WESTERN
GEO-ENGINEERS
CALIF. CONTRACTOR #513857
REGISTERED GEOLOGISTS

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STID 1248

June 11, 1998

Mr. John Rutherford
Environmental Compliance
Desert Petroleum, Inc.
P.O. Box 1601
Oxnard, CA 93032
(805) 654-8084 ext. 202
FAX (805) 654-0720

RE: Workplan to investigate the lateral extent of contamination downgradient of RS-7 as requested in the June 2, 1998 letter from Alameda County Health Care Services (ACHCS at former Desert Petroleum Station DP 793, 4035 Park Blvd. Oakland, CA 94602.

Dear Mr. Rutherford:

1 INTRODUCTION

The following workplan has been generated as requested by Mr. Thomas Peacock, Manager of ACHCS. Our previous workplan is approved to perform a RBCA Tier Two assessment and install five additional hand augered groundwater monitoring wells, project management, and to acquire permit and permission to install a receptor trench in Brighton Avenue, for 4035 Park Blvd., Oakland, California. Western Geo-Engineers has already gained Pre-Approval of Corrective Action Costs, which include the five additional hand augered groundwater monitoring wells, project management, and to acquire permit and permission to install a receptor trench in Brighton Avenue. See Appendix A.

1.1 SITE CHRONOLOGY

1.1.1 Discovery of Unauthorized Release

The service station at 4035 Park Boulevard was originally built in 1931. Tidewater Oil Company operated the site as a "full service" type service station in 1966. After the Loma Prieta earthquake in 1989 the station was closed after discovery of a leak in piping which was associated with a piping replacement job.

Desert Petroleum was notified on November 30, 1989, by Alameda County Health, that gasoline was trickling into the sewer on Brighton Avenue through a crack in the bottom of the sewer manway. The regular unleaded supply piping failed the subsequent tank and piping integrity tests. On December 7, 1989 all fuel was removed from the underground storage tanks (UST's). A ½ inch hole was discovered in the regular unleaded supply line beneath the eastern pump island and a Unauthorized Release Report filed on December 8, 1989.

1.1.2 Site Investigations and Remedial Actions

Soil borings RS-1, RS-2, RS-3, RS-4, RS-5 and RS-6 were drilled and sampled on December 11, 12, and 13, 1989. RS-1, RS-2, RS-5 and RS-6 were converted into groundwater monitoring wells. At this time an exploratory excavation near the discovery of gasoline in the sewer manway exposed three different underground lines. The storm drain was encountered at around the 2.5 to 3.0-foot depth, the sewer drain line at approximately the 5-foot depth and a water supply line at about the 6-foot depth. Gasoline appeared to be seeping from the fill around the sewer line. Remediation Service, Int'l (RSI) described the native formation exposed in this excavation as a tight clay. The excavation was converted into monitor well RS7 by installing an 8-foot section of 4 inch perforated PVC pipe and then backfilling the excavation with pea gravel. RSI using a portable internal combustion engine vapor extraction system pulled and destroyed gasoline vapors from RS-7 during daylight hours and from RS-1, RS-2, RS-5 and RS-6 continuously for a time.

RESNA Industries'Water Works Corporation (August 21, 1990 and September 19, 1990) and Levine-Fricke (September 8, 1993) collected soil and groundwater samples from six soil borings situated near the north-south portion of the sewer lateral in the site vicinity to investigate the probability of neighboring sites being impacted.

On June 22 and 23, 1994 three gasoline UST's and one waste oil UST were removed. After documentation sampling the excavated soil was placed back into the pit, for temporary storage, was removed August 8 – 11, and 14, 1995, along with material from the pump island area. Documentation samples were obtained at that time.

Source removal of contaminated soil occurred beneath, south and north of the pump island area to the seventeen-foot depth occurred between August 8 and 14, 1995. Prior to backfilling 6-inch diameter 0.020 inch slotted PVC casing was installed vertically from about the 14 to 4 foot depth with bland PVC to surface. Pea gravel was used to backfill the excavation to about the 5 ½ foot depth with the remainder of the excavation compaction backfilled to preexisting surface with A/B. This well is noted as R3. Two other excavations were dug on August 31, 1995 to the seventeen-foot depth and backfilled with slotted casing in similar matter. One excavation was dug west of the station building (R1) and the other over-excavated the waste oil UST area, north of the building (R2).

A Soil Probe Survey (SPS) was conducted along the sewer lateral north of the site in May 1996 to define the extent and degree of soil and groundwater hydrocarbon contamination. Free phase product sheen was discovered in the front yard of 4032 Brighton Avenue.

