CONESTOGA-ROVERS
& ASSOCIATES

19449 Riverside Drive, Suite 230, Sonoma, California 95476
Telephone: 707-935-4850 Facsimile: 707-935-6649
www.CRAworld.com

July 24, 2007

Mr. Jerry Wickham
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: **Site Investigation Work Plan**
Shell-branded Service Station
230 West MacArthur Boulevard
Oakland, California
SAP Code 135676
Incident No. 98995741
ACHCSA Case No. RO0000303

Dear Mr. Wickham:

Conestoga-Rovers & Associates (CRA) prepared this work plan on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell) to further define the offsite plume extent in the downgradient direction along the west side of West MacArthur Boulevard, as requested in Alameda County Health Care Services Agency's (ACHCSA's) May 2, 2007 letter. The proposed scope of work presented in this document complies with Regional Water Quality Control Board (RWQCB) and ACHCSA guidelines.

SITE LOCATION AND DESCRIPTION

The subject property is an operating Shell-branded service station located on the northern corner of West MacArthur Boulevard and Piedmont Avenue in Oakland, California (Figure 1). The station layout includes three underground fuel storage tanks (USTs), two dispenser islands, and a station kiosk (Figure 2). The station is located in a primarily commercial area in Oakland. A former Gulf service station is located northwest and adjacent to the site.

WORK PLAN

In the May 2, 2007 letter, citing the concentrations of total petroleum hydrocarbons as gasoline (TPHg) reported in the onsite groundwater monitoring well MW-5 in September and December of 2006, the ACHCSA requested that a work plan be submitted to further define the extent of the groundwater plume offsite and downgradient of MW-5, along the west side of West MacArthur Boulevard. The May 2, 2007 letter also requests that Shell research the potential for groundwater discharge into subsurface drainage systems or sumps associated with basements or subsurface structures on the west side of West MacArthur Boulevard. The requested work plan is presented below.

TECHNICAL RATIONALE FOR PROPOSED SCOPE OF WORK

- Groundwater gradient at the subject site has consistently been west-southwesterly.
- To further define the groundwater plume offsite and downgradient of onsite well MW-5, three soil borings are proposed in the sidewalk on the west side of West MacArthur Boulevard for the collection of grab groundwater samples.
- To better evaluate any detectable concentrations of petroleum hydrocarbons that may be reported in the grab groundwater samples from the offsite borings, one soil boring is proposed on the site adjacent to MW-5 for the collection of a grab groundwater sample for data comparison with that well.

WORK TASKS

Permits: CRA will obtain the required drilling permits from the Alameda County Public Works Agency for the borings, and the required encroachment and excavation permits from the City of Oakland for work performed in their right-of-way.

Site Safety Plan: CRA will prepare a comprehensive Site-Specific Safety Plan to protect site workers. The plan will be reviewed and signed by each site worker and kept on the site during field activities. If necessary, CRA will also prepare a Traffic Control Plan for the offsite work.

Utility Clearance: CRA will mark proposed boring locations and will clear the locations through Underground Service Alert (USA) prior to drilling. A private utility locating service will be used to verify clearance of each boring from subsurface utilities or other obstructions. In addition, the first five feet of each boring will be cleared to a diameter of 3-inches larger than the lead auger using an air-knife, or by hand augering, to minimize potential damage to underground structures not identified through USA or the utility locating service. For any borings installed in "critical areas" (i.e. within 10 feet of the dispenser/rack canopy, and/or a natural gas line) a casing will be placed into the borehole extending the entire depth of the required clearing.

Site Investigation: Three offsite soil borings (SB-9, SB-10, and SB-11), and one onsite soil boring (SB-12), are proposed at the locations shown on Figure 3. Should the offsite borings not be able to be installed at their proposed locations due to conflicts with utilities (or any other reason), the borings will be relocated into the street and will be placed in locations that will still accomplish the intent of this work plan. The soil borings will be drilled using direct-push technology equipment in accordance with CRA's Standard Operating Procedures (SOP) found in Attachment A. Borings will be extended to first

encountered groundwater, anticipated at about 13 to 17 feet below grade (fbg), and to a maximum depth of approximately 25 fbg.

