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URS

Alameda County

MAY 2 9 2003

Environmental Health

May 28, 2003

Mr. Don Hwang
Hazardous Material Specialist
Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

SUBJECT: Soil and Groundwater Investigation Workplan Addendum for the Former BP Service Station #11132, 3201 35th Avenue, Oakland, California ACHCS Fuel Leak Case No. RO0000014

Dear Mr. Hwang:

On behalf of the Group Environmental Management Company (an affiliated company of BP), 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 a letter from the Alameda County Health Care Services (ACHCS) to BP dated March 19, 2003 (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. An active gasoline service station, and two former gasoline service stations are located along 35th Avenue west, and within 250 feet downgradient, of the subject site. 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. It is uncertain from the available records if any soil excavation or disposal was performed following the UST removal. The product lines and dispensers were upgraded in 1990, and 100 cubic yards of soil excavated and disposed.

Numerous site investigations have been performed at this site since the mid-1980s. A total of ten monitoring wells and one groundwater recovery well have been installed between 1986 and 1991, and are currently being gauged and sampled as part of a quarterly groundwater monitoring program. Ten soil borings were completed as temporary wells and groundwater samples collected in 1990.

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 14 to 20 feet below ground surface (bgs) and flow to the southwest at gradient of 0.013 feet per foot as calculated during the recent January 2003 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, MW-2 and RW-1, and the

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offsite wells MW-8, MW-9 and MW-10. The hand bailing of these separate phase hydrocarbons are routinely conducted as part of the quarterly groundwater monitoring program. During the January 2003 event, 0.3 gallons, 0.07 gallons, 0.2 gallons and 0.03 gallons were removed from MW-1, RW-1, MW-9 and MW-10, respectively. A separate phase hydrocarbon recovery and groundwater extraction and treatment system was intermittently operational for several years following 1992. The system is still in place, but is not currently active.

Sorbed phase hydrocarbons have been reported in soils on and off-site during various excavations and subsurface investigations. Total petroleum hydrocarbon (TPH) as gasoline (TPH-g) were reported up to 210 parts per million (ppm) from the excavation (depth not recorded) following removal of the former USTs in 1986. It is uncertain from available records if this soil was subsequently over-excavated. TPH-g concentrations up to 21 ppm and benzene concentrations up to 0.0099 ppm to were reported in confirmatory soil sample PT-3 at a depth of 4 feet bgs from the product line excavation during 1990. The highest petroleum hydrocarbon concentrations detected in soil samples from borings onsite were in the boring for well RW-1 in 1990, with 50 ppm TPHg and 1.4 ppm benzene detected at a depth of 25 feet bgs. The highest petroleum hydrocarbon concentrations detected in soil samples from borings offsite were in the boring for well MW-5 in 1990, with 770 ppm TPHg and 4.8 ppm benzene detected at a depth of 25 feet bgs. MW-5 is located approximately 200 feet directly down-gradient from the subject site USTs, and is adjacent, but cross-gradient, to the Quick Stop gasoline service station at 3130 35th Avenue and Mangels Avenue. Toluene, ethylbenzene and xylenes have also been reported in soil samples collected on and off-site.

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 (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. MW-1 has not been sampled since that event due to the presence of separate phase hydrocarbons. 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. RW-1 has not been sampled since that event due to the presence of separate phase hydrocarbons. During the most recent groundwater sampling event of January 29, 2003, the highest onsite concentrations of petroleum hydrocarbons reported were in a groundwater sample from MW-2 at 77,000 ppb TPHg, 4,700 ppb benzene and 820 ppb MTBE.

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 January 2003 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 200,000 ppb, 810 ppb and 360 ppb, respectively. Considerably lower TPH-g 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

January 2003 sampling event, a groundwater sample collected from MW-5 was reported to contain TPH-g, benzene and MTBE at 7,900 ppb, 7,900 and 82 ppb, respectively. This decrease in TPH-g 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 in their letter of March 19, 2003 (Attachment A) for an addendum to the work plan submitted by URS on October 28, 2002 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 is currently performing 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. The underground utility location data obtained was used to determine the locations of the soil borings proposed in this workplan addendum.

The ACHCS letter of March 19, 2003 did not address the conduit study, therefore the scope of work will remain unchanged from the previous workplan. 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 ACHCS letter of March 19, 2003 did not agree with the URS workplan proposal for the installation of two new groundwater monitoring wells near the down gradient extent of the known hydrocarbon plume. Instead, the ACHCS requested that borings be used for the purpose of determining extent of the remaining petroleum hydrocarbons in the soil and groundwater. In their letter dated September 9, 2002 (Attachment A), the ACHCS requested that an expedited site assessment be conducted using direct push boring methods with depth discrete soil and groundwater sampling at 5-foot intervals, soil/groundwater interface, changes in lithology, and areas of obvious contamination. The ACHCS letter requested that the borings be continuously cored for lithologic purposes.

URS proposes the definition of the downgradient extent of petroleum hydrocarbons in the soil and groundwater by advancing borings at six sample locations (two borings per location) using a GeoProbe™ or equivalent direct push sampling rig. The offsite downgradient sample locations will be located along 35th Avenue and Mangels Avenue west and southwest, respectively, of the subject site. The sample locations will be spaced approximately 30 feet apart in linear groups of three each, centered near the approximate locations of the previously proposed monitoring wells MW-11 and MW-12. As shown on Figure 1, the proposed group of sample locations UB-1, UB-2 and UB-3 will be located between approximately 30 and 90 feet south and down gradient of MW-5; centered near the originally proposed MW-12 location. The proposed group of sample locations UB-4, UB-5 and UB-6 will be located between approximately 60 and 120 feet west and down gradient of MW-8; centered near the originally proposed MW-11 location. The borings will be located at least 10 feet from the nearest underground utilities per BP GEM utility clearance procedures.

The borings will be advanced to a total depth of 40 to 50 feet, or approximately 20 to 30 feet below expected depth to first encountered groundwater. The first 5 feet of each boring will be performed using air knife methods per BP GEM utility clearance procedures. Since it is not practical to collect depth discrete groundwater samples within a continuously cored soil boring, or conduct soil sampling while using depth discrete groundwater sampling probes, URS proposes a closely spaced pair of borings (within 2 feet apart) at each sampling location. Each pair of borings per sample location will be numbered UB-1A and UB-1B, etc. Foreknowledge of the lithologic and hydrogeologic conditions is necessary to anticipate proper discrete groundwater sampling depths. Therefore, URS proposes to continuously core the first soil boring at each location for lithologic characterization, with soil analytical samples to be collected at 5-foot intervals, soil/groundwater interface, changes in lithology, and areas of obvious contamination. Previous boring logs suggest that subsurface lithology is largely homogeneous in nature.

A depth discrete groundwater sampling probe will then be advanced within 2 feet of the original boring using direct push methods to approximately 40 to 50 feet bgs. Depth discrete groundwater samples will be collected at the saturated/unsaturated zone interface, at 10 feet depth intervals below, and at multiple discrete water-bearing zones and lithologic changes, if encountered within the initial boring. As presented in Attachment B, standard direct push drilling and sampling procedures will be followed.

Soil samples collected for possible laboratory analysis will be screened for volatile hydrocarbons by a photo-ionization detector (PID). Soil samples collected at a minimum of 5-foot depth intervals, at the

groundwater interface, and intervals containing significant hydrocarbon concentrations as screened by the PID, will be selected for laboratory analysis. A State of California DHS Certified Laboratory will analyze the selected soil and groundwater samples for TPH-g, BTEX and MTBE using EPA Methods 8015/8021. In addition, ether oxygenates, ethanol, EDB and 1,2-DCA using EPA Method 8260 will be included for groundwater samples.

The proposed soil and groundwater sampling program will be used to refine the CSM, based also 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. The CSM will be used to determine the proposed locations of future offsite groundwater monitoring wells in order to monitor the leading downgradient edge of the dissolved hydrocarbon plume.

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 URS workplan proposed that the initial step in the task would be 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 ACHCS letter of March 19, 2003 requested that both soil and groundwater data be incorporated into the CSM.