Weekly purging of water from RS-7 for interim free product removal commenced on August 14, 1996 and was terminated on September 9, 1996. A total of 303 gallons of water and sheen of product were recovered.

Air monitoring of the crawl spaces and sewer manways was conducted on September 20, 1996. Alameda County Health and the Oakland Fire Department requested this monitoring. All air samples obtained were below detection limits for TPHg, Benzene, Toluene, Ethylbenzene, and Xylenes. Air samples were obtained from crawl spaces at the following addresses: 1211, 1215, 1221, and 1227 Hampel Street and 4006 and 4026 Brighton Avenue and 4003 and 4032 Park Boulevard.

On January 17, 1997 a subsequent SPS was performed along Brighton Avenue to define the extent of the free product sheen and to help in the development of a corrective action workplan, which is dated April 3, 1997.

Groundwater sampling and monitoring for this site commenced June 1994 and is currently ongoing on a quarterly basis.

A workplan to perform Risk Base Corrective Action (RBCA Tier 2) was approved by Alameda County Health December 5, 1997 and revised December 9, 1997 for pre-approval by the Cal/EPA SWRCB UST Cleanup Fund; pre-approval was received April 22, 1998.

The following describes the methods and procedures for the placement and installation of wells to define the lateral extent of groundwater contamination downgradient of RS-7 and evaluate the offsite groundwater plume.

1.2 ADDITIONAL MONITORING WELLS

The additional five monitoring wells are a necessity in achieving:

1. A complete Tier 2 assessment.
2. Investigate the lateral extent of contamination downgradient of RS-7.
3. Delineate the area that is to be used for free product removal via a receptor trench along the eastern curb/gutter area of Brighton Avenue, see Figure 3.

Previous investigations have delineated the Gasoline Range Hydrocarbon Plume as it migrated off site along the sewer lateral beneath private property, its north and south spread beneath the eastern curb along Brighton Avenue and the lateral extent along the sewer lateral west of RS-7.

1.2.1 SITING OF WELLS

The siting of the additional 5 groundwater monitoring wells was accomplished with information generated from the two Soil Probe Surveys, which obtained soil and groundwater samples to evaluate the lateral extent of the hydrocarbon plume, see Figure 4.

1.2.2 CONSTRUCTION OF WELLS

The five additional wells will be hand augered to approximately the fifteen-foot depth. The decision to use the hand auger method over the conventional truck mounted auger drilling rig was

made after previous site visits indicated the difficulty in accessing the drilling areas and the unpreventable damage to landscaping that would occur using the conventional drilling rig.

The five wells will be drilled using an eight-inch diameter hand auger with five-foot extensions. The surface formation is clayey silt to silty clay with water bearing medium sand at approximately the ten-foot depth. Each hand auger bucket removed will be field screened for volatile organic compounds using a photoionizing detector (PID) with a 10.2 ev bulb and will be visually inspected for lithology and signs of contaminant. A borehole log will document the field geologists' findings for each well. Samples will be collected from the bucket of the hand auger at the highest PID response, above groundwater and at total depth of boring, for analysis by a State of California Certified Laboratory. Western Geo-Engineers has contracted North State Environmental Laboratories to analyze the soil and water samples collected during this investigation.

Once the boring has reached total depth, clean 2 inch Sch 40 F480 PVC 0.010 slotted casing with a pointed bottom plug will be placed from total depth to the five-foot depth; with Sch 40 F480 PVC blank to surface. All joints are threaded with a rubber gasket. Clean #2/12 and will then be placed surronding the slots to 4.5 foot depth. Two feet of clean #030 sand will be placed above the #2/12 sand to prevent the bentonite from migrating into the #2/12 sand pack. After the sand has been placed the well will be surged with a two inch surge block to help settle the sand pack and suspend fine solids, if needed more sand will be added at this time. Two feet of hydrated bentonite will be placed above the #030 sand and then neat cement to surface. Surface security will be a ¼ inch above grade six inch traffic rated traffic box secured in a 2 foot square concrete pad along Brighton Avenue. In the backyard areas of the private residences, the wells will be secured with either the six inch traffic rated traffic box secured in a 1 foot square concrete pad or a 6 inch steel monument set approximately 4 inches above ground, in a 1 foot square concrete pad. The chose of well security will depend upon the individual property owners. All well casings will be secured inside the traffic boxes with a locking watertight thermos type cap.

1.2.3 DEVELOPMENT OF WELLS

Approximately one week after the wells have been installed they will be developed using surging and bailing method, where a two inch surge block is rapidly pushed up and down inside of the casing adjacent to the slots to suspend fine solids and create good communication for groundwater flow from the formation to the well. After surging the wells will be bailed until clarity of purged water indicates removal of most of the suspended solids.