A CRA geologist will supervise the drilling and describe soils encountered in the borings using the Unified Soil Classification System and Munsell Soil Color Charts. Soil samples will be collected continuously from 5 fbg to the bottom of the boring for lithologic description. Soil samples will be screened in the field for organic vapors using a photo-ionization detector (PID). Exploratory boring logs will be prepared for each boring with the PID measurements recorded on the logs.

Soil samples designated for chemical analyses will be retained at five-foot intervals, from the soil groundwater interface, and at changes in lithology from each of the borings in steel, brass, or plastic tubes. The tubes will be covered on both ends with Teflon sheets and plastic end caps. Upon their collection, each soil will be labeled, entered onto a chain-of-custody record, and placed into a cooler with ice for transport to a State of California certified laboratory for analysis. A standard two week turn-around time will be requested for laboratory results.

Grab groundwater samples will be collected from each boring at the first encountered water bearing zone from a temporary well screen placed into the borehole. Field filtering of the groundwater samples will be performed to minimize the amount of sediment in the sample and the groundwater samples will be transferred to appropriate sample containers supplied by the laboratory. Upon their collection, each groundwater sample will be labeled, entered onto a chain-of-custody record, and placed into a cooler with ice until transport to a State of California laboratory for analyses. A standard two week turn-around time will be requested for laboratory results.

Chemical Analyses: Select soil and grab groundwater samples will be analyzed for TPHg by EPA Method 8015M, and for benzene, toluene, ethylbenzene, xylenes, methyl tertiary butyl ether, tertiary butyl alcohol, di-isopropyl ether, ethyl tertiary butyl ether, and tertiary amyl methyl ether by EPA Method 8260B.

Potential Receptor Research: CRA will contact the owners, or representatives, of the structures located on the west side of West MacArthur Boulevard, specifically the Kaiser Oakland Medical Center, to obtain information regarding subsurface drainage systems or sumps that may exist within any basements or subsurface structures. This data, along with the grab groundwater data collected from the above noted soil borings, will be used to evaluate the potential for, and nature of, any potential discharge of groundwater into existing subsurface drainage systems or sumps.

Report Preparation: Following the receipt of analytical results from the laboratory, CRA will prepare a written report which will include a description of the field procedures, a presentation of the analytical results, tabulated data, figures showing sample locations, the complete analytical laboratory reports, boring logs, and investigation findings.

CERTIFICATION

The scope of work described in this work plan will be performed under the supervision of a California professional geologist or engineer.

SCHEDULE

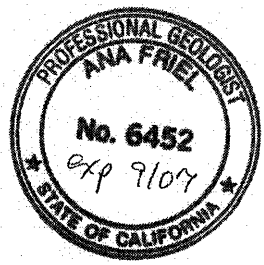
CRA is prepared to begin work upon approval of this work plan by ACHCSA and receipt of approval for any requisite permit(s).

CLOSING

If you have any questions regarding the scope of work outlined in this work plan, please call Dennis Baertschi at (707) 268-3813.