Preliminary evaluation by URS of the available historical soil and groundwater analytical data indicates the presence of some data gaps that need to be addressed before completion of the CSM. Therefore, URS proposes completion of an expedited site assessment in the vicinity of the onsite source area, prior to the completion of the CSM. The expedited site assessment will consist of twelve soil borings (two per sample location) to be advanced at six sample locations in the vicinity of the onsite USTs and dispensers, using direct push methods to collect soil and groundwater samples in a manner similar to that described in the Contaminant Plume Definition section above. The proposed sample locations were determined by historical soil and groundwater analytical data from previous sample locations (Attachment C). The proposed onsite sample locations UB-7 through UB-12 are shown on Figure 1.

Proposed sample locations UB-7 and UB-8 are to be located downgradient from the USTs in the southwest portion of the site adjacent to Suter Street. Proposed sample location UB-9 is to be located immediately upgradient of the USTs near well MW-1. Proposed sample location UB-10 is to be located downgradient from the USTs adjacent to the two southern dispenser islands. Proposed sample location UB-11 is to be located downgradient from the USTs adjacent to 35th Avenue. Proposed boring sample location UB-12 is to be located upgradient of the USTs near the northern dispenser island. The proposed sample locations are preliminary, and may be subject to change in order to obtain the necessary clearance from underground and above-ground utilities per the BP GEM drilling and utility clearance guidelines. 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 both onsite and offsite.

Groundwater Contaminant Plume Monitoring and Interim Remedial Action

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. As an interim remedial action measure, pending approval and implementation of the Corrective Action Plan, URS will implement monthly separate-phase hydrocarbon gauging and bailing of wells MW-1, RW-1, MW-9 and MW-10.

The previous URS workplan proposed the construction of two additional offsite downgradient wells, MW-11 and MW-12, to be added to the monitoring program. The ACHCS response letter of March 19, 2003 disagreed with this approach and requested an expedited site assessment, as described in the Contaminant Plume Definition section above, be performed first to determine optimum offsite well locations. URS will incorporate the results of the expedited site assessment and the current groundwater sampling program into the CSM, which will be used to determine optimum locations of future offsite wells. In addition, URS proposes coordination of quarterly groundwater monitoring activities and data exchange with the former Exxon Station located at 3055 35th Avenue, approximately 250 feet southwest of the subject site in the downgradient direction. The Exxon site currently contains four groundwater monitoring wells sampled quarterly by Cambria Environmental Technology, Inc. Data from the Exxon site may be valuable in refining the CSM downgradient of the subject former BP site.

The CSM will be refined based on on-site and offsite 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. As quarterly groundwater data is evaluated, the CSM will be undated on a 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. As part of the CAP, an evaluation will be made of the feasibility and cost of repairing and reactivating the existing groundwater/separate phase hydrocarbon extraction and treatment system. The CAP will also propose verification monitoring to confirm completion of the correction actions and evaluate the CAP implementation effectiveness.

In the previous workplan URS proposed to utilize the Oakland Risk-Based Correction Action (RBCA) approach in the decision-making process to identify and manage potential health and environmental risks, address impacts to water resources, and manage nuisance conditions, following the "Oakland Urban Land Redevelopment Program: Guidance Document, January 1, 2002". In their March 19, 2003 letter, the ACHCS judged the Oakland RBCA process inappropriate for the evaluation of risk from TPH-g and MTBE, and requested that the TPH-g ceiling value of 5,000 µg/l from the California Regional Water Quality Control Board, San Francisco Bay Region (SFRWQCB) *Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater*, dated December 2001, be used. The ACHCS also requested that the resource protection cleanup goal of not greater than 5 µg/l for MTBE be used. The ACHCS letter did not specify whether these cleanup levels apply to soil or groundwater; due to the low concentrations, URS assumes these are groundwater cleanup levels.

Therefore, URS will evaluate risk and recommend cleanup levels in the CAP based on the SFRWQCB Risk-Based Screening Levels (RBSLs) contained in the *Summary Tier 1 Lookup Table*s in Volume 1 of the previously referenced document.

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. Leonard P. Niles, A State Registered Geologist and Certified Hydrogeologist. Mr. Niles 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. Niles 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.

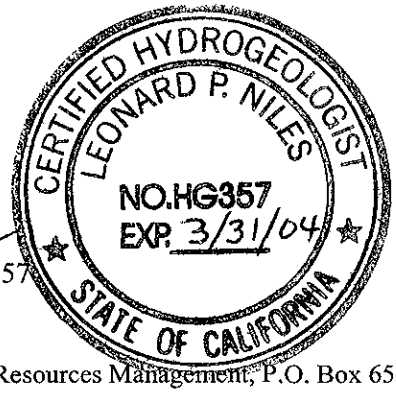
URS has relied on this information as furnished, and is neither responsible for nor has confirmed the accuracy of this information.

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) 874-1720.

Sincerely,

URS CORPORATION

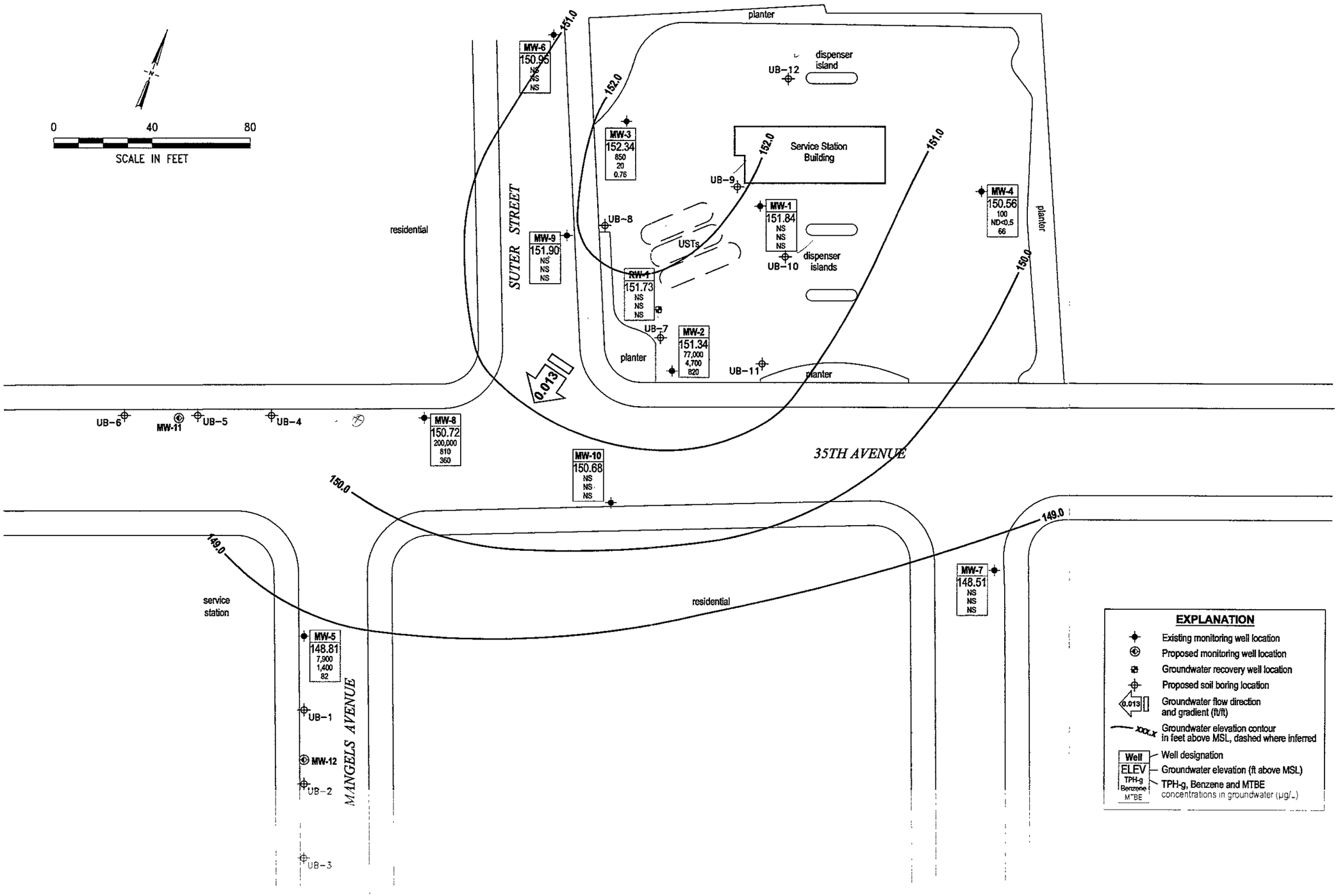


Leonard P. Niles, R.G. #5774, C.H.G. #357
Project Manager

cc: Mr. Paul Supple, BP, Environmental Resources Management, P.O. Box 6549, Moraga, California 94549
Mr. Ade Fagorala, San Francisco Bay Regional Water Quality Control Board, 1515 Clay Street, Suite 1400, Oakland, California 94612
Ms. Liz Sewell, ConocoPhilips, 75 Broadway, Sacramento, California 95818