1.2.4 DISPOSAL OF SOILS GENERATED FROM DRILLING OF WELLS

Excavated soil will be field screened with a PID, placed on and covered with 6-mil plastic liner. Dependent upon the amount of soil generated, a sample(s) will be obtained to determine the best means for soil disposal.

1.2.5 DISPOSAL OF FLUIDS GENERATED DURING DECON AND WELL DEVELOPMENT

Groundwater, rinseate water and all other fluids collected during the drilling activities will be placed in labeled 55 gallon 17H DOT drums for later removal by Evergreen Environmental Services for recycling.

1.2.6 MONITORING OF NEWLY INSTALLED WELLS

The newly installed wells will be sampled during a scheduled quarterly monitoring event, these wells along with five of the pre-existing wells will also have slug tests performed on them in addition to the natural attenuation sampling/study that will help in the RBCA TIER 2 evaluation of this site.

1.3 FREE PRODUCT REMOVAL AND EVALUATION

Free phase gasoline range hydrocarbons have been discovered during the SPS investigations of the sewer lateral at Brighton Avenue, Oakland, California. The sheen of product appears to be trapped in sand bound between the natural gas underground utility trench in Brighton Avenue and the eastern sidewalk area along Brighton Avenue. As the sewer lateral leaves the backyards and travels west to Brighton Avenue, it is sloped to a deeper elevation and passes under the natural gas line located in Brighton Avenue. The shallow groundwater in this area is found above both the sewer and the natural gas line and most likely fills the backfill creating a barrier for the western migration of the petroleum hydrocarbons. The cross sections have been developed to graphically show this relationship, see the April 3,1997 report "FREE PRODUCT INVESTIGATION REPORT ALONG BRIGHTN AVENUE", figures 8 and 9 pages 31 and 32.

1.4 RECEPTOR TRENCH IN BRIGHTON AVENUE

To collect the free product and any injection fluids that may be used along the sewer lateral, a receptor trench has been approved. This receptor trench will be installed in the western gutter area along Brighton Avenue and will intercept the sewer lateral backfill and the silty sand zone north of the sewer lateral. The trench will be approximately 30 feet in length, 6 feet deep and 3 feet wide, with a collection basin/vault near the sewer lateral dug to the 7 foot depth, see Figure 11 page 34 of the April 3, 1997 report. The original plan for the receptor trench was to collect the fluids and then pump them back to the treatment compound located at 4035 Park Blvd. The high costs for right-of-way permits, and approved installation made pumping to expensive, requiring weekly removal of fluids by a vacuum transport tanker truck.

1.5 WEEKLY REMOVAL OF FLUIDS COLLECTED IN RECEPTOR TRENCH

As mentioned above the removal of fluids from the receptor trench will be accomplished once a week by a vacuum service tanker truck and hauled to their site for recycling and disposal. At this time the City of Oakland sewer district does not except fluids other than *normal* fluids found in sewer systems.

1.6 MONITORING/EVALUATION OF PROGRESS MADE WITH WEEKLY REMOVALS

To evaluate the progress of the weekly pumping of the receptor trench along with the introduction of bio-nutrients along the sewer lateral, monthly monitoring is proposed. Monitoring will concentrate on the Brighton Avenue receptor trench, the newly installed wells along the sewer lateral and those adjacent to the receptor trench, and possibly the recovery and injection wells located at 4035 Park Blvd. The following information will be collected during the monthly monitoring. Depth to water/fluid all wells, Dissolved Oxygen, at the injection well and the newly installed wells along the sewer lateral and Brighton Avenue. After nutrient addition to R3 has commenced the receptor trench and wells along Brighton Avenue will be monitored and checked for the presence of those fluids.

1.7 SEWER LATERAL FILL WASHING

As proposed in the April 3, 1997 report, Tri-Sodium Phosphate (TSP) was to be injected into the infiltrations wells placed at 4035 Park Blvd (R1, R2 and R3). Communications with Food Machinery Corp. (FMC), the manufacture of TSP, suggested that Ortho-Sodium Phosphate (OSP) and or Mono-Sodium Phosphate also be added to the solution to maintain the "injection" fluid pH between 6.5 and 7.5.