Sincerely,
Conestoga-Rovers & Associates

Dennis Baertschi
Project Geologist



Ana Friel, PG
Associate Geologist

Attachments

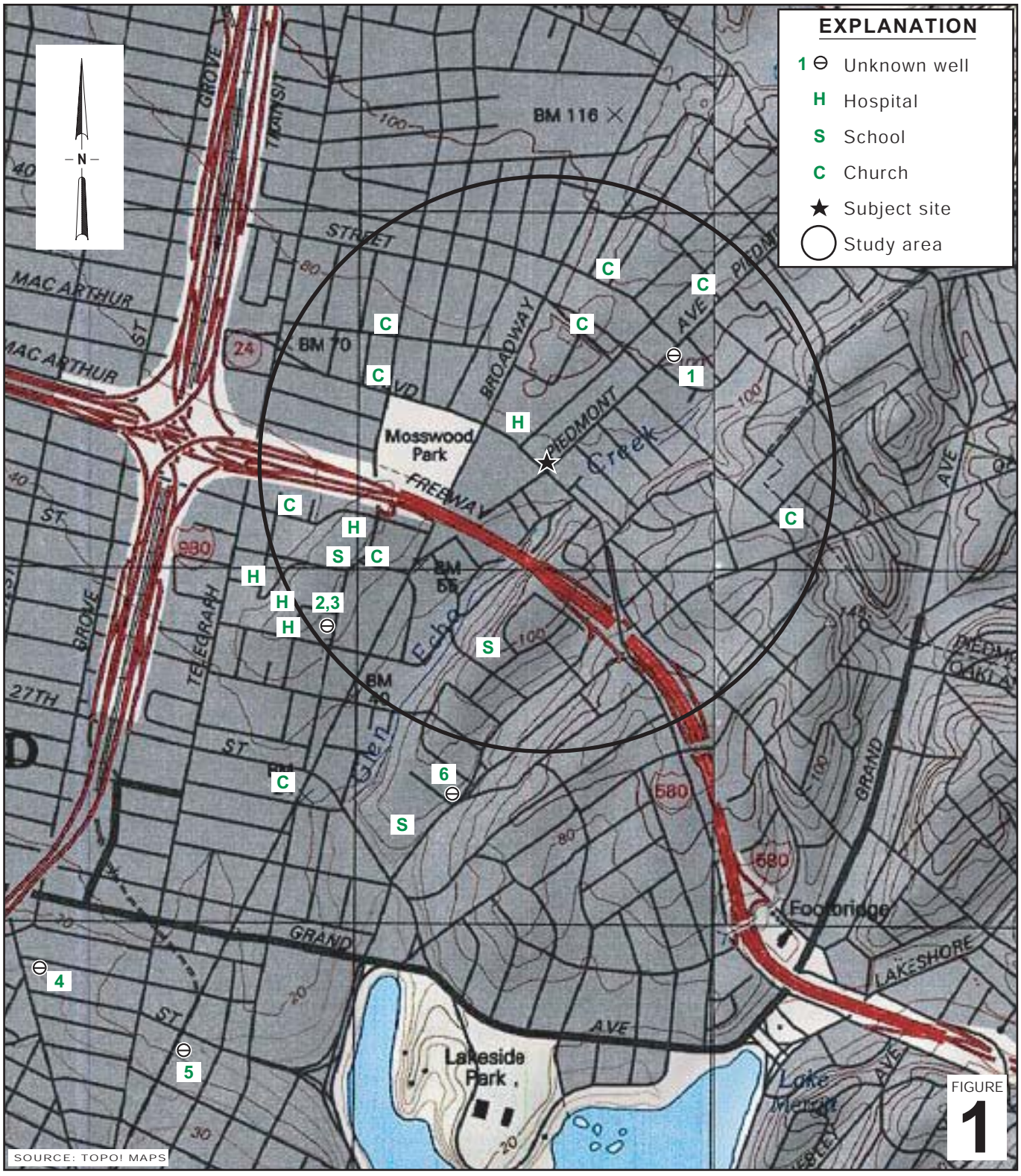
Figure 1. Vicinity Map
Figure 2. Site Plan
Figure 3. Proposed Soil Boring Location Map

Attachment A. SOP for Geoprobe® Sampling

cc: Mr. Denis Brown, Shell Oil Products US

I:\Sonoma.Shell\Oakland 230 MacArthur\WORK PLANS\WP Jul07 Offsite Delin\Offsite Borings.doc