ATTACHMENTS

Figure 1 – Proposed Soil Borings and Groundwater Elevation Contour and Analytical Summary Map
Attachment A - ACHCS September 9, 2002 and March 19, 2003 Letters
Attachment B – Standard Well Installation and Development Procedures
Attachment C – Historical Soil and Water Analytical Data and Sample Locations



URS	Project No. 38486259 Former BP Service Station #11132 3201 35th Avenue Oakland, California	PROPOSED SOIL BORINGS AND GROUNDWATER ELEVATION CONTOUR AND ANALYTICAL SUMMARY MAP First Quarter 2003 (January 29, 2003)	FIGURE 1

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ATTACHMENT A

Alameda County Health Care Services
September 9, 2002 & March 19 2003 Letters

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

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
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(510) 567-6700
FAX (510) 337-9335

March 19, 2003

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

Dear Messrs. Hooton and DeWitt:

Subject: Fuel Leak Case No. RO0000014, BP Station #11132, 3201 35th Ave., Oakland, CA

Our office is in receipt of the March 7, 2003 letter from URS Corporation (URS) regarding their submission of their workplan dated October 28, 2002, their disagreement with a conversation from our office, which requested additional investigation, and their intent to implement the workplan by March 20, 2003. URS and Mr. Scott Hooton of BP Oil were notified by our office on November 1, 2002 that the workplan was not approved and an addendum to the workplan was required. We request that you address the following technical comments and send us the technical reports requested below.

TECHNICAL COMMENTS

1. Contaminant Plume Definition - We do not agree that the proposal to install groundwater monitoring wells will determine the extent of contamination in the soil and groundwater. Instead, we want a proposal for borings for that purpose. Submit your proposal in the Workplan Addendum requested below.
2. Groundwater Contaminant Plume Monitoring – We do not agree with the proposal to install groundwater monitoring wells at this time. Instead, we want a proposal for borings to better determine the location for future wells. Submit a proposal for borings to locate wells in the Workplan Addendum requested below.
3. Corrective Action Plan - We do not agree with the proposal to solely use the Oakland Risk-Based Corrective Action (RBCA) approach to evaluate risk. The Oakland RBCA does not include Total Petroleum Hydrocarbons (TPH). The ceiling value of 5,000 ug/l found in the State Regional Water Quality Control Board (SRWQCB)'s "Application of Risk Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater" dated December 2001, may be used. Also, we judge the RBCA process to be inappropriate for Methyl Tertiary-Butyl Ether (MTBE) but instead use a resource protection cleanup goal of not greater than 5 ppb. Characterization and definition of your contaminant plumes should be completed before performing risk evaluation. Submit a proposal to evaluate risk from TPH, and MTBE using the resource protection cleanup goal of 5 ppb in the Workplan Addendum requested below.

4. Contaminant Source Characterization - The workplan proposes to incorporate soil data into the conceptual site model (CSM). The data need not be limited to soil only. Modify the workplan in the Workplan Addendum requested below.

TECHINCAL REPORT REQUEST

Please submit technical reports to the Alameda County Environmental Health (Attention: Don Hwang), according to the following schedule:

May 19, 2003 - Workplan Addendum

These reports are being requested pursuant to the Regional Water Quality Control Board's (Regional Board) authority under Section 13267 of the California Water Code. If you have any questions, please call me at (510) 567-6746.

Sincerely,

Don Hwang
Hazardous Materials Specialist
Local Oversight Program

C: Leonard Niles, URS Corporation, 500-12th St., Suite 200, Oakland, CA 94607-4014
Donna Drogos
File

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

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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

Field Sampling Procedures

FIELD PROCEDURES

Groundwater Sampling Procedures

The sampling procedure for each well consists first of measuring the water level and depth to bottom, and checking for the presence of free phase petroleum product (free product), using either an electronic indicator and a clear Teflon™ bailer or an oil-water interface probe. Wells not containing free product are purged approximately three casing volumes of water (or until dewatered) using a centrifugal pump, gas displacement pump, or bailer. Equipment and purging method used for the current sampling event is noted on the attached field data sheets. During purging, temperature, pH, and electrical conductivity are monitored to document that these parameters are stable prior to collecting samples. After purging, water levels are allowed to partially (approximately 80%) recover. Groundwater samples (both purge and no purge) are collected using a Teflon bailer, placed into appropriate Environmental Protection Agency- (EPA) approved containers, labeled, logged onto chain-of-custody records, and transported on ice to a California State-certified laboratory. Wells with free product are not sampled and free product is removed according to California Code of Regulation, Title 23, Div. 3, Chap. 16, Section 2655, UST Regulations.

FIELD PROCEDURES

Direct-Push Drilling Soil Sampling Procedures

The direct push method of soil boring has several advantages over hollow-stem auger drill rigs. The direct push method produces no drill cuttings and is capable of 150 to 200 feet of boring or well installation per work day. Direct push can be used for soil gas surveys, soil sampling, groundwater sampling, installation of small-diameter monitoring wells, and components of remediation systems such as air sparge points. The equipment required to perform direct push work is varied ranging from a roto-hammer and operator to a pickup truck-mounted Geoprobe™ - type rig capable of substantial static downward force combined with percussive force. This method allows subsurface investigation work to be performed in areas inaccessible to conventional drill rigs such as in basements, beneath canopies, or below power lines. Direct push equipment is ideal at sites with unconsolidated soil or overburden, and for sampling depths of less than 30 feet. This method is not appropriate for boring through bedrock or gravelly soils.

Permitting and Site Preparation

Prior to direct push boring work, URS will obtain all necessary permits and locate all underground and above ground utilities through Underground Service Alert (USA) and a thorough site inspection. All drilling equipment will be inspected daily and will be maintained in safe operating condition. All down-hole drilling equipment will be cleaned prior to arriving on-site. Working components of the rig near the borehole, as well as driven casing and sampling equipment will be thoroughly decontaminated between each boring location by either steam cleaning or washing with an Alconox™ solution. All drilling and sampling methods will be consistent with ASTM Method D-1452-80 and county, state and federal regulations.

Boring Installation and Soil Sampling

Direct push uses either a continuous core barrel or descrete soil sampler. The continuous core sampler consists of a 4-foot long, 1.5-inch inside diameter core barrel with a polyethylene liner. After the core barrel is driven the desired depth interval, it is withdrawn and the liner removed. The desired sample interval containing the recovered soil core is cut from the length of polyethylene tubing. The discrete sampler is similar except that a stainless steel end point is held in place with an inner rod during pushing. Soil samples are collected by penetrating to the desired depth, retracting the inner rod and end point, and then driving the sampler the desired depth interval. Soil samples are recovered in polyethylene tubing lining the sampler.

