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URS

Alameda County

OCT 31 2002

Environmental Health

October 28, 2002

Ms. Eva Chu
Hazardous Material Specialist
Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

SUBJECT: Soil and Groundwater Investigation Workplan for the Former BP Service Station #11132, 3201 35th Avenue, Oakland, California

Dear Ms. Chu:

On behalf of BP (an affiliated company of the Group Environmental Management Company), URS Corporation (URS) has prepared this workplan for additional soil and water characterization at the above referenced facility. This workplan was prepared in response to letter from the Alameda County Health Care Services (ACHCS) to BP dated September 9, 2002 (Attachment A). This work plan includes a discussion of the site background, proposed scope of work and schedule.

SITE FEATURES AND BACKGROUND

The site is located on the northeast corner of 35th Avenue and Sutter Street, south of Interstate 580, in a mix commercial and residential area of East Oakland. The site has been operating as gasoline service station since the early 1970s and was acquired by BP in 1989 and sold to Tosco in 1994. Improvements to the property include the service station building, pump islands and underground storage tanks (USTs). The original USTs were replaced in 1986.

Numerous site investigations have been performed at this site since the mid-1980s. A total of ten monitoring wells have been installed and are currently being gauged and sampled as part of an quarterly groundwater monitoring program.

Site investigative activities have revealed that the site soils generally consist of silty clays with various amounts of sand and gravel. The depth to first groundwater is approximately 20 feet below ground surface (bgs) and flow to the southwest at gradient of 0.02 feet per foot as calculated during the recent September 2002 monitoring event.

Previous monitoring of the groundwater wells noted separate phase and dissolved phase hydrocarbons. Separate phase hydrocarbons have been reported in the on-site wells MW-1 and RW-1. The hand bailing of these separate phase hydrocarbons are routinely conducted as part of the quarterly groundwater monitoring program. During the September 2002 event, 0.06 gallons and 0.04 gallons were removed from MW-1 and RW-1, respectively.

Dissolved phase hydrocarbons have been reported in the on and off-site groundwater wells. Total petroleum hydrocarbon (TPH) as gasoline (TPH-g) has been reported up to 1,700,000 parts per billion

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(ppb) as measured in MW-1 in January 2000. TPH-g concentration reported during the latest sampling event of this well in February 2002 noted the levels to decrease to 52,000 ppb. Benzene, toluene, ethylbenzene and xylenes (BTEX compounds) and MTBE have also been reported in the groundwater. Benzene was reported at a maximum concentration of 19,000 ppb in a groundwater sample collected from MW-1 in February 1998 but was noted to attenuate to 465 ppb during the February 2002 sampling event. MTBE was reported at a maximum concentration of 61,000 ppb from the sample collected from RW-1 during the February 1999 monitoring event. The concentration of MTBE was noted to decrease to 7,240 ppb in a sample collected from RW-1 during the February 2002 monitoring event. These decreases indicate that natural attenuation is occurring in the shallow groundwater of the subject property and surrounding area.

The down gradient extent of dissolved phase hydrocarbons have been monitored through the sampling of the down gradient wells MW-5 and MW-8. During the September 2002 sampling event, TPH-g, benzene and MTBE were reported in a groundwater collected from MW-8 located approximately 80 feet down gradient of the subject property at 190,000 ppb, 1,500 ppb and 1,200 ppb, respectively. Considerable lower concentrations were reported in the groundwater sample collected from MW-5 located approximately 100 feet further down (and slightly cross gradient) with respect to MW-8. During the February 2002 sampling event, a groundwater sample collected from MW-5 was reported to contain TPH-g, benzene and MTBE at 4,200 ppb, 940 and 55.6 ppb, respectively. This decrease in concentrations indicates that the amount of dissolved phase hydrocarbons is naturally attenuating through advection and dispersion and also likely by chemical and biological degradation as it migrates in the down gradient direction.

A sensitive receptor survey was completed in 1991 by Alton Geosciences. The survey revealed that the nearest residence is 50 feet from the subject property, the nearest hospital was 11,000 feet, and the nearest school was 11,000 feet from the subject property.

A groundwater remediation system was activated on the property in 1992 and operated intermittently through the 1990s. The treated groundwater was discharged into the sanitary sewer system under permit from the East Bay Municipal Utility District (EBMUD).

