URS

February 15, 2008

Ms. Amy Boley
Illinois Environmental Protection Agency
Bureau of Land
1021 North Grand Avenue East
Springfield, Illinois 62794

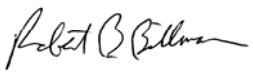
Subject: **Route 111/Rand Avenue Vicinity Investigation Work Plan**
Shell Oil Products U.S.
Roxana, Illinois

Dear Ms. Boley:

On behalf of Shell Oil Products U.S., URS Corporation is submitting the enclosed investigation work plan for your review and comment. An electronic version of the work plan is also being sent to you via email.

We look forward to your feedback on this plan. If you have any questions during your review, please contact Kevin Dyer, SOPUS project manager, at kevin.dyer@shell.com (618/288-7237), or me at bob_billman@urscorp.com (314/743-4108).

Sincerely,



Robert B. Billman
Senior Project Manager

Cc: Kevin Dyer, SOPUS
Sanjay Garg, Shell Global Solutions
Eric Petersen, ConocoPhillips

Enclosure

1001 Highland Plaza Drive West, Suite 300
St. Louis, MO 63110
Phone: 314.429.0100
Fax: 314.429.0462

WORK PLAN

ROUTE 111/RAND AVENUE VICINITY INVESTIGATION ROXANA, ILLINOIS

Prepared for:

Shell Oil Products U.S.
17 Junction Dr.
Glen Carbon, Illinois 62034

February 15, 2008

URS Corporation
1001 Highlands Plaza Drive West, Suite 300
St. Louis, MO 63110
(314) 429-0100
Project #21561979

Introduction, Background and Objectives

Shell Oil Products U.S. (SOPUS) with the cooperation of ConocoPhillips Company (ConocoPhillips) is planning to conduct intrusive investigative activities outside of the WRB Refining LLC Wood River Refinery (WRR) in Roxana, Illinois[1]. The area to be investigated is generally located between the site of a 1986 benzene release and WRR well P-93, which is located near the west fenceline of the refinery (**Figure 1**).

URS Corporation (URS), on behalf of SOPUS, performed a subsurface investigation in 2006 to help gather information on the extent of benzene impacts. The investigation provided initial information on the distribution of benzene in groundwater in the area. The primary objectives of this investigation are to: gather data to help refine the conceptual site model for the area; evaluate potentially complete exposure pathways; and develop remedial options as warranted. The general scope of the planned investigation was outlined in a letter from SOPUS to IEPA dated December 20, 2007. In a call between URS and IEPA on January 22, 2008, we agreed to submit a brief work plan for this work.

Data Collection Activities

Data collection activities will consist of direct push rig soil sampling, piezometer installation, piezometer development, monitoring well/piezometer gauging and sampling, and vapor monitoring point sampling. **Figure 1** shows the planned sampling locations.

A Health and Safety Plan (HASP) will be developed for the activities described in this work plan and will include relevant COP and SOPUS procedures/protocols. This HASP will be flexible in the types of activities identified in order to account for possible adjustments going forward.

The investigation locations will be marked in the field (e.g. spray paint, stakes). The proposed locations will be reviewed with Village of Roxana representatives and Illinois' Joint Utility Locating Information for Excavators (JULIE).

The following paragraphs describe the investigation activities. References are made to URS' Standard Operating Procedures (SOPs) for certain investigative procedures. The SOPs are incorporated by reference, but are not included in this work plan.

Hand Augering/Air-Knifing – A hand auger will be used at each sampling location to excavate to depths of 5 to 10 feet below ground surface (bgs) in order to clear subsurface utilities or other

[1] WRB, formed January 1, 2007, is a 50/50 joint venture between ConocoPhillips (COP) and EnCana US Refineries LLC. The facility is owned by WRB and operated by COP employees.

obstructions. An air-vacuum system will then be used to widen the full depth of the excavation to approximately 5 inches in diameter according to SOPUS protocol. This combination of the hand auger and air-knife methods for the preliminary excavations will allow for continuous soil logging to begin at the ground surface so that more complete boring logs of the shallow subsurface may be compiled and shallow subsurface samples may be collected. The specific target depths of the hand auger/air-knife holes will be determined based upon a review of the subsurface utilities in the area. The air-knife work will be conducted by a vacuum excavation contractor under the supervision of URS (SOP-5 Utility Clearance Procedures).