Soil removed from the upper tube section is used for lithologic descriptions (according to the unified soil classification system) and for organic vapor field analysis. If organic vapors will be analyzed in the field, a portion of each soil sample will be placed in a plastic zip-lock bag. The bag will be sealed and warmed for approximately 10 minutes to allow vapors to be released from the soil sample and diffuse into the head space of the bag. The bag is then pierced with the probe of a calibrated organic vapor detector. The results of the field testing will be noted with the lithologic descriptions on the field exploratory soil boring log. Soil samples selected for laboratory analysis will be covered on both ends with Teflon™ tape and plastic end caps. The samples will then be labeled, documented on a chain-of-custody form and placed in a cooler for transport to a state certified analytical laboratory

LABORATORY PROCEDURES

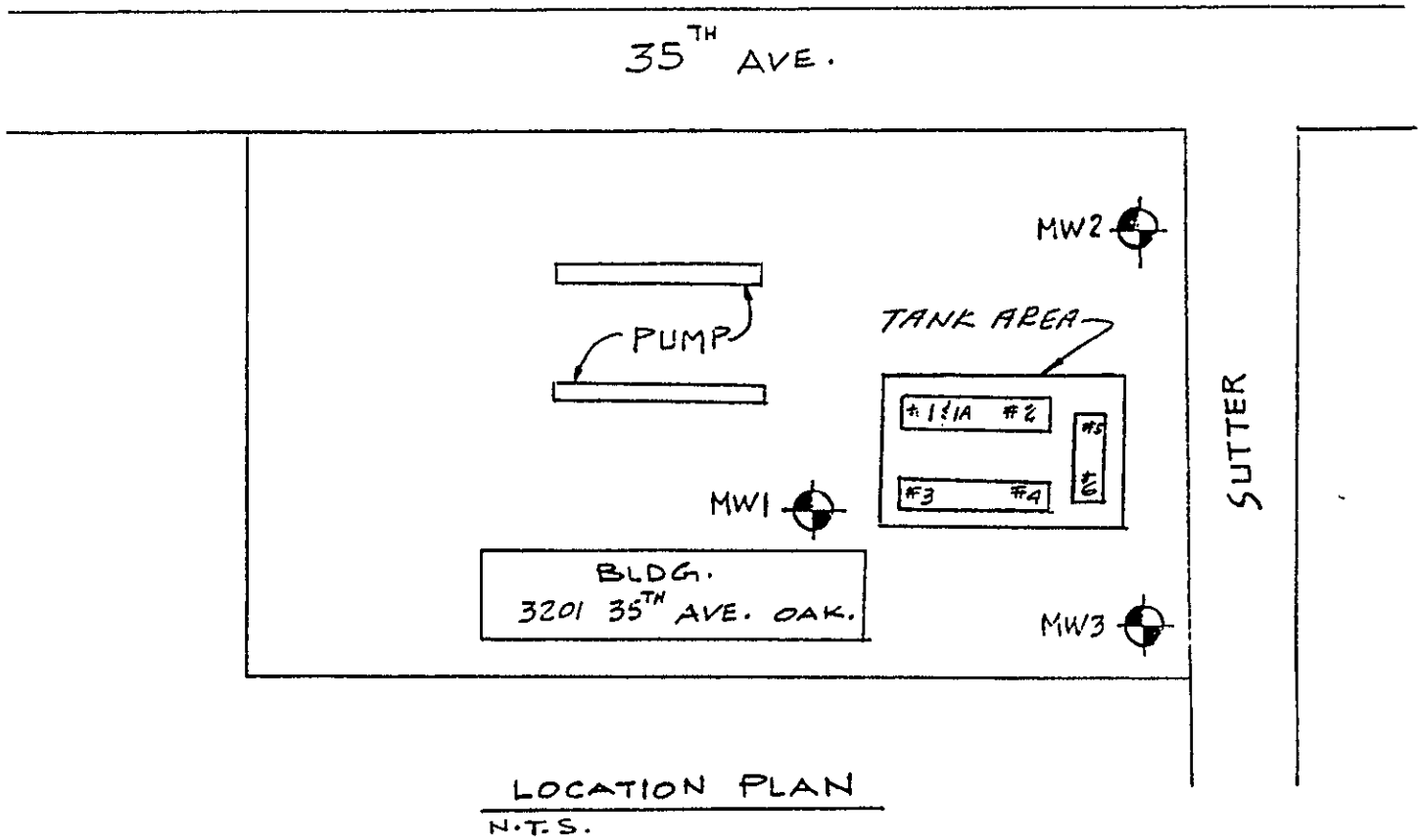
Laboratory Procedures

The groundwater samples were analyzed for the presence of the chemicals mentioned in the chain of custody using standard EPA methods. The methods of analysis for the groundwater samples are documented in the certified analytical report. The certified analytical reports and chain-of-custody record are presented in this attachment. The analytical data provided by the laboratory approved by Group Environmental Management Company have been reviewed and verified by that laboratory.

ATTACHMENT C

Historical Soil and Water Analytical Data and Sample Locations

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
535 Main Street
Martinez, Ca. 94553
(415) 372-5444



LOCATION PLAN
N.T.S.

MW (MONITORING WELL)

Source: KEI, September 10, 1986

Figure C-1

ENVIRONMENTAL RESEARCH GROUP, INC.

117 N. First Ann Arbor, Michigan 48104 (313) 662-3104

April 7, 1986

KEI Engineers
535 Main Street
Martinez, CA 94553

Attention: Mardo Kaprilieian

Report #7535 P.O. #Contract

Site Location: Mobil, Oakland, 35th

RE: Seven (7) soil samples submitted on April 2, 1986, for rush total hydrocarbon response analysis.

Procedure: The samples are analyzed for total hydrocarbon response (gasoline) by following the method described in Attachment 2, Analytical Procedures for Fuel Leak Investigations. The samples are concentrated on a Tekmar LSC-2 automatic sample concentrator prior to injection into a gas chromatograph fitted with a flame ionization detector. Quantitation is performed, as total hydrocarbon response, against known concentrations of heptane-isooctane (55/45). The limit of detection for this method of analysis is one part per million (mg/kg), unless indicated.

The results are displayed in the table below.

ERG #	CLIENT ID#	CONCENTRATION (mg/kg)
7535-1	1	8
7535-2	1A	16
7535-3	2	3.1
7535-4	3	210
7535-5	4	ND (1)
7535-6	5	ND (5)
7535-7	6	5.7

ND = None Detected. The limits of detection are in ( ).

Submitted by:

Robert B. Flay
Manager, Organics Department

RBF:clp
040886t

Source: KEI, April 21, 1986

Table C-1

KEI-86-045
September 10, 1986

TABLE - 1

Results of Groundwater Analysis

Parameter	MW #1	MW #2	MW #3
Total Fuel Hydrocarbons (ppm)	4.4	26.0	<0.05
Benzene (ppm)	0.8	3.8	<0.001
Toluene (ppm)	0.52	1.0	<0.001
Xylene (ppm)	0.35	1.7	<0.001
Depth (feet)	22.0	20.0	21.2
Free Product (inches)	0.0	0.0	0.0
Odor	ND	ND	ND
Sheen	ND	ND	ND

Results of Soil Analysis

Total Fuel Hydrocarbons (ppm)	12.0	5.7/2.0	<1.0
Depth (feet)	26.0	16.0/26.0	16.0
Odor	ND	ND	ND