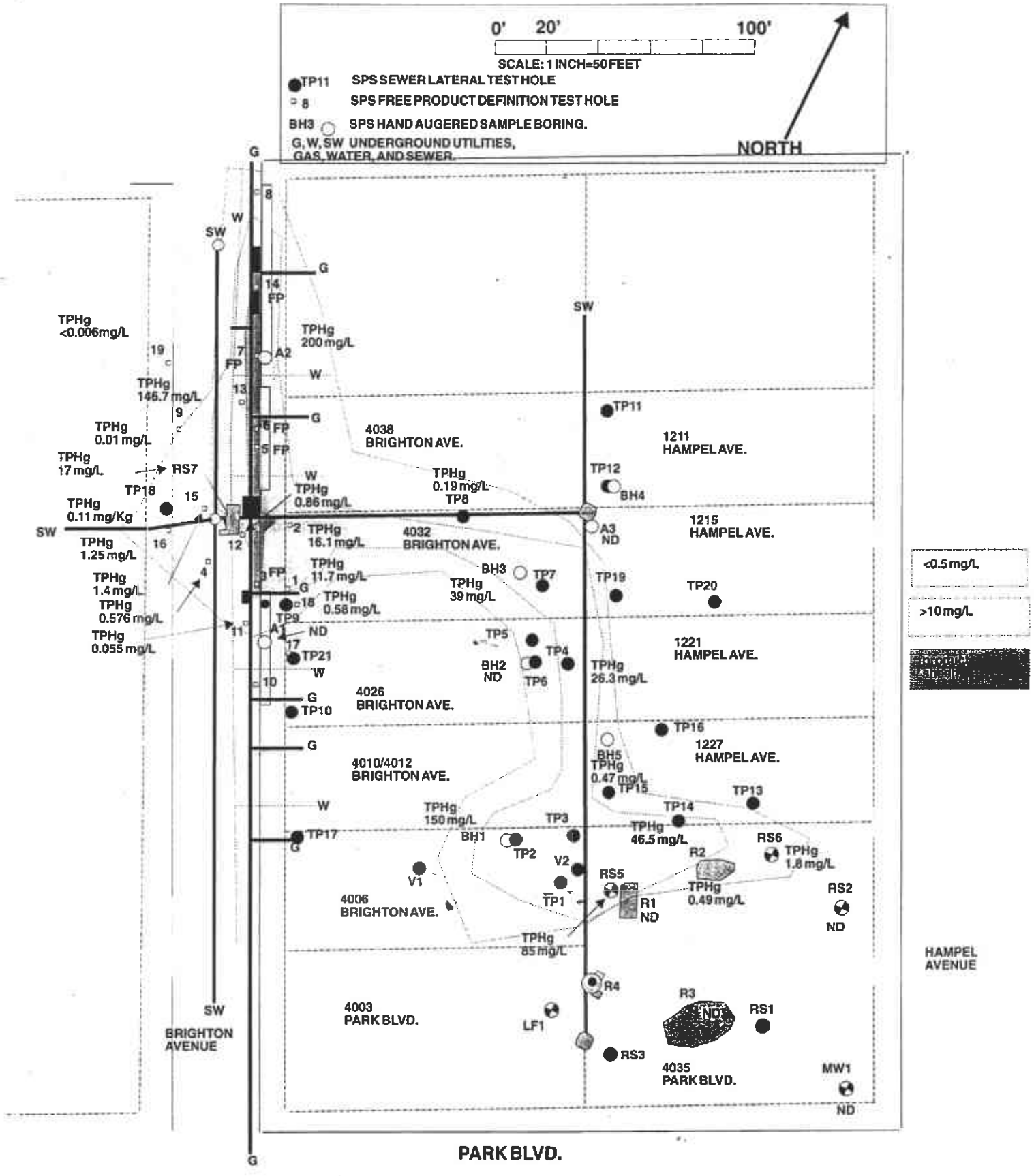
At the completion of the natural attenuation study, the decision will be made, as to what nutrients will be needed to augment the natural attenuation/degradation of the hydrocarbons along the sewer lateral. Currently Western Geo-Engineers is using a Sodium Hexametaphosphate and Sodium Sulfate blend to perform similar results at another site in Oakland (3609 East 14th Street).

If you should have any questions regarding this workplan and the items necessary to complete the workplan with RBCA Tier II assessment please give me a call at (530) 668-5300.

Sincerely yours,

George L. Converse
Project Geologist

Cc: Mr. Thomas Peacock, Manager Environmental Protection Division, Alameda County Health Care Services (510) 567-6700
Mr. Leroy Griffin, Oakland Fire Dept., OES, Haz Mgmt Program



TPHg 0.49 mg/L — TOTAL PETROLEUM HYDROCARBONS GASOLINE

CONCENTRATIONS IN GROUNDWATER FROM THE MAY, 1996 SPS, THE DECEMBER, 1996 QUARTERLY SAMPLING OF GROUNDWATER MONITOR WELLS AND THE JANUARY, 1997 SPS.