Direct Push Soil Sampling & Piezometer Installation – Soil sampling will be performed at the locations shown on **Figure 1** using a dual-tube sampling system for logging and soil sampling purposes (SOP 29-Soil Probe Operation). The dual tube system consists of a 4-foot long by 1.125-inch diameter clear acetate liner attached to 1-inch diameter inner rods. The acetate liner and inner rods are advanced simultaneously with the 2.125 inch diameter outer rods. Once a sample is collected within the acetate liner, the inner rods and acetate liner are retrieved while the outer rods remain in place. The acetate liner is replaced and returned to the sampling depth, at which point the process is repeated.

The subsurface stratigraphy will be continuously logged (SOP 17-Logging) by a qualified field scientist in accordance with the Unified Soil Classification System (USCS). The field scientist will note soil attributes such as color, particle size, consistency, moisture content, structure, plasticity, odor (if obvious), and organic content (if visible). The soil samples will also be screened in the field using a photoionization detector (PID) (SOP 14-Head Space Soil Screening). Observations will be noted on the soil boring logs.

The borings located adjacent to existing vapor monitoring points GP-7 and GP-12 will extend to a depth of approximately 20 feet bgs, and the other borings will extend to a depth of approximately 60 feet bgs. This work will be conducted by a drilling/probing contractor under the supervision of URS.

Upon completion, the borings adjacent to vapor probe locations GP-7 and GP-12 will be backfilled with bentonite grout and the ground surface will be returned to its original location (SOP 12-Grouting Procedures).

During soil sampling at each of the eight proposed investigation locations, up to two soil samples may be collected based upon field headspace PID readings and/or from more permeable zones (SOP 28-Soil Sampling and SOP 38-Methanol Preservation Sampling). These soil samples will be analyzed for benzene, toluene, ethylbenzene and xylene (BTEX) via USEPA Method 8260B

by a contract laboratory. Groundwater samples may also be collected from perched water zones identified during the soil sampling activities.

Upon completion of borings B-1 through B-6, a piezometer will be installed at each location (SOP 21-Monitoring Well Installation). The piezometers will be installed through the dual tube casing and will be screened across the water table. The exact placement of the well screens will be determined based upon the lithology encountered and historical groundwater information. The piezometers will consist of 1-inch inside-diameter Schedule 40 polyvinyl chloride (PVC) pipe, with a 10-foot section of 0.010-inch slotted PVC screen. The sand pack will consist of the native sand in the water bearing stratum, and will extend to approximately 2 feet above the top of the piezometer screen. The probe hole annulus will then be grouted to the surface with high solids bentonite grout and surface completed.

Piezometer Development and Monitoring Well/Piezometer Gauging and Sampling – Once the piezometer installations are complete, the piezometers will be developed in order to remove fines from the sand pack and screen (SOP 20-Monitoring Well Development). The piezometers will be developed by pumping or bailing a minimum of five times the amount of any water introduced during probing plus five well volumes of water. During piezometer development, water quality parameters including pH, temperature, conductivity, turbidity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) will be measured and recorded on field sheets after each well volume is removed (SOP 33-Water Quality Monitoring). Development will continue until the water quality parameters have stabilized over two consecutive well volumes and those well volumes are visually sediment-free. After development, sufficient time will be allowed for the new piezometers to equilibrate with the groundwater (approximately two weeks).

Approximately two weeks after the completion of piezometer development, a comprehensive round of gauging and sampling will be performed. This comprehensive event will include COP wells near the western fenceline (e.g., P-54 [gauging only], P-56, P-57, P-58, P-66, P-73, P-75 and P-93A) as well as the newly installed piezometers.

The groundwater levels, product thickness (if present), and total depth of the wells and piezometers will be measured and recorded on the field sheets (SOP 10-Groundwater Level Measurements). During these gauging activities, the ambient and well-head VOC levels will be measured and recorded on the field sheets.

