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April 13, 2010

Mr. Roger Nye
Washington State Department of Ecology – Northwest Region
Toxics Cleanup Program
3190 – 160th Ave. SE
Bellevue, WA 98008-5452

Subject: **Supplemental Investigation Work Plan Submission**
Former Standard Oil Service Station No. 20-9335 Seattle Housing Authority
1225 North 45th Street
Seattle, Washington

Dear Mr. Nye:

Science Applications International Corporation (SAIC), on behalf of Chevron Environmental Management Company (Chevron), is pleased to submit this Supplemental Investigation Work Plan for the above-referenced site. This Plan includes a summary of all environmental related remedial activities conducted at the property since 2005. Also, included is a discussion of the current environmental conditions present and the ongoing remedial activities and monitoring efforts being performed.

Should you have any questions or comments regarding our current and planned actions at this site, please feel free to contact me at (425) 482-3321 or by e-mail at catterallp@saic.com. Please include Ms. Olivia Skance of Chevron in any future correspondence regarding the above referenced property.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Peter Catterall
Senior Project Manager

Mr. Peter Catterall
Science Applications International Corporation (SAIC)
18912 North Creek Parkway, Suite 101
Bothell, WA 98011
Phone: 425-482-3321
Email: catterallp@saic.com

cc: Ms. Olivia Skance, Chevron Environmental Management Company
6111 Bollinger Canyon Road K2252
San Ramon, CA 94583

Enclosures:

VCP Supplemental Investigation Work Plan
Figure 1. Site Map

SUPPLEMENTAL INVESTIGATION WORK PLAN

Former Standard Oil Service Station No. 20-9335
1225 North 45th Street
Seattle, Washington

March 25, 2010

Prepared for:
Washington State Department of Ecology
Toxics Cleanup Program
3190 160th Ave SE
Bellevue, WA 98008-5452

On Behalf of:
Chevron Environmental Management Company
6111 Bollinger Canyon Road
San Ramon, California 94583-5186

By:
Science Applications International Corporation
18912 North Creek Parkway Ste. 101
Bothell, WA 98011

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Peter Catterall
Project Manager

Gabriel Cisneros, PG #2357
Project Geologist

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FIGURE

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ACRONYMS, ABBREVIATIONS, AND DEFINITIONS

bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
Chevron	Chevron Environmental Management Company
COC	Chain-of-Custody
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
EPH	Extractable petroleum hydrocarbons
G-R	Gettler-Ryan Inc.
HRG	Housing Resources Group
LNAPL	Light Non-Aqueous Phase Liquid
QC	Quality Control
SAIC	Science Applications International Corporation
TPH-D	Diesel-range hydrocarbons
TPH-G	Gasoline-range hydrocarbons
VCP	Voluntary Cleanup Program
VOCs	Volatile organic compounds

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SUPPLEMENTAL INVESTIGATION WORK PLAN

1.0 INTRODUCTION

Science Applications International Corporation (SAIC), on behalf of Chevron Environmental Management Company (Chevron), is pleased to submit this Supplemental Investigation Work Plan detailing proposed activities at former Chevron Service Station No. 20-9335 located at1225 North 45th Street in Seattle, WA ("the site"). The site is currently enrolled in the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP) under VCP No. NW1415.

2.0 BACKGROUND

2.1 SITE DESCRIPTION

The Site is located on the southwest corner of North 45th Street and Stone Avenue North and is currently a multistory housing complex with underground parking. The surrounding area is composed of mixed use commercial and residential. The areas to the north, northeast, and east consist of a commercial/residential mix with businesses on the lowest floor and residential units above. To the south of the property is an auto parts store. To the southwest, there are single family residences. Three monitoring wells (MW-6, MW-7, and MW-8) are located in a parking garage within the building. Two additional wells (MW-9 and MW-10) are located downgradient on the east side of Stone Avenue North across from the subject property (Figure 1).

2.2 FACILITY HISTORY

A former Standard Oil service station operated at this location from approximately 1935 to 1969. The service station and garage were removed in 1969. The property was purchased in 1978 by The Seattle Housing Authority and it remained undeveloped until the property was sold to Housing Resources Group (HRG) in 2005.

Since being sold to HRG, the property has been redeveloped as a multi-story housing complex with an underground parking garage. During the redevelopment, approximately 2,460 tons of impacted soil was removed to approximately 42 feet below the original grade.

Following the building redevelopment in November 2005, three groundwater monitoring wells (MW-6, MW-7, and MW-8) were installed within the underground parking garage on the north and east portions of the property. In December 2006, two additional wells (MW-9 and MW-10) were installed downgradient from the property (Figure 1).