ND = None Detected

Source: KEI, September 10, 1986

Source: Alton, February 28, 1990

Figure C-2

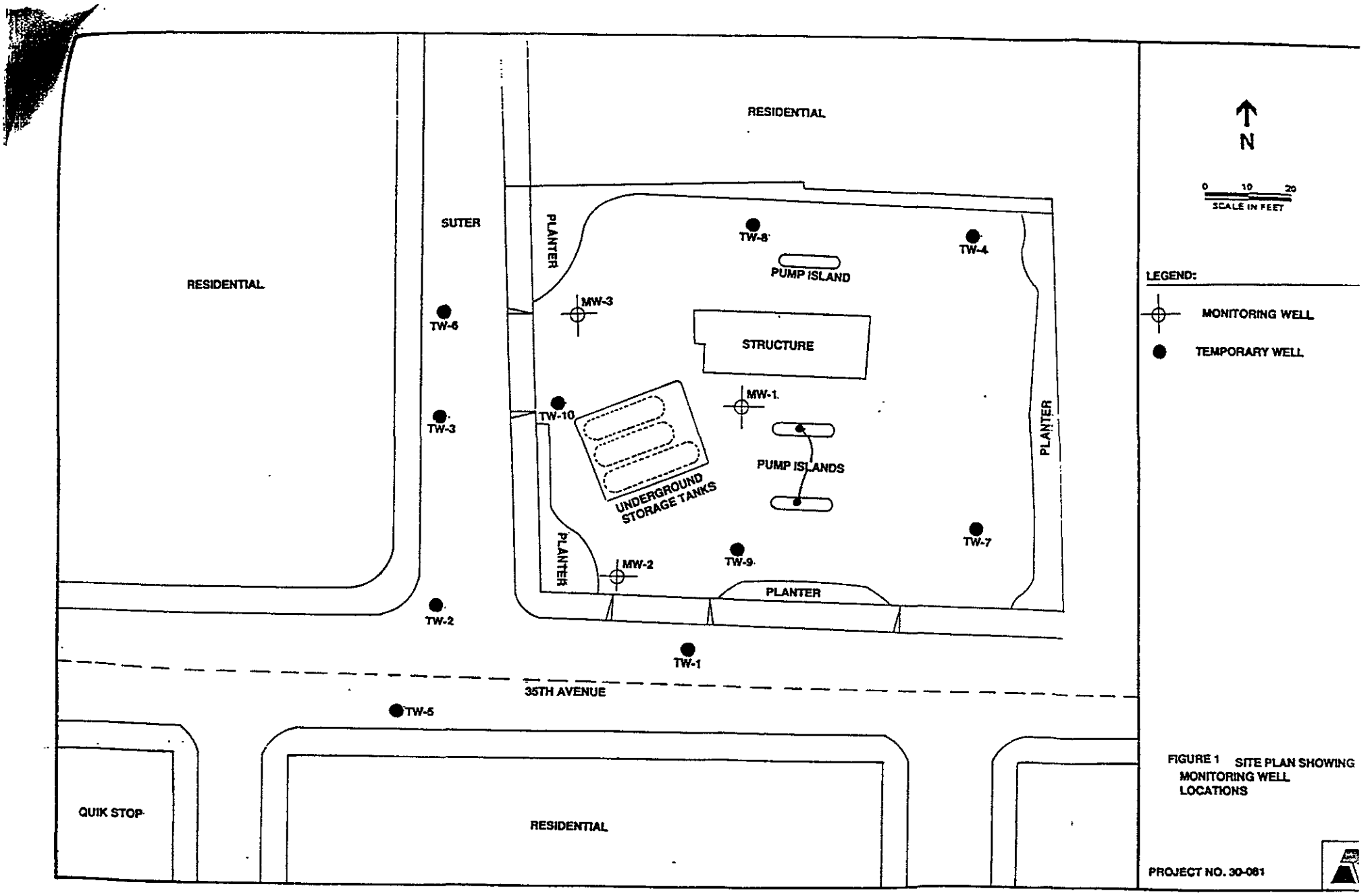


FIGURE 1 SITE PLAN SHOWING MONITORING WELL LOCATIONS

PROJECT NO. 30-081

TABLE 1

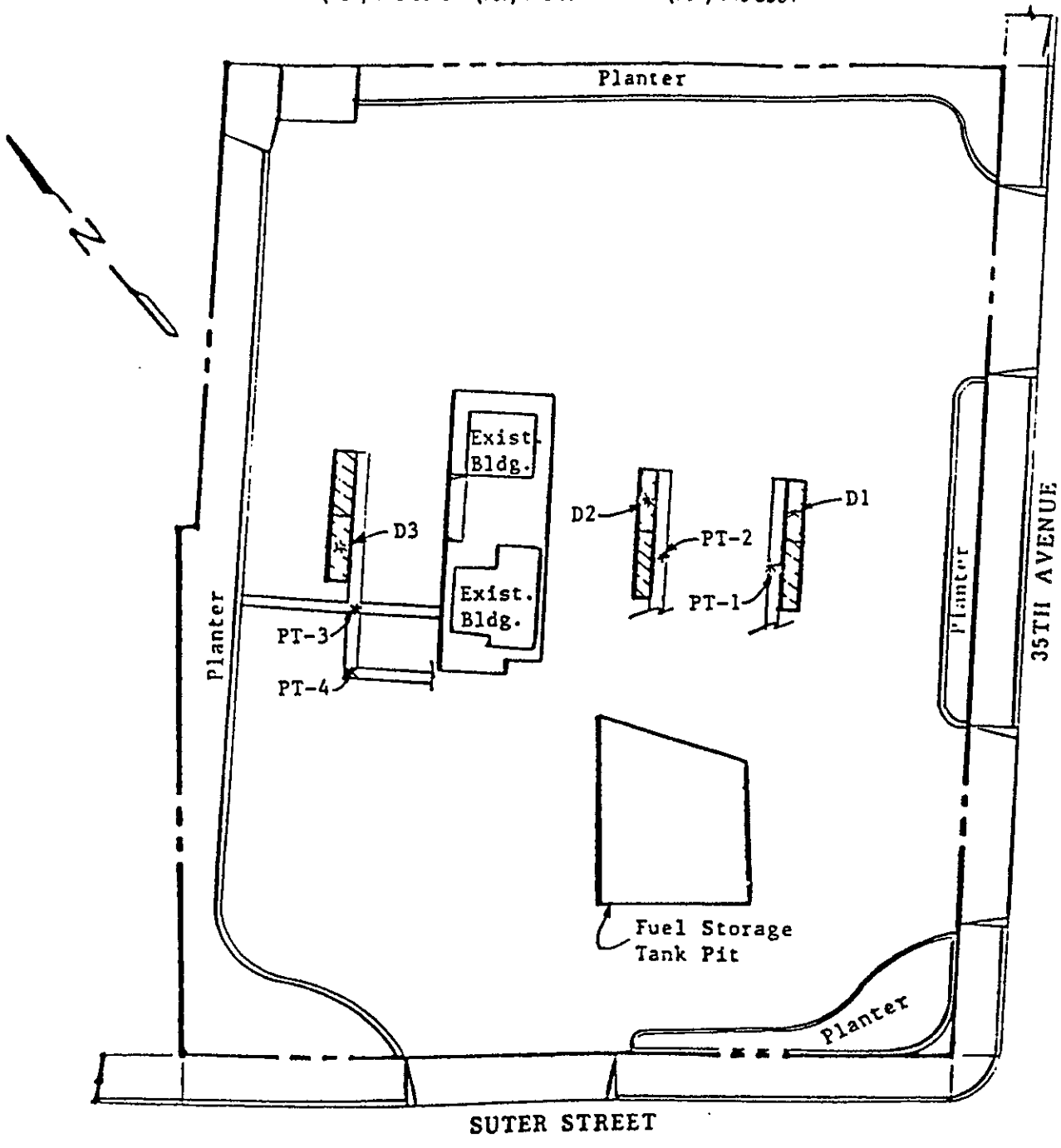
RESULTS OF ANALYSIS
GROUND WATER SAMPLES

Well	TPH (ppm)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)
MW-1	FP	---	---	---	---
MW-2	14	580	1300	460	2300
MW-3	0.5	20	30	24	35
TW-1	7.4	230	180	690	1200
TW-2	FP	---	---	---	---
TW-3	22	2400	2800	530	4000
TW-4	ND <0.1	ND <0.3	ND <0.3	ND <0.3	0.7
TW-5	240	1100	5100	5600	28000
TW-6	20	56	910	590	3700
TW-7	ND <0.1	ND <0.3	0.4	0.7	4.3
TW-8	ND <0.1	0.3	0.6	1.1	7.9
TW-9	41	2100	5700	120	6900
TW-10	50	1900	7300	1400	8000

ND = Non-Detected
FP = Free Product
ppm = parts per million
ppb = parts per billion
MW = Monitoring Well
TW = Temporary Well

Source: Alton, February 28, 1990

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
PO BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX (707) 746-5581



SITE PLAN

LEGEND

* Sample Point Location

0 30 60
Approx. scale feet

BP Service Station
3201 35th Avenue
Oakland, CA

Source: KEI, October 11, 1990a

Figure C-4

TABLE 2

RESULTS OF
LABORATORY ANALYSIS OF SOIL SAMPLES
June - July 1990

11132

Boring	Sample Depth (ft)	TPH-G	B	T	E	X
		(Concentrations in Parts Per Million)				
		June 1990				
MW-4	5.0	ND	ND	ND	ND	ND
MW-4	10.0	ND	ND	ND	ND	ND
MW-4	15.0	ND	ND	ND	ND	ND
MW-4	20.0	ND	ND	ND	ND	ND
MW-4	25.0	ND	ND	ND	ND	ND
RW-1	5.0	ND	ND	ND	ND	ND
RW-1	10.0	ND	ND	ND	ND	ND
RW-1	15.0	22	0.72	1.6	0.58	2.2
RW-1	20.0	41	ND	18.0	8.0	40.0
RW-1	25.0	50	1.4	3.3	1.0	5.4
		July 1990				
MW-5	5.0	ND	ND	ND	ND	ND
MW-5	10.0	9.3	ND	0.019	ND	0.11
MW-5	15.0	14	0.16	0.037	0.29	0.42
MW-5	20.0	190	1.8	11	2.5	17
MW-5	25.0	770	4.8	44	13	94
MW-6	15.0	ND	ND	ND	ND	ND
MW-6	20.0	ND	ND	ND	ND	ND
MW-7	15.0	ND	ND	ND	ND	ND