The groundwater sampling will be performed using low-flow procedures (SOP 18-Low Flow Groundwater Purging and Sampling). For the monitoring wells, a stainless steel submersible pump with the proper length of disposable polyethylene tubing will be slowly and carefully

lowered into the well and set with the pump intake near the mid-point of the screen or water column, whichever is deeper. For the piezometers, a stainless steel submersible bladder pump with the proper length of bonded disposable polyethylene tubing will be slowly and carefully lowered into the well and set with the pump intake near the mid-point of the screen or water column, whichever is deeper. The tubing from the pump will be connected to a flow-through cell, which will discharge into a five-gallon plastic bucket. Pumping will be performed at a low flow rate (<500 ml/minute) so as to not create drawdown of the water level within the well or piezometer. During groundwater purging, water quality parameters (pH, temperature, conductivity, turbidity, DO, and ORP) will be measured in the field and recorded on field sheets after every flow-through cell volume (SOP 33-Water Quality Monitoring). Purging will continue until a minimum of three flow-through cell volumes of water have been removed and the water quality parameters have stabilized. Once stabilization is achieved, the groundwater flow will be diverted from the flow-through and the groundwater will be sampled for BTEX via USEPA Method 8260B.

The piezometers will be surveyed upon completion of the sampling event.

Vapor Monitoring Point Sampling – Vapor monitoring point (VMP) sampling activities will be performed at four ports at each of six VMP locations (GP-7, GP-8, GP-9, GP-11, GP-12 and GP-13), if accessible. These six VMP locations were installed by Equilon in 1999/2000 to assess the potential for vapor migration in the area. Each of the six locations has four six-inch long sampling ports screened at approximately 5, 10, 15 and 20 feet bgs. First, a field check of the existing VMPs will be performed to verify that the locations and ports still exist and whether they can be sampled. Prior to sampling from a vapor port, the vacuum/pressure reading will be collected utilizing a digital manometer, whose readings will be allowed to stabilize for a maximum of 30 minutes. The vacuum/pressure reading will be recorded on field sheets noting any fluctuations during data collections.

After the vacuum/pressure readings are determined, three well volumes of air will be purged from the vapor port using a 60 milliliter (mL) syringe. During the purging process, if water is encountered or drawback of the syringe plunger occurs, this will be noted on the VMP sampling sheets. The sampling process will then be stopped and no soil vapor sample will be collected.

Once purging is completed, the summa canister and regulator will be inspected for damage or defects, and to verify that the initial vacuum of the canister is 25 to 30 inches of mercury (Hg). The canister ID number, flow regulator ID number and the initial inches of Hg will be recorded on the field sheets, and the summa canister will be labeled with the sample information. The

sampling assembly will be setup in such a way as to allow extraction from the monitoring port only and shut off from the atmosphere. The sample will be collected with a minimum change of 15 inches of Hg while not allowing the summa canister vacuum to go below 2 inches of Hg. The sample times and other information will be recorded on the field sample sheets and the samples collected will be analyzed for BTEX via Method TO-15 and for relevant gases (such as carbon dioxide, methane, nitrogen, oxygen, etc.) via ASTM D-1946 by a contract laboratory.

Once the sample summa canister is filled, a tedlar bag will be filled using a peristaltic pump. A rotometer will be used to adjust the flow of vapor to a rate less than or equal to 200 mL/min. The flow will be adjusted as quickly as possible so as to prevent unnecessary purging. When the proper flow rate is achieved, the tedlar bag will be attached and filled with the vapor. The vapor sample will then be screened in the field for total VOCs via a PID, and for oxygen, carbon monoxide, hydrogen sulfide and the lower explosive limit via a 4-gas meter. The results of the field screening will be recorded on the field sheets.

Due to the potential flammable nature of the vapor within the summa canisters, all of the soil vapor samples will be shipped via air according to all applicable regulations as required by the International Civil Aviation Organization (ICAO).

Analytical Sample Handling

Personnel conducting the sampling will wear clean disposable protective gloves. Sample containers will be labeled with a sample ID number, site name, sampler initials, sample date and time, sample preservative, and the parameters to be analyzed. After sample collection, the samples will be logged on a chain-of-custody (COC) form, packaged to prevent damage during shipment, and cooled to 4°C (except vapor samples, which are not shipped on ice). The samples will then be delivered, under the proper COC documentation, to the appropriate laboratory via delivery or courier service. Refer to SOP 24-Sample Classification, Packaging, and Shipping (DOT), SOP 25-Sample Containers, Preservation, and Holding Times and SOP 26-Sample Control and Custody Procedures

The data from the field activities will be collected in accordance with the procedures described in this work plan. Quality assurance samples in the form of duplicates, trip blanks, and matrix spike and matrix spike duplicates (MS/MSD) will be collected (SOP 23-Quality Assurance Samples). Duplicates of selected samples will be collected and analyzed from 10 percent of the sample locations to check for sampling and analytical reproducibility. MS and MSD samples will be collected and analyzed from 5 percent of the sample locations to evaluate the effect of the

sample matrix on the accuracy of the analysis. Trip blanks will be collected and analyzed on a daily basis to assess VOC cross contamination of samples during shipment to the laboratory. The trip blank will consist of one or more VOA vials prepared by the laboratory, transported to the field, and shipped with the other samples to the laboratory. The trip blanks will not be opened in the field. Equipment blanks will also be collected and analyzed from 10 percent of the sample locations if non-dedicated or non-expendable equipment are used.