During development of monitoring wells MW-6 through MW-8 in February 2006, approximately 0.5 feet of light non-aqueous phase liquid (LNAPL) was detected in MW-7. The LNAPL was removed during well development, and weekly bailing of LNAPL from MW-7 was implemented in early February 2006. LNAPL thickness declined over time but was still present when bailing events ceased in August 2006. LNAPL bailing events were discontinued due to concerns expressed by HRG about residents occupying the building and the storage of recovered LNAPL on the property.

2.3 GEOLOGY AND HYDROGEOLOGY

The site is located on the western slope of the Lake Washington drainage basin in King County, Washington. Regionally, Lake Washington is a glacially carved valley bounded by glacial drift plains, which are composed of unconsolidated sand, silt, and gravel outwash deposits in varying proportions. The service station is located on the eastern slope of the Seattle Drift Plain on fill materials that overlie native sand, silt and gravel outwash deposits. Soils underlying the site have been described as brown-brownish gray, medium to dense silty sand from near ground surface to 18 feet bgs. The silty sand is underlain by a gray or grayish-brown, medium to dense sand from approximately 18 feet bgs to 50 feet bgs.

Groundwater monitoring and sampling activities conducted on the site indicate that depth to groundwater varies between 24 feet and 28 feet below the original grade with seasonal fluctuations of 3.5 feet. The approximate groundwater flow direction is to the southeast at an approximate gradient of 0.007 to 0.04 feet per foot.

3.0 PURPOSE

The purpose of the supplemental investigation work plan is attainment of soil cleanup levels through natural attenuation of soil by the removal of LNAPL from the groundwater. The specific tasks proposed to be completed are in the following sections.

4.0 SCOPE OF WORK

A summary of the tasks to be performed during the investigation activities is presented below:

- Collect and analyze a sample of the LNAPL in monitoring well MW-7;
- Remove, decontaminate, and dispose the skimmer located in monitoring well MW-7;
- Perform LNAPL bail-down testing at well MW-7;
- Collect groundwater samples from each monitoring well on a quarterly basis; and
- Analyze all groundwater samples collected for gasoline-range hydrocarbons (TPH-G), diesel-range hydrocarbons (TPH-D), and benzene, toluene, ethylbenzene, and total xylene (BTEX) constituents.

5.0 PROCEDURES

5.1 LNAPL SAMPLE

In order to determine the proper handling and disposal procedures of the LNAPL, a sample will be collected, delivered to Test America, and analyzed for the following:

- Gasoline-range hydrocarbons by Ecology Method NWTPH-Gx;
- BTEX by Environmental Protection Agency (EPA) Method 8260B;
- Resource Conservation and Recovery Act (RCRA) 8 Metals by EPA Method 6010/7141; and

- Flash Point by EPA Method 1010.

5.2 SKIMMER REMOVAL AND DECONTAMINATION

As soon as the LNAPL analytical results are received and the proper disposal procedures are determined, the skimmer present in monitoring well MW-7 will be removed, drained, and decontaminated for disposal.

The skimmer will be pulled from the monitoring well MW-7 and the LNAPL will be drained and stored within a properly labeled container. The skimmer and all non-disposable equipment will be decontaminated. The skimmer and groundwater measurement equipment will be washed with a mixture of tap water and laboratory-grade detergent (e.g. Liquinox or Alconox), followed by rinses with tap water and then distilled water. The decontaminated gauging equipment will be either wrapped in aluminum foil or positioned to preclude inadvertent contamination prior to reuse.

The decontaminated skimmer and all disposable equipment, such as nitrile gloves, sample baggies, and groundwater bailers, will be disposed of as sanitary waste.

5.3 BAIL DOWN TESTING

Once the skimmer is removed from monitoring well MW-7, a bail down test will be conducted in order to determine the LNAPL recharge rate and the optimal removal rate of LNAPL from monitoring well MW-7.

5.3.1 Bailing to Remove LNAPL

Prior to removing any LNAPL, the depth-to-LNAPL and depth-to-groundwater will be measured using an electric interface probe. After recording the measurements in a field notebook, LNAPL will be extracted from MW-7 by hand bailing with a disposable bailer. Bailing will continue until LNAPL is no longer present. Depth-to-LNAPL and depth-to-groundwater will be periodically measured over a course of a week or two in or determine the LNAPL accumulation rate.

Once the LNAPL accumulation rate is established, supplemental cleanup action alternatives will be reviewed in order to determine the most easily implemented and feasible method for LNAPL removal.

5.3.2 Management and Disposal of Extracted LNAPL

The LNAPL removed from the skimmer and monitoring well MW-7 will be stored in properly labeled containers at the site and will be transported by an Ecology approved waste hauler to an approved hazardous waste facility on the same day the LNAPL was removed. Therefore, LNAPL will not be stored on the property. The extracted LNAPL will either be disposed or recycled pending analytical results.

5.4 GROUNDWATER MONITORING AND SAMPLING

Groundwater monitoring and sampling will be performed by Gettler-Ryan Inc. (G-R) on a quarterly basis.