Notes:

TPH-G = Total Petroleum Hydrocarbons as Gasoline
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total Xylenes
ND = Not Detected at Method Detection Limit (refer to Appendix D, Official Laboratory Reports)

Source: Alton, September 4, 1990

KEI-J90-0804.R2
October 11, 1990

TABLE 1

SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected on August 21 & 24, 1990)

Sample	Depth (feet)	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	Organic Lead
D1	4.5	ND	ND	ND	ND	ND	ND
D2	3.0	ND	ND	ND	ND	ND	ND
D3	7.0	ND	ND	ND	ND	ND	ND
PT-1	3.0	ND	ND	ND	ND	ND	0.55
PT-2	3.0	ND	ND	ND	ND	ND	ND
PT-3	4.0	21	0.0099	0.062	0.038	0.060	ND
PT-4	3.0	ND	ND	ND	ND	ND	ND
Detection Limits		1.0	0.0050	0.0050	0.0050	0.0050	0.050

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

Source: KEI, October 11, 1990a

Table C-8

KEI-J90-0804.R1
October 11, 1990

TABLE 1

SUMMARY OF LABORATORY ANALYSES

(Collected on August 21 & 31, 1990)

Sample	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
Comp A*	8.0	ND	0.019	0.14	0.014
Comp B	240	0.060	0.70	9.5	0.68
Comp 1	6.1	ND	ND	0.019	0.0060
Detection Limits	1.0	0.0050	0.0050	0.0050	0.0050

* Organic lead was non-detectable.

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

Source: KEI, October 11, 1990b

TABLE 2

11132

RESULTS OF
LABORATORY ANALYSIS OF SOIL SAMPLES
March 1991

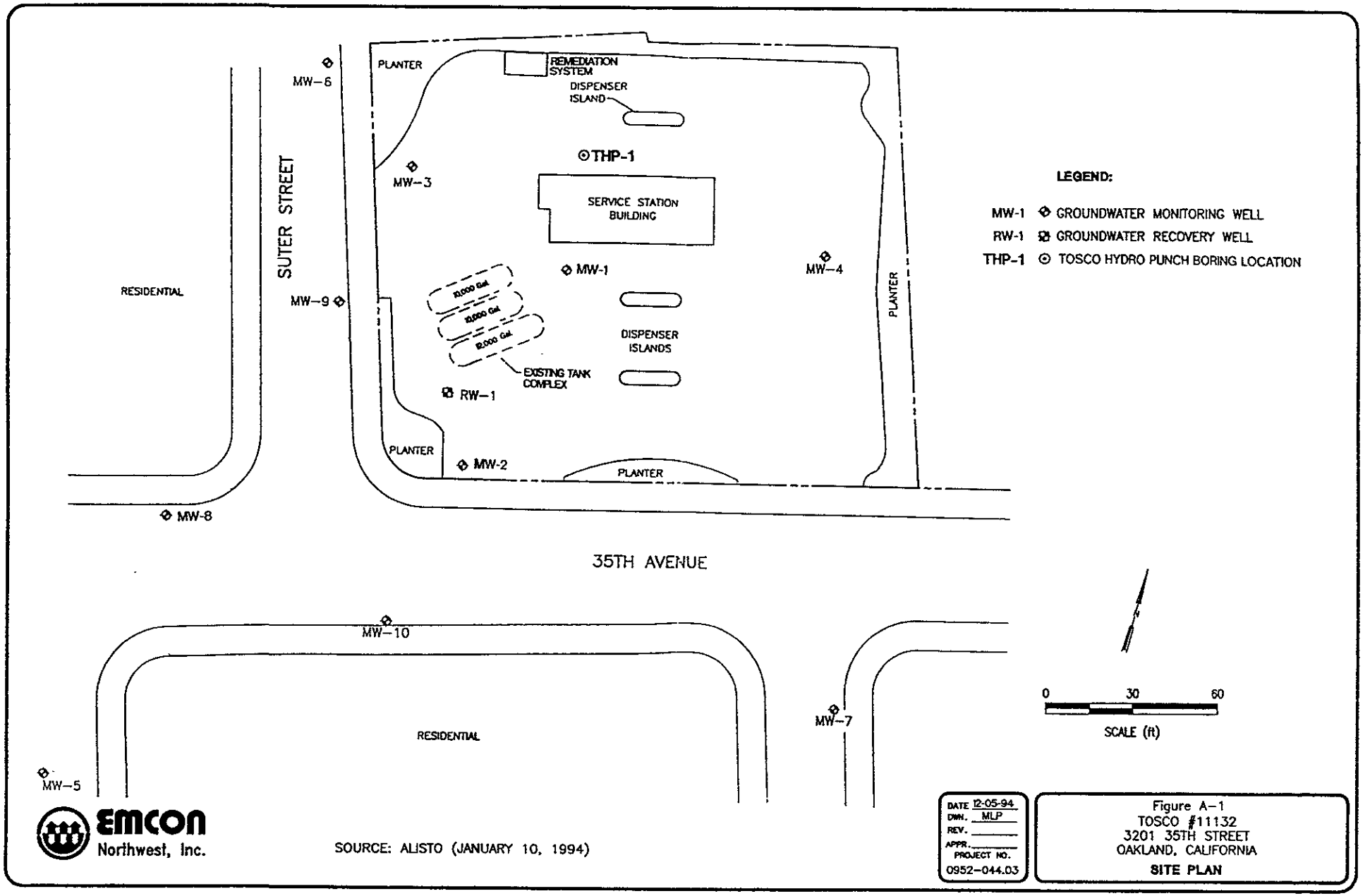
Boring	Sample Depth (ft)	TPH-G	B	T	E	X
		(Concentrations in Parts Per Million)				
SB-8	10.5-11.0	ND<1	ND<0.003	0.004	ND<0.003	ND<0.003
	20.5-21.0	390	1.8	16	6.7	37
	25.5-26.0	ND<1	0.013	0.028	0.009	0.05
SB-9	10.5-11.0	ND<1	ND<0.003	0.004	ND<0.003	0.006
	20.5-21.0	120	1.7	7.1	1.7	11
	25.5-26.0	130	0.47	3.9	1.6	12
SB-10	10.5-11.0	ND<1	ND<0.003	0.007	ND<0.003	0.017
	20.5-21.0	73	0.49	3.3	1.3	6.9
	25.5-26.0	1	0.41	0.009	0.007	0.019

Notes:

TPH-G = Total Petroleum Hydrocarbons as Gasoline
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total Xylenes
ND = Not Detected at Method Detection Limit shown

Source: Alton, AUgust 21, 1991

Table C-10



EMCON Northwest, Inc.

SOURCE: ALISTO (JANUARY 10, 1994)

DATE 12-05-94
DWN. MLP
REV.
APPR.
PROJECT NO.
0952-044.03

Figure A-1
TOSCO #11132
3201 35TH STREET
OAKLAND, CALIFORNIA
SITE PLAN

Table A-1

Site Number 11132
3201 - 35th Avenue, Oakland, California

Soil Sample Results of Analyses (ppm)

Sample Number	Depth (feet)	Date Collected	California DHS LUFT Method TPH-G	California DHS LUFT Method Hydrocarbon Scan		BTEX EPA Method 5030/8020			
			TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes
THP1-S-4-4.5*	4-4.5	11/22/94	*nd*	*nd*	120	*nd*	*nd*	*nd*	*nd*

NOTE:
TPH-G = Total petroleum hydrocarbons as gasoline.
TPH-D = Total petroleum hydrocarbons as diesel.
TPH-O = Total petroleum hydrocarbons as oil.
nd = Not detected at or above method reporting limit.
n/a = Not applicable.
— = Not analyzed.
TW = Tosco well.
TB = Tosco boring.
TD = Tosco dispenser soil sample.
THP = Tosco HydroPunch.
SGP = Soil gas probe.
* = THP1 is referred to as HP1 on the lab report (see Attachment D).