FIGURE 3 - GROUNDWATER PLUME SEWER AND FREE PRODUCT INVESTIGATION FOR DP793, 4035 PARK BLVD. OAKLAND, CALIFORNIA

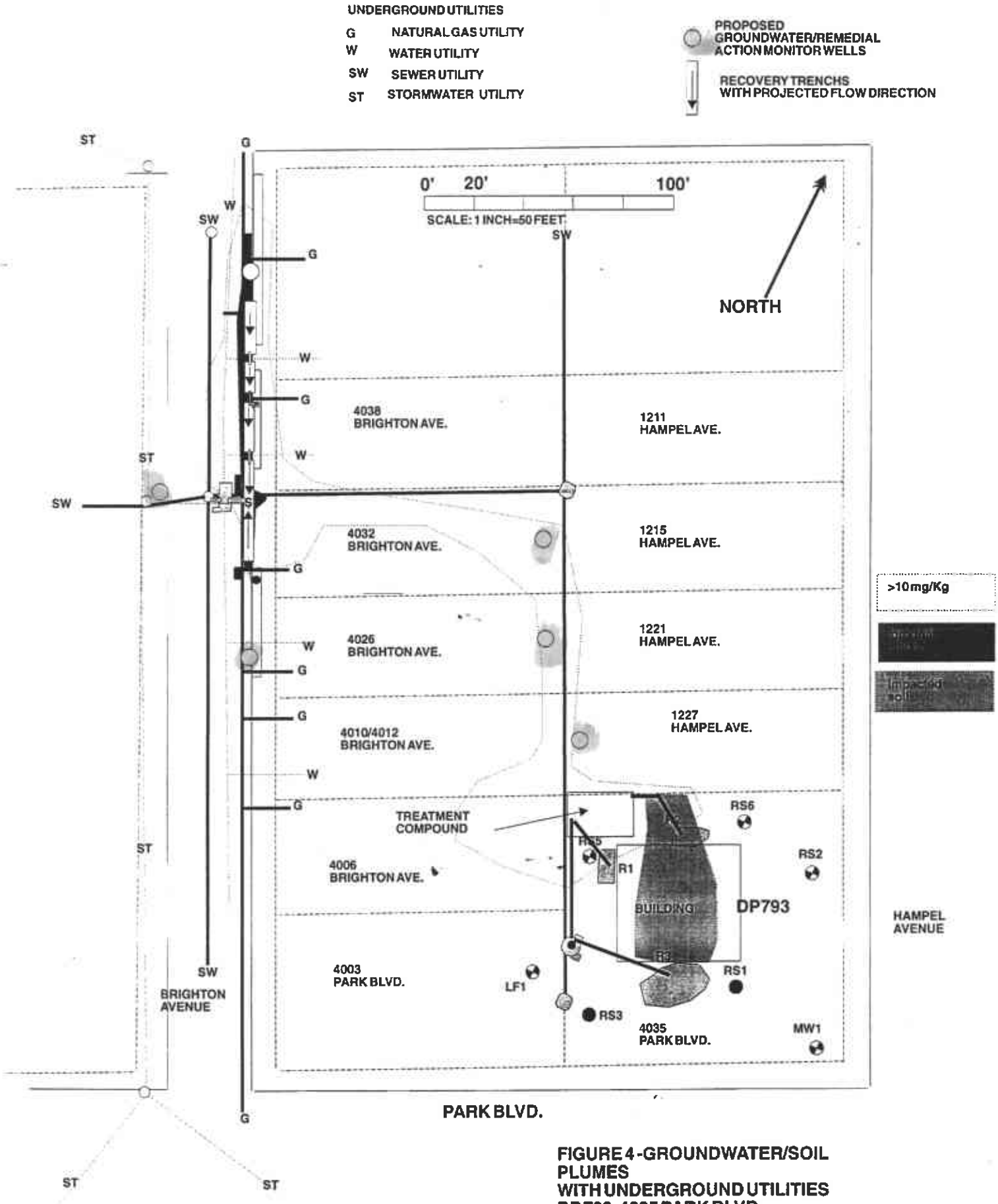


FIGURE 4 - GROUNDWATER/SOIL PLUMES WITH UNDERGROUND UTILITIES DP 793, 4035 PARK BLVD. OAKLAND, CALIFORNIA

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

ENVIRONMENTAL HEALTH SERVICES
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
(510) 337-9335 (FAX)

June 2, 1998

STID 1248

John Rutherford
Desert Petroleum Inc.
PO Box 1601
Oxnard, CA 93032

RE: Desert Petroleum site #793, 4035 Park Blvd., Oakland, CA 94602

Dear Mr. Rutherford,

This office has received and reviewed a Fourth Quarter 1997 and a First Quarter 1998 groundwater monitoring report dated February 23, 1998 and April 22, 1998 respectively. Additionally, in this time frame there was an Oakland Planning Commission meeting on March 18, 1998 which I attended. The following are comments concerning these reports and the meeting:

1. Contamination in RS-5, RS-6, and RS-7 has not reached stability as some constituents have declined in concentration while others have gone up substantially. There has been very heavy rain this winter, which is highly unusual. It might have been presumed that this could cleanup the situation but that has not happened yet.