Personal Protective Equipment and Decontamination Procedures

Field personnel will wear Level D personal protective equipment (PPE) with the potential to upgrade to USEPA Modified Level D or Level C if site conditions warrant. A PID with a 10.2 electron volt (eV) probe and combustible gas indicator (CGI) will be used during the field activities to monitor air quality for health and safety purposes. Field instruments will be calibrated prior to each use in accordance with the manufacturer's specifications. Health and safety related information will be primarily recorded in field logbooks. For work conducted on the WRR, COP personnel may inspect the work areas and monitor the ambient air, as necessary prior to the issuance of daily work permits in areas where they are required.

Field personnel and equipment will undergo decontamination procedures to ensure the health and safety of those present, to maintain sample integrity, and to minimize cross contamination between sampling locations (SOP 4-Decontamination). Reusable sampling equipment (e.g., groundwater pumps) will be decontaminated between each sampling location by washing with Alconox®, LiquiNox®, or equivalent detergent wash, a desorbing agent (i.e. isopropyl alcohol), and a distilled water rinse. Personnel and small equipment decontamination will be performed at the sample locations. Drill rods will be decontaminated prior to the drilling of each new borehole with a high-pressure hot water wash. The washing will be conducted on a temporary decontamination station in the investigation area. Decontamination fluids will be collected and staged on-site in 55-gallon drums for proper disposal.

Investigative-Derived Waste Handling

Investigative derived waste (IDW) including soil cuttings, PPE, and expendable materials will be collected and disposed of properly (SOP 16-IDW Handling). Expendable materials (e.g., disposable sampling equipment, such as gloves and tubing) having a low probability of contamination will be collected in trash bags and disposed of as municipal waste. Impacted expendable materials and soil cuttings will be collected and placed in labeled and sealed 55-

gallon drums or directly into roll-offs for future disposal. Prior to disposal, the soil cuttings and purgewater will be sampled for waste characterization as part of the disposal profile process.

Data Review, Analysis and Investigation Report

Laboratory data will be provided electronically and on hard copy forms. Analytical data from the sampling will be independently reviewed and qualified by URS. A report will be prepared summarizing and providing documentation of the field work and collected data. The report will include tables, figures, boring logs and supporting information (e.g., laboratory data). Analytical data will be compared to relevant screening criteria in Illinois' Tiered Approach to Corrective Action Objectives (TACO) rules. The report will focus on the conceptual site model, and will provide conclusions with respect to potentially complete exposure pathways.

LEGEND

- URS PROPOSED ADDITIONAL SAMPLE LOCATION
- URS GROUNDWATER PROFILING LOCATION (2006)
- EXISTING COP
- COP SOIL SAMPLING/GROUNDWATER SAMPLING LOCATION
- EXISTING VAPOR MONITORING POINT (APPROXIMATE LOCATION)
- G006 EXISTING BP MONITORING WELLS

NOTES:

1) LOCATION OF "COP" BORINGS PROVIDED BY CONOCOPHILLIPS.
2) LOCATIONS OF VAPOR MONITORING POINTS ARE APPROXIMATE, BASED UPON A FIGURE PROVIDED BY COP.

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SCALE FEET

SHELL OIL PRODUCTS U.S/WRB REFINING LLC ROUTE 111/RAND AVENUE VICINITY INVESTIGATION ROXANA, ILLINOIS	PROJECT NO. 21561979
URS	
DRN. BY: wmp 2/14/08 DSGN. BY: tja CHKD. BY:	INVESTIGATION LOCATIONS — FIG. NO. 1

File: P:\ENVIRONMENTAL\21561979 SOPUS WEST FENCELINE P-93 INVESTIGATION\P-93 WORK PLAN (FEBRUARY 2008)\FIG 1 INVESTIGATION LOCATIONS.DWG Last edited: FEB. 15, 08 @ 2:45 p.m. by: wendy_pennington