NOTE TO THE COMMUNITY:

The attached Report, "Dissolved Phase Groundwater Investigation and P-60 Free Phase Product Delineation Report" was submitted to the Illinois Environmental Protection Agency on February 18, 2010, completing the investigation required by the Illinois EPA's May 12, 2009 letter. The report and its conclusions are currently under review by the agency, and as such are subject to potential revision.

REPORT SUMMARY

Shell Oil Products US (SOPUS) conducted a multimedia subsurface investigation (e.g., soil, groundwater, soil vapor) in the Village of Roxana as outlined in the *Dissolved Phase Groundwater Investigation and P-60 Free Phase Product Delineation Work Plan for Roxana, Illinois* (January 21, 2009).

The primary objectives of this investigation were to: refine our understanding of the extent of benzene impact in the subsurface; assess the nature and extent of dissolved hydrocarbons in groundwater in the area west of the WRB Refining LLC Wood River Refinery (WRR) west fenceline; and gather data to assist in the delineation of the extent of petroleum product historically observed in groundwater beneath the WRR in the area of Monitoring Well P-60. The field investigation was conducted during multiple mobilizations between June and November 2009. These investigations were used to supplement previous investigations by URS Corporation and others.

From the results of this investigation, SOPUS has concluded:

- "Soil exposure does not pose a risk, except with respect to construction workers along the pipeline corridor. These potential risks are managed via safe work procedures.
- No LNAPL product *(separate phase petroleum product)* has been measured in the village.
- Exposure to groundwater does not pose a risk. Only a limited area of groundwater in the Village exceeds Class I screening criteria. The groundwater ordinance prevents exposure via prohibition on water wells. The use of production water, and Part B permit-required pumping at the WRR has a significant impact on the capture and treatment of groundwater in the area.
- Soil vapors do not appear to pose a risk; however two specific areas will be further evaluated."

As a result of this work and previous investigations, SOPUS submitted recommendations for additional work. The results of the work will be presented to the Illinois EPA along with a revised "Conclusions and Recommendations" in a brief letter report.

URS

February 18, 2010

Mr. Steven F. Nightingale, P.E.
Manager, Permit Section
Illinois Environmental Protection Agency
Bureau of Land
1021 North Grand Avenue East
Springfield, Illinois 62794

Subject: **Dissolved Phase Groundwater Investigation and P-60 Free Phase Product Delineation Report**
Roxana, Illinois
119115002 – Madison County
Log No. B-43-CA-12

Dear Mr. Nightingale:

On behalf of Shell Oil Products US, URS Corporation is submitting the enclosed investigation report for your review. The work was conducted in accordance with the *Dissolved Phase Groundwater Investigation and P-60 Free Phase Product Delineation Work Plan*, dated January 21, 2009, and the Illinois Environmental Protection Agency's approval letter dated May 12, 2009.

We look forward to your feedback on this report. 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

Enclosures (original plus 2 copies)

Cc: Mara McGinnis, IEPA Springfield
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REPORT

DISSOLVED PHASE GROUNDWATER INVESTIGATION AND P-60 FREE PHASE PRODUCT DELINEATION

Roxana, Illinois

VOLUME I
Text, Tables and Figures

Prepared for:

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LICENSED PROFESSIONAL GEOLOGIST
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February 2010

URS

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EXECUTIVE SUMMARY

Shell Oil Products US (SOPUS) conducted a multimedia subsurface investigation in the Village of Roxana as outlined in the *Dissolved Phase Groundwater Investigation and P-60 Free Phase Product Delineation Work Plan for Roxana, Illinois* (January 21, 2009).

The investigation area is generally located in a mixed use area (e.g., commercial/industrial and residential). The primary investigation area is generally bounded by Illinois Route 111 and the west property boundary (aka west fenceline) of the WRB Refining LLC Wood River Refinery[1] (WRR). Limited investigation was conducted inside the WRR under this scope of work.

The primary objectives of this investigation were to: refine our understanding of the extent of benzene impact in the subsurface; assess the nature and extent of dissolved hydrocarbons in groundwater in the area west of the WRR west fenceline; and gather data to assist in the delineation of the extent of petroleum product historically observed in groundwater beneath the WRR in the area of Monitoring Well P-60. These investigations were used to supplement previous investigation by URS and others.

A dynamic investigation approach was used, in that various technologies/data collection activities were used including: ROST™/ CPT; geoprobe soil sampling; piezometer installation and gauging; direct push groundwater profiling; groundwater monitoring well installation, development, gauging and sampling; vapor monitoring point installation, development, and sampling; and surveying. The field investigation was conducted during multiple mobilizations between June and November 2009.

The surface topography in most of the investigation area is relatively flat; however the southern portion of the area slopes downward to the west-southwest, with a total drop in elevation of approximately 15 feet across the area. The stratigraphy beneath the investigation area consists of the following materials, from top down: Fill (mainly clay, some gravel and cinders, etc.) extends from the ground surface to 10 feet in depth; Clay extends from the surface (where fill is absent) to 25 feet in depth, with intermittent layers of silt or sand (0 to 5 feet thick); Sand, consisting of primarily fine to medium grained sand (which coarsens with depth) is present below clay and extends to the depths explored.

Groundwater is present in the sand unit below a depth of approximately 35 to 50 feet below ground surface (bgs), depending on the portion of the site being referred to. This corresponds to an elevation of approximately 404 to 402 feet above sea level. Groundwater elevations are currently approximately 10 feet higher than in 2007, reflecting the above average precipitation over the past

[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.

few years. Groundwater contours for the sand indicate flow toward the northeast, toward WRR production water pumping centers. Discontinuous lenses of lower permeability clay with some silt and sand is present beneath portions of the area starting at a depth of 20 feet bgs. The discontinuous nature of the lenses limits infiltrating groundwater from perching above it.

Soil analytical results from this and previous investigations indicate the following: soil samples collected from outside the WRR (Village of Roxana proper and 1986 release area) meet the TACO screening criteria. The exception being that benzene concentrations exceed TACO criteria for some soil borings located in the Public Works Property and in soils collected from a limited area surrounding pipelines and/or at depths where impacts are likely related to residual groundwater impact.

Subsurface soil samples collected from inside the WRR property have exceedances of TACO criteria for some BTEX constituents (benzene, toluene, ethylbenzene, xylenes), which can be expected due to the long history of petroleum refining activities in the area. Soil from inside the WRR, while they have exceedances of TACO criteria, pose little risk due to existing refinery procedures which govern safe excavation and construction activities, including the selection and use of appropriate Personal Protective Equipment (PPE) and site specific training.

The light, non-aqueous phase liquid (LNAPL) (product) portion of the investigation indicated that LNAPL was not found in the monitoring locations in the Village of Roxana. In addition, the LNAPL present in the WRR along the west fenceline appears to be most consistently present in the area of Monitoring Well P-60. It appears that the current recovery efforts are having a positive effect, decreasing the amount of LNAPL which has historically been present in the vicinity of P-60.

Groundwater samples were collected from two new monitoring wells and from 23 groundwater profiling locations and analyzed for combinations of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). The cumulative analytical information (i.e., including the 2007 and 2008 data) depicts two distinct groundwater plumes, a dissolved benzene plume located primarily beneath the Public Works yard and a dissolved phase hydrocarbon plume located in the refinery and extending west into the Village a short distance.

Cumulative analytical information indicates that the highest benzene concentrations are generally in a pie-shaped area on the order of 200 to 400 feet wide, extending between the 1986 benzene release location and the refinery. The pie-shaped area of impact widens closer to the refinery, consistent with groundwater flow toward pumping centers on the WRR North and Main properties. Benzene concentrations in the pie-shaped area have been identified in the hundreds to approximately 1,100 parts per million (ppm). Monitoring wells on the north and south sides of this pie-shaped area exhibit low parts per billion (ppb) benzene concentrations.

The area in which groundwater exceeds Class I criteria is impacted by petroleum constituents that are generally in close proximity to the WRR west fenceline, with all but one exceedance of screening criteria being located off Chaffer Street. Inside the WRR, dissolved phase concentrations quickly decrease to ppb levels north of Monitoring Well P-60, and are non-detect (ND) in monitoring wells north of P-55 (i.e., T-1, T-13).

Groundwater pumping from the WRR has a significant affect on the flow/containment of impacted groundwater at the site. In addition, the Village of Roxana's groundwater ordinance prohibits the installation and use of private potable water supply wells, further preventing any potential exposure to impacted groundwater.

Soil vapor samples were collected from 16 locations and 63 ports. Several of these locations coincided with the areas of maximum groundwater impact. The hydrocarbon vapors diffuse and biodegrade upwards through the soil, so as expected the highest concentrations are at depth and decrease closer to the surface.

For vapor intrusion, the primary concern with the soil gas concentrations is contact with building slabs (slab-on-grade or structures with basements). So, the elevated hydrocarbon levels at greater depths are not directly significant in this area (i.e., >15 feet bgs).

Within the Village of Roxana, benzene concentrations range from ND to low ppm levels in the upper 10 feet of the shallow subsurface.

Within the Public Works Yard, benzene concentrations range from ND to hundreds of ppm in the upper five feet of the shallow subsurface.

The results of this investigation indicate the following significant conclusions:

- Soil exposure does not pose a risk, except with respect to construction workers along the pipeline corridor. These potential risks are managed via safe work procedures.
- No LNAPL product has been measured in the village.
- Exposure to groundwater does not pose a risk. Only a limited area of groundwater in the Village exceeds Class I screening criteria. The groundwater ordinance prevents exposure via prohibition on water wells. The use of productions water, and Part B permit-required pumping at the WRR has a significant impact on the capture and treatment of groundwater in the area.

- Soil vapors do not appear to pose a risk; however two specific areas will be further evaluated.

As a result of this work and previous investigations, SOPUS recommends the following additional work and actions:

Soil

- Borings GP-3 and GP-5 will be drilled once access is obtained from the Village of Hartford.

LNAPL

- Existing piezometers in the Village of Roxana will continue to be gauged periodically to evaluate the absence or presence of LNAPL. The LNAPL in Monitoring Well P-60 will continue to be collected using the existing remediation system.
- A four-inch diameter monitoring well will be installed at the location of Piezometer P-60-11 (located approximately 100 feet north of P-60) to allow for product recovery and the feasibility of installing an automated recovery system, will be assessed.

Groundwater

- Groundwater data will be collected at Locations GWP-3 and GWP-5 once access is obtained from Hartford. The results of this work will be used to refine the monitoring well network previously submitted to Illinois Environmental Protection Agency (IEPA) on September 16, 2009.
- The monitoring locations in Roxana will be gauged in conjunction with the WRR groundwater monitoring program (i.e., quarterly). This will continue to build the groundwater data set to account for seasonal fluctuations.
- SOPUS and COP are in the process of evaluating maintenance needs for the refinery groundwater production wells. This process began in mid-2009. Currently, one water production well is heavily silted and scheduled for replacement. In December 2009 a project to replace this well was authorized. This and similar projects will help maintain and strengthen the inward gradient.

Soil Vapor

- A shallow sampling port (~10 feet) will be installed at Location VMP-3 to assess potential vapors at this depth (existing ports are at 5 and 22 feet). The proposed depth is optimal to determine if there is a vapor issue with structures that have a basement in the area.

- A shallow sampling port (~5 feet) will be installed near the building located at the northeast corner of the Village of Roxana Public Works Yard. The proposed depth is optimal to determine if there is a potential vapor issue with the subslab construction of this structure.

The activities described above are currently in queue and the results of the work will be presented along with a revised “Conclusions and Recommendations” in a brief letter report. The letter report will be submitted approximately three months after the final data collection. This submittal is expected in second quarter 2010.

Introduction

Shell Oil Products US (SOPUS) recently conducted a multimedia investigation in the Village of Roxana (**Figure 1**). The primary investigation area is generally bounded by Illinois Route 111 and the west property boundary (aka west fenceline) of the WRB Refining LLC Wood River Refinery[2] (WRR) (**Figure 2**). In addition, some limited investigation was completed inside the WRR; this work was conducted in cooperation with ConocoPhillips Company (ConocoPhillips).

Background

URS Corporation (URS), on behalf of SOPUS, performed a subsurface investigation in 2006 to help gather information on the extent of benzene impact in groundwater related to a historical release and to gain additional information on petroleum product (light, non-aqueous phase liquid (LNAPL)) in the vicinity of Monitoring Well P-60. The investigation provided additional information on the distribution of benzene in groundwater in the area, based primarily on screening technologies (e.g., cone penetration testing (CPT), membrane interface probe (MIP) and groundwater profiling). Product thicknesses in Monitoring Well P-60, located along the WRR west fenceline, have historically been much greater than in nearby monitoring wells (e.g., 6 to 8 feet or more in P-60 as compared to less than approximately 1 to 2 feet in other locations). It had been suspected that the monitoring well was compromised, allowing product possibly in the shallow subsurface to enter the monitoring well. A subsurface investigation was performed in the vicinity of Monitoring Well P-60 to assess the condition of the monitoring well and begin to delineate the extent of product historically observed, using CPT, Rapid Optical Screening Tool (ROST™), piezometer installation, and the replacement of Monitoring Well P-60. The report of this work, *West Fenceline P-93 Dissolved Phase Benzene Investigation Report – Roxana, Illinois*; was submitted to the Illinois Environmental Protection Agency (IEPA) on September 28, 2007 (SOPUS/WRB-WRR, 2007).

ATC Associates Inc. (ATC), on behalf of ConocoPhillips, conducted a subsurface investigation in February and March 2007 to investigate releases from the #1 and #4 Dock Lines. These incidents were reported in the 3rd quarter 2006. The report *ConocoPhillips-Wood River Refinery Subsurface Investigation Report On #1 and #4 Dock Lines* summarized the results of the limited soil and groundwater investigation (ConocoPhillips, 2007). The results indicated evidence of petroleum impact around the pipelines.

[2] 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.

URS conducted additional work in the spring and summer of 2008 to further delineate the extent of benzene impact in soil and groundwater. The investigation revealed evidence of hydrocarbon impact along the west fenceline in the area north of the previously identified benzene impacts. The report of this work was submitted to the IEPA on January 21, 2009 (SOPUS, 2009A).

The IEPA issued SOPUS a Violation Notice (VN) dated May 2, 2008 (L-2008-01134) relative to groundwater conditions that pertain to the 1986 benzene release. In response, SOPUS submitted a proposed Compliance Commitment Agreement (CCA) to IEPA on July 22, 2008. While the CCA was rejected by the IEPA in correspondence dated August 4, 2008, SOPUS was instructed verbally by the IEPA to conduct the work suggested in that agreement.

The CCA included preparation of an investigation work plan *The Dissolved Phase Groundwater Investigation Work Plan for Roxana* (SOPUS, 2008) which was submitted to IEPA on September 5, 2008. A letter from the IEPA dated November 25, 2008 offered several comments but did not directly approve this work plan. Based on IEPA's November 25, 2008 letter, the work plan was revised and resubmitted on January 21, 2009 as the *Dissolved Phase Groundwater Investigation and P-60 Free Phase Product Delineation Work Plan for Roxana, Illinois* (SOPUS, 2009B). This revised work plan was approved, with conditions and modifications, by the Agency in a letter dated May 12, 2009. SOPUS responded to the Agency's comments in a letter dated June 23, 2009.

On July 8, 2009, URS, on behalf of SOPUS, submitted a Water Well Survey (WWS), to meet condition 3(h) of the May 12, 2009 approval letter. The survey identified water wells within 2,500 feet of the WRR. No public water wells were identified within the survey area. A total of 277 private wells were identified, with 50 being active, 98 being not in use, and 129 identified as "unknown". Of the 50 active wells, 38 were identified for commercial/industrial (i.e., non-potable) use, one for a community supply well, and one for private (residential) use. Set-back zones were identified for the Village of Hartford (1,000 feet) and the City of Wood River (400 to 2,500 feet). Wellhead protection areas were identified for the Village of Hartford and City of Bethalto, though none of the Bethalto community supply wells were found to be located within the WWS area. There were no regulated recharge areas relating to public water supply wells identified within the water well survey area.

During the development of the most recent work plan, the Village of Roxana enacted an ordinance which prohibits the installation and use of private potable water supply wells. The ordinance was adopted on June 2, 2008 (Ordinance No. 867). The ordinance applies to a portion of the Village which does not have private wells. The subject investigation area is contained within the ordinance area.

Work which was completed in the Village of Roxana was communicated to the residents as part of a community relations effort being completed under Illinois Administrative Code Part 1600 rules (aka Right to Know). Residents or owners of property in an area generally bound by Route 111 to the west, the fenceline of WRR to the east, Eight Street to the south, and north to approximately First Street receive mailings. Fact Sheet #1 was issued to residents in the investigation area in the Village of Roxana on February 13, 2009. This fact sheet outlined the background of the area and explained the planned investigation activities. Fact Sheet #2 was issued to residents on July 7, 2009 to notify them of the upcoming work to be performed in their area. Copies of the fact sheets, relevant work plans/reports are also captured at a website repository http://roxanainvestigation.urs-stl.net.

Objectives

The primary objectives of this investigation were to:

- Refine our understanding of the extent of benzene impact in the subsurface,
- Assess the nature and extent of dissolved hydrocarbons in groundwater in the area west of the WRR west fenceline, and
- Gather data to assist in the delineation of the extent of product historically observed in groundwater in the area of Monitoring Well P-60.

This report summarizes the results of the work performed in accordance with the approved work plan. Based on subsequent communications with the Agency, it was agreed that the results of this work would be presented in a single report due by February 18, 2010.

The field investigation was performed in accordance with the work plan developed for this project and applicable IEPA comments, conditions, and/or modifications. In addition, applicable URS standard operating procedures, and SOPUS' and COP's protocols were followed. The field investigation was conducted during multiple mobilizations between June and November 2009.