PROPOSED SCOPE OF WORK

The proposed scope of work responds to the ACHCS request for a work plan to further characterize the nature, extent and associated risks with hydrocarbon contamination. The scope of work includes:

- Completion of a Conduit Study;
- Contaminant Plume Definition;
- Contaminant Source Characterization;
- Groundwater Contaminant Plume Monitoring; and
- Corrective Action Plan.

Conduit Study

URS proposes to complete a conduit study to identify potential migration pathways and conduits to assess the probability of the plume encountering preferential pathways and conduits that may promote the migration of petroleum hydrocarbons. A map showing location and depth of utility lines, trenches, sewers, storm drains, wells, creeks and underground water channels will be prepared at the conclusion of this study.

The data from the conduit study and data from previous investigations at the site and surrounding area will be used to develop the initial conceptual site model (CSM) for the site which will be used to assess future sampling points for the soil and groundwater sampling portions of this workplan.

Contaminant Plume Definition

The purpose of the assessing the contaminant plume is to develop a three-dimensional model of the nature and extent of the remaining petroleum hydrocarbons in the soil and groundwater. The initial task will be the installation of two new groundwater monitoring wells near the down gradient extent of the known hydrocarbon plume. As shown on Figure 1, MW-11 is proposed to be located approximately 100 feet west and down gradient of MW-8.

As presented in Attachment B, standard well drilling, installation, develop and sampling procedures will be followed. However, as requested by he ACHCS, the well selection of the well screened interval will be carefully determined to allow specific groundwater zones to be monitored. In order to assess the proper screened interval, the borings for the wells will be continuous cored. At the conclusion of well installation activities, the new wells will be surveyed in by a State Licensed Surveying following State Tank Geotracker lateral and vertical reporting requirements.

A State Certified Laboratory will analyze the groundwater samples for TPH-g, BTEX and MTBE using EPA Method 8021. In addition, ether oxygenates, ethanol, EDB and 1,2-DCA using EPA Method 8260 will be included in the initial two rounds of groundwater sampling.

The groundwater sampling program and CSM model will be refined based on on-site measurements and observations, and the results of recent monitoring events. The proposed scope of work will remain flexible so that the field manager can adjust the location, quantity, depth and type of samples based on the developing conceptual model to expedite data collection.

Contaminant Source Characterization

The purpose of the contaminant source characterization is to assess the nature and extent of separate and dissolved phase hydrocarbons in the soil and groundwater in the vicinity of the former and current USTs. The initial step in the task is to incorporate all existing soil data into the CSM to assess locations and depths of soil and groundwater sampling points. Once the data is plotted and evaluated, soil and groundwater samples will be collected by continuous coring direct-push drilling methods. The US EPA protocol "Expedited Site Assessment Tools for Underground Storage Tanks Sites: A Guide for Regulator" (EPA 510-B-97-001) dated March 1997 will be evaluated to provide a cost-effective approach to assess the nature and extent of the remaining petroleum hydrocarbons in the soil and groundwater.

Groundwater Contaminant Plume Monitoring

The purpose of the groundwater monitoring is to assess the nature and extent over time of the remaining petroleum hydrocarbons in groundwater of the subject property and surrounding area. In order to achieve this objective, groundwater monitoring for all wells will continue on the current schedule except for change in the sampling schedule for MW-5 from annual to quarterly as requested by Ms. Chu on October 28, 2002. In addition, as previously noted, two proposed wells, MW-11 and MW-12 will be added to the monitoring program and be sampled on a quarterly basis.

As quarterly groundwater data is evaluated, the CSM will be updated on regular basis and will include cross-sections, structural contours and concentration isopachs maps.

Corrective Action Plan

The purpose for the Corrective Action Plan (CAP) is to evaluate data obtained during investigative activities to propose a cost-effective final cleanup objective for the remaining petroleum hydrocarbons in the soil and groundwater. The CAP will also select a final remedial alternative for soil and groundwater that will adequately address human health and safety, the environment, eliminate nuisance conditions, and protect water resources. The CAP will evaluate at least two technically and economically feasible methods to restore and protect the beneficial uses of water and to meet the cleanup objectives for each contaminant established in the CAP. The CAP will also propose verification monitoring to confirm completion of the correction actions and evaluate the CAP implementation effectiveness.

To identify and manage potential health and environmental risks, address impacts to water resources, and manage nuisance conditions, URS proposes to utilize the Oakland Risk-Based Correction Action (RBCA) approach in the decision-making process following the "Oakland Urban Land Redevelopment Program: Guidance Document, January 1, 2002".