05/05/06



G:\OAKLAND230MACARTHUR\FIGURES\VIC-WELL-SURVEY.AI

FIGURE 1

0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

Shell-branded Service Station

230 West MacArthur Boulevard
Oakland, California

Vicinity Map

(1/2-Mile Radius)

07/23/07

EXPLANATION

SB-4	Soil boring location (4/4-6/06)
EX-1-6	Over-excavation soil sample location (4/27/05)
D-1-4.0	Soil sample location (4/18/05)
MW-1	Monitoring well location (Shell, 7/11-12/88)
MW-1	Monitoring well location (240 W. MacArthur)
SB-1	Soil boring location (3/24/04)
Probe 1	Grab groundwater sample location (05/19/90)
GS-1	Grab groundwater sample location (10/17/89)
SB-1	Soil boring location (8/16/89)
A1	Soil sample location (11/05/87)
B-1	Soil boring location (8/27/87)
VR-1	Soil venting well location (3/12/87)
S-A	Soil boring location (4/14/86)

Storm drain line (SD)
Sanitary sewer line (SS)
Water line (W)
Gas line (G)
Electrical line (E)
Telecommunications line (T)

Flow direction
Storm drain inlet
FL — Flow line elevation, in feet above mean sea level
fbg — Feet below grade
Product dispenser number

HOWE STREET
PIEDMONT AVENUE
WEST MACARTHUR BOULEVARD

Oakland Auto Works *240 W. MacArthur*
Former W/O sump
Former W/O UST
Former Fuel USTs
MW-5
MW-1
MW-7
MW-2
MW-6
MW-4
MW-3
MW-8
SB-2
SB-1
Probe 1
Probe 3
Probe 6
Probe 4
Probe 2
Probe 5

Shell-branded Service Station *230 W. MacArthur*
air/water
building
planter
kiosk
sidewalk
Existing USTs (unused)
former USTs (ext.)
SB-3
SB-4
SB-5
SB-6
SB-8/ MW-5
SB-7
Over-excavation areas (2004)
GS-1
GS-2
GS-3
D-1-4.0
D-4-4.0
P-1-2.0
P-2-4.5
P-3-3.5
P-4-4.0
P-5-4.0
D-3-3.0
EX-B2-6.5
EX-6-6
EX-5-6
EX-4-6
EX-1-6
EX-2-6
EX-B-6.5
EX-3-6
D-2-1.5, D-2-3.5
VR-1
VR-2
VR-3
S-A
S-B
S-C
B-1
B-2
A1
A2
B1
B2
C1
C2
D1
D2

Kaiser MB Center *235 W. MacArthur*

benchmark elev. 75.96' msl

FL = 66.5
FL = 66.68
FL = 66.7
MH = ~10.5 fbg
FL = 52.4
SS ~23 fbg
E 3-8 fbg
FL = ~67.24, ~9 fbg
SS (FL = 67.8)
W ~3-10 fbg
FL = ~66, ~10 fbg
FL = ~53.05, ~22.25 fbg
FL = 65.4, ~11 fbg
FL = 65.2
MH = ~11 fbg
FL = 53.7, ~22.25 fbg
FL = 53.8
G 3-8 fbg

SD 12"
SD 24"
SD 21"
SS 24"
SS 10"
SS 8" (abandoned)
SS 24" (abandoned)
SS (abandoned)
SD
SS
SIGNAL

Groundwater Flow Direction (Shell, 4Q96 through 1Q06)

0 15 30 60
Scale (ft)

Site features for 240 W. MacArthur based on figure provided by Stellar Environmental Solutions, Inc.