The following firms supported URS on this field work:

- Air Toxics, Ltd. of Folsom, California – Soil vapor analytical services.
- Environmental Design International, Inc (EDI) of Collinsville, Illinois – Surveying.
- Fugro Geosciences, Inc. of Houston, Texas – CPT and ROST^{TM} probing services.
- Kantex Inc. of Wood River, Illinois - Borehole clearing.
- Roberts Environmental Drilling Inc. (REDI), of Millstadt, Illinois – Borehole clearing, drilling and probing services.
- TerraSense, LLC of Totowa, New Jersey – Soil properties testing.
- Xenco Laboratories, Inc. of Stafford, Texas – Soil and groundwater analytical services.

A dynamic investigation approach was used, in that various technologies/data collection activities were used including:

- ROST^{TM}/ CPT,
- Geoprobe soil sampling,
- Piezometer installation and gauging,
- Direct Push groundwater profiling,
- Groundwater monitoring well installation, development, and sampling,
- Vapor monitoring point installation, development, and sampling,
- Monitoring well gauging, and
- Surveying.

Figure 3 shows the investigation locations and **Table 1** summarizes the investigation method, the activity/analysis completed, and any notes relevant to each location. Photographs of the various field activities are presented in **Appendix A.**

Health and Safety during the field activities was governed by the *Route 111/Rand Avenue Vicinity Investigation Health and Safety Plan (HASP)* dated May 2008 (and updates) as prepared by URS (URS, 2008). In addition, for work performed on WRR property, health and safety procedures were supplemented by the *ConocoPhillips Environmental and Geotechnical Work 2009 HASP*, dated March 2009, as prepared by URS (URS, 2009). More information on site health and safety procedures is presented in **Section 2.10**.

IEPA personnel visited the site multiple times during this scope of work to observe and document the field activities. No comments or exceptions were made by the IEPA personnel as to the field methodologies or the data being collected.

2.1 PRE-FIELD ACTIVITIES

Field activities for this investigation were conducted on: the Village of Roxana Public Works Department property or street rights-of-way; on WRR property; and on Illinois Department of Transportation (IDOT) rights-of-way. The work in the Village of Roxana was performed in accordance with an access agreement, signed July 9, 2009, between SOPUS and the Village of Roxana. The work on IDOT property was performed under an IDOT permit issued August 3, 2009. Some of the planned locations were on Village of Hartford property (e.g., Rand Avenue right of way) and were unable to be completed during this scope of work as access had not yet been secured.

A meeting was held on June 15, 2009 between representatives of SOPUS, ConocoPhillips, URS and the Village of Roxana to discuss logistical issues regarding the upcoming work (e.g., site access, underground utilities, work schedules, equipment staging, etc.).

Prior to the start of work, investigation locations were marked in the field (e.g., spray paint, stakes). A utility locate was arranged using Illinois' Joint Utility Locating Information for Excavators (JULIE) service. In addition, the Roxana Public Works Department and the WRR reviewed the locations and provided relevant information concerning their utilities in the area.

2.2 BOREHOLE CLEARANCE

Combinations of an air-vac system (air or water jetting and/or vacuum excavation) and/or hand augering were used to clear borehole locations (e.g., air-knife) with respect to underground utility lines or other obstructions. The specific target depths of the air-knife holes were determined based upon a review of the subsurface utilities in the area with input from Roxana and COP, as appropriate, and ranged from 5 to 10 feet below ground surface (bgs). Cleared locations were backfilled with sand. URS' "Air Knifing Forms" are included in **Appendix B.**

2.3 RAPID OPTICAL SCREENING TOOL/CONE PENETROMETER TESTING

ROST^{TM} and CPT were performed at various locations in the investigation area to gain information on the potential presence of residual hydrocarbons in the subsurface and to help characterize the geology of the area (**Figure 3**).

The work plan outlined 18 ROST^{TM}/CPT locations (ROST-1 through ROST-18). The following modifications were made:

- ROST-19 and ROST-20, located in the alley between Third and Fourth Streets, were added based on Agency comments;
- ROST-21 and ROST-22, located on Fifth and Sixth Streets, respectively, were added based on Agency comments;
- ROST-23, ROST-24, and ROST-25 were added along the western perimeter of the investigation area to gather CPT information to further our understanding of the site geology; and
- ROST-26, ROST-27, ROST-28, and ROST-29 were added inside the WRR to assist in the delineation of potential product.

ROST^{TM}/CPT probes were advanced through the previously-cleared sand-filled boreholes. The probes were completed to depths ranging from approximately 45 to 52 feet (bgs). Probes were typically terminated once groundwater was encountered.

CPT probes were completed in accordance with ASTM D-5778-07 by hydraulically pushing a cone, equipped with a pore pressure transducer, through the soil at a rate of 2 cm/sec. The cone has a tip cross sectional area of 15 cm^2 and a friction sleeve area of 200 cm^2. Measurements of resistance to penetration, sleeve friction and pore pressure were recorded once per second during advancement of each boring. These measurements provided soil property data, which were converted to a stratigraphic profile for each boring. The results of the CPT probes are provided in **Table 2;** CPT logs (along with additional information on this technology) can be viewed in **Appendix C** and the results of the work are discussed in **Section 3.1.1**.

The ROST^{TM} technology was advanced at the same time as the CPT technology. ROST^{TM} utilizes a laser-induced fluorescence sensor, which consists of a small diameter sapphire window mounted flush with the side of a CPT probe. The down-hole ROST^{TM} sensor uses the standard CPT technology described above. As the ROST^{TM} sensor is advanced, the laser transmits pulses of light to the sensor through a fiber optic cable connected to the sapphire window. The pulsed light causes petroleum hydrocarbons in the soil to fluoresce, and the fluorescence signal travels through a second cable to a detection system in the CPT rig. Relative concentration and a spectral product fingerprint are presented continuously in real-time. Since fluorescence intensity is proportional to petroleum hydrocarbon concentration, ROST™ technology can effectively delineate the extent of affected soils. A reference solution was placed on the sapphire window prior to each location as a quality control check to make sure the system's performance was within specification and to allow for normalization of the data from the various test locations (e.g., laser power, operating conditions, etc.). Refer to the report in **Appendix C** for additional information. The results of the ROST™ probes (in % fluorescence) are provided in **Tables 2** and **3**[3], ROST™ logs (along with additional information on this technology) can be viewed in **Appendix C** and the results of the work are discussed in **Section 3.3**.

Upon completion, each probe hole located next to a monitoring well or vapor monitoring point or other locations were either backfilled with granular bentonite poured from the surface or with high solids bentonite grout via the tremmie method. The surface at each probe hole was returned to its original condition.

During the ROST™/CPT activities, equipment decontamination and investigation-derived waste (IDW) (e.g., purge water, soil cuttings, etc.) were managed per the work plan. Additional information regarding decontamination protocols and IDW management is provided in **Section 2.10** of this report.

2.4 SOIL SAMPLING

Soil sampling was performed at three locations in the area of the 1986 benzene release (GP-1, GP-2 and GP-4). The purpose of these borings was to help characterize conditions in the 1986 release area. Soil sampling has not yet been performed at locations GP-3 or GP-5 pending access with the Village of Hartford. An access agreement was provided to Hartford late January 2010. Soil sampling was also performed at various other locations throughout the investigation area to use for correlation with the ROST™ and CPT data (GP-7 through GP-12) [4]. Refer to **Figure 3** for soil boring locations.

Soil sampling was conducted via geoprobe, using a dual-tube sampling system. The dual-tube system consisted 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 were advanced simultaneously with the

[3] It is important to note that benzene has a much lower relative response to the ROST technology than other hydrocarbons. As such, a relatively high concentration of benzene by itself (or with other combinations of other hydrocarbons) would not necessarily yield a corresponding high fluorescence.

[4] No soil sampling activities were performed at location GP-6 because geologic information was collected during activities at location VMP-16.

2.125-inch diameter outer casing. Once a sample was collected within the acetate liner, the inner rods and acetate liner were retrieved while the outer rods remained in place. The acetate liner was replaced and returned to the sampling depth, at which point the process was repeated. The soil borings were advanced to groundwater, which was encountered at depths of approximately 40 to 50 feet bgs.

The subsurface stratigraphy was continuously logged by a qualified field scientist in accordance with applicable ASTM standards and the Unified Soil Classification System (USCS). The field scientist noted soil attributes such as color, particle size, consistency, moisture content, structure, plasticity, odor (if obvious), and organic content (if visible). Soil samples were also screened in the field using a photoionization detector (PID) and observations were noted on the soil boring logs (**Appendix D**) and are tabulated on **Table 4**.

During probing at locations GP-1, GP-2, GP-4, and GP-7 through GP-9, additional field screening was conducted on three to six selected soil samples per boring using Sudan IV® test kits (using the brand Scarlet Red® kits) in order to determine the presence of residual hydrocarbons in the soil. These samples were selected based on ROST™ results, PID readings, visual observations of impact, and/or geology (e.g., more permeable zones). The Sudan IV® test kits utilized a dye that stains residual hydrocarbons present in the soil at concentration roughly greater than or equal to about 500 ppm. The observations of the Sudan IV® tests are presented in **Table 3**[5]. Sudan IV® field screening was not conducted on borings GP-10 through GP-12, as these borings were for CPT correlation and no significant PID readings were noted.

Two or three discrete soil samples per boring were collected for analysis of volatile organic compounds (VOCs) based on field headspace readings and/or Sudan IV® field screening results. The soil samples for laboratory analysis were separate from those used for the various field screening tests and were not composited prior to sample collection.

Samples were labeled in the field and information was recorded on Chain-of-Custody (COC) forms at the time of sampling**,** as described in **Section 2.11.**

Upon completion of Borings GP-1, GP-2, GP-4, GP-7, GP-8, and GP-10 through GP-12, the boreholes were backfilled with bentonite grout through the outer casing and the ground surface was returned to its original condition.

[5] The Sudan IV® kits are a qualitative test for the presence of hydrocarbon constituents (VOCs and SVOCs), therefore there may not be a direct correlation to laboratory VOC results.

Prior to backfilling at Borings GP-1 and GP-4, groundwater samples were collected via groundwater profiling techniques (refer to **Section 2.6** for the groundwater profiling discussion).

Upon completion of soil Boring GP-9, a piezometer (GP-9-PZ) was installed. Refer to **Section 2.5** for the piezometer installation discussion.

As presented in more detail in **Section 2.13**, selected samples were collected for geotechnical testing.

Table 1 summarizes the details of the soil sampling activities along with the soil samples collected for chemical analysis. An appropriate number of field duplicates, matrix spike/matrix spike duplicate, equipment rinsate blanks, and trip blanks (one for each cooler containing samples for volatile organic compound (VOC) analysis) were collected to fulfill the quality assurance/quality control (QA/QC) requirements. Additional information regarding sample preparation and shipment, and laboratory testing, is provided in **Section 2.11** of this report.

During the soil sampling activities, equipment decontamination and IDW (e.g. purge water, soil cuttings, etc.) handling was managed appropriately. Additional information regarding decontamination protocols and IDW management is provided in **Section 2.10** of this report.

The results of the soil sampling activities are integrated into various parts of **Section 3**.

2.5 PIEZOMETER INSTALLATION

Piezometers were installed at select locations where field observations (e.g., ROST^{TM}, Sudan IV$^{®}$) suggested LNAPL may accumulate:

- ROST-3-PZ (at ROST-3), ROST-4-PZ (at ROST-4), and ROST-7-PZ (at ROST-7) were installed in the Village of Roxana.
- GP-9-PZ (at GP-9 and ROST-18) was installed on WRR property.
- P-60-13 (and 13S) (at ROST-29) were installed on WRR property.

The locations where piezometers were installed are shown on **Figure 3**. At locations where piezometers were installed, the boring was advanced through sand-filled boreholes or the existing investigation probe holes.

The piezometers were installed through dual tube casing and were screened across the water table, with the exact placement of the piezometer screen determined based upon the lithology encountered, the depth at which potential evidence of impact was noted, and/or historical groundwater information.

The piezometers consisted of a 0.75-inch ID, variable length (10-20 feet) PVC screen (based on field observations) and riser, which were installed through the outer casing of the drill rods. The annular space around the screen was filled with placed and caved-in native sand. The annular space above the sand pack was filled with a bentonite chip seal and high solids bentonite slurry grout introduced as the outer rods were removed.

At ROST-29, a separate shallow piezometer (P-60-13S) was installed to a depth of 20 feet bgs, based on the potential presence of product indicated by the ROST™ response in relation to a shallower silty clay layer (less permeable layer). This piezometer was installed and completed in a manner consistent with the methods described above for the deeper piezometer installations.

The piezometers were not developed, since groundwater sampling was not planned at those locations.

During the piezometer activities, equipment decontamination and investigative derived waste (IDW) (e.g., soil cuttings, etc.) handling was managed appropriately. Additional information regarding decontamination protocols and IDW management is provided in **Section 2.10** of this report.

Table 5 summarizes the piezometer completion details and gauging information and the results of the work are discussed in **Section 3.3**.

2.6 GROUNDWATER PROFILING

Groundwater profiling was conducted to delineate the lateral extent of impacted groundwater in the investigation area. Groundwater profiling was conducted at 23 locations (GWP-1 through GWP-21, GP-1 and GP-4) as shown in **Figure 3.** Locations GWP-1 through GWP-10 are positioned on the north-south “Primary” profiling transect along Chaffer Street. Locations GWP-11 through GWP-15 are positioned on the “Secondary” profiling transect; and locations GWP-16 through GWP-20 are positioned on the “Tertiary” profiling transect nearest Route 111. Locations GWP-21, GP-1 and GP-4 are positioned on the west side of Route 111 near the 1986 benzene release area.

The following analytical approach was used to characterize groundwater in the area. The samples from locations on the “Primary” transect were analyzed for semivolatile organic compounds (SVOCs) on an expedited basis. The samples were also analyzed for VOCs. The SVOC analytical results from these samples were then compared with the Illinois Class I Groundwater Quality Standards (GQSs), where available. If the SVOC results from these samples exceeded the Class I GQSs, groundwater samples collected from adjacent profiling locations along the “Secondary” transect were also analyzed for SVOCs and so on for the

"Tertiary" transect profiling locations. All the samples collected from the Secondary and Tertiary profiling transect were analyzed for VOCs.

Groundwater profiling equipment was advanced through sand-filled boreholes which were previously cleared. Profiling activities were performed using a 4-foot long, mill-slotted sampler advanced by the hydraulic push system of a geoprobe. Samples were collected from near the top of the groundwater table (approximately 34 to 50 feet bgs) and at a depth of approximately 8 feet below the first sample (approximately 42 to 58 feet bgs). PID measurements were taken on the groundwater at each depth and recorded on the groundwater sampling forms in **Appendix E**.

Once the sampler was advanced to the predetermined depth, the water level was measured using an electronic interface probe and recorded on a groundwater sampling form (**Appendix E)**. LNAPL was not observed during groundwater profiling. Dedicated polyethylene tubing equipped with a ball and check valve system was then placed down into the slotted portion of the mill-slotted sampler and set at approximately the middle of the screened interval (2 feet from the bottom of the screen). The tubing was then connected through a Waterra pump to a flow-through cell. The groundwater was then purged and monitored for pH, temperature, conductivity, turbidity, dissolved oxygen (DO), and oxygen-reduction potential (ORP). Parameter readings were collected and recorded after each flow-through cell volume, and purging continued until water-quality parameters stabilized over 3 flow-through cell volumes or for 1 hour, whichever occurred first. Once stabilization was achieved, the groundwater flow was diverted from the flow-through cell and the groundwater was sampled.

Samples were collected in laboratory-supplied containers, labeled in the field and information was recorded on the COC form at the time of sampling (see laboratory data in **Appendix I),** as described in **Section 2.11**.

A new section of tubing measured to the appropriate length was used for every sampling interval. Upon completion of each groundwater profiling probe, the borehole was filled with grout from the bottom up using the geoprobe rods as a tremmie pipe, and the surface was returned to its original condition.

Table 1 summarizes the groundwater samples collected for chemical analysis. The appropriate numbers of field duplicates, matrix spike/matrix spike duplicates, equipment rinsate blanks, and trip blanks were collected to fulfill the QA/QC requirements. Additional information regarding sample preparation and shipment, and laboratory testing, is provided in **Section 2.11** of this report.

During the groundwater profiling activities, equipment decontamination and IDW (e.g., purge water, soil cuttings, etc.) was managed appropriately. Additional information regarding decontamination protocols and IDW management is provided in **Section 2.10** of this report.

The field sampling sheets for this groundwater profiling event are provided in **Appendix E** and the results of the work are discussed in **Section 3.4**.

2.7 GROUNDWATER MONITORING WELL INSTALLATION, DEVELOPMENT, AND SAMPLING

Groundwater Monitoring Well Installation

Two monitoring wells (MW-7 and MW-8) were installed at the Roxana Public Works yard located south of Eighth Street (**Figure 3**). Additional monitoring wells were proposed in a September 16, 2009 Memorandum from URS to IEPA (as requested in Condition 3.g of the May 12, 2009 work plan approval letter), however IEPA in an email sent on September 18, 2009 deferred the review of the *Proposed Groundwater Monitoring Well Installation Plan* until after their review of the subject report.

Monitoring wells were installed using 4.25-inch inside diameter hollow stem augers that were advanced through sand-filled boreholes (previously cleared). Soil was continuously collected and logged as discussed in **Section 2.4**. The soil samples were screened in the field using a PID. Observations are tabulated on **Tables 3** and **4** and were noted on the soil boring logs (**Appendix D**).