URS

Facsimile

Date: May 28, 2003 Page 1 of: 10

To: Mr. Don Hwang From: Leonard Niles

Firm: Alameda County Health Care Services cc: Mr. Paul Supple, ARCO

Facsimile: (510) 337-9335 (925) 299-8872

Subject: **Workplan Addendum for Former BP Site #11132, 3201 35th Avenue, Oakland, CA**

Message:

Mr. Hwang,

Attached is the workplan addendum (text and figure only) for an expedited site assessment at the former BP Service Station #11132, 3201 35th Avenue, Oakland, CA. This workplan addendum was prepared to comply with the scope of work requested in your letter of March 19, 2003 and Eva Chu's letter of September 9, 2002. The original will be forwarded to you by Fed-X.

Sincerely,

Leonard Niles

Leonard Niles

URS Corporation
500 12TH Street, Suite 200
Oakland, CA 94607-4014
Tel: 510.893.3600
Fax: 510.874.3268
www.urscorp.com

URS

May 28, 2003

Mr. Don Hwang
Hazardous Material Specialist
Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

SUBJECT: Soil and Groundwater Investigation Workplan Addendum for the Former BP Service Station #11132, 3201 35th Avenue, Oakland, California
ACHCS Fuel Leak Case No. RO0000014

Dear Mr. Hwang:

On behalf of the Group Environmental Management Company (an affiliated company of BP), 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 a letter from the Alameda County Health Care Services (ACHCS) to BP dated March 19, 2003 (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. An active gasoline service station, and two former gasoline service stations are located along 35th Avenue west, and within 250 feet downgradient, of the subject site. 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. It is uncertain from the available records if any soil excavation or disposal was performed following the UST removal. The product lines and dispensers were upgraded in 1990, and 100 cubic yards of soil excavated and disposed.

Numerous site investigations have been performed at this site since the mid 1980s. A total of ten monitoring wells and one groundwater recovery well have been installed between 1986 and 1991, and are currently being gauged and sampled as part of a quarterly groundwater monitoring program. Ten soil borings were completed as temporary wells and groundwater samples collected in 1990.

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 14 to 20 feet below ground surface (bgs) and flow to the southwest at gradient of 0.013 feet per foot as calculated during the recent January 2003 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, MW-2 and RW-1, and the

URS Corporation
500 12th Street, Suite 200
Oakland, CA 94607-4014
Tel: 510.893.3600
Fax: 510.874.3268

URS

offsite wells MW-8, MW-9 and MW-10. The hand bailing of these separate phase hydrocarbons are routinely conducted as part of the quarterly groundwater monitoring program. During the January 2003 event, 0.3 gallons, 0.07 gallons, 0.2 gallons and 0.03 gallons were removed from MW-1, RW-1, MW-9 and MW-10, respectively. A separate phase hydrocarbon recovery and groundwater extraction and treatment system was intermittently operational for several years following 1992. The system is still in place, but is not currently active.

Sorbed phase hydrocarbons have been reported in soils on and off-site during various excavations and subsurface investigations. Total petroleum hydrocarbon (TPH) as gasoline (TPH g) were reported up to 210 parts per million (ppm) from the excavation (depth not recorded) following removal of the former USTs in 1986. It is uncertain from available records if this soil was subsequently over-excavated. TPH-g concentrations up to 21 ppm and benzene concentrations up to 0.0099 ppm to were reported in confirmatory soil sample PT-3 at a depth of 4 feet bgs from the product line excavation during 1990. The highest petroleum hydrocarbon concentrations detected in soil samples from borings onsite were in the boring for well RW-1 in 1990, with 50 ppm TPHg and 1.4 ppm benzene detected at a depth of 25 feet bgs. The highest petroleum hydrocarbon concentrations detected in soil samples from borings offsite were in the boring for well MW-5 in 1990, with 770 ppm TPHg and 4.8 ppm benzene detected at a depth of 25 feet bgs. MW-5 is located approximately 200 feet directly down-gradient from the subject site USTs, and is adjacent, but cross-gradient, to the Quick Stop gasoline service station at 3130 35th Avenue and Mangels Avenue. Toluene, ethylbenzene and xylenes have also been reported in soil samples collected on and off-site.

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 (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. MW-1 has not been sampled since that event due to the presence of separate phase hydrocarbons. 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. RW-1 has not been sampled since that event due to the presence of separate phase hydrocarbons. During the most recent groundwater sampling event of January 29, 2003, the highest onsite concentrations of petroleum hydrocarbons reported were in a groundwater sample from MW-2 at 77,000 ppb TPHg, 4,700 ppb benzene and 820 ppb MTBE.

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 January 2003 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 200,000 ppb, 810 ppb and 360 ppb, respectively. Considerably lower TPH-g 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

URS

January 2003 sampling event, a groundwater sample collected from MW-5 was reported to contain TPH-g, benzene and MTBE at 7,900 ppb, 7,900 and 82 ppb, respectively. This decrease in TPH-g 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 in their letter of March 19, 2003 (Attachment A) for an addendum to the work plan submitted by URS on October 28, 2002 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 is currently performing 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. The underground utility location data obtained was used to determine the locations of the soil borings proposed in this workplan addendum.

The ACHCS letter of March 19, 2003 did not address the conduit study, therefore the scope of work will remain unchanged from the previous workplan. 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.

URS

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 ACHCS letter of March 19, 2003 did not agree with the URS workplan proposal for the installation of two new groundwater monitoring wells near the down gradient extent of the known hydrocarbon plume. Instead, the ACHCS requested that borings be used for the purpose of determining extent of the remaining petroleum hydrocarbons in the soil and groundwater. In their letter dated September 9, 2002 (Attachment A), the ACHCS requested that an expedited site assessment be conducted using direct push boring methods with depth discrete soil and groundwater sampling at 5 foot intervals, soil/groundwater interface, changes in lithology, and areas of obvious contamination. The ACHCS letter requested that the borings be continuously cored for lithologic purposes.

URS proposes the definition of the downgradient extent of petroleum hydrocarbons in the soil and groundwater by advancing borings at six sample locations (two borings per location) using a GeoProbe™ or equivalent direct push sampling rig. The offsite downgradient sample locations will be located along 35th Avenue and Mangels Avenue west and southwest, respectively, of the subject site. The sample locations will be spaced approximately 30 feet apart in linear groups of three each, centered near the approximate locations of the previously proposed monitoring wells MW-11 and MW-12. As shown on Figure 1, the proposed group of sample locations UB-1, UB-2 and UB-3 will be located between approximately 30 and 90 feet south and down gradient of MW-5; centered near the originally proposed MW-12 location. The proposed group of sample locations UB 4, UB 5 and UB 6 will be located between approximately 60 and 120 feet west and down gradient of MW-8; centered near the originally proposed MW-11 location. The borings will be located at least 10 feet from the nearest underground utilities per BP GEM utility clearance procedures.

The borings will be advanced to a total depth of 40 to 50 feet, or approximately 20 to 30 feet below expected depth to first encountered groundwater. The first 5 feet of each boring will be performed using air knife methods per BP GEM utility clearance procedures. Since it is not practical to collect depth discrete groundwater samples within a continuously cored soil boring, or conduct soil sampling while using depth discrete groundwater sampling probes, URS proposes a closely spaced pair of borings (within 2 feet apart) at each sampling location. Each pair of borings per sample location will be numbered UB-1A and UB-1B, etc. Foreknowledge of the lithologic and hydrogeologic conditions is necessary to anticipate proper discrete groundwater sampling depths. Therefore, URS proposes to continuously core the first soil boring at each location for lithologic characterization, with soil analytical samples to be collected at 5-foot intervals, soil/groundwater interface, changes in lithology, and areas of obvious contamination. Previous boring logs suggest that subsurface lithology is largely homogeneous in nature.

A depth discrete groundwater sampling probe will then be advanced within 2 feet of the original boring using direct push methods to approximately 40 to 50 feet bgs. Depth discrete groundwater samples will be collected at the saturated/unsaturated zone interface, at 10 feet depth intervals below, and at multiple discrete water-bearing zones and lithologic changes, if encountered within the initial boring. As presented in Attachment B, standard direct push drilling and sampling procedures will be followed.