SCHEDULE AND PROJECT MANAGEMENT

The schedule for the above noted work is as follows:

- Soil and Water Investigation Report – 110 days after the approval of this workplan;
- Soil and Water Investigation Completion Report – 180 days after the completion of the Soil and Water Investigation Report; and
- Corrective Action Plan – 90 days after the completion of the Soil and Water Investigation Completion Report.

In addition, quarterly groundwater monitoring reports will be completed within 30 days of the end of each quarter.

The Project Manager for this proposed work will be Mr. Robert M. Horwath, A State Registered Geologist. Mr. Horwath will oversee all technical aspects of this work and act as liaison between ACHCS

and BP. Other URS staff of engineers, geologists and technicians will support Mr. Horwath during the course of this project.

LIMITATIONS

This report is based on data, site conditions and other information that is generally applicable as of the date of the report, and the conclusions and recommendations herein are therefore applicable only to that time frame. Background information including but not limited to previous field measurements, analytical results, site plans and other data have been furnished to URS by Group Environmental Management Company, their previous consultants, and/or third parties, which URS has used in preparing this report. URS has relied on this information as furnished, and is neither responsible for nor has confirmed the accuracy of this information.

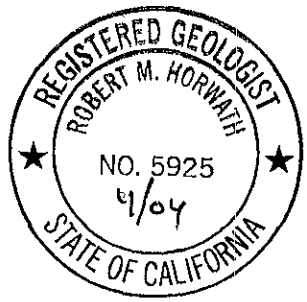
Analytical data provided by the Group Environmental Management Company approved laboratory has been reviewed and verified by the laboratory. URS has not performed an independent review of the data and is neither responsible for nor has confirmed the accuracy of this data. Field measurements have been supplied by a groundwater sampling subcontractor. URS has not performed an independent review of the field sampling data and is neither responsible for nor has confirmed the accuracy of this data.

If you have any questions or concerns, please contact me at (510) 874-3115.

Sincerely,

URS CORPORATION

Robert M. Horwath, R.G. #5925
Project Manager



cc: Mr. Scott Hooton, BP, Environmental Resources Management, 295 SW 41st Street, Bldg. 13, Suite N, Renton, Washington 98055 - 4931
Mr. Ade Fagorala, San Francisco Bay Regional Water Quality Control Board, 1515 Clay Street, Suite 1400, Oakland, California 94612
Ms. Liz Sewell, Risk Management and Remediation Group, Tosco, 3525 Hyland Avenue, Costa Mesa, California 92626