2. The monitoring well with the highest concentration of benzene is RS-7, which is not only down gradient some 300 feet through a series of residential properties, but it is along a sewer lateral that continues into residential property. This is not a good situation as it shows that the extent of contamination, especially contamination under private property off the source site, is not defined.

3. You are required to submit a workplan to investigate the lateral extent of contamination downgradient of RS-7 along the presumed preferential pathway of the sewer line, which apparently does not continue to run in the street, but rather under private property. The workplan should be submitted to this office within 90 days, in order to allow you to explore the cost and reimbursement potential with the UST Cleanup Fund.

If you have any questions or comments, please contact me directly at 510-567-6782.

Sincerely,

Thomas Peacock, Manager
Environmental Protection Division

cc: Tony Razi, 3609 East 14th St., Oakland, CA 94601
Alireza Shirazian, 2 Anchor Dr. # F-386, Emeryville, CA 94608
Mansour Sepehr, SOMA Environmental Engineering, 2680 Bishop Dr., Suite 203, San Ramon, CA 94583
George Converse, WEGE, 1386 E. Beamer St., Woodland CA 95776
Michael Gabriel, Glenview Neighborhood Association, 4200 Park Blvd., Box 111, Oakland, CA 94602
Attn: Shawn Stark, Councilmember Dick Spees' office, City of Oakland, One City Hall Plaza, 2nd Floor, Oakland, CA 94612
Attn: Nicole Brown, Councilmember John Russo's office, City of Oakland, One City Hall Plaza, 2nd Floor, Oakland CA 94612
Leroy Griffin, Oakland Fire Dept., OES, Haz Mat Mgmt Program, 1605 Martin Luther King Jr. Dr., Oakland, CA 94612
Joseph Cotton, City of Oakland, Environmental Services, 1333 Broadway, Suite 330A, Oakland, CA 94612
Ralph Wheeler, City of Oakland, City Attorney's Office, One City Hall Plaza, Oakland, CA 94612
Derrik Williams, 4032 Brighton Ave., Oakland, CA 94602
Steve Marquez, SWRCB, Cleanup Fund
Thomas Peacock/file

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Cal/EPA

State Water Resources Control Board

Division of Clean Water Programs

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World Wide Web
http://www.swrcb.ca.gov/~cwphome/fundhome.htm

Pete Wilson
Governor

April 22, 1998

Desert Petroleum, Inc.
P O Box 1601
Oxnard, CA 93032

PRE-APPROVAL OF CORRECTIVE ACTION COSTS, CLAIM NO. 3274,
SITE ADDRESS: 4035 PARK BLVD, OAKLAND, CA 94602

The WEGE proposal totaling $22,500 to perform project management, permit and obtain permission to install additional wells and a receptor trench, install 5 had augured monitoring wells, oversee the trench installation and perform sampling, perform a site survey, perform quarterly monitoring of 13 wells and slug test 10 wells, perform natural attenuation sampling, develop a TIER II RBCA, and prepare a report of findings is pre-approved subject to the following provisions:

- The actual costs and scope of work performed must be consistent with the pre-approval for it to remain valid. If a different scope of work becomes necessary, then you must request pre-approval of costs on the new scope of work.
- The work products must be acceptable to the Regional Board (and/or local agency).
- The three-bid requirement has been waived for this pre-approval. For any future corrective action work, you must obtain three competitive, comparable bids and request pre-approval of costs from the Fund (or request and be granted a bid waiver).

Please remember that it is still necessary to submit the actual costs of the work as explained in the Reimbursement Request Instructions to confirm that the costs are consistent with this pre-approval before you will be reimbursed. ***To make this easier, insure that your consultant prepares his invoices to match the format of the original estimate, and provides reasonable explanations for any changes made in the scope of work or increases in the costs.*** *When the invoices are submitted you must include copies of all:*

- *subcontractor invoices,*
- *technical reports, when available, and*
- *applicable correspondence from the oversight agency.*

If you should have any questions, please contact me at (916) 227-7748.