Soil samples collected for possible laboratory analysis will be screened for volatile hydrocarbons by a photo-ionization detector (PID). Soil samples collected at a minimum of 5-foot depth intervals, at the

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approach to assess the nature and extent of the remaining petroleum hydrocarbons in the soil and groundwater both onsite and offsite.

Groundwater Contaminant Plume Monitoring and Interim Remedial Action

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. As an interim remedial action measure, pending approval and implementation of the Corrective Action Plan, URS will implement monthly separate phase hydrocarbon gauging and bailing of wells MW-1, RW-1, MW-9 and MW-10.

The previous URS workplan proposed the construction of two additional offsite downgradient wells, MW-11 and MW-12, to be added to the monitoring program. The ACHCS response letter of March 19, 2003 disagreed with this approach and requested an expedited site assessment, as described in the Contaminant Plume Definition section above, be performed first to determine optimum offsite well locations. URS will incorporate the results of the expedited site assessment and the current groundwater sampling program into the CSM, which will be used to determine optimum locations of future offsite wells. In addition, URS proposes coordination of quarterly groundwater monitoring activities and data exchange with the former Exxon Station located at 3055 35th Avenue, approximately 250 feet southwest of the subject site in the downgradient direction. The Exxon site currently contains four groundwater monitoring wells sampled quarterly by Cambria Environmental Technology, Inc. Data from the Exxon site may be valuable in refining the CSM downgradient of the subject former BP site.

The CSM will be refined based on on-site and offsite 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. As quarterly groundwater data is evaluated, the CSM will be updated on a 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. As part of the CAP, an evaluation will be made of the feasibility and cost of repairing and reactivating the existing groundwater/separate phase hydrocarbon extraction and treatment system. The CAP will also propose verification monitoring to confirm completion of the correction actions and evaluate the CAP implementation effectiveness.

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In the previous workplan URS proposed to utilize the Oakland Risk-Based Correction Action (RBCA) approach in the decision making process to identify and manage potential health and environmental risks, address impacts to water resources, and manage nuisance conditions, following the "Oakland Urban Land Redevelopment Program: Guidance Document, January 1, 2002". In their March 19, 2003 letter, the ACHCS judged the Oakland RBCA process inappropriate for the evaluation of risk from TPH-g and MTBE, and requested that the TPH-g ceiling value of 5,000 µg/l from the California Regional Water Quality Control Board, San Francisco Bay Region (SFRWQCB) *Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater*, dated December 2001, be used. The ACHCS also requested that the resource protection cleanup goal of not greater than 5 µg/l for MTBE be used. The ACHCS letter did not specify whether these cleanup levels apply to soil or groundwater; due to the low concentrations, URS assumes these are groundwater cleanup levels.

Therefore, URS will evaluate risk and recommend cleanup levels in the CAP based on the SFRWQCB Risk-Based Screening Levels (RBSLs) contained in the *Summary Tier 1 Lookup Tables* in Volume 1 of the previously referenced document.

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. Leonard P. Niles, A State Registered Geologist and Certified Hydrogeologist. Mr. Niles 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. Niles 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.

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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) 874-1720.

Sincerely,

URS CORPORATION

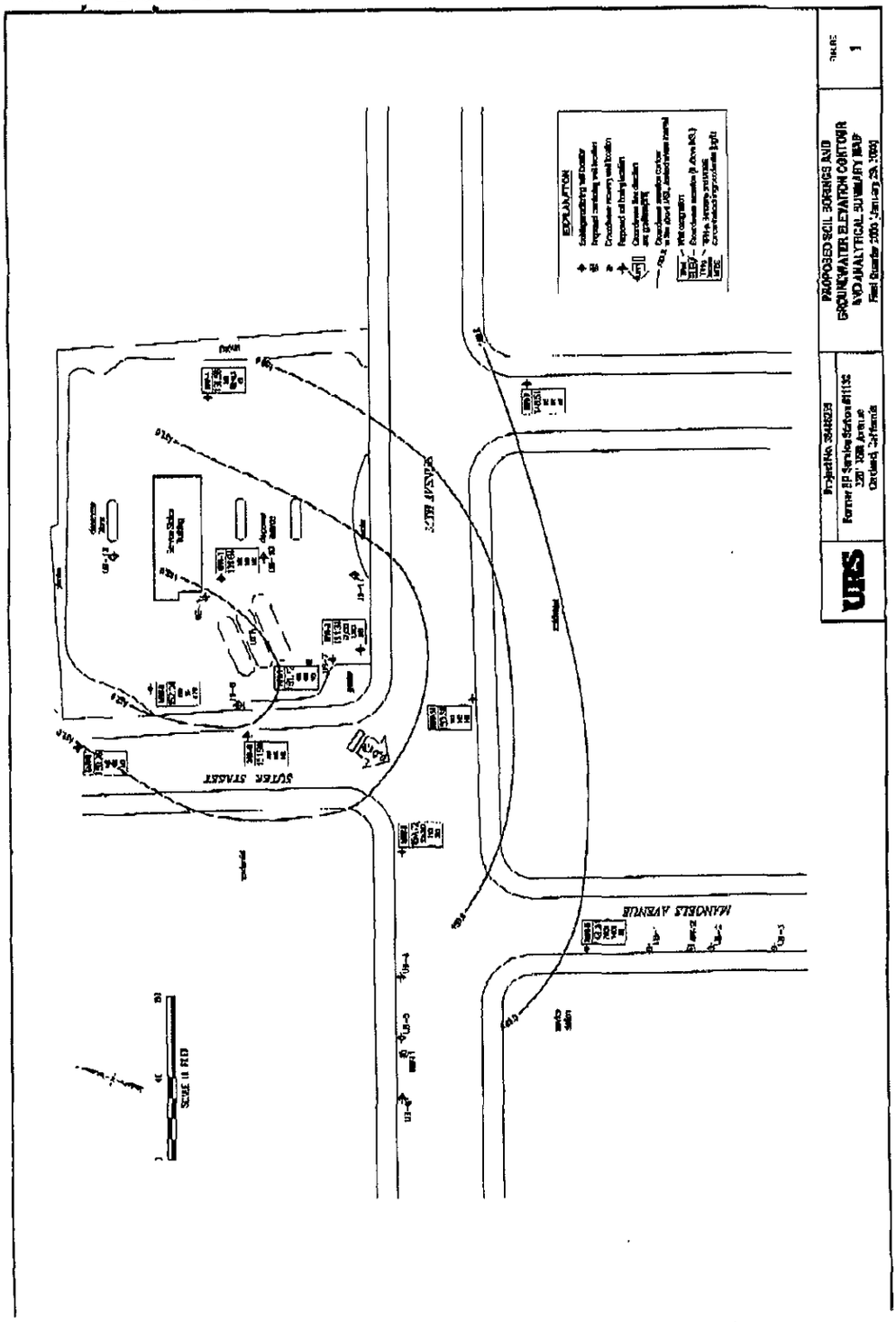
Leonard P. Niles

CERTIFIED HYDROGEOLOGIST
LEONARD P. NILES
NO. HG357
EXP. 3/31/04
STATE OF CALIFORNIA

Leonard P. Niles, R.G. #5774, C.H.G. #357
Project Manager

cc: Mr. Paul Supple, BP, Environmental Resources Management, P.O. Box 6549, Moraga, California 94549
Mr. Ado Fagorala, San Francisco Bay Regional Water Quality Control Board, 1515 Clay Street, Suite 1400, Oakland, California 94612
Ms. Liz Sewell, ConocoPhillips, 75 Broadway, Sacramento, California 95818

ATTACHMENTS
Figure 1 – Proposed Soil Borings and Groundwater Elevation Contour and Analytical Summary Map
Attachment A - ACHCS September 9, 2002 and March 19, 2003 Letters
Attachment B – Standard Well Installation and Development Procedures
Attachment C – Historical Soil and Water Analytical Data and Sample Locations


EXPLANATION
PROPOSED SOIL BORINGS AND
GROUNDWATER ELEVATION CONTOUR
AND ANALYTICAL SUMMARY MAP
FIGURE
1
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SUTTER STREET
MANDELA AVENUE
SCALE IN FEET

TOTAL P.10