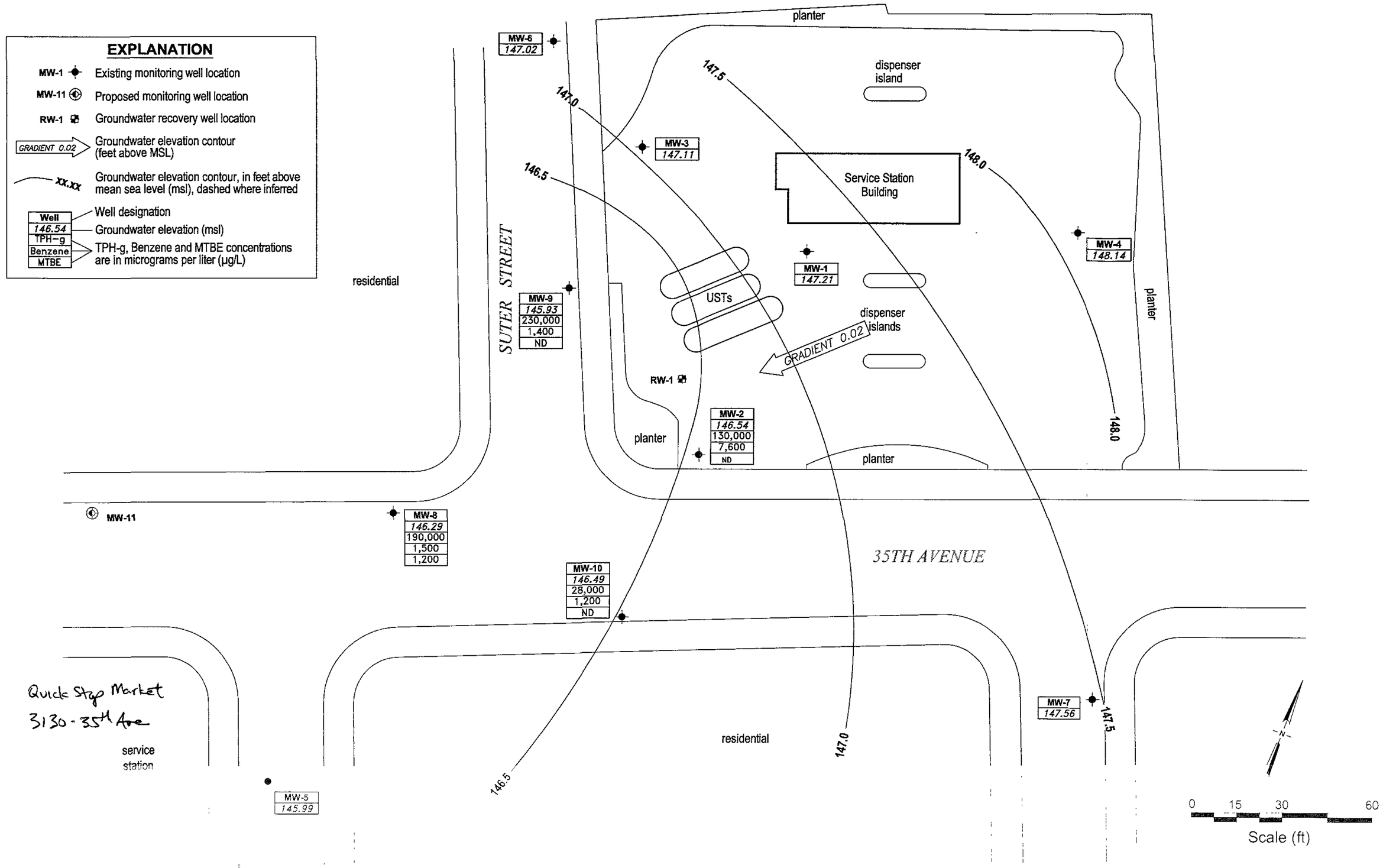
ATTACHMENTS
Figure 1 – Site Map
Attachment A - ACHCS September 9, 2002 Letter
Attachment B – Standard Well Installation and Development Procedures

EXPLANATION

- MW-1 — Existing monitoring well location
- MW-11 — Proposed monitoring well location
- RW-1 — Groundwater recovery well location
- GRADIENT 0.02 — Groundwater elevation contour (feet above MSL)
- XX.XX — Groundwater elevation contour, in feet above mean sea level (msl), dashed where inferred

Well
146.54
TPH-g
Benzene
MTBE

Well designation; Groundwater elevation (msl); TPH-g, Benzene and MTBE concentrations are in micrograms per liter (µg/L)



URS	Project No. 38485986 BP Service Station #11132 3201 35th Avenue Oakland, California	GROUNDWATER ELEVATION CONTOUR MAP Third Quarter 2002 (September 11, 2002)	FIGURE 1

Attachment A

Alameda County Health Care Services
September 9, 2002 Letter

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
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BP OIL COMPANY
MIDWEST ENVIRONMENTAL SERVICES

RO0000014

September 9, 2002

Mr. Scott Hooton
BP Oil
295 SW 41st Street, Bldg 13, Suite N
Renton, CA 98055-4931

Mr. Dave DeWitt
Tosco Marketing Co
2000 Crow Canyon Pl, Ste 400
San Ramon, CA 95118-3686

RE: SWI and CAP for BP Station #11132 at 3201 35th Ave, Oakland, CA

Dear Messrs. Hooton and DeWitt:

I have completed review of the fuel leak case file for the above referenced site. Up to 1,700,000 ppb TPHg, 19,000 ppb benzene and 56,000 ppb MTBE has been detected in groundwater. Separate phase hydrocarbon has been noted in wells RW-1 and MW-1 since July 1990. This letter presents a request for full three-dimensional definition, investigation, and a proposal for cleanup of soil and groundwater contamination from the unauthorized release at the site. You are hereby required to complete a Soil and Water investigation and prepare a Corrective Action Plan (CAP) for the subject site in accordance with California Code of Regulations, Title 23, Division 3, Chapter 16, Article11, "Corrective Action Requirements; State Water Resources Control Board Resolution 92-49, "Policies and Procedure for Investigation, Cleanup and Abatement of Discharges Under Water Code Section 13304"; and with the Regional Water Quality Control Board Water Quality Control Plan for the basin.

