTING/QUALITY ASSURANCE CONTROL

The soil samples will be analyzed for total petroleum hydrocarbons (TPH), and benzene, toluene, ethylbenzene and xylene (BTEX) by California LUFT Manual Method and EPA Methods 8020, respectively.

Ground water samples from each of the monitoring wells will be analyzed for TPH and BTEX by California LUFT Manual Method and EPA Methods 8020, respectively. In addition, one quality assurance/quality control (QA/QC) will be submitted for analysis. The QA/QC sample will be a duplicate sample collected from a selected monitoring well and submitted to the laboratory with a false well number.

WARRANTY AND LIABILITY

In developing the proposed program USPCI assumes Union Pacific Railroad will approve the drilling locations (with regard to underground utilities) before we begin drilling. Proposed boring locations will be marked with paint prior to drilling, and the proper utility agencies will be contacted to screen the areas.

Prior to initiating drilling, USPCI will make all efforts to locate and identify underground utilities which may be located in the proposed boring locations. USPCI will not assume any liability for damage to underground utilities and other subsurface structures encountered during drilling, or environmental impairment resulting thereof. In addition, USPCI assumes the field program will not be delayed by inclement weather, access problems, power outages, or subsurface obstructions (such as debris or utilities). In the event that unforeseen problems develop, we will notify Union Pacific Railroad.

APPENDIX A

Drilling and Soil Sampling of Borings

All borings will be advanced under the technical supervision of a USPCI geologist. The on-site geologist will be present at all times during drilling to: 1) technically supervise the drilling subcontractor; 2) maintain a continuous log of materials penetrated by the borehole; 3) obtain and document soil samples; 4) test soil samples, drilling cuttings, and atmospheric conditions within the workplace with an organic vapor Monitor (OVM); and 5) oversee implementation of USPCI's Health and Safety Plan.

Soil borings will be completed using a truck-mounted drilling rig equipped with 8-inch diameter hollow-stem augers. Drilling will be performed without the introduction of drilling fluids to allow collection of relatively undisturbed soil samples through the hollow stem of the auger.

During drilling, soil samples will be obtained using a continuous core barrel sampler lowered through the hollow stem of the auger and advanced along with the auger to the desired depth. This method allows for continuous monitoring of soils penetrated during drilling. After retrieving the sampler, soils will be screened in the field for organic vapor emissions using a portable Organic Vapor Monitor (OVM). The OVM will also be used to monitor organic vapor emissions from drill cuttings during drilling. Organic vapor measurements will be recorded on the boring logs.

Soil samples collected for possible chemical analysis will be placed in 8-ounce glass sample jars. The sample jars will be equipped with teflon lined lids supplied by the analytical laboratory. Labels will be attached to each sample and will include the following information: 1) boring number; 2) sample number; 3) date and time; 4) collectors name; 5) owner; and 6) location. Appropriately sealed and labeled samples will be stored in ice chests cooled with blue ice. Chain of custody records will be maintained during the sampling program and transmitted to the laboratory with the samples. Samples will be delivered to the laboratory by overnight courier.

Prior to initiating each boring, the downhole equipment, including auger sections and sampling equipment will be thoroughly steam cleaned. The core barrel sampling equipment will be either steam cleaned or carefully washed in a dilute trisodium phosphate (TSP) solution and rinsed in de-ionized water before retrieving each sample.

Soil cuttings generated during drilling will be placed in DOT approved 55 gallon drums and left on-site. Upon completion, borings not completed as monitoring wells will be backfilled with a cement/bentonite grout to ground surface.

Monitoring Well Installation and Water Sampling

Some of the exploratory borings will be completed as shallow groundwater monitoring wells. The proposed monitoring well locations are displayed on Figure 3.

The well borings will be completed and the monitoring wells installed to the depth of approximately 10 feet below saturated sediments, or 15 feet total depth. The wells will be installed through the hollow stem of the auger. Well casing will consist of 4-inch and 2-inch diameter flush threaded schedule 40 PVC. Ten feet of well screen with 0.010-inch slot size will be fitted at the bottom end of the well casing, such that 8 feet of
the screen will extend below the saturated sediments as encountered during drilling.

The annular space between the well screen and borehole will be filled with pre-washed silica sand to a position approximately one foot above the top of the well screen to form a filter pack. A bentonite seal will be then placed above the filter pack. The remainder of the borehole will then be backfilled to the ground surface with a cement-bentonite slurry. A locking cap and protective cover will be installed over the well head and finished slightly above grade to limit ponding of water around the well head. Wells will be finished with either a slightly mounded, flush mount, well box or a four foot stick-up guarded by three, four-foot steel poles set in concrete.

The wells will be developed using the surge and bail technique. Measurements of the Ph and conductivity of the produced water will be taken at regular intervals during development. Development will proceeded until these parameters stabilize and the water produced is relatively free of sediment.

Each monitoring well will be purged prior to sample collection to obtain samples which represent groundwater in the formation rather than water standing in the well casing. Purging will continue until three to five casing volumes have been removed from the well and the field measured Ph and conductivity of the produced water had stabilized.

Water samples will be collected from the well using a dedicated sampling bailer in a manner that minimizes exposure of the samples to the atmosphere. Water samples will be placed

into appropriate sample bottles for the specific analysis, as provided by the analytical laboratory. The water samples will be properly labeled, chain of custody records maintained, and the sample bottles placed in an ice chest cooled with blue ice for shipment to the laboratory.

Water produced during well development and sampling will be placed into labeled, 55-gallon DOT-approved drums.

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