I:\SONOMA.SHELL\OAKLAND 230 W. MACARTHUR\FIGURES\SITE PLAN.DWG

Site Plan

CONESTOGA-ROVERS & ASSOCIATES

Shell-branded Service Station
230 West MacArthur Boulevard
Oakland, California
Incident No.98995741

FIGURE
2

07/24/07

Proposed Soil Boring Location Map

EXPLANATION

- SB-9 — Proposed soil boring location
- MW-1 — Monitoring well location (Shell, 7/11-12/88)
- MW-1 — Monitoring well location (240 W. MacArthur)
- Flow direction
- Storm drain inlet
- Storm drain line (SD)
- Sanitary sewer line (SS)
- Water line (W)
- Gas line (G)
- Electrical line (E)
- Telecommunications line (T)
- FL — Flow line elevation, in feet above mean sea level
- fbg — Feet below grade
- ❶ — Product dispenser number

HOWE STREET

PIEDMONT AVENUE

WEST MACARTHUR BOULEVARD

Oakland Auto Works *240 W. MacArthur*

Former W/O sump

Former W/O UST

Former Fuel USTs

Shell-branded Service Station *230 W. MacArthur*

Existing USTs (abandoned)

former USTs (ext.)

kiosk

air/water

building

planter

sidewalk

Kaiser MB Center *235 W. MacArthur*

benchmark elev. 75.96' msl

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8

SB-9 SB-10 SB-11 SB-12

FL = 66.5 FL = 66.68 FL = 66.7 MH = ~10.5 fbg FL = 52.4 SS ~23 fbg E 3-8 fbg FL = ~67.24, ~9 fbg SS (FL = 67.8) FL = ~66, ~10 fbg W ~3-10 fbg FL = 65.4, ~11 fbg FL = 65.2 MH = ~11 fbg FL = ~53.05, ~22.5 fbg FL = 53.7, ~22.25 fbg FL = 53.8 G 3-8 fbg

SD 12" SD 24" SD 21" SS 24" SS 10" SS 8" (abandoned) SS 24" (abandoned) SS (abandoned) SIGNAL

0 15 30 60

Scale (ft)

Site features for 240 W. MacArthur based on figure provided by Stellar Environmental Solutions, Inc.

CONESTOGA-ROVERS & ASSOCIATES

Shell-branded Service Station

230 West MacArthur Boulevard

Oakland, California

Incident No.98995741

FIGURE

3

I:\SONOMA.SHELL\OAKLAND 230 W. MACARTHUR\FIGURES\Fig 3 Site Plan_DRAFT.DWG

ATTACHMENT A

Standard Field Procedures for Geoprobe® Sampling

STANDARD FIELD PROCEDURES FOR GEOPROBE® SAMPLING

This document describes Conestoga-Rovers & Associates standard field methods for GeoProbe® soil and ground water sampling. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist or engineer working under the supervision of a California Professional Geologist (PG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e., sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or separate-phase hydrocarbon saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e., cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Sampling

GeoProbe® soil samples are collected from borings driven using hydraulic push technologies. Prior to drilling, the first 5 ft of the boring are cleared using an air or water knife and vacuum extraction. This minimizes the potential for impacting utilities.

A minimum of one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples can be collected near the water table and at lithologic changes. Samples are collected using samplers lined with polyethylene or brass tubes driven into undisturbed sediments at the bottom of the borehole. The ground surface immediately adjacent to the boring is used as a datum to measure sample depth. The horizontal location of each boring is measured in the field relative to a permanent on-site reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned or washed prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Storage, Handling, and Transport

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon® tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

After a soil sample has been collected, soil from the remaining tubing is placed inside a sealed plastic bag and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable GasTech® or photo ionization detector measures volatile hydrocarbon vapor concentrations in the bag's headspace, extracting the vapor through a slit in the plastic bag. The measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

Grab Ground Water Sampling

Ground water samples are collected from the open borehole using bailers, advancing disposable Tygon® tubing into the borehole and extracting ground water using a diaphragm pump, or using a hydro-punch style sampler with a bailer or tubing. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4° C, and transported under chain-of-custody to the laboratory.

Duplicates and Blanks

Blind duplicate water samples are usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory quality assurance/quality control (QA/QC) blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.