The following technical comments address investigation and cleanup performance objectives that shall be considered as part of the required Soil and Water Investigation and CAP. A workplan for the Soil and Water Investigation is **due by October 28, 2002** that addresses each of the following technical comments.

TECHNICAL COMMENTS

1. **Conduit Study**

   The purpose of the conduit study is to locate potential migration pathways and potential conduits and determine the probability of the plume encountering preferential pathways and conduits that could spread the contamination. Please provide a map showing the location and depth of all utility lines and trenches (including sewers and storm drains), wells (water supply, irrigation, monitoring, abandoned and improperly-destroyed), and creeks (former and present) or underground water channels.

   Using the results of the conduit study and data from previous investigations at the site, you are to develop the initial three-dimensional conceptual model of site conditions. You are to use this initial conceptual model to determine the appropriate configuration for samplings points in the SWI phase of work at this site. Discuss your analysis and interpretation of the results of the conduit study and explain your rationale for the configuration of sampling points in the SWI work plan requested below.

2. Contaminant Plume Definition

The purpose of contaminant plume definition is to determine the three-dimensional extent of contamination in soil and groundwater. The plume extent at the site is undefined. In July 2002, up to 86,000 ppb TPHg, 7,310 ppb benzene and 2,520 ppb MTBE was detected in groundwater. Free phase product is currently present at the site.

MTBE is more mobile in soil and groundwater than the typical petroleum hydrocarbon compounds, is highly soluble in groundwater, and is not readily biodegradable. MTBE plumes can be long, narrow, and erratic. Because of these characteristics, conventional investigation techniques and monitoring well networks currently used at fuel leak sites are generally insufficient to adequately characterize MTBE contamination. Therefore, it is recommended that you propose an investigation that will include depth discrete soil and groundwater sampling. Soil and groundwater samples should be collected at 5 feet intervals, areas of obvious contamination, the soil/groundwater interface, and at each unit of lithology change. It is recommended that your investigation incorporate expedited site assessment techniques and borings installed along transects to define and quantify the full three-dimensional extent of MTBE. The borings should be continuously cored. Detailed cross sections, fence diagrams, structural contours, isopachs, and rose diagrams for groundwater should be subsequently incorporated in the SWI completion report. Discuss your proposal for performing this work in the SWI work plan requested below.

Expedited site assessment tools and methods are a scientifically valid and cost-effective approach to fully define the three-dimensional extent of the plume. Technical protocol for expedited site assessments are provide in the US EPA "Expedited Site Assessment Tools for Underground Storage Tank Sites: A guide for Regulators" (EPA 510-B-97-001), dated March 1997.

3. Contaminant Source Characterization

The purpose of contaminant source characterization is to determine the nature and extent of free product (liquid phase), petroleum saturate soils (residual phase), hydrocarbons dissolved in groundwater (aqueous phase), and high concentrations of soil vapor (vapor phase) that will continue to increase the concentration and mass of the dissolved phase contaminant plume.

It is requested that source area characterization be initiated at the start of the Soil and Water Investigation phase of work. Source area characterization and contaminant mass estimations are needed to determine the necessity and aggressiveness of interim source cleanup and/or dissolved phase mass removal. Report the results of your work in the Soil and Water Investigation Report requested below.

4. Groundwater Contaminant Plume Monitoring

The purpose of groundwater monitoring is to determine the three-dimensional movement of the plume, the rate of plume growth, and the effectiveness of cleanup activities.

Once the extent of the plume is defined, we request that you install permanent monitoring wells to monitor the three-dimensional movement of the plume. Multi-depth discrete wells may be required. We request that you use the detailed cross section, structural contours, isopachs, and rose diagrams for groundwater gradient developed during Task 2 above, to determine the appropriate locations and designs for monitoring

wells that are necessary to appropriately monitor the movement of the plume. Please submit your proposal for the installation of monitoring wells in the Soil and Water Investigation Report and report on the installation of the wells in the Soil and Water Investigation Completion Report.

Quarterly groundwater monitoring should continue at the site. Analysis for ether oxygenates, ethanol, EDB and 1,2-DCA (using EPA Method 8260) should be included for the next two quarters, at a minimum.

5. **Corrective Action Plan**

The purpose of the CAP is to use the information obtained during investigation activities to propose cost-effective **final cleanup objective for the entire contaminant plume and remedial alternative for soil and groundwater** that will adequately protect human health and safety, the environment, eliminate nuisance conditions, and protect water resources.