The monitoring wells were constructed using a 2-inch diameter Schedule 40 PVC casing, with a 10-foot section of 0.010-inch slotted PVC well screen. The monitoring well screens were set such that they straddled the water table. The sand pack consisted of a combination of placed and/or native sand in the annular space, and extended to approximately 2 feet above the top of the monitoring well screen. A minimum 3-foot thick bentonite seal was placed above the sand pack. The borehole annulus was then grouted to the surface with high solids bentonite grout. Surface completions, including a locking expandable cap and flush-mount protector, were added. The monitoring well details are summarized on **Table 6** and construction diagrams for the monitoring well installations are provided in **Appendix F**.

Groundwater Monitoring Well Development

Once the monitoring well installations were complete, the monitoring wells were developed in order to remove fines from the screen and sand pack. The monitoring wells were developed by pumping, with a Proactive high-flow submersible development pump, five monitoring well volumes of water plus five times the amount of any water introduced during installation. During monitoring well development, water quality parameters including pH, temperature and conductivity were measured and recorded on field sheets after each monitoring well volume was removed. Development continued until pH, temperature, and conductivity had stabilized over two consecutive monitoring well volumes and the water was visually sediment-free. About 270 and 280 gallons of water were removed from MW-7 and MW-8, respectively. The monitoring well development sheets are provided in **Appendix E**.

Groundwater Monitoring Well Sampling

After development of the newly installed monitoring wells, sufficient time was allowed for the new monitoring wells to equilibrate with the groundwater prior to sampling (a minimum of two weeks). Monitoring Wells MW-7 and MW-8 were sampled utilizing low-flow purging and sampling procedures. Prior to sampling, the initial water level was measured and recorded on the field sheets. The monitoring wells were purged and sampled utilizing a 1.82-inch diameter Proactive Stainless Steel Monsoon submersible pump and disposable polyethylene tubing (new tubing was used at each monitoring well). The submersible groundwater pump with the proper length of disposable polyethylene tubing was slowly lowered into the monitoring well to be sampled and set with the pump intake near the top of the monitoring well screen. The tubing from the pump was connected to a flow-through cell, which discharged into a 5-gallon plastic bucket. Pumping was performed at a low flow rate (≤ 500 mL/minute) so as to not create drawdown of the water level within the monitoring well. During groundwater purging, water quality parameters (pH, temperature, conductivity, turbidity, DO and ORP) were measured and recorded on the field sheets after every flow-through cell volume. Purging continued until a minimum of three flow-through cell volumes of water were removed and the water quality parameters stabilized.

Once stabilization was achieved, the groundwater flow was diverted from the flow-through cell and groundwater samples were collected for analysis of VOCs and SVOCs as described in the groundwater profiling section above.

Table 1 summarizes the groundwater samples collected for chemical analysis. An appropriate number of field duplicates, matrix spike, matrix spike duplicates, and equipment rinsate blanks, and trip blanks were collected to fulfill the QA/QC requirements. Additional information regarding sample preparation and shipment, and laboratory testing, is provided in **Section 2.11** of this report.

During the groundwater monitoring well activities, equipment decontamination and IDW (e.g., purge water, soil cuttings, etc.) was managed appropriately. Additional information regarding decontamination protocols and IDW management is provided in **Section 2.10** of this report.

The field sampling sheets for this groundwater sampling event are provided in **Appendix E** and the results of the work are discussed in **Section 3.4**.

2.8 VAPOR MONITORING POINT INSTALLATION, DEVELOPMENT, AND SAMPLING

Vapor Monitoring Point Installation

Vapor monitoring points (VMPs) were installed at 16 locations in the Village of Roxana and the WRR. A total of 64 vapor monitoring ports were installed during this effort. VMPs were installed near several of the alley intersections with Chaffer Street (VMP-1 through VMP-7 and VMP-9) and VMP-8 was installed adjacent to existing Monitoring Well MW-4. Additionally, VMPs VMP-10 through VMP-16 were installed at locations in or around the Roxana Public Works Yard, as requested in the Agency's May 12, 2009 work plan approval letter.

The vapor monitoring ports at each location were installed using a Hollow Stem Auger rig. The drilling equipment was advanced through sand-filled boreholes which were previously cleared. Soil was continuously collected and logged as discussed in **Section 2.4**. The soil samples were screened in the field using a PID. Observations are tabulated in **Tables 3** and **4** and were noted on the soil boring logs (**Appendix D**).

At each of the VMP locations, ports were generally installed at four depths throughout the unsaturated zone as follows:

- 5 feet below ground surface,
- 5 feet above the observed groundwater depth,
- Generally 1 foot below the shallow clay/sand interface (the upper bentonite seal was below the interface)[6], and
- The final port was screened approximately halfway between the port at the shallow clay/sand interface and the port located five feet above the water table with a bias to elevated PID readings.

These different sample depths are designated as the bottom depth of the screened interval in the sample IDs used during this field investigation. As shown on **Table G-1** (in **Appendix G**), the individual ports were color coded in the field, shallow to deep, using the color scheme of yellow (5 feet bgs), blue (second interval), green (third interval), and red (5 feet above water). With the exception of VMP-3, all depths were installed in the same boring. At VMP-3, the second depth

[6] Exceptions were made at 3 (VMP-3, VMP-4, and VMP-9) of the 16 locations based on a review of either geological information and/or PID readings.

VMP-3-22 was installed in a boring adjacent to the original boring, due to issues that arose during the initial installation.

Each vapor monitoring port consisted of a 0.5-inch outer diameter by 6-inch long Geoprobe Systems stainless steel screen connected to a 0.125-inch diameter continuous stainless steel riser tubing extending to the ground surface. A sand pack was placed in the annular space from approximately six inches below to six inches above each stainless steel screen. Hydrated bentonite chip seals were placed between individual vapor monitoring port sand pack intervals. The remaining annular space was filled with hydrated bentonite chips to the ground surface and completed at the surface with a flush-mounted protective cover. The stainless steel tubes from each individual sampling port were capped with a Swagelok® stainless steel reducer and plug (as shown in the center of the photograph below). The vapor monitoring port construction logs are provided in **Appendix F**.

Vapor Monitoring Port Development

The VMPs were developed prior to sampling. During development, a volume of air equal to three times the volume of the sand pack and the vapor port was purged from each vapor monitoring port using a peristaltic pump at a rate of no greater than 2 L/min.

Soil vapors were discharged to the atmosphere through an in-line charcoal filter. During development, discharged vapors were monitored for VOCs, carbon dioxide (CO_2), carbon monoxide (CO), hydrogen sulfide (H_2S), the lower explosive limit (LEL) and oxygen (O_2), with a PID and 4-gas monitor to ensure that the in-line charcoal filter was working properly. PID measurements were non-detect at 62 of the 64 locations and < 7 ppm in two locations.

The field crew also monitored for the presence of groundwater that may have potentially infiltrated the vapor port. Groundwater was not observed in any of the ports during VMP development activities.

Table G-1 in **Appendix G** documents the vapor monitoring port development.

Vapor Monitoring Port Sampling

VMP sampling activities were performed at each vapor monitoring port, except VMP-8-35.5[7] . The sampling was performed in accordance with a revised Standard Operating Procedure (SOP) No. 44 – Soil Vapor Purging and Sampling (see **Appendix G**). The SOP was revised based on various discussions and email correspondence with IEPA in September and October, 2009. The following provides a summary of the sampling procedures, based on the revised SOP.

1. Data pertaining to canister ID, start and finish time, and initial and final vacuum readings, purge volumes, and leak checks were recorded on the Soil Vapor Sampling – Canister Sampling Data field sheet, included as pages 1 through 5 of **Appendix G**. Data recorded in the field using portable field analyzers such as PIDs, multi-gas meters, and Dielectric Technologies MGD-2002 (Helium) field analyzer were recorded on the Soil Vapor Sampling – Tedlar Sampling Data field sheet, included as pages 6 through 10 of **Appendix G**.

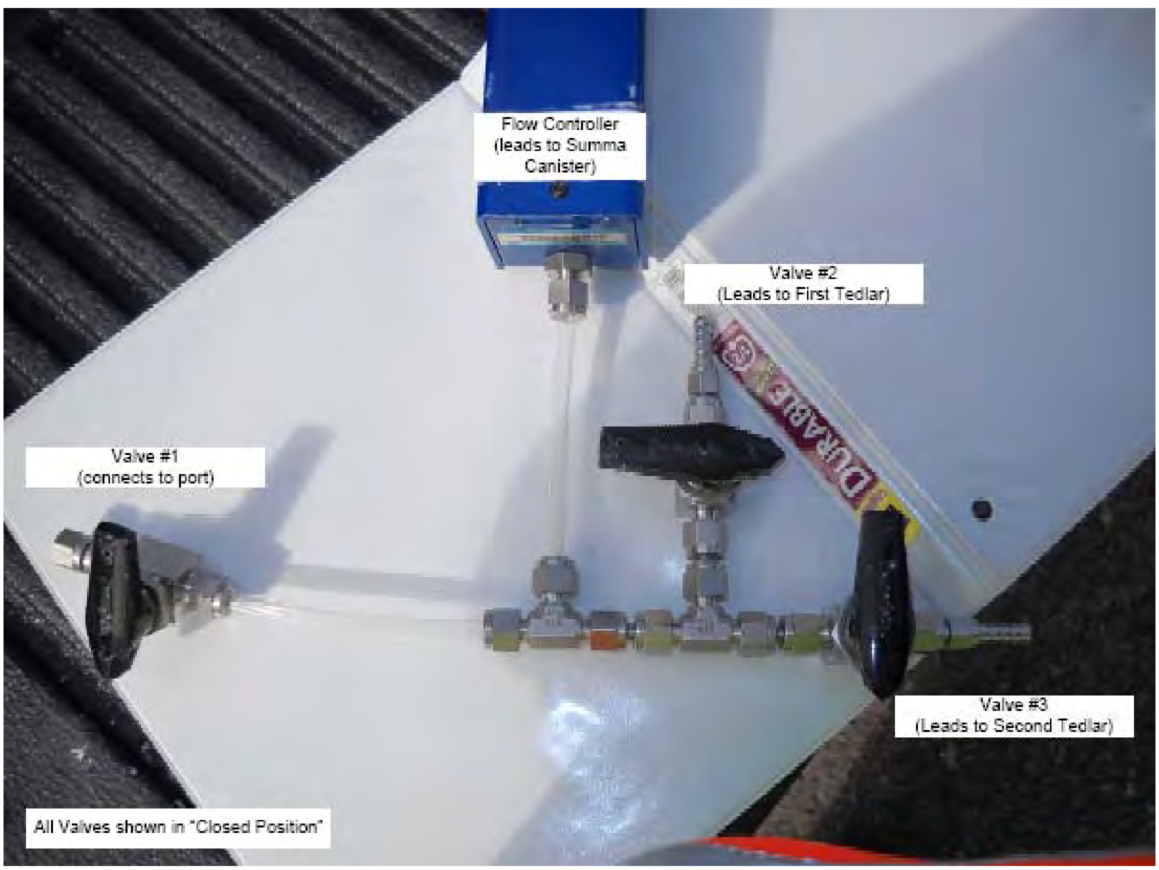
2. Prior to mobilizing to a vapor point, an initial Summa canister vacuum check was performed. A designated pressure gauge provided by the laboratory was attached to the Summa canister inlet. The Summa canister valve was opened completely. Pressure gauge reading was recorded as "Initial Vacuum Reading" on the Summa canister tag and the field sheet. This ensured that the canister showed a vacuum of approximately 28 inches of mercury (Hg). If the canister displayed a vacuum of less than 25 inches of Hg, the canister was discarded.

   In addition, prior to mobilization, each flow controller was subjected to an isolated vacuum check. This test was added due to the controllers and Summa canisters having the most frequently used connectors. As such they were more susceptible to leaking than other sections of the sample assembly. This was conducted by attaching a plug to one end of the controller and a barbed connector to the other. A 15 mL hand pump with a vacuum gauge was then attached to the barb. The hand pump evacuated the air inside the controller until a vacuum of at least 15 inches Hg was achieved. If the vacuum change over five minutes was equal or less than 0.5 in. Hg, the controller was considered acceptable for sampling use.

[7] During two separate attempts to sample VMP-8-35.5, it was found that the port would not allow for purging due to the possible presence of some form of obstruction inside the port.

3. Prior to sampling from a vapor port, each vapor point vault was opened to check the integrity of the individual soil vapor monitoring port(s). Each port was found to be closed with its plug in place.

   The sampling apparatus was assembled as shown in the figure that is part of SOP No. 44 in **Appendix G** (refer to photograph below). The Summa canister, Valve #1 and Valve #3 were kept in the "off" or "closed" position. Valve #2 was kept in the "open" position. The photograph below shows the various valves, etc. A 15 mL hand pump was attached to the sample train where indicated. Air from the sampling apparatus was withdrawn until a vacuum of at least 15 inches Hg was achieved. The induced vacuum was observed for at least five minutes. If the change in vacuum over five minutes was equal to or less than 0.5 inch Hg, the system leak rate was acceptable. If the change in vacuum over five minutes was greater than 0.5 inch Hg, the fittings and connections were checked, tightened or replaced and a second leak check was performed.



4. Once the vacuum check was completed, the Summa canister ID, initial vacuum, and flow controller ID were recorded on the sample tag and the field sheet. The Summa

canister sampling assembly was then attached to the vapor port through Valve #1 with a Swagelok® port connector. A clear plastic enclosure of approximately 100 L volume was placed over the assembled sample train connected to the port in order to isolate it from the atmosphere (as shown on the photograph on the next page). The enclosure had two small openings: one for introduction of tracer gas and one open to the atmosphere for pressure relief and access of a tracer gas monitoring device. The base of the enclosure was sealed around the base using hydrated bentonite. Helium tracer gas was introduced inside the plastic enclosure (near the VMP) to test the integrity of the probe seal and the above ground connections.

The helium gas was introduced to the enclosure at a steady rate until the atmosphere within the enclosure had a concentration of at least 10% more than an order of magnitude greater than the detection limit of the instrument used to monitor the tracer gas concentration (i.e., ≥275 ppm). The Helium concentration was measured using a portable field analyzer, a Dielectric Technologies MGD-2002. The readings were noted down on the above referenced field sheet as “Helium in Shroud 1”.

5. Once the helium atmosphere was established, Valves #1 and #2 were opened and three port volumes of air from the entire sample train were purged from the vapor port using a 15 mL hand pump

6. Following the purge, the first sample (field leak check sample), was collected in a tedlar bag via a peristaltic pump connected via Tygon tubing to Valve #2. A digital flow calibrator was used to adjust the flow of vapor to a rate less than or equal to 200 mL/min. The helium concentration in the Tedlar bag was then measured[8].

7. The second sample (laboratory sample) was collected via a Summa canister connected to the sample train as shown in the figure that is part of SOP No. 44 in **Appendix G**. Valve #2 was closed and the valve on the Summa canister was opened to commence sample collection and the start time was then recorded on the field sheet. During sampling, any time the flow control box read less than 10 inch Hg vacuum, the concentration of the Helium gas inside the enclosure was measured using the field analyzer. The readings were noted on the above referenced field sheet as “Helium in Shroud 2”. At the end of 30 minutes or when the gauge on the flow controller indicated 5 inch Hg and a minimum change of 15 Hg, the valve on the Summa canister was closed and the sample end time was recorded on the field sheet.

   A third sample (field parameters/fixed gases sample), was collected via Tedlar bag that was previously placed inside the helium filled enclosure and filled using a peristaltic pump and Tygon tubing attached to Valve #3. The Tedlar bag was filled at a rate no faster than 200 mL/min. Once filled, the seal around the enclosure was broken and the sample train disassembled. The third vapor sample was then screened in the field for total VOCs using a PID, for H_2S, LEL, CO and O_2 with a QRAE Plus meter, CO_2 with a MultiRAE IR meter, and the concentration of helium from the Tedlar bag was tested using the helium field analyzer. The screened parameters were recorded on the above referenced field sheets.

8. A Summa canister vacuum check was performed at the end of sample collection. The pressure gauge reading was recorded as “Final Vacuum Reading” on the Summa canister tag and the above referenced field sheet. The samples collected using the above procedures were shipped to the laboratory to be analyzed for VOCs, fixed gases, and helium.

[8] If the concentration of the tracer gas in the sample was ≤10% of the concentration of the helium in the enclosure, the sample was considered to be acceptable (this was the case for 85% of the sample locations).

Table 1 summarizes the vapor monitoring samples collected for chemical analysis. An appropriate number of field duplicates were collected to fulfill the QA/QC requirements. Additional information regarding sample preparation and shipment, and laboratory testing, is provided in **Section 2.11** of this report.

During the vapor monitoring point activities, equipment decontamination and IDW (e.g. soil cuttings, etc.) was managed appropriately. Additional information regarding decontamination protocols and IDW management is provided in **Section 2.10** of this report.

The field sampling sheets for this event are provided in **Appendix G** and the results of the work are discussed in **Section 3.5**.

Modifications/Additional Steps

If the concentration of the helium in the second Tedlar bag was ≥10% of the concentration of the helium in the enclosure, additional vapor was captured directly from the vapor port in the Tedlar bag via a peristaltic pump. Of the 63 vapor monitoring ports sampled, the concentration of the tracer gas in the Tedlar bag was >10% of the concentration of helium in the enclosure at 21 vapor monitoring ports. Therefore, an additional sample was collected directly from the vapor port without the enclosure at these vapor monitoring ports. If the concentration of helium from the direct port reading was still high, the results are most likely attributed to methane.

If the concentration of helium in the resample was low compared to the concentration of helium in the first and second Tedlar bag, the Summa canister used for sampling was discarded due to helium leak and the vapor port was resampled. During vapor sampling activity, it was noted that concentration of helium in the resample was low compared to the concentration of helium in the first and second Tedlar bag at VMP-16-5. Therefore, vapor port VMP-16-5 was resampled.