Sincerely,

James DiGiorgio, P.E.
Associate Water Resources Control Engineer
Underground Storage Tank Cleanup Fund

cc: George Converse, WEGE

WESTERN GEO-ENGINEERS
CALIF CONTRACTOR # 513857 A CORPORATION
REGISTERED GEOLOGISTS

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November 5, 1997
Revised (December 9, 1997)

Mr. John Rutherford
Environmental Compliance
Desert Petroleum, Inc.
P.O. Box 1601
Oxnard, CA 93032
(805) 654-8084 ext. 202
FAX (805) 654-0720

RE: Workplan to perform Risk Base Corrective Action (RBCA) Tier two for petroleum release sites at former Desert Petroleum Station DP 793, 4035 Park Blvd. Oakland, CA 94602.

Dear Mr. Rutherford:

The following workplan has been generated to perform a RBCA Tier Two assessment for your site located at 4035 Park Blvd., Oakland, CA. To further assess the need for additional remedial efforts at this site and the surrounding areas that have been effected by the release from this site, a RBCA Tier Two for petroleum release sites needs to be performed.

Owing to topography and land use (residential) the area effected by the dissolved and free phase gasoline plume the RBCA Tier Two assessments will be divided into three subgroups.

- The station proper.
- The area of the sewer lateral as it leaves the station northwest into the neighboring properties backyards, before exiting at Brighten Avenue.
- And the Brighton Avenue area.

1 COMPONENTS OF WORKPLAN FOR TIER TWO RBCA

The following are the components needed to provide a workplan for performing a Risk Base Corrective Action (RBCA) Tier Two study on Desert Petroleum Service Station 793.

Because of the complex nature of this site and the resulting product and contaminated ground water movement, the site will be divided into three zones and Tier Two screening studies will be performed on each of them.

The Zones are as follows:

A. Station proper, over excavated area.
B. Sewer lateral and effected homes.

C. Street and floating product plume.

The following data are needed to perform and effective Tier Two RBCA assessment:

1. The Constituents of Concern (COC). In this case the BTEX hydrocarbons.

2. Concentration and distribution of the COC in soil and water.

3. Soil.
   - Moisture content
   - Total organic carbon content
   - Soil type
   - Depth and thickness of capillary fringe
   - Depth to contamination
   - Effective permeability

4. Depths to water.

5. Aquifer parameters, ie. Hydraulic Conductivity, (K) and Gradient.

6. Electron Acceptors,
   - Dissolved Oxygen, O2
   - Nitrate, NO3-
   - Sulfate, SO42-
   - Ferrous iron, Fe2+. The actual electron acceptor is ferric iron Fe3+ but it is insoluble, so the reaction product Fe2+ is measured.

7. Additionally because of the overly conservative nature of the vapor transport models, vapor samples are needed.
   - CO2
   - Methane
   - Total petroleum hydrocarbons as gasoline
   - BTEX/MTBE

Most of the above information has already been obtained through various investigations conducted at or near the site. Only items 6 (the electron acceptors) and 7 (vapor samples), still have to be collected prior to performing the Tier two screening at this site. Additionally, it would be beneficial to have sample points along the sewer lateral and along the free product plume in Brighton Avenue (5 wells) and to conduct a groundwater sampling round when the new wells have been installed, to obtain the latest groundwater hydrocarbon concentrations. The installation of the new wells is shown as an option and would greatly enhance the Tier 2 assessment

In order to collect this information five additional shallow two-inch PVC monitor wells should be placed along the sewer lateral and near Brighton Avenue, see Figure 3. A groundwater monitoring round will be performed prior to the Tier Two Screening, see Appendix A for sampling methods. In addition to the TPHg/MBTEX samples normally collected during a monitor round, electron acceptor samples will be collected in order to determine a base line concentration of these

compounds and to determine the site potential for natural attenuation. Owing to the more unstable nature of these compounds the concentrations of following electron acceptors will be determined in the field using the HACH DR 2000 Spectrophotometer:

1. Dissolved Oxygen, O2
2. Nitrate, NO3-
3. Sulfate, SO42-
4. Ferrous iron, Fe2+. The actual electron acceptor is ferric iron Fe3+ but it is insoluble, so the reaction product Fe2+ will be tested for.

Once the electron acceptors and the current groundwater concentrations of the constituents of concern are determined, the tier two studies will be preformed.

Results of the RBCA Tier Two assessments will be used to provide cost benefit remedial action plans and/or suggest that no further action is needed for the different segments studied.