Prior to purging and sampling each monitoring well, depth to groundwater will be measured using an electronic water-level indicator tape. Each monitoring well will then be purged of stagnant casing water using a disposable polyethylene bailer until a minimum of three casing volumes of groundwater have been removed. In the event a monitoring well runs dry during purging, the groundwater level in the well will be allowed to recover to approximately 75 percent of its original static level and purging will continue. If the well is again purged dry, it will be allowed to recover to 75 percent of its original static water level (if possible), at which point it will be considered sufficiently purged.

After purging is complete, groundwater samples will be collected by bailer. Groundwater samples will be collected in laboratory-supplied sample containers and immediately placed in a pre-chilled sample cooler for storage prior to transport to the analytical laboratory.

Groundwater samples will be shipped to Lancaster Laboratories via overnight courier and analyzed for the following:

- Gasoline-range hydrocarbons by Ecology Method NWTPH-Gx;
- Diesel- and oil-range hydrocarbons by Ecology Method NWTPH-D extended with silica gel cleanup; and
- BTEX by EPA Method 8260B.

5.5 DECONTAMINATION

All non-disposable monitoring and sampling equipment will be decontaminated before and after use at each sampling location. Groundwater measurement equipment (e.g. electronic water level indicator) will be washed with a mixture of tap water and laboratory-grade detergent (e.g. Liquinox or Alconox), followed by rinses with tap water and then distilled water. Decontaminated equipment will be either wrapped in aluminum foil or positioned to preclude inadvertent contamination prior to reuse.

Disposal equipment, such as nitrile gloves, sample baggies, and groundwater bailers, will be disposed of after each groundwater sample is collected.

6.0 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

6.1 DOCUMENTATION

Field documentation for this project will include the following:

- *Field logbooks* will contain a record of each day's activities and all relevant observations, measurements, and data not recorded elsewhere. Copies of the field logbooks will be made at the end of each field event and maintained in the project file.
- *Sample collection data sheets* will be completed for each groundwater sample. Sample data sheets will contain date and time of sample collection, sample number, station location and depth-to-groundwater, field measurements, and analyses performed.

- *Sample labels* will be attached to each sample container collected. Labels will contain the sample number, date and time of sample collection, analyses requested, and sample preservation compounds present.

- *Chain of custody forms* will accompany all samples shipped to the analytical laboratory. In addition to containing a record of sample information, chain of custody forms will document the date and time the samples were shipped. Upon receipt at the laboratory, the chain of custody record will be compared with the samples received, and any discrepancies noted and reported to the SAIC project manager.

6.2 FIELD QUALITY CONTROL SAMPLES

Field Quality Control (QC) samples will include the following:

- *Trip blanks* will be submitted with every sample shipment in which samples are being analyzed for volatile organic compounds (VOCs) (i.e. TPH-G or BTEX). One trip blank, consisting of laboratory-supplied organic-free water, will be included in each cooler containing samples intended for VOC analysis and analyzed upon receipt for the same constituents as the environmental samples.

6.3 SAMPLE STORAGE, PACKING, AND SHIPMENT

All groundwater samples will be contained in re-sealable plastic bags and placed in a pre-cooled ice chest while at the Site and during transportation to the laboratory. A temperature compliance vial (temperature blank; provided by the laboratory) will accompany each cooler to verify that proper holding temperatures were maintained during transport.

6.4 CHAIN-OF-CUSTODY PROCEDURES

Each sample cooler (or batch of coolers) containing laboratory samples will contain a fully completed chain-of-custody (COC) form. The field personnel will retain a copy of the COC form, and the original will be sent with the samples to the laboratory.

7.0 SCHEDULE

SAIC will finalize the fieldwork schedule following review and approval of this work plan by Ecology. The anticipated schedule for implementation of these activities is as follows:

1) Preparation for fieldwork – 4-6 weeks (contingent on work plan approval)

2) Product Sampling – 1 day

3) Removing and Decontaminating the Skimmer – 1 day

4) Bailing Drawdown Test– 1 to 2 weeks

5) Groundwater sampling on a quarterly basis by Gettler-Ryan.

Figure

NORTH 45TH STREET

Sidewalk

MW-6

MW-7

MW-8

New Construction Footprint

Sidewalk

STONE WAY NORTH

Residence

Residence

Residence

Residence

Parking Lot (Asphalt)

Big Wheel Auto Parts

NORTH ALLEN PLACE

Sidewalk

Beso del Sol Restaurant/
Natural Health Clinic

MW-9

Parking Lot

MW-10

N

0 20 40

Feet

Legend

Groundwater Monitoring Wells

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Former Chevron Service Station #20-9335
1225 North 45th Street
Seattle, Washington

FIGURE 1
Site Map

DATE: 06/01/2009

DRAWING: 209335_GR051109_SiteMap.dwg