A CAP for the final cleanup of contamination in soil and groundwater caused by an unauthorized release at the site will be requested upon completion of the Soil and Water Investigation in accordance with the schedule specified below. The CAP shall address at least two technically and economically feasible methods to restore and protect beneficial uses of water and to meet the cleanup objectives for each contaminant established in the CAP. The CAP must propose verification monitoring to confirm completion of corrective actions and evaluate CAP implementation effectiveness.

TECHINCAL REPORT REQUEST

Please submit technical reports according to the following schedule:

October 28, 2002 – Work plan for Soil and Water Investigation

110 Days from Work Plan Approval – Soil and Water Investigation (Results of Expedited Site Assessment) Report

180 Days from Submittal of Soil and Water Investigation Report – Soil and Water Investigation Completion Report

90 Days after Submittal of Soil and Water Investigation Completion Report - Corrective Action Plan

October 30, 2002 – Quarterly Report for the Third Quarter 2002

January 30, 2003 – Quarterly Report for the Fourth Quarter 2002

April 30, 2003 – Quarterly Report for the First Quarter 2003

These reports are being requested pursuant to the Regional Board's authority under Section 13267 of the California Water Code. **Each report shall include conclusions and recommendations for the next phases of work required at the site.** It is requested that all required work be performed in a prompt and timely manner. I have proposed a schedule for the submittal of the Soil and Water Investigation Report and the CAP. Revisions to the proposed schedule shall be requested in writing with appropriate justification for anticipated delays.

If you have any questions, I can be reached at (510) 567-6762.

Sincerely,

eva chu
Hazardous Materials Specialist

bp11132-1

Attachment B

Standard Operating Procedures
Groundwater Monitoring Well Installation and Development

New groundwater monitoring wells will be installed by a drilling contractor with a current California C-57 license under the supervision of a California Registered Geologist (#5925) from URS. The groundwater monitoring well will be installed inside a soil boring advanced by a hollow-stem auger drilling rig with 8-inch outside diameter (O.D.) continuous flight hollow-stem augers.

During the boring advancement, an URS representative will be present to collect soil samples, to conduct field screening, and to maintain a log of the drilling activities. Discreet samples at 5-foot centers or continuous cores will be generated from ground surface to a maximum depth of the boring using a modified California split spoon sampler. The soil samples will be field screened for classification purposes and then preserved for possible chemical analyses.

After the soil boring advancement is complete, the well casing will be lowered into the borehole through the center of the hollow stem augers. The augers are then removed one section at a time while the filter pack was being placed around the well casing. The well casings will be composed of 2-inch diameter, schedule 40, PVC piping. The screen section of the casing will have factory-slotted 0.01-inch or 0.02-inch perforations. The well screened interval will be determined based on actual field conditions. The blank (non-perforated) section will then added to the screen sections to complete the well casings to a few inches bgs.

Pre-washed #2/12 or #3 Monterey sands will be placed around the screen section of the well casing to form a filter pack. The filter packs will be placed from the bottom of the well up to one foot above the screen section. An one-foot bentonite seal will then placed above the filter pack between 4 and 5 feet bgs to prevent surface water infiltration. The remaining length of the annular space in the borehole will be backfilled with neat cement grout up to a one-half foot below the ground surface. The uppermost foot of the well casing will be protected by a traffic-rated well vault set in concrete. A water-tight locking end-cap will be placed on top of the well casing to prevent surface water intrusion and unauthorized access. Soil cuttings generated during the well installation will be contained in Department of Transportation (DOT) approved 55-gallon steel drums. Based on laboratory results of samples collected from the soil cuttings, the drummed soils will be disposed at an off-site facility as non-hazardous waste by a State licensed disposal contractor.

New groundwater wells will be developed prior to the initial round of groundwater sampling. Development will occurr, after sufficient time (generally more than 72 hours) had passed after well installations to allow proper curing of the well sealing materials. The wells will be development by first bailing out any sediments which may have accumulated in the base of well annulus followed by pumping groundwater at variable rates to remove native mud and silt which may been mixed into the sand filter pack. Well developments will be considered complete when the physical properties (temperature, pH, conductivity) of the groundwater are stabilized (consecutive readings within 10% of each other) and the pumped groundwater is relatively sediment free. Between 10 to 20 well volumes will be removed from the wells during the well development process. Groundwater generated from the well development process will be contained in DOT approved 55-gallon steel drums until they are disposed off-site as non-hazardous waste by a State licensed disposal contractor.