The following enclosed table itemizes the not to exceed costs to fulfill this phase of the ongoing investigation of this site. The information needed to complete the RBCA Tier 2 assessment of the site will be performed concurrent with the next scheduled quarterly groundwater sampling event, which is included in the cost estimate table. Total estimated cost for this next phase, which includes the natural attenuation analysis with RBCA Tier 2 assessment is $7,500.00, which breaks down as follows:

A. ¼ly Groundwater monitoring	$2,500.00
B. Natural attenuation study monitoring	$2,200.00
C. RBCA Tier 2 assessment	$2,800.00

2 OPTIONS: Numbers 2.1, 2.2, 2.3, 2.4, 2.5 and 2.6 below are necessary options.

2.1 ADDITIONAL MONITORING WELLS

We feel the additional five monitoring wells are a necessity in achieving a complete Tier 2 assessment and will also access the area of free product for interim free product removal. If the five monitor wells are installed prior to the ¼ly monitoring the sampling and testing of these wells can be performed during the ¼ly monitoring and would add an additional $7,850.00 to the investigation.

2.2 FREE PRODUCT REMOVAL AND EVALUATION

Free phase gasoline range hydrocarbons have been discovered during the SPS investigations of the sewer lateral at Brighton Avenue, Oakland, California. The sheen of product appears to be trapped in sand bound between the natural gas underground utility trench in Brighton Avenue and the eastern sidewalk area along Brighton Avenue. As the sewer lateral leaves the backyards and

travels west to Brighton Avenue, it is sloped to a deeper elevation and passes under the natural gas line located in Brighton Avenue. The shallow groundwater in this area is found above both the sewer and the natural gas line and most likely fills the backfill creating a barrier for the western migration of the petroleum hydrocarbons. The cross sections have been developed to graphically show this relationship, see the April 3,1997 report "FREE PRODUCT INVESTIGATION REPORT ALONG BRIGHTN AVENUE", figures 8 and 9 pages 31 and 32.

2.3 RECEPTOR TRENCH IN BRIGHTON AVENUE

To collect the free product and any injection fluids that maybe used along the sewer lateral, a receptor trench is needed. This receptor trench would be installed in the western gutter area along Brighton Avenue and would intercept the sewer lateral backfill and the silty sand zone north of the sewer lateral. The trench would be approximately 30 feet in length, 6 feet deep and 3 feet wide, with a collection basin/vault near the sewer lateral dug to the 7 foot depth, see Figure 11 page 34 of the April 3, 1997 report. The original plan for the receptor trench was to collect the fluids and then pump them back to the treatment compound located at 4035 Park Blvd. This is not cost beneficial and has been changed to weekly removal of fluids by a vacuum transport tanker truck.

2.4 WEEKLY REMOVAL OF FLUIDS COLLECTED IN RECEPTOR TRENCH

As mentioned above the removal of fluids from the receptor trench will be accomplished once a week by a vacuum service tanker truck. At this time the City of Oakland sewer district does not except fluids other than *normal* fluids found in sewer systems.

2.5 MONITORING/EVALUATION OF PROGRESS MADE WITH WEEKLY REMOVALS

To evaluate the progress of the weekly pumping of the receptor trench along with the injection of fluids along the sewer lateral, monthly monitoring is proposed. Monitoring will concentrate on the Brighton Avenue receptor trench, the newly installed wells along the sewer lateral and adjacent to the receptor trench, the proposed wells to be installed along the sewer lateral, and if being utilized the recovery and injection wells located at 4035 Park Blvd. The following information will be collected during the monthly monitoring: Depth to water/fluid all wells, Dissolved Oxygen, at the injection well and the newly installed wells along the sewer lateral and Brighton Avenue. If fluids are being injected, the presence of those fluids at the receptor trench and the thickness of free phase product at the receptor trench and wells along Brighton Avenue. The monthly monitoring which will include 5 dissolved oxygen analysis will be $650.00.

2.6 SEWER LATERAL FILL WASHING

As proposed in the April 3, 1997 report, Tri-Sodium Phosphate (TSP) will be injected into the infiltrations wells placed at 4035 Park Blvd. Communications with Food Machinery Corp. (FMC), the manufacture of TSP, suggested that Ortho-Sodium Phosphate (OSP) also be added to the solution to maintain the pH between 6.5 and 7.5 of the injection fluids.

The injection of the phosphate fluid will help remove additional hydrocarbon sources by washing residual petroleum hydrocarbons from the soils beneath the station building located at 4035 Park Blvd and along the fill of the sewer lateral to the receptor trench. The SPs will also enhance biodegradation by adding nutrients to the groundwater and capillary fringe along the sewer lateral. If it is felt that dissolved oxygen levels are too low the injection well will be sparged using an oilles air compressor.

The cost to install the receptor trench and build the infiltration-mixing tank and treatment compound will be determined after the project has been sent out to bid.

If you should have any questions regarding this quote and the items necessary to complete the workplan with RBCA Tier II assessment please give me a call at (530) 668-5300.

Sincerely yours,

George L. Converse
Project Geologist