During vapor sampling activities, the equipment was monitored for water that may have potentially entered the port. Water entered VMP-14-4 during sampling activities, most likely attributed to recent rainfall. This condition was reevaluated four days later, when the vapor port was purged using a peristaltic pump. Once it was confirmed that no water had entered at the time of purging, VMP14-4 was sampled.

2.9 SURVEYING

A closed circuit survey of points associated with the field activities was conducted by EDI. The horizontal coordinates as well as the elevation were determined for each newly installed monitoring well and VMP, as well as for each investigation location that did not result in a permanent feature.

Each location was surveyed relative to Illinois State Plane Coordinates (NAD 83), while elevations were determined using 1988 US Geological Survey (USGS) datum.

The following general procedures were used for the survey:

- The top of the casing elevation and location were measured at each monitoring well. Typically, the measurement was taken on the north side of the well casing. Well casings were marked to indicate the measuring point. The ground surface elevation was also measured at each monitoring well.
- The location and elevation of each VMP were measured. Each VMP was completed flush with the surrounding ground surface. Therefore, the location and elevation of each VMP were taken from the center of the flush mount vault cover while the cover was closed.
- The ground surface location and elevation for the other investigation points were surveyed at the approximate location of the investigation point.

Survey data are summarized on relevant monitoring well completion logs, monitoring well construction summary tables, etc.

2.10 HEALTH & SAFETY, DECONTAMINATION, AND INVESTIGATION DERIVED WASTE

Health & Safety

Field personnel (URS and subcontractors) primarily wore U.S. Environmental Protection Agency (USEPA) Level D personal protective equipment (PPE). Modified Level D PPE (e.g., including Tyvek and face-shields) were used during decontamination efforts. In addition, field personal needed to upgrade to Level C (i.e., respiratory protection) to complete the installation of vapor monitoring points at VMP-4. In addition, work performed within the WRR was completed while wearing flame retardant clothing (FRCs).

A PID with a 10.2 electron volt (eV) probe and combustible gas indicator (CGI) were used during the field activities to monitor air quality for health and safety purposes. A Drager CMS Analyzer was used to specifically monitor for benzene. Field instruments were calibrated prior to each use in accordance with the manufacturer's specifications. Health and safety related information was primarily recorded in field logbooks. For work conducted on the WRR, COP personnel inspected the work areas and monitored the ambient air, as necessary prior to the issuance of daily work permits (in areas where required).

Prior to beginning site work, and at the start of work each day, a daily safety meeting was held. The purpose of this meeting was to discuss the day’s planned activities and to address any potential health and safety concerns. URS and subcontract employees attended these daily meetings.

Decontamination

Field personnel and equipment underwent decontamination procedures to ensure the health and safety of those present, to maintain sample integrity, and to minimize cross contamination between sampling locations.

Non-disposable/reusable sampling equipment (e.g., drilling equipment, groundwater pumps) was decontaminated prior to the collection of each analytical sample, between sample locations, and prior to leaving the site by washing with Alconox or LiquiNox and a distilled water rinse. For vapor sampling equipment, a 15 mL hand pump was attached to the sampling apparatus and air was pumped into the sampling apparatus to ensure that any dust particles or moisture inside the apparatus was removed.

Personnel and small equipment decontamination was performed at the sample locations. Drilling equipment was decontaminated prior to its use at subsequent sampling locations with a high-pressure hot water wash at a temporary decontamination pad at the Roxana Public Works Yard (for work conducted in the village) or a separate pad inside the WRR (for work inside the WRR).

Investigation Derived Waste (IDW)

IDW including soil cuttings, PPE, and expendable materials were collected and disposed of properly. Expendable materials (e.g., disposable sampling equipment, such as gloves and tubing) having a low probability of impact were collected in trash bags and disposed of as municipal waste.

Soil cuttings were collected and placed directly in labeled and sealed roll-offs for disposal. Soil cuttings generated from locations outside the WRR were staged in roll-offs at the Village of Roxana Public Works yard. Soil cuttings generated from locations inside the WRR were staged in a roll-off and managed by current site owner representatives on behalf of SOPUS.

Decontamination fluids and purged groundwater generated outside the WRR were collected and staged at the Village of Roxana Public Works yard in a 4,000-gallon double-wall polyethylene tank prior to disposal. Decontamination fluids generated from inside of the WRR were disposed through the refinery's National Pollutant Discharge Elimination System (NPDES)-permitted Wastewater Treatment Plant (WWTP).

Prior to disposal, the soil cuttings and purge water were sampled for waste characterization as part of the disposal profile process and the results are provided in **Appendix H**. The media were classified as non-hazardous waste.

Soil cutting were disposed of at the Waste Management, Inc. Milam Recycling and Disposal Facility (Milam) in Fairmont City, Illinois. Decontamination fluids and purged groundwater were also taken to Milam, solidified and landfilled.

2.11 SAMPLE HANDLING, LABORATORY TESTING AND DATA QUALITY REVIEW

Sample Handling

Sample containers were labeled with a sample ID number, site name, sampler initials, sample date and time, sample preservative, and the parameters that were to be analyzed. After sample collection, the samples were logged on a COC form, packaged to prevent damage during shipment, and cooled to 4°C (except vapor samples, which were not shipped on ice). The samples were then delivered, under the proper COC documentation, to the appropriate laboratory. Due to the potential flammable nature of the vapor in the Summa canisters, the soil vapor samples were shipped as hazardous materials according to applicable International Civil Aviation Organization (ICAO) regulations.

Laboratory Testing and Data Quality Review

The following test methods were utilized during this scope of work:

- VOCs via USEPA Method 8260B for soil and groundwater and USEPA TO-15 for soil vapor.
- SVOCs via USEPA Method 8260 for groundwater, and
- Fixed gases via Modified ASTM D-1946 for soil vapor.

Laboratory data were provided in electronic form. Analytical data were reviewed for quality and completeness, as described in the work plan. Data qualifiers were added, as appropriate, and are included on the data tables and the laboratory result pages. The Quality Assurance Report is included in **Appendix I**. Laboratory data reports along with data validation review sheets are also included in **Appendix I**.

A total of 59 groundwater samples (48 investigative samples, 5 field duplicates, 3 matrix spike/matrix spike duplicate (MS/MSD) pairs and 3 equipment blanks) were prepared and analyzed for combinations of VOCs and SVOCs. In addition, eight trip blanks (each consisting of a set of two 40-mL vials) were included in the coolers that contained samples for aqueous VOC analysis and were analyzed for VOCs.

For soil, a total of 22 samples (16 investigative, 4 field duplicates, 1 MS/MSD pair and 1 equipment blank) were prepared and analyzed for VOCs. In addition, one trip blank (consisting of a set of two 40-mL vials) was included in the cooler that contained soil samples for VOC analysis.

For vapor sampling, a total of 70 samples (63 investigative and 7 field duplicates) were prepared and analyzed for VOCs and fixed gases.

Evaluation of the groundwater analytical data followed procedures outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2008) and the Work Plan.

Based on the above-mentioned criteria, groundwater, soil, and soil vapor results reported for the analyses performed were accepted for their intended use. Acceptable levels of accuracy and precision, based on MS/MSD, laboratory control sample (LCS), surrogate and field duplicate data were achieved for these sample delivery groups (SDGs) to meet the project objectives. Completeness which is defined to be the percentage of analytical results which are judged to be valid, including estimated detect/nondetect (**J/UJ**) data was 100 percent.

2.12 DATA MANAGEMENT, ANALYSIS AND REPORTING

Data Management

Field data and documentation collected as part of this scope of work became part of the project file. URS maintains the files for the site, including relevant records, logs, field logbooks, pictures, subcontractor reports, data reviews, and the database management system.

The following documentation was completed and supplements the chain-of-custody records:

- Field logbooks and data
- Field sample collection sheets
- Photographs and drawings
- Soil boring and monitoring well construction logs
- Contractor and subcontractor reports
- Safety Documentation
- Correspondence.
-

Data Analysis/Reporting

URS worked with the laboratory to attain reporting limits to meet the project objectives for soil, groundwater, and soil vapor. The laboratory reporting limits meet the project objectives except where dilutions were necessary.

Analytical results for soil and groundwater were primarily compared to media screening tables in the latest version of the Tiered Approach to Corrective Action Objectives (TACO) rules (35 IAC Part 742 Appendix B). Additionally, and where screening criteria did not exist in the TACO tables, the *Chemicals Not in TACO Tier 1 Tables* (http://www.epa.state.il.us/land/taco/chemicals-not-in-taco-tier-1-tables.html) and the *Proposed Amendments to TACO* (dated September 2, 2008) screening levels were used.

2.13 RELATED ACTIVITIES

The following additional activities were conducted in order to address certain comments in the Agency's May 12, 2009 work plan approval letter:

- ***IEPA Comment 5 (d)-****As appropriate, select soil samples must be sent to a laboratory and properly classified in accordance with ASTM-D2487; this information will verify the visual classifications in the field.*
    - **URS Response-**In order to address Comment 5 (d), select samples were sent to TerraSense, LLC in Totowa, New Jersey for soil classification and classified in Accordance with ASTM-D-2487. The results of this work are presented in **Appendix J.** As demonstrated in the table in the appendix, the classifications in the field were comparable to those from the independent laboratory.
- ***IEPA Comment 14-****All available information related to petroleum pipelines near the western boundary of the refinery must be reviewed. A report documenting the results of the review must be submitted to Illinois EPA for review and approaval, including identification of: (1) the information reviewed; (2) the location of characteristics of any pipelines in the area; and (3) any reported releases from these pipelines.*
    - **URS Response-**In order to address Comment 14, available information related to petroleum pipelines near the western boundary of the refinery was reviewed and compiled in a figure presented in **Appendix K**.

This section summarizes our current understanding of the investigation site's geology/hydrogeology and the nature and extent of hydrocarbon impacts in the various media (e.g., soil, groundwater, and soil vapor) from releases. It also, primarily presents the results of the current investigation, but also incorporates relevant historical data to present a "Conceptual Model" of current conditions for the various media.

3.1 DESCRIPTION OF SITE AND SUBSURFACE CONDITIONS

The investigation area consists of a residential area in the Village of Roxana, the Public Works Yard for the Village, and the adjoining portions of the refinery. The surface topography in the Village is primarily grass covered with either concrete and/or chip and seal alleys and streets (see **Figure 2**). The surface in this portion of the refinery is primarily gravel covered.

3.1.1 Site Geology

The site is located approximately 0.7 miles east of the Mississippi River. The surface topography across the investigation area generally slopes downward to the west-southwest, with a total drop in elevation of approximately 15 feet across the area. The investigative site and surrounding area are located on a broad floodplain of the Mississippi River known as the American Bottoms. The geology at the site and its general vicinity were influenced by alluvial and glacial processes during the last 125,000 years. The floodplain deposits consist of recent alluvial (i.e., river) deposits overlying Pleistocene (i.e., Ice Age) glacial outwash. The recent alluvial deposits consist of heterogeneous sequences of sands, silts, and clays. The underlying deposits consist of sandy glacial outwash (more uniform sands and gravels) that extend to bedrock. The depth to bedrock in the area typically exceeds 100 feet.

The stratigraphy beneath the investigation area consists of the following materials, from top down:

- Fill - (mainly clay, some gravel and cinders, etc.) Primarily located under the WRR and extends from the surface to approximately 10 feet in depth; fill is located under a small portion of the Village of Roxana near the Public Works Yard.
- Clay - Primarily silty clay, present at the surface over most of the area west of Chaffer Street (i.e., beneath the residential portion of the Village) and extends to a depth of approximately 25 feet. The thickest clay sequence is located near the release area on the western side of Route 111. The thickness of clay underneath the Village of Roxana varies from five to seven feet. Throughout the investigation area the clay has intermittent layers of silt or sand (0 to 5 feet thick).
- Sand - Consisting of primarily fine to medium grained (which coarsens with depth).

Discontinuous lower permeability lenses of clay with some silt and sand are occasionally present starting at a depth of approximately 20 feet bgs. These lenses vary in thickness from a few feet up to 13 feet.

The depth to the top of the sand ranges between approximately 5 and 24 feet bgs. This unit was primarily explored to a depth of about 50 feet bgs.

Cross-section locations can be viewed in **Figure 4** and typical subsurface cross-sections are shown in **Figures 5** through **9**. The cross sections were primarily developed based on information provided on CPT logs and supplemented with logged borings. As described in **Section 2.13**, field soil classifications were comparable to those made in the laboratory, and confirm the CPT information.

3.1.2 Site Hydrogeology

The glacial outwash deposits (i.e., sands) underlying the area are the primary source for large volume water production in the area (e.g., industrial and municipal supply). Prior to development in the area, the natural movement of groundwater through the valley material was toward the west (toward the Mississippi River) (Schicht, 1965).

Since development in the area, groundwater pumping has significantly altered this pattern. Regional groundwater flow in the area is directed toward pumping centers, locally the WRR to the east and the BP former Wood River Refinery to the west.

The sand unit is currently water saturated below a depth of approximately 35 to 50 feet bgs (approximately elevation 404 to 402). For historical perspective, water levels have risen from about elevation 393 to about elevation 402 along the WRR west fenceline between first quarter 2007 and fourth quarter 2009.

Discontinuous lower permeability lenses of clay with some silt and sand are sometimes present starting at a depth of 20 feet bgs. The discontinuous nature of these lenses limits their ability to perch infiltrating water.

Two gauging events were completed on December 9, 2009 and January 6, 2010 to evaluate groundwater flow direction at the site. **Table 6** presents information from the gauging events along with monitoring well construction details for those monitoring wells gauged. **Figure 10** shows the groundwater potentiometric surface for the site, indicating groundwater flow toward the northeast, toward WRR pumping wells. In addition, water levels are also presented on the cross sections shown in **Figures 5** through **9**.

3.2 SOIL ANALYTICAL RESULTS

The laboratory analytical results for the soil samples collected during this investigation can be viewed in an "All Results Table" and/or the laboratory data included in **Appendix I**[9]. A tabular summary of the analytical detections is presented in **Table 7** and the BTEX results are also depicted in **Figure 11** of this report. A tabular summary of all soil analytical results is presented in **Table I-1** in **Appendix I**.

The following petroleum hydrocarbons were detected in soil during this investigation:

Benzene	tert-Butylbenzene (estimated BDL[10])
Ethylbenzene	Isopropylbenzene
Toluene	p-Isopropyltoluene
m,p-Xylenes	Methyl tert-Butyl Ether (estimated BDL)
o-Xylenes	n-Propylbenzene
n-Butylbenzene	1,2,4-Trimethylbenzene
sec-Butylbenzene	1,3,5-Trimethylbenzene

The analytical detections were compared with TACO Tier 1 soil remediation objectives (TACO industrial/commercial screening criteria), since impacts are either at depth (below any residential exposure) or along pipelines (where a construction worker exposure is more relevant). This comparison is also presented in **Table 7**.

The analytical results generally meet the screening criteria except for four constituents found in three borings inside the WRR: GP-7 at depths of 37 feet and 41 feet; GP-8 at a depth of 47 feet; and GP-9 at a depth of 18 feet.

- Analytical exceedances were observed at location GP-7 for benzene at depths of 37 feet and 41 feet, and for ethylbenzene at a depth of 41 feet. The soil component of the groundwater ingestion pathway screening criterion for benzene (0.03 mg/kg) was exceeded in the sample and duplicate at 37 feet (0.987 and 0.878 mg/kg, respectively). The industrial/commercial inhalation screening criterion for benzene (1.6 mg/kg) (and also the soil component of the groundwater ingestion pathway screening criterion (0.03 mg/kg)) was exceeded in the sample at 41 feet (2.18 mg/kg). The soil component of the groundwater ingestion pathway also exceeded the proposed screening criterion for ethylbenzene (12 mg/kg) in the 41 foot sample (12.8 mg/kg), however the current soil

[9] The "all results" tables present the results of investigative, duplicate, equipment blank and trip blank samples.
[10] Denotes estimated concentration(s) below detection limit (BDL).

component of the groundwater ingestion pathway screening criterion for benzene (13 mg/kg) was not exceeded.

- The soil component of the groundwater ingestion pathway screening criterion for benzene (0.03 mg/kg) was exceeded in the soil sample at GP-8 at a depth of 47 feet (1.48 mg/kg).
- The industrial/commercial inhalation screening criterion for benzene (1.6 mg/kg) (and also the soil component of the groundwater ingestion pathway screening criterion (0.03 mg/kg)) was exceeded in the soil sample at GP-9 at a depth of 18 feet (2.78 mg/kg). The current soil component of the groundwater ingestion pathway screening criteria for ethylbenzene and toluene (13 mg/kg and 12 mg/kg, respectively) (and by default proposed) were exceeded in this soil sample (60.6 mg/kg and 94.2 mg/kg, respectively). The soil component of the groundwater ingestion pathway screening criterion for 1,3,5-trimethylbenzene (10 mg/kg) was also exceeded in this soil sample (26.0 mg/kg).

Soil "Conceptual Model"

In addition to the current data, **Figure 11** also presents the soil results and screening of previous investigations (i.e., ConocoPhillips 2007, SOPUS 2009). The data tables from these investigations are also presented in **Appendix L**.

Figure 11 presents the results of the soil screening for soil data collected on WRR property and shows that locations inside of the refinery have exceedances of TACO criteria for some BTEX constituents.

The analytical results from soil previously collected outside of the refinery meet the industrial/commercial screening criteria except for benzene. Benzene concentrations exceeded the industrial/commercial ingestion screening criterion (100 mg/kg), and/or the industrial/commercial inhalation screening criterion (1.6 mg/kg), and/or the soil component of the groundwater ingestion pathway screening criterion (0.03 mg/kg) at:

- Boring B-2 at a depth of 41 feet (0.0927 mg/kg),
- Boring GP-7(II) at a depth of 19 feet (0.344 mg/kg and 0.795 mg/kg for sample and duplicate),
- ConocoPhillips boring B-3 at depths of 22 to 24 (21.9 mg/kg), and 34 to 36 feet (3.71 mg/kg), and
- ConocoPhillips boring B-5 at a depth of 38 to 40 feet (165 mg/kg).

In general, these exceedances in soil are limited to the area surrounding pipelines and/or at depths where impacts are likely related to residual groundwater impact. The results of samples collected in the 1986 benzene release area (GP-4) indicate low BTEX concentrations (below screening levels). Borings GP-3 and GP-5, once access is granted, should provide additional characterization of conditions in the release area.

3.3 LNAPL DISCUSSION

The results of the ROST™ investigation in the Village of Roxana and in the WRR are discussed in the sections below. A total of 30 current ROST™ soil probes were completed to characterize petroleum hydrocarbons in the subsurface of the WRR and potentially the Village of Roxana (**Figure 3**). The ROST™ logs generated during the investigation are presented in **Appendix C** of this report and a tabular summary of the ROST™ results is presented in **Tables 2** and **3**. In addition, some results of the ROST™ investigation are presented on the cross-sections (**Figures 5** through **9**).

The purpose of the ROST™ investigation was to compliment previous ROST™ work and monitoring well/piezometer gauging activities; to better understand LNAPL in the subsurface, specifically in the vicinity of Monitoring Well P-60; and to focus piezometer installation efforts.

3.3.1 Village of Roxana

ROST™ identified petroleum hydrocarbon impacts along Chaffer Street and other points in the Village of Roxana and are shown on the ROST™ print-outs in **Appendix C** and summarized in **Tables 2** and **3**. Some ROST™ responses in the Village of Roxana can be viewed on the cross sections in **Figures 5**, **6**, **8**, and **9**. ROST™ identified impacts were primarily diesel range hydrocarbons (green response) with some gasoline range hydrocarbons (blue response). The percent fluorescence indicated by the ROST™ unit ranged from non-detect to 122.74% (at ROST-4). Petroleum hydrocarbon impacts, where present, are generally limited to depths just above the water table (typically about 43 to 51 feet) and/or near the discontinuous clay (e.g., silty clay) lenses (typically about 20 to 33 feet).

Piezometers were installed at ROST-3 (ROST-3-PZ), ROST-4 (ROST-4-PZ), and ROST-7 (ROST-7-PZ) based on the percent fluorescence observed at these locations. The piezometers were installed to depths of 50 feet, 48 feet and 30 feet, respectively, each with a 10-foot screen.

These piezometers, as well as other piezometers and monitoring wells in the Village were gauged at various times during the investigation. LNAPL has not been measured in any of the monitoring wells or piezometers in the Village of Roxana between September 2009 and January 2010.

3.3.2 Wood River Refinery

ROST™ identified petroleum hydrocarbon impacts primarily along the WRR North Property west fenceline and in the vicinity of Monitoring Well P-60 are shown on the ROST™ print-outs in **Appendix C** and summarized on **Tables 2** and **3**. Some ROST™ responses in the WRR can be viewed on the cross sections in **Figures 7** through **9**. ROST™ identified impacts were primarily diesel range hydrocarbons (green response) and gasoline range hydrocarbons (blue response) with some heavy-end hydrocarbons (yellow response). The percent fluorescence indicated by the ROST™ unit ranged from non-detect to 218.68% (at ROST-17). A piezometer was not installed at this location based on the ROST™ response from a neighboring ROST™ location (ROST-9) in the Village of Roxana and the low PID readings in a corresponding soil boring (VMP-4). Petroleum hydrocarbon impacts, where present, are generally limited to depths just above the water table (typically about 39 to 51 feet) and the shallow less permeable lenses (typically about 10 to 30 feet).

A single piezometer was installed at Location GP-9/ROST-18 (GP-9-PZ) and two piezometers were installed at ROST-29 (P-60-13S and P-60-13) based on the percent fluorescence observed at these two locations. Piezometer GP-9-PZ was installed to a depth of 47.60 feet bgs, with a screen length of 10 feet. Product has not been observed in the GP-9-PZ piezometer since its installation. The two piezometers at ROST-29 were installed to depths of 20 feet and 60 feet bgs, respectively, with screens lengths of 10-feet and 20-feet, respectively. Product has not been observed in the P-60-13S piezometer since its installation. Product has been observed in the P-60-13 piezometer with thicknesses of up to about 0.81 feet.

Various gauging events of the URS piezometers and WRR monitoring wells were performed prior to and during this investigation. **Table 5** shows the product thicknesses found in the piezometers during this investigation and **Table 6** shows the product thicknesses found in the monitoring wells during this investigation. LNAPL has been encountered periodically in various monitoring wells and piezometers in the refinery along the west fenceline of the North Property as depicted on **Figure 12**.

Monitoring Well P-60 has exhibited LNAPL over the years and has been actively recovered, most consistently beginning in May 2008 and continuing to the present. Since it was suspected that Monitoring Well P-60 was compromised, it was plugged and abandoned in 2006, and a new replacement monitoring well was installed (also called P-60). Product was still present after the installation of the P-60; therefore it is believed that the product is indicative of LNAPL present on the water table. A Xitech Instruments Inc. (Xitech) ADJ 200 Smart Skimmer pump system was installed in Monitoring Well P-60 to recover free product. Product depth and thickness are being monitored and recorded on a weekly basis. Based on these measurements and along with consultation with Xitech, the depth to pump, cycles per day, and run-time per cycle are periodically being adjusted to optimize operation of the unit. The unit recovers approximately one-half to one gallon of product a day, when fluid levels are within the screened interval.

Since the system was installed in May 2008, approximately 170 gallons of product have been recovered. The product thicknesses measured in P-60 has decreased from an average of approximately 7 feet (2008) to approximately 2 feet during 2009. It appears that the current efforts are successfully decreasing the amount of LNAPL which has historically been present in the vicinity of P-60. The system is being maintained in accordance with an IEPA letter dated April 21, 2009.

3.4 GROUNDWATER ANALYTICAL RESULTS

The laboratory analytical results for the groundwater samples collected during this investigation can be viewed in an "All Results Table" and/or the laboratory data included in **Appendix I**. A tabular summary of the analytical detections is presented in **Table 8** and the locations of analytical exceedances are depicted on **Figure 13**. A tabular summary of all groundwater analytical results is presented in **Table I-2** in **Appendix I**.

The following petroleum hydrocarbons were detected in groundwater during this investigation:

Benzene
Ethylbenzene
Toluene
m,p-Xylenes
o-Xylenes
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
Chlorobenzene (estimated BDL)
Isopropylbenzene
p-Isopropyltoluene (estimated BDL)
Methyl tert-Butyl Ether
n-Propylbenzene
Styrene (estimated BDL)
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Acenaphthene (estimated BDL)
Dibenzofuran
Diethyl phthalate (estimated BDL)
2,4-Dimethylphenol (estimated BDL)
Fluorene (estimated BDL)
2-Methylnaphthalene
2-Methylphenol
3-Methylphenol & 4-Methylphenol
Naphthalene
Phenanthrene
Phenol

The analytical detections were compared with the Class 1 groundwater remediation objectives outlined in the TACO rules[11]. This comparison is also presented in **Table 8** and on **Figure 13**.

The analytical results for organics generally meet the groundwater screening criteria except for exceedances of benzene, ethylbenzene, toluene, 2-methylnaphthalene, 3- & 4- methylphenol, naphthalene, and phenol.

- The groundwater screening criterion for benzene (0.005 mg/L) was exceeded at 12 of the 24 profiling locations (with concentrations ranging from 0.0137 to 16.3 mg/L) and both of the samples from the new Monitoring Wells MW-7 (684 mg/L) and MW-8 (1,130 and 1,010 mg/L(duplicate)).
- The groundwater screening criterion for ethylbenzene (0.7 mg/L) was exceeded at 8 of the 24 profiling locations (with concentrations ranging from 1.02 to 3.20 mg/L).
- The groundwater screening criterion for toluene (1.0 mg/L) was exceeded at 3 of the 24 profiling locations (with concentrations ranging from 1.54 to 24.6 mg/L).
- There is no current groundwater screening criterion for 2-methylnaphthalene. The proposed groundwater screening criterion for 2-methylnaphthalene (0.028 mg/L) was exceeded at 6 of the 24 profiling locations (with concentrations ranging from 0.035 to 0.321 mg/L).
- The groundwater screening criterion for 3- and 4-methylphenol (0.035 mg/L) was exceeded in the sample from groundwater profile location GWP-7 at a depth of 50 feet (0.042 mg/L).
- The groundwater screening criterion for naphthalene (0.14 mg/L) was exceeded at 7 of the 24 profiling locations (with concentrations ranging from 0.146 to 0.294 mg/L).
- The groundwater screening criterion for phenol (0.1 mg/L) was exceeded in the sample from Monitoring Well MW-8 (0.124 mg/L).

Groundwater "Conceptual Model"

In addition to the current data, **Figure 13** also presents the groundwater results and screening of previous investigations (ConocoPhillips, 2007; SOPUS, 2009A; SOPUS, 2009B). The data tables from these investigations are also presented in **Appendix L**.

[11] While groundwater data were screened to Class I groundwater remediation objectives, the groundwater ordinance enacted by the Village of Roxana prevents exposure to impacted groundwater.

The analytical results from groundwater collected generally meet the TACO Class 1 screening criteria except for the analytes previously described.

Figure 13 depicts two distinct groundwater plumes, a dissolved benzene plume located primarily beneath the Public Works yard and a dissolved phase hydrocarbon plume located further north beneath the WRR and extending approximately 200 feet west into the Village.

The dissolved benzene plume is generally bound by the intersection of Roxana and Route 111 to the southwest, Monitoring Well MW-6 to the southeast, and the alleyway between Sixth and Seventh Streets to the north (Monitoring Well MW-2). Cumulative analytical information indicates the highest benzene concentrations generally in a pie-shaped band on the order of 200-400 feet wide, extending between the 1986 benzene release location and the refinery. The pie-shaped area of impact widens closer to the refinery, consistent with groundwater flow toward pumping centers on the WRR North and Main properties (refer to **Figure 10**). Benzene concentrations in the pie-shaped area have been identified in the hundreds to approximately 1,100 part per million (ppm). Monitoring wells on the north and south sides of the pie-shaped area generally exhibit per billion (ppb) benzene concentrations.

The dissolved phase hydrocarbon plume is generally bound by the alley between Sixth and Seventh Street to the south and Second Street to the north. The cumulative data indicate groundwater impact by petroleum constituents generally in close proximity to the WRR west fenceline. Inside the WRR, dissolved phase concentrations quickly decrease to ppb levels north of Monitoring Well P-60, and are non-detect (ND) in monitoring wells north of P-55 (i.e., T-1, T-13).

3.5 SOIL VAPOR ANALYTICAL RESULTS

The laboratory analytical results for the soil vapor samples collected during this investigation can be viewed in **Appendix I.** A tabular summary of the volatile organic analytical detections is presented in **Table 9**[12] and a tabular summary of the natural or fixed gas detections is presented in **Table 10**. The results for benzene in soil vapor are depicted in **Figures 14** and **15**. A tabular summary of all the soil vapor analytical results is presented in **Table I-3** in **Appendix I**.

[12] Data from soil vapor samples were originally planned to be evaluated using IEPA's proposed amendments to TACO for soil gas, however due to the retraction of the amendments during this scope of work this screening was not performed.

The following analytes were detected in soil vapor during this investigation:

Benzene	Ethanol
Ethylbenzene	4-Ethyltoluene
Toluene	Heptane
m,p-Xylenes	Hexane
o-Xylenes	Isopropylbenzene
Acetone	2-Propanol
1,3-Butadiene	n-Propylbenzene
2-Butanone	1,2,4-Trimethylbenzene
Carbon Disulfide	1,3,5-Trimethylbenzene
Cyclohexane	2,2,4-Trimethylpentane

Soil Vapor "Conceptual Model"

The source of soil vapor is impacted groundwater, as depicted in comparing the groundwater impacts shown on **Figure 13** and the vapor impacts on **Figure 15**. **Figure 15** also clearly shows how the hydrocarbon vapors diffuse upwards through the soil, so as expected the highest concentrations are at depth and decrease closer to the surface.

At most locations, oxygen is present in the shallow depths and little or no aromatic hydrocarbons (e.g., BTEX). The aliphatic hydrocarbons (i.e., hexane, heptane, cyclohexane, and 2,2,4-trimethylpentane) are attenuated to a lesser extent as the vapors move upward. Carbon dioxide (i.e., biogas) levels are relatively high throughout the soil column at many locations suggesting that degradation of petroleum hydrocarbons has occurred via aerobic biodegradation.

For vapor intrusion, the primary concern with the soil gas is contact with building slabs. So, the elevated hydrocarbon levels at greater depths are not directly significant.

Village of Roxana

For evaluation of potential migration into slab-on-grade structures, data from a depth of five feet were evaluated. Benzene concentrations from locations within the Village of Roxana range from ND to 5.8 mg/m^3 (VMP-6-5) for the samples from five feet bgs. For evaluation of potential migration into structures with basements, data from a depth of ten feet below grade were evaluated. Benzene concentrations from locations within the Village of Roxana range from ND to 6.4 mg/m^3 (VMP-6-10) for the samples collected from approximately 10 feet bgs.

Public Works Yard

Benzene concentrations from locations within the Public Works Yard ranged from 0.02 mg/m^3 (VMP-10-5) to 5,900 mg/m^3 (VMP-13-5) for the samples from five feet bgs for evaluation of potential migration into slab-on-grade structures.

URS conducted a subsurface investigation on behalf of SOPUS in the Village of Roxana and a limited portion of the WRR. The following conclusions are based on the data collected as part of this work plan, as integrated with the results from previous site work.

Soil

- Subsurface conditions generally consist of a variable thickness of surficial fill and lower permeability soils (e.g., clay, silt, clayey sand) underlain by sands to the depths explored. The maximum thickness of lower permeability soils, up to 25 feet, occurs to the west and southwest, near the intersection of Rand Avenue and Route 111. This material thins toward the east, coincident with the rise in surface topography, and is approximately 0 to 5 feet thick beneath the rest of the investigation area.
- The analytical results from this and previous investigations indicate the following:
    - Soil sample results collected from within the Village of Roxana proper are below TACO criteria, as are the results for soil samples from the 1986 release area. The exception being that benzene concentrations exceed TACO criteria for some soil borings located in the Public Works Property and in soils collected from a limited area surrounding pipelines and/or at depths where impacts are likely related to residual groundwater impact.
    - Soil samples collected from inside the WRR property have exceedances of TACO criteria for some BTEX constituents (benzene, toluene, ethylbenzene, xylenes), which can be expected given the long history of petroleum refining in the area. Soils from inside the WRR, while they have exceedances of TACO criteria, pose little risk due to existing refinery procedures which govern safe excavation and construction activities, including the selection and use of appropriate PPE and site specific training.

LNAPL

- The LNAPL portion of the investigation indicated that LNAPL was not found in the monitoring locations in the Village of Roxana. In addition, the LNAPL present in the WRR along the west fenceline appears to be most consistently present in the area of Monitoring Well P-60. It appears that the current recovery efforts are having a positive effect, decreasing the amount of LNAPL which has historically been present in the vicinity of P-60.

Groundwater

- Groundwater occurs at depths varying from approximately 35 to 50 feet bgs in the areas investigated, as a result of the change in surface elevation. This corresponds to a groundwater elevation of approximately 404 to 402 feet, from west to east. Groundwater elevations are as much as 10 feet higher than in 2007, reflecting the above average precipitation the past few years. The groundwater contours show a clear northeastern gradient toward WRR pumping centers.
- The cumulative analytical information (i.e., including the 2007 and 2008 data) depicts two distinct groundwater plumes, a dissolved benzene plume located primarily beneath the Public Works yard and a dissolved phase hydrocarbon plume located in the refinery and extending west into the Village a short distance.

  Cumulative analytical information indicates the highest benzene concentrations generally in a pie-shaped area on the order of 200 to 400 feet wide, extending between the 1986 benzene release location and the refinery. The pie-shaped area of impact widens closer to the refinery, consistent with groundwater flow toward pumping centers on the WRR North and Main properties. Benzene concentrations in the pie-shaped area have been identified in the hundreds to approximately 1,100 ppm. Monitoring wells on the north and south sides of this pie-shaped area exhibit low ppb benzene concentrations.

  The area in which groundwater exceeds Class I screening criteria is generally in close proximity to the WRR west fenceline, with all but one exceedance being located off Chaffer Street. Inside the WRR, dissolved phase concentrations quickly decrease to ppb levels north of Monitoring Well P-60, and are ND in monitoring wells north of P-55 (i.e., T-1, T-13).

  Groundwater pumping from the WRR has a significant impact on the flow/containment of impacted groundwater at the investigation site. Groundwater pumping by the WRR is part of their refinery water production process, as well as a Part B permit requirement of SOPUS, with a current minimum 3,000 gallons per minute. In addition, the Village of Roxana enacted a groundwater ordinance acceptable to IEPA that prohibits the installation and use of private potable water supply wells, further preventing potential exposure to impacted groundwater.

Soil Vapor

- Soil vapor samples were collected from 16 locations and 63 ports. Many of these locations coincided with areas of maximum groundwater impact. The hydrocarbon vapors diffuse and biodegrade upwards through the soil, so as expected the highest concentrations are at depth and decrease closer to the surface.

  For vapor intrusion, the primary concern with the soil gas concentrations is contact with building slabs (slab-on-grade or structures with basements). So, the elevated hydrocarbon levels at greater depths are not directly significant in this area (i.e., >15 feet bgs).

  Within the Village of Roxana, benzene concentrations range from ND to low ppm in the upper 10 feet of the shallow subsurface.

  Within the Public Works Yard, benzene concentrations range from ND to hundreds of ppm in the upper five feet of the shallow subsurface.

The results of this investigation indicate the following significant conclusions:

- Soil exposure does not pose a risk, except with respect to construction workers along the pipeline corridor. These potential risks are managed via safe work procedures.
- No LNAPL product has been measured in the village.
- Exposure to groundwater does not pose a risk. Only a limited area of groundwater in the Village exceeds Class I screening criteria. The groundwater ordinance prevents exposure via prohibition on water wells. The use of production water, and Part B permit-required pumping at the WRR has a significant impact on the capture and treatment of groundwater in the area.
- Soil vapors do not appear to pose a risk; however two specific areas-will be further evaluated.

As a result of this work and previous investigations, SOPUS recommends the following additional work and actions:

Soil

- Borings GP-3 and GP-5 will be drilled once access is obtained from the Village of Hartford.

LNAPL

- Existing piezometers in the Village of Roxana will continue to be gauged periodically to evaluate the absence or presence of LNAPL. The LNAPL in Monitoring Well P-60 will continue to be collected using the existing remediation system.
- A four-inch diameter monitoring well will be installed at the location of Piezometer P-60-11 (located approximately 100 feet north of P-60) to allow for product recovery and we will assess the feasibility of installing an automated recovery system.

Groundwater

- Groundwater data will be collected at Locations GWP-3 and GWP-5 once access is obtained from Hartford. The results of this work will be used to refine the monitoring well network previously submitted to IEPA on September 16, 2009.
- The monitoring locations in Roxana will be gauged in conjunction with the WRR groundwater monitoring program (i.e., quarterly). This will continue to build the groundwater data set to account for seasonal fluctuations.
- SOPUS and COP are continuing to evaluate maintenance needs for the refinery groundwater production wells. This process began in mid 2009. Currently, one water production well is heavily silted and scheduled for replacement. This and similar projects will help maintain and strengthen the inward gradient.

Soil Vapor

- A shallow sampling port (~10 feet) will be installed at Location VMP-3 to assess potential vapors at this depth (existing ports are at 5 and 22 feet). The proposed depth is optimal to determine if there is a potential vapor issue with structures that have a basement in the area.
- A shallow sampling port (~5 feet) will be installed near the building located at the northeast corner of the Village of Roxana Public Works Yard. The proposed depth is the ideal depth to determine if there is a potential vapor issue with the subslab construction of this structure.
- Soil vapor sampling will be conducted using industry-accepted guidance and standards.

The activities described above are currently in queue and the results of the work will be presented along with a revised “Conclusions and Recommendations” in a brief letter report. The letter report will be submitted approximately three months after the final data collection. This submittal is expected in second quarter 2010.

ConocoPhillips Company, 2007 (ConocoPhillips, 2007); *Subsurface Investigation Report on #1 and #4 Dock Lines*; Prepared by ATC Associates Inc.; dated April 24, 2007.

Illinois Environmental Protection Agency (IEPA); Notice of Violation L-2008-01134 letter; Issued to Shell Oil Products U.S. (SOPUS); dated May 2, 2008.

Illinois Environmental Protection Agency (IEPA); Letter providing comments but not approving the SOPUS, 2008 work plan; Issued to Shell Oil Products US (SOPUS); dated November 25, 2008.

Illinois Environmental Protection Agency (IEPA); Letter providing approval with comments and modifications of the SOPUS, 2009B work plan; Issued to Shell Oil Products US (SOPUS); dated May 12, 2009.

Schicht, R.J., 1965 (Schicht, 1965); *Groundwater Development in the East St. Louis Area, Illinois*; Illinois State Water Survey Report of Investigation 51.

Shell Oil Products US (SOPUS) and WRB Refining LLC - Wood River Refinery (WRB-WRR), 2007 (SOPUS/WRB-WRR, 2007); *West Fenceline P-93 Dissolved Phase Benzene Investigation Report – Roxana, Illinois*; Prepared by URS Corporation (URS); dated September 2007.

Shell Oil Products US (SOPUS), 2008 (SOPUS, 2008); *Dissolved Phase Groundwater Investigation Work Plan – Roxana, Illinois*; Prepared by URS Corporation (URS); dated September 5, 2008.

Shell Oil Products US (SOPUS), 2009 (SOPUS, 2009A); *Subsurface Investigation – Route 111/Rand Avenue Vicinity Investigation – Roxana, Illinois*; Prepared by URS Corporation (URS); dated January 21, 2009.

Shell Oil Products US (SOPUS), 2009 (SOPUS, 2009B); *Dissolved Phase Groundwater Investigation and P-60 Free Phase Product Delineation Work Plan – Roxana, Illinois*; Prepared by URS Corporation (URS); dated January 21, 2009.

Shell Oil Products US (SOPUS); Water Well Survey; Issued to Illinois Environmental Protection Agency (IEPA); dated July 8, 2009.

Shell Oil Products US (SOPUS); Letter responding comments and modifications in IEPA May 12, 2009 letter; Issued to Illinois Environmental Protection Agency (IEPA); dated June 23, 2009.

URS Corporation (URS), 2008 (URS, 2008); *Route 111/Rand Avenue Vicinity Investigation Health and Safety Plan – Roxana, Illinois*; dated May 2008.

URS Corporation (URS), 2009 (URS, 2009); *ConocoPhillips Environmental and Geotechnical Work 2009 Health and Safety Plan – WRB Refining LLC Wood River Refinery*; dated March 2009.

US Environmental Protection Agency (USEPA), 2008; Contract Laboratory Program National Functional Guidelines for Organic Methods Data Review.

TABLE 1
FIELD ACTIVITY SUMMARY

SEE LAST PAGE OF TABLE FOR NOTES.

Sample Location	Location ID	Investigation Method	Date Completed	Activity/Analysis Completed	Notes	Date Developed
GROUNDWATER PROFILING						
Primary Transect	GWP-1	Groundwater Profile	7/27/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	No SVOC exceedances of GQSs	N/A
Primary Transect	GWP-2	Groundwater Profile	7/28/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	No SVOC exceedances of GQSs	N/A
Primary Transect	GWP-3	Groundwater Profile	7/28/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	SVOC exceedance of GQSs in both samples	N/A
Primary Transect	GWP-4	Groundwater Profile	7/29/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	No SVOC exceedances of GQSs	N/A
Primary Transect	GWP-5	Groundwater Profile	7/30/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	SVOC exceedance of GQSs in both samples	N/A
Primary Transect	GWP-6	Groundwater Profile	7/29/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	SVOC exceedance of GQSs in both samples	N/A
Primary Transect	GWP-7	Groundwater Profile	7/30/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	SVOC exceedance of GQSs in 50' sample; No SVOC exceedance of GQSs in 58' sample	N/A
Primary Transect	GWP-8	Groundwater Profile	7/31/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	SVOC exceedance of GQSs in both samples	N/A
Primary Transect	GWP-9	Groundwater Profile	8/3/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	No SVOC exceedance of GQSs in 50' sample; SVOC exceedance of GQSs in 58' sample	N/A
Primary Transect	GWP-10	Groundwater Profile	8/3/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	No SVOC exceedance of GQSs in 50' sample; SVOC exceedance of GQSs in 58' sample	N/A
Secondary Transect	GWP-11	Groundwater Profile	8/6/2009	2 GW samples (50 and 58 ft bgs); VOC only for both samples	No SVOC exceedance of GQSs to the east so no SVOC analysis.	N/A
Secondary Transect	GWP-12	Groundwater Profile	8/4/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	No SVOC exceedances of GQSs	N/A
Secondary Transect	GWP-13	Groundwater Profile	8/5/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	No SVOC exceedance of GQSs in 50' sample; SVOC exceedance of GQSs in 58' sample	N/A
Secondary Transect	GWP-14	Groundwater Profile	8/5/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for 50' sample; VOC only for 58' sample	No SVOC exceedances of GQSs; No SVOC exceedance of GQSs at 58' bgs to the east so no SVOC analysis	N/A
Secondary Transect	GWP-15	Groundwater Profile	8/6/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	No SVOC exceedances of GQSs	N/A
Tertiary Transect	GWP-16	Groundwater Profile	8/7/2009	2 GW samples (50 and 58 ft bgs); VOC only for both samples	No SVOC exceedance of GQSs to the east so no SVOC analysis.	N/A
Tertiary Transect	GWP-17	Groundwater Profile	8/10/2009	2 GW samples (50 and 58 ft bgs); VOC only for both samples	No SVOC exceedance of GQSs to the east so no SVOC analysis.	N/A
Tertiary Transect	GWP-18	Groundwater Profile	8/11/2009	2 GW samples (50 and 58 ft bgs); VOC & SVOC for both samples	No SVOC exceedances of GQSs	N/A
Tertiary Transect	GWP-19	Groundwater Profile	8/12/2009	2 GW samples (50 and 58 ft bgs); VOC only for both samples	No SVOC exceedance of GQSs to the east so no SVOC analysis.	N/A
Tertiary Transect	GWP-20	Groundwater Profile	8/12/2009	2 GW samples (50 and 58 ft bgs); VOC only for both samples	No SVOC exceedance of GQSs to the east so no SVOC analysis.	N/A
North of 1986 Release	GWP-21	Groundwater Profile	9/3/2009	2 GW samples (34 and 42 ft bgs); VOC & SVOC for both samples	No SVOC exceedances of GQSs	N/A
SOIL SAMPLING						
Near 1986 Release	GP-1	Direct Push Soil Boring	9/2/2009	Soil Logging; VOC Sample @ 22.5 ft / 31 ft bgs; Sudan Test @ 23.5 ft / 27 ft / 31.5 ft / 33 ft bgs	GWP sample (VOC & SVOC) at 34' and 42' bgs	N/A
Near 1986 Release	GP-2	Direct Push Soil Boring	8/31/2009	Soil Logging; VOC Sample @ 17 ft / 23.5 ft bgs; Sudan Test @ 17 ft / 23.5 ft / 35 ft bgs		N/A
Near 1986 Release	GP-3	Direct Push Soil Boring			Access Agreement Pending	N/A

TABLE 1
FIELD ACTIVITY SUMMARY

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Sample Location	Location ID	Investigation Method	Date Completed	Activity/Analysis Completed	Notes	Date Developed
Near 1986 Release	GP-4	Direct Push Soil Boring	8/31/2009	Soil Logging; VOC Sample @ 11 ft / 22.5 ft / 33 ft bgs; Sudan Test @ 11 ft / 23.5 ft / 33 ft bgs	GWP sample (VOC & SVOC) at 34' and 42' bgs	N/A
Near 1986 Release	GP-5	Direct Push Soil Boring			Access Agreement Pending	N/A
WRR - Main Property	*GP-6*	*Direct Push Soil Boring*	*NO BORING. LITHOLOGIC INFORMATION AT THIS LOCATION WAS OBTAINED FROM BORING FOR VMP-16 INSTALLATION.*			
WRR - North Property	*GP-7*	*Direct Push Soil Boring*	*8/26/2009*	*Soil Logging; VOC Sample @ 25 ft / 37 ft / 41 ft bgs; Sudan Test @ 25 ft / 36.5 ft / 39 ft / 43 ft bgs*		*N/A*
WRR - North Property	*GP-8*	*Direct Push Soil Boring*	*8/26/2009*	*Soil Logging; VOC Sample @ 13 ft / 35 ft / 47 ft bgs; Sudan Test @ 13 ft / 35 ft / 47 ft bgs*		*N/A*
WRR - North Property	*GP-9*	*Direct Push Soil Boring*	*8/25/2009*	*Soil Logging; VOC Sample @ 18 ft / 37 ft bgs; Sudan Test @ 12 ft / 18 ft / 23 ft / 31 ft / 37 ft / 44 ft*	*Piezometer GP-9-PZ installed (48 ft bgs w/ 10 ft screen)*	*N/A*
Alley North of Second Street	*GP-10*	*Direct Push Soil Boring*	*8/24/2009*	*Soil Logging*		*N/A*
Alley North of Third Street	*GP-11*	*Direct Push Soil Boring*	*8/24/2009*	*Soil Logging*		*N/A*
Alley North of Sixth Street	*GP-12*	*Direct Push Soil Boring*	*8/25/2009*	*Soil Logging*		*N/A*
CPT / ROST						
Chaffer Street	ROST-1	ROST / CPT	8/26/2009	ROST / CPT		N/A
Third Street	ROST-2	ROST / CPT	8/27/2009	ROST / CPT		N/A
Third Street	ROST-3	ROST / CPT	8/27/2009	ROST / CPT	Piezometer installed (ROST-3-PZ @ 50' bgs w/ 10' screen)	N/A
Chaffer Street	ROST-4	ROST / CPT	8/25/2009	ROST / CPT	Piezometer installed (ROST-4-PZ @ 48' bgs w/ 10' screen)	N/A
Chaffer Street	ROST-5	ROST / CPT	8/25/2009	ROST / CPT		N/A
Fourth Street	ROST-6	ROST / CPT	8/28/2009	ROST / CPT		N/A
Fourth Street	ROST-7	ROST / CPT	8/28/2009	ROST / CPT	Piezometer installed (ROST-7-PZ @ 30' bgs w/ 10' screen)	N/A
Chaffer Street	ROST-8	ROST / CPT	8/26/2009	ROST / CPT		N/A
Chaffer Street	ROST-9	ROST / CPT	8/26/2009	ROST / CPT		N/A
Chaffer Street	ROST-10	ROST / CPT	8/26/2009	ROST / CPT		N/A
WRR - North Property	ROST-11	ROST / CPT	8/24/2009	ROST / CPT		N/A
WRR - North Property	ROST-12	ROST / CPT	8/24/2009	ROST / CPT		N/A
WRR - North Property	ROST-13	ROST / CPT	8/25/2009	ROST / CPT		N/A
WRR - North Property	ROST-14	ROST / CPT	8/25/2009	ROST / CPT		N/A
WRR - North Property	ROST-15	ROST / CPT	8/25/2009	ROST / CPT		N/A
WRR - North Property	ROST-16	ROST / CPT	8/25/2009	ROST / CPT		N/A
WRR - North Property	ROST-17	ROST / CPT	8/25/2009	ROST / CPT		N/A

TABLE 1
FIELD ACTIVITY SUMMARY

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Sample Location	Location ID	Investigation Method	Date Completed	Activity/Analysis Completed	Notes	Date Developed
WRR - North Property	ROST-18	ROST / CPT	8/25/2009	ROST / CPT		N/A
Alley North of Fourth Street	ROST-19	ROST / CPT	8/26/2009	ROST / CPT		N/A
Alley North of Fourth Street	ROST-20	ROST / CPT	8/26/2009	ROST / CPT		N/A
Chaffer Street	ROST-21	ROST / CPT	8/26/2009	ROST / CPT		N/A
Chaffer Street	ROST-22	ROST / CPT	8/26/2009	ROST / CPT		N/A
Alley North of Second Street	*ROST-23*	ROST / CPT	*8/28/2009*	ROST / CPT		*N/A*
Alley North of Sixth Street	*ROST-24*	ROST / CPT	*8/28/2009*	ROST / CPT		*N/A*
Alley North of Eighth Street	*ROST-25*	ROST / CPT	*8/27/2009*	ROST / CPT		*N/A*
WRR - North Property	*ROST-26*	ROST / CPT	*8/27/2009*	ROST / CPT		*N/A*
WRR - North Property	*ROST-27*	ROST / CPT	*8/27/2009*	ROST / CPT		*N/A*
WRR - North Property	*ROST-28*	ROST / CPT	*8/27/2009*	ROST / CPT		*N/A*
WRR - North Property	*ROST-29*	ROST / CPT	*8/27/2009*	ROST / CPT	*2 piezometers installed (P-60-13 @ 60' bgs w/ 20' screen; P-60-13S @ 20' bgs w/ 10' screen)*	*N/A*
Alley North of Third Street	*ROST-30*	ROST / CPT	*8/28/2009*	ROST / CPT		*N/A*
MONITORING WELL INSTALLATION, GAUGING, & SAMPLING						
Village of Roxana Public Works	B-7	Monitoring Well Installation/Sampling	Installed 7/9/2009 Sampled 10/23/2009	Soil Logging; PID Headspace; 2" monitoring well installed; Low Flow Sampling; Sampled for VOC & SVOC	Well ID is MW-7	10/12/2009
Village of Roxana Public Works	B-8	Monitoring Well Installation/Sampling	Installed 7/6/2009 Sampled 10/23/2009	Soil Logging; PID Headspace; 2" monitoring well installed; Low Flow Sampling; Sampled for VOC & SVOC	Well ID is MW-8	10/9/2009
VAPOR MONITORING POINT INSTALLATION & SAMPLING						
Second Street	VMP-1	Vapor Monitoring Point Installation	Installed 7/31/2009 Sampled 11/2/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 8.5', 23.5', 38.5'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/5/2009
Alley North of Third Street	VMP-2	Vapor Monitoring Point Installation	Installed 7/28/2009 Sampled 11/2-3/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 8.5', 22', 42'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/5/2009
Alley North of Fourth Street	VMP-3	Vapor Monitoring Point Installation	Installed 7/29-31/2009 Sampled 11/3-4/2009	Soil Logging/Headspace; 3 soil vapor ports installed together (5', 31.5', 39'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium	1 soil vapor port installed in adjacent borehole (22')	10/7/2009
Alley North of Fifth Street	VMP-4	Vapor Monitoring Point Installation	Installed 8/3/2009 Sampled 11/5/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 12', 23.5', 39'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium	Upgrade to Level C PPE required	10/7/2009
Alley North of Sixth Street	VMP-5	Vapor Monitoring Point Installation	Installed 8/4/2009 Sampled 11/5-6/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 12.5', 31', 40'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/9/2009
Alley North of Seventh Street	VMP-6	Vapor Monitoring Point Installation	Installed 8/5/2009 Sampled 11/6-9/2006	Soil Logging/Headspace; 4 soil vapor ports installed (5', 10', 31.5', 39'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/9/2009

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Sample Location	Location ID	Investigation Method	Date Completed	Activity/Analysis Completed	Notes	Date Developed
Seventh Street	VMP-7	Vapor Monitoring Point Installation	Installed 8/10/2009 Sampled 11/9/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 13.5', 29.5', 38'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/13/2009
Alley North of Eighth Street	VMP-8	Vapor Monitoring Point Installation	Installed 8/12/2009 Sampled 11/10/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 9.5', 23.5', 35.5'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium	VMP-8-35.5 was unable to be sampled due to inability to purge.	10/13/2009
Alley North of Eighth Street	VMP-9	Vapor Monitoring Point Installation	Installed 8/11/2009 Sampled 11/10-11/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 11.5', 25.5', 38.5'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/15/2009
Village of Roxana Public Works	VMP-10	Vapor Monitoring Point Installation	Installed 7/13/2009 Sampled 11/11-13/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 10', 20', 30'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/15/2009
Village of Roxana Public Works	VMP-11	Vapor Monitoring Point Installation	Installed 7/10/2009 Sampled 11/17-18/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 8', 29', 38'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/16/2009
WRR - North Property	VMP-12	Vapor Monitoring Point Installation	Installed 7/24/2009 Sampled 11/13/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 11.5', 25', 39'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/14/2009
Village of Roxana Public Works	VMP-13	Vapor Monitoring Point Installation	Installed 7/15/2009 Sampled 11/16-17/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 10.5', 21.5', 29.5'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/16/2009
Village of Roxana Public Works	VMP-14	Vapor Monitoring Point Installation	Installed 7/14/2009 Sampled 11/16/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 11.5', 20', 29'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium	VMP-14-5 was resampled on 11/19/2009 due the presence of water during first attempt.	10/19/2009
WRR - Frontage Road	VMP-15	Vapor Monitoring Point Installation	Installed 7/20/2009 Sampled 11/18-19/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 21.5', 25.5', 29'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium		10/16/2009
WRR - Main Property	VMP-16	Vapor Monitoring Point Installation	Installed 7/22/2009 Sampled 11/19/2009	Soil Logging/Headspace; 4 soil vapor ports installed (5', 13.5', 19', 31'); 4 ports sampled, each for Modified TO-15 & ASTM D-1946 + Helium	VMP-16-5 was resampled on 11/20/2009 due to failure of helium leak check in the field.	10/15/2009

NOTES:

1) GQS - Groundwater Quality Standard

2) Locations added by URS after agency approval of the work plan are in italics.

TABLE 2
ROST/CPT RESPONSE SUMMARY

SEE LAST PAGE OF TABLE FOR NOTES.

ROST Location	Date Conducted	Stratigraphy*	Top of Stratum (ft bgs)	Bottom of Stratum (ft bgs)	End of Boring (ft bgs)	ROST Response Interval (ft bgs)	ROST Response** (% Flourescence)	Interpretation	Response Color
ROST-1	8/26/2009	air-knifed	0.0	5.0	47.35	0 - 47.35		background	
		clayey silt with sand	5.0	8.0					
		silty sand to sand	8.0	36.0					
		sand with clay and silt zones	36.0	46.5					
ROST-2	8/27/2009	air-knifed	0.0	5.0	47.36	0 - 47.36		background	
		silty clay with sand	5.0	7.0					
		sand to silty sand	7.0	27.0					
		sandy silt to clayey silt	27.0	32.0					
		sand with clayey silt and sandy silt zones	32.0	46.3					
ROST-3	8/27/2009	air-knifed	0.0	5.0	48.18	46 - 48	44	predominantly gas/diesel mix	blue-green
		sand to silty sand	5.0	25.0					
		zones of silty sand and silty clay	25.0	30.0					
		sand with zones of silty sand	30.0	44.8					
ROST-4	8/25/2009	air-knifed	0.0	5.0	49.33	43 - 46.5	123	predominantly diesel	green
		sand with zones of silty sand	5.0	40.0					
		sand with zones of clayey silt to silty clay	40.0	46.1					
ROST-5	8/25/2009	air-knifed	0.0	5.0	47.37	23 - 24	34	predominantly diesel	green
		clay to clayey silt to silty clay	5.0	8.1		32 - 33.5	37	predominantly diesel, some gas to mix	green to blue-green
		silty sand to sandy silt	8.1	23.1					
		sandy silty to clayey silt	23.1	32.0					
		(clay seam)	32.0	33.0					
		sand to silty sand	33.0	45.5					
ROST-6	8/28/2009	air-knifed	0.0	5.0	50.30	0 - 50.30		background	
		sandy silt to clayey silt to silty clay to clay	5.0	7.4					
		sand with zones of silty sand to sandy silt	7.4	38.7					
ROST-7	8/28/2009	air-knifed	0.0	5.0	50.30	22.5 - 26.5	50	predominantly gas/diesel mix	blue-green
		silty sand to sandy silt with clayey silt zones	5.0	18.3		27 - 29.5	14	predominantly diesel (some gas)	green
		sand with silty sand zones	18.3	47.4					
ROST-8	8/26/2009	air-knifed	0.0	5.0	51.52	34.5 - 37	48	predominantly gas, some diesel	blue-green
		clay to silty clay	5.0	6.9		48 - 48.5	6	predominantly gas, some diesel	blue-green
		sand and silty sand to sandy silt	6.9	39.3					
		(clay seam)	39.3	40.0					
		sand	40.0	40.2					
ROST-9	8/26/2009	air-knifed	0.0	5.0	47.30	20 - 22	19	predominantly gas, some diesel	blue-green
		sandy silt to clayey silt to silty clay to clay	5.0	7.5					
		sand to silty sand	7.5	30.3					
ROST-10	8/26/2009	air-knifed	0.0	5.0	51.41	49.5 - 50.5	14	predominantly diesel	green
		silty sand to sandy silt (some clayey silt to silty clay)	5.0	11.8					
		sand to silty sand	11.8	20.0					
		clayey silty to silty clay to clay	20.0	29.6					
		sand to silty sand	29.6	47.1					
ROST-11	8/24/2009	air-knifed	0.0	10.0	47.28	36 - 37	10	predominantly gas/diesel mix	blue-green
		clay to clayey silt to sandy silt	10.0	14.3		42.5 - 43	29	predominantly gas	blue
		sand to sandy silt	14.3	41.3					
		(clay seam)	41.3	41.4					
		(clay seam)	42.7	43.0					
		(clay seam)	43.9	44.3					
		sand	45.7						

TABLE 2
ROST/CPT RESPONSE SUMMARY

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ROST Location	Date Conducted	Stratigraphy*	Top of Stratum (ft bgs)	Bottom of Stratum (ft bgs)	End of Boring (ft bgs)	ROST Response Interval (ft bgs)	ROST Response** (% Flourescence)	Interpretation	Response Color
ROST-12	8/24/2009	air-knifed	0.0	10.0	47.30	44 - 46	191	predominantly gas/diesel mix	blue-green
		silty sand to sandy silt (with sand zones)	10.0	36.8					
		clay to clayey silt (with sand zones)	36.8	43.9					
ROST-13	8/25/2009	air-knifed	0.0	10.0	47.39	10 - 11	22	predominantly diesel	green
		sand to silty sand	10.0	16.3		13.5 - 35	54	predominantly diesel	green
		sand	16.3	32.5		40 - 46	159	predominantly diesel	green
		sand to silty sand	32.5	42.5					
ROST-14	8/25/2009	air-knifed	0.0	10.0	47.30	9.5 - 12.5	11	predominantly gas	blue
		sand to silty sand	10.0	32.3		12.5 - 25	72	predominantly diesel, some gas	green
		(clay seam)	32.3	32.8		42 - 42.5	70	predominantly diesel, some gas	green
		sand to silty sand	32.8	42.3					
ROST-15	8/25/2009	air-knifed	0.0	10.0	47.32	12 - 13.5	52	predominantly gas/diesel mix	blue-green
		sand to silty sand to sandy silt (some clayey silt to silty clay)	10.0	20.7					
		(clay seam)	20.7	21.3					
		sand to silty sand	21.3	34.1					
ROST-16	8/25/2009	air-knifed	0.0	10.0	48.78	13.5 - 22.5	22	predominantly gas, some diesel to mix	blue to blue-green
		silty sand to sandy silt	10.0	12.9		23.5 - 30	54	predominantly gas, some diesel to mix	blue to blue-green
		sand to silty sand	12.9	36.3		32.5 - 35	57	predominantly gas, some diesel to mix	blue to blue-green
ROST-17	8/25/2009	air-knifed	0.0	10.0	45.57	8.5 - 13	113	predominantly gas/diesel mix	blue-green
		sand to silty sand	10.0	13.2		13 - 19.5	219	predominantly diesel, some gas	green
		sand	13.2	17.9		20.5 - 25	70	predominantly gas/diesel mix	blue-green
		silty clay to clay	17.9	22.1					
		sand	22.1	42.9					
ROST-18	8/25/2009	air-knifed	0.0	10.0	46.66	10 - 12.5	20	predominantly diesel	green
		sandy silt to clayey silt to silty clay	10.0	11.4		17.5 - 19.5	28	predominantly diesel, some gas	green
		sand to silty sand	11.4	34.1		22 - 24.5	29	predominantly diesel, some gas	green
		(clay seam)	34.1	34.5					
		sand	34.5	46.6					
ROST-19	8/26/2009	air-knifed	0.0	5.0	47.39	0 - 47.39		background	
		sandy silt to clayey silt to silty clay to clay	5.0	7.0					
		sand to silty sand to sandy silt	7.0	16.6					
		sandy silt to clayey silt to silty clay to clay	16.6	19.3					
		sand to silty sand to sandy silt	19.3	23.9					
		clayey silt to silty clay to clay	23.9	41.8					
ROST-20	8/26/2009	air-knifed	0.0	5.0	47.56	0 - 47.56		background	
		sandy silt to clayey silt to silty clay to clay	5.0	6.9					
		sand to silty sand to sandy silt	6.9	31.6					
		sandy silty to clayey silt to silty clay to clay (some sand to silty sand)	31.6	41.0					
		sand	41.0	47.5					
ROST-21	8/26/2009	air-knifed	0.0	5.0	47.32	8.5 - 13.5	23	predominantly diesel, some gas	blue-green
		sandy silty to clayey silt to silty clay	5.0	8.3		14.5 - 16	24	predominantly diesel, some gas	blue-green
		silty sand to sandy silt to sand	8.3	20.0		19 - 25	25	predominantly diesel and gas mix	blue-green
		clayey silt to silty clay to sandy silt	20.0	35.0					
		sand to sandy silt	35.0	47.0					
ROST-22	8/26/2009	air-knifed	0.0	5.0	50.76	20 - 22.5	20	predominantly diesel, some gas mix	blue-green
		silty sand to sandy silt to sand	5.0	19.3		28 - 31	26	predonimnantly diesel and gas mix	blue
		sandy silt to clayey silt to silty clay to clay	19.3	24.0					
		sand to slity sand	24.0	50.0					

TABLE 2
ROST/CPT RESPONSE SUMMARY

SEE LAST PAGE OF TABLE FOR NOTES.

ROST Location	Date Conducted	Stratigraphy*	Top of Stratum (ft bgs)	Bottom of Stratum (ft bgs)	End of Boring (ft bgs)	ROST Response Interval (ft bgs)	ROST Response** (% Flourescence)	Interpretation	Response Color
ROST-23	8/28/2009	air-knifed	0.0	5.0	50.30	0 - 50.30		background	
		silty clay to clay (some sandy silt)	5.0	9.0					
		sand to silty sand to sandy silt	9.0	48.0					
		clay to clayey silt to sandy silt	48.0	50.0					
ROST-24	8/28/2009	air-knifed	0.0	5.0	51.32	0 - 51.32		background	
		silty clay to clay (some sandy silt)	5.0	8.1					
		silty sand to sandy silt	8.1	18.0					
		sandy silt to clayey silt	18.0	20.0					
		sand to silty sand	20.0	51.0					
ROST-25	8/28/2009	air-knifed	0.0	5.0	50.31	0 - 50.31		background	
		clay to sandy silt	5.0	6.3					
		sand to silty sand to sandy silt	6.3	50.0					
ROST-26	8/27/2009	air-knifed	0.0	10.0	50.36	8.5 - 22.5	78	predominantly heavy end/diesel mix	yellow-green
		silty sand to sandy silt to clayey silt to silty clay	10.0	12.4		23 - 25	13	predominantly diesel	green
		sand	12.4	21.3		48.5 - 50.36	11	predominantly diesel, some gas	green
		silty sand to sandy silt to clayey silt to silty clay	21.3	23.5					
		sand	23.5	50.0					
ROST-27	8/27/2009	air-knifed	0.0	10.0	50.37	10.5 - 17.5	46	predominantly heavy end/diesel mix	yellow-green
		sand to silty sand	10.0	11.5		19 - 28.5	43	predominantly gas/diesel mix	blue-green
		silty sand to sandy silt to clayey silt to silty clay to clay	11.5	12.5		29 - 50.37	44	predominantly gas/diesel mix	blue-green
		sand to silty sand to sandy silt	12.5	22.0					
		sand	22.0	50.0					
ROST-28	8/27/2009	air-knifed	0.0	10.0	50.32	6 - 18.5	126	predominantly diesel, some heavy end and gas	yellow-blue-green
		silty sand to sandy silty to clayey silt	10.0	12.0		35 - 41	43	predominantly diesel, some heavy end and gas	yellow-blue-green
		sand to silty sand	12.0	21.0		45 - 50	36	predominantly diesel, some heavy end and gas	yellow-blue-green
		silty sand to sandy silt to clayey silt	21.0	23.0					
		sand to silty sand	23.0	27.0					
		clay to silty clay to sandy silt	27.0	28.0					
		sand to silty sand	28.0	31.0					
		sandy silty to clayey silt to silty clay to clay	31.0	33.0					
		sand to silty sand	33.0	36.0					
		sandy silty to clayey silt to silty clay to clay	36.0	37.0					
		sand to silty sand	37.0	50.0					
ROST-29	8/27/2009	air-knifed	0.0	10.0	50.35	10.5 - 17.5	116	predominantly heavy end	yellow/red
		sand to silty sand	10.0	17.0		17.5 - 32.5	82	predominantly diesel, some gas	green
		silty sand to sandy silt to clayey silt to silty clay	17.0	20.0		34.5 - 37	15	predominantly diesel, some gas	green
		sand	20.0	41.0		39 - 41.5	17	predominantly diesel, some gas	green
		sandy silt to clay	41.0	42.0		42.5 - 46.5	130	predominantly diesel, some gas	green
		sand to silty clay to silty sand	42.0	49.0					
ROST-30	8/28/2009	air-knifed	0.0	5.0	51.30	0 - 51.30		background	
		clayey silt to silty clay to clay	5.0	7.0					
		silty sand to sandy silt	6.7	19.0					
		sand to silty sand silty clay	19.0	39.0					
		clay	39.0	40.0					
		silty sand to sandy silty to clayey silt to silty clay to clay	40.0	50.0					

NOTES:

1) * Soil descriptions listed are based on CPT information.

2) ** ROST^{TM} Response is the maximum % Fluorescence observed at each interval on the ROST^{TM} logs.

3) The bottom of boring shown above is the bottom of the CPT boring, which extends 1.25' deeper than the ROST^{TM} sensor.

TABLE 3
FIELD METHODS CORRELATION TABLE

SEE LAST PAGE OF TABLE FOR NOTES.

Depth (ft bgs)	VMP-2 PID (ppm)	ROST-1 % Fluor.	VMP-3 PID (ppm)	ROST-5 % Fluor.	VMP-4 PID (ppm)	ROST-9 % Fluor.	VMP-5 PID (ppm)	ROST-10 % Fluor.	GP-10 PID (ppm)	ROST-23 % Fluor.	GP-11 PID (ppm)	ROST-2 % Fluor.	GP-12 PID (ppm)	ROST-24 % Fluor.	ROST-11 % Fluor.	GP-7 PID (ppm)	GP-7 Sudan Kit	GP-7 VOC Results (mg/kg)
1																		
2																		
3																		
4																		
5																		
6	1.8		0.2		77.0		20.1											
7									6.3		0.4		8.8					
8	2.9		6.9		122		16.2											
9									7.6		3.2		6.8					
10	2.3		16.3		79.6		11.9											
11									7.2		3.1		7.4			43.9		
12	3.9		16.9		116		107											
13									6.2		4.5		7.0			36.7		
14	3.8		9.5		117		334											
15									6.0		2.5		6.1			28.9		
16	10.8		35.8		58.1		338											
17									5.2		6.1		0.9			27.4		
18	13.0		16.9		297		77.7											
19									4.3		5.1		7.7			41.3		
20	22.7		5.3		526	19	61.0											
21									7.5		3.9		9.4			19.3		
22	22.7		1071		9648		13.1											
23				34					7.2		3.5		7.3			7.9		
24	8.0		387		401		11.8											
25									5.0		2.9		9.7			127		0.012
26	3.5		117		1279		108											
27									7.2		4.7		8.0			21.3		
28	7.4		45.2		1277		22.4											
29									5.5		5.2		12.1			69.7		
30	16.6		81.9		1210		93.3											
31									7.8		3.6		9.3			33.1		
32	12.4		525	37	957		659											
33									6.5		15.9		9.1			54.6		
34	28.0		57.1		1263		70.5											
35									7.0		8.0		10.8			552		
36	4.1		184		1642		715								10		PINK	
37									6.4		10.4		8.0			1519		47.608
38	105		345		1379		675											
39									5.0		6.8		6.8			1700	WHITE	
40	44.5		693		733		469											
41									7.3		16.7		10.4			46.2		100.382
42	7.8		187		121		1545											
43									7.6		54.8		9.0		29	40.0	WHITE	
44	89.3		793		1018		1149											
45									4.9				9.3					
46	86.4		863				450											
47									3.9				8.1					
48	780																	
49																		
50								14										
51																		
52																		
53																		

TABLE 3
FIELD METHODS CORRELATION TABLE

Depth (ft bgs)	ROST-15	GP-8			ROST-18	GP-9			GP-1			GP-2			GP-4		
	% Fluor.	PID (ppm)	Sudan Kit	VOC Results (mg/kg)	% Fluor.	PID (ppm)	Sudan Kit	VOC Results (mg/kg)	PID (ppm)	Sudan Kit	VOC Results (mg/kg)	PID (ppm)	Sudan Kit	VOC Results (mg/kg)	PID (ppm)	Sudan Kit	VOC Results (mg/kg)
1																	
2																	
3																	
4												3.2			1.1		
5																	
6												2.8					
7									3.8						1.2		
8												2.7					
9									6.1								
10												3.7					
11		72.0			20	1982			2.4						18.0	WHITE	0.038
12	52						RED					3.2					
13		445	WHITE	0.036		1267			3.7						3.0		
14												3.7					
15		331				1851			4.3						2.7		
16												4.0					
17		211				1808			5.1			7.8	WHITE	ND	3.0		
18					28		RED	548.74									
19		23.0				1704			4.9			5.1			4.0		
20																	
21		30.0				1663			5.5			7.5			3.1		
22											0.003						ND
23		28.0			29	1459	RED		4.9	WHITE		5.2	WHITE	ND	3.1	WHITE	
24																	
25		24.4				192			6.9			4.3			3.7		
26																	
27		60.9				185	WHITE		7.9	WHITE		3.3			3.8		
28																	
29		32.0				831			5.1			3.8			4.3		
30																	
31		16.9			46	1315	PINK/RED		5.3	WHITE	ND	4.0			4.0		
32																	
33		31.0				1511			9.2	WHITE		5.0			27.1	WHITE	0.005
34																	
35		124	PINK	0.02		1139			6.3			7.7	WHITE		20.1		
36																	
37		10.2				1233	PINK	3.561	6.0			4.6			9.4		
38																	
39		7.0			60	1217			7.1			4.5			12.1		
40																	
41		37.4				1387											
42																	
43		17.5				1250											
44							RED										
45		233				1187											
46																	
47		586	RED	8.412		1350											
48																	
49																	
50																	
51																	
52																	
53																	

NOTES:

1) **PID** - Organic vapor headspace measurements recorded using a MiniRAE 2000 PID with a 10.6 eV lamp.

2) **% Fluor.** - Value shown is the % fluorescence. Color shown matches the % fluorescence spike and waveform. Shading indicates no ROST response was observed above background values.

3) **Sudan Kit** - WHITE <500 ppm; PINK >500 ppm & <2500 ppm; RED >2500 ppm

4) **VOC Results** - Value shown is the sum of the detected analytical VOC constituents for that particular sample. ND = No Detections

TABLE 4
ORGANIC VAPOR HEADSPACE MEASUREMENTS

SEE LAST PAGE OF TABLE FOR NOTES.

	VAPOR MONITORING POINTS															
	VMP-1	**VMP-2**	**VMP-3**	**VMP-4**	**VMP-5**	**VMP-6**	**VMP-7**	**VMP-8**	**VMP-9**	**VMP-10**	**VMP-11**	**VMP-12**	**VMP-13**	**VMP-14**	**VMP-15**	**VMP-16**
DEPTH (ft bgs)	**PID Headspace (ppm)**															
5	2.0	1.8	0.2	77.0	20.1	6.7	3.3	1.1	2.3	0.0	0.0		5.2	0.0		
6																
7	4.0	2.9	6.9	122	16.2	13.8	4.7	2.1	1.7	0.1	0.1		6.4	0.0		
8		1.8								0.7				0.4		
9	4.2	2.3	16.3	79.6	11.9	47.8	7.1	2.0	1.8		0.0		8.9	51.1		
10						349				0.5		124	9.3		0.3	1473
11	NR	3.9	16.9	116	107	1285	3.4	2.4	2.4	0.4	0.0		58.0	1093		
12							4.7					315			0.6	469
13	1.0	3.8	9.5	117	334	264	5.8	3.3	2.3	0.4	0.0		64.9	1290		
14												439			1.0	30.3
15	3.4	3.8	5.5	58.1	338	987	4.0	3.8	6.2	0.6	0.0		59.1	4589		
16		10.8	35.8									639			4.1	875
17	1.5	13.0	16.9	297	77.7	1016	8.1	3.0	9.4	0.5	0.0		407	9999+		
18												653			5.6	1042
19	3.2	22.7	5.3	526	61.0	1248	13.6	2.6	4.4	0.1	0.0		472	9999+		
20					11.5							342				29.3
21	4.3	22.7	1071		13.1	1453	3.1	2.7	4.1	0.4	0.0		336	9999+	12.2	
22				9648	9.9							375			9.5	73.4
23	5.7	8.0	387	401	11.8	992	50.1	2.4	7.5	0.4	6.0		383	9999+		
24			144									880			33.4	29.9
25	4.0	3.5	117	1279	30.1	1267	4.8	4.0	7.5	0.2	0.0		1043	9999+		
26					108							606			20.2	39.6
27	5.1	7.4	45.2	1277	22.4	1103	3.9	1.2	16.8	0.1	256		112	9999+		
28												94.0			26.5	27.8
29	11.0	16.6	81.9	1210	47.9	1397	78.8	2.8	21.2	0.2	127		695	279		
30					93.3							673			55.9	59.1
31	99.3	12.4	525	957	659	2167	31.2	2.4	11.9	0.5	426		506	2692		
32												504			56.5	1870
33	76.1	28.0	57.1	1263	70.5	1658	54.7	2.7	15.6	36.9	687		1475	9580		
34												96.0			NR	1876
35	43.8	4.1	184	1642	715	630	32.8	2.0	22.4	970	594		B.O.B.	B.O.B.		
36												275			B.O.B.	1472
37	36.8	105	345	1379	675	605	98.5	2.0	6.4	B.O.B.	605					
38												416				B.O.B.
39	143	44.5	693	733	469	5102	114	3	48.6		428					
40												4458				
41	104	7.8	187	121	1545	3251	76.0	0.7	13.6		261					
42												4335				
43	213	89.3	793	1018	1149	397	27.0	B.O.B.	38.9		4103					
44							53.4					4142				
45	B.O.B.	86.4	863	B.O.B.	450	B.O.B.	B.O.B.		B.O.B.		B.O.B.					
46												B.O.B.				
47		780	B.O.B.		B.O.B.											
48																
49		B.O.B.														
50																
51																
52																
53																

TABLE 4
ORGANIC VAPOR HEADSPACE MEASUREMENTS

DEPTH (ft bgs)	MONITORING WELLS		SOIL SAMPLE LOCATIONS								
	MW-7 (B-7)	MW-8 (B-8)	GP-1	GP-2	GP-4	GP-7	GP-8	GP-9	GP-10	GP-11	GP-12
	PID Headspace (ppm)										
5	0.4	0.2		2.8							
6											
7	0.3	0.2	3.8	2.7	1.2				6.3	0.4	8.8
8											
9	0.3	0.1	6.1						7.6	3.2	6.8
10				3.7							
11	0.3	0.4	2.4		18.0	43.9	72.0	1982.0	7.2	3.1	7.4
12				3.2							
13	0.2	1.4	3.7		3.0	36.7	445	1267	6.2	4.5	7.0
14				3.7							
15	0.2	22.1	4.3		2.7	28.9	331	1851	6.0	2.5	6.1
16				4.0							
17	0.2	29.8	5.1	7.8	3.0	27.4	211	1808	5.2	6.1	0.9
18											
19	0.1	112	4.9	5.1	4.0	41.3	23.0	1704	4.3	5.1	7.7
20											
21	0.1	75.0	5.5	7.5	3.1	19.3	30.0	1663	7.5	3.9	9.4
22											
23	0.1	271	4.9	5.2	3.1	7.9	28.0	1459	7.2	3.5	7.3
24											
25	6.7	729	6.9	4.3	3.7	127	24.4	192	5.0	2.9	9.7
26											
27	17.8	1437	7.9	3.3	3.8	21.3	60.9	185	7.2	4.7	8.0
28											
29	19.2	1179	5.1	3.8	4.3	69.7	32.0	831	5.5	5.2	12.1
30											
31	84.7	4002	5.3	4.0	4.0	33.1	16.9	1315	7.8	3.6	9.3
32											
33	376	3439	9.2	5.0	27.1	54.6	31.0	1511	6.5	15.9	9.1
34											
35	229	491	6.3	7.7	20.1	552	124	1139	7.0	8.0	10.8
36											
37	16.9	B.O.B.	6.0	4.6	9.4	1519	10.2	1233	6.4	10.4	8.0
38											
39	351		7.1	4.5	12.1	1700	7.0	1217	5.0	6.8	6.8
40											
41	658		B.O.B.	B.O.B.	B.O.B.	46.2	37.4	1387	7.3	16.7	10.4
42											
43	2605					40.0	17.5	1250.0	7.6	54.8	9.0
44											
45	9999+					B.O.B.	233	1187	4.9	B.O.B.	9.3
46											
47	4958						586	1350	3.9		8.1
48											
49	3186						B.O.B.	B.O.B.	B.O.B.		B.O.B.
50											
51	1015										
52											
53	B.O.B.										

NOTES:

1) NR = Not Recorded
2) B.O.B. = Bottom of Boring
3) Organic vapor headspace measurements recorded using a MiniRAE 2000 with a 10.6 eV lamp

TABLE 5

PIEZOMETER COMPLETION SUMMARY AND NAPL GAUGING

														12/9/2009			1/6/2010		
Piezometer Identification	Location	Surface Completion	Casing Diameter (in)	Top of Casing Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Height Above Ground Surface (ft)	Total Well Depth (ft btoc)	Bottom of Well Elevation (ft MSL)	Installed Screened Interval (ft btoc)		Screened Interval Elevation (ft MSL)		Screen Length (ft)	Depth to Product (ft btoc)	Depth to Water (ft btoc)	Product Thickness (ft)	Depth to Product (ft btoc)	Depth to Water (ft btoc)	Product Thickness (ft)
ROST-3-PZ*	Village of Roxana	FM	1	442.29	442.62	-0.33	50.00	392.29	40.00	50.00	402.29	392.29	10.00	NE	42.27	NA	NE	40.31	NA
ROST-4-PZ*	Village of Roxana	FM	1	442.27	442.48	-0.21	48.00	394.27	38.00	48.00	404.27	394.27	10.00	NE	41.60	NA	NE	39.74	NA
ROST-7-PZ*	Village of Roxana	FM	1	442.19	442.53	-0.34	30.00	412.19	20.00	30.00	422.19	412.19	10.00	NE	24.55	NA	NE	23.35	NA
GP-9-PZ*	WRR - North Property	FM	1	442.41	442.71	-0.30	47.60	394.81	37.60	47.60	404.81	394.81	10.00	NE	40.70	NA	NE	40.31	NA
P-60-11	WRR - North Property	FM	0.75	443.39	443.70	-0.31	65.31	378.08	50.31	65.31	393.08	378.08	15.00	42.34	43.41	1.07	41.40	42.50	1.10
P-60-12S	WRR - North Property	FM	0.75	443.33	443.80	-0.47	23.84	419.49	13.84	23.84	429.49	419.49	10.00	22.29	22.71	0.42	21.55	21.90	0.35
P-60-12	WRR - North Property	FM	0.75	443.31	443.76	-0.45	70.00	373.31	60.00	70.00	383.31	373.31	10.00	NE	42.43	NA	NE	41.51	NA
P-60-13S*	WRR - North Property	FM	0.75		427.93		20.00		10.00	20.00			10.00	NE	17.23	NA	NE	17.17	NA
P-60-13*	WRR - North Property	FM	0.75		443.04		60.00		40.00	60.00			20.00	41.58	41.60	0.02	40.59	41.40	0.81

NOTES:

1) Piezometers ROST-3-PZ, ROST-4-PZ and ROST-7-PZ were installed on 9/3/2009; Piezometer GP-9-PZ was installed on 8/25/2009; Piezometers P-60-13S and P-60-13 were installed on 11/25/2009.
2) Elevations are relative to the 1988 USGS datum.
3) FM = Flush Mounted Surface Completion
4) NE = Not Encountered; NA = Not Applicable
5) The P-60-13S and P-60-13 piezometers were not surveyed.

TABLE 6

MONITORING WELL COMPLETION SUMMARY & GROUNDWATER GAUGING

Monitoring Well Identification	Location	Surface Completion	Well Diameter (in)	Top of Casing Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Height Above Ground Surface (ft)	Total Well Depth (ft btoc)	Bottom of Well Elevation (ft MSL)	Installed Screened Interval (ft btoc)		Screened Interval Elevation (ft MSL)		Screen Length (ft)	12/9/2009					1/6/2010				
														Depth to Product (ft btoc)	Depth to Water (ft btoc)	Product Thickness (ft)	Product/ Water Interface (ft MSL)	Corrected Water Elevation (ft MSL)	Depth to Product (ft btoc)	Depth to Water (ft btoc)	Product Thickness (ft)	Product/ Water Interface (ft MSL)	Corrected Water Elevation (ft MSL)
MW-1	Village of Roxana	FM	2	442.86	442.86	0.00	58.41	384.45	43.31	58.31	399.55	384.55	15.00	NE	40.74	NA	402.12	402.12	NE	40.18	NA	402.68	402.68
MW-2	Village of Roxana	FM	2	443.93	443.93	0.00	62.19	381.74	48.49	63.49	395.44	380.44	15.00	NE	42.07	NA	401.86	401.86	NE	41.35	NA	402.58	402.58
MW-3	Village of Roxana	FM	2	430.36	430.36	0.00	45.98	384.38	31.07	46.07	399.29	384.29	15.00	NE	27.81	NA	402.55	402.55	NE	27.27	NA	403.09	403.09
MW-4	Village of Roxana	FM	2	441.58	441.58	0.00	57.63	383.95	42.73	57.73	398.85	383.85	15.00	NE	39.17	NA	402.41	402.41	NE	38.57	NA	403.01	403.01
MW-5	Village of Roxana	FM	2	429.73	429.73	0.00	46.13	383.60	31.20	46.20	398.53	383.53	15.00	NE	27.11	NA	402.62	402.62	NG	NG	NA	NA	NA
MW-6	Village of Roxana	FM	2	432.42	432.42	0.00	46.98	385.44	35.00	50.00	397.42	382.42	15.00	NE	29.39	NA	403.03	403.03	NE	28.78	NA	403.64	403.64
MW-7*	Roxana Public Works	FM	2	443.10	443.46	-0.36	52.92	390.18	42.92	52.92	400.18	390.18	10.00	NE	40.78	NA	402.32	402.32	NE	40.12	NA	402.98	402.98
MW-8*	Roxana Public Works	FM	2	434.11	434.40	-0.29	43.60	390.51	33.50	43.60	400.61	390.51	10.00	NE	31.58	NA	402.53	402.53	NE	31.01	NA	403.10	403.10
P-52	Village of Roxana	SU	2	444.25	442.29	1.96	60.00	384.25	35.00	60.00	409.25	384.25	25.00	NG	NG	NA	NA	NA	NE	41.21	NA	403.04	403.04
P-53	Village of Roxana	SU	2	446.23	444.25	1.98	63.50	382.73	38.50	63.50	407.73	382.73	25.00	NG	NG	NA	NA	NA	NE	43.85	NA	402.38	402.38
P-54	Village of Roxana	FM	2	442.18	442.41	-0.23	63.00	379.18	38.00	63.00	404.18	379.18	25.00	NE	40.53	NA	401.65	401.65	NE	39.95	NA	402.23	402.23
P-55	WRR - North Property	SU	2	445.95	444.00	1.95	63.50	382.45	38.50	63.50	407.45	382.45	25.00	NE	44.89	NA	401.06	401.06	NE	44.07	NA	401.88	401.88
P-56	WRR - North Property	SU	2	446.02	444.34	1.68	63.50	382.52	38.50	63.50	407.52	382.52	25.00	NE	44.56	NA	401.46	401.46	NE	43.76	NA	402.26	402.26
P-57	WRR - North Property	SU	2	446.53	444.57	1.96	63.50	383.03	38.50	63.50	408.03	383.03	25.00	NE	44.54	NA	401.99	401.99	NE	43.80	NA	402.73	402.73
P-58	WRR - North Property	SU	2	444.92	443.20	1.71	63.50	381.42	38.50	63.50	406.42	381.42	25.00	NE	42.53	NA	402.39	402.39	NE	41.81	NA	403.11	403.11
P-59	WRR - North Property	SU	2	446.78	443.87	2.91	70.00	376.78	45.00	70.00	401.78	376.78	25.00	NE	45.46	NA	401.32	401.32	NE	44.64	NA	402.14	402.14
P-60	WRR - North Property	SU	2	446.57	443.61	2.97	65.00	381.57	45.00	65.00	401.57	381.57	20.00	45.51	45.92	0.41	400.65	400.96	44.68	44.84	0.16	401.73	401.85
P-61	WRR - North Property	SU	2	444.27	441.59	2.68	68.00	376.27	43.00	68.00	401.27	376.27	25.00	NG	NG	NA	NA	NA	42.42	42.65	0.23	401.62	401.79
P-62	WRR - North Property	SU	2	442.32	440.85	1.47	65.00	377.32	40.00	65.00	402.32	377.32	25.00	NG	NG	NA	NA	NA	40.54	42.41	1.87	399.91	401.30
P-66	WRR - North Property	SU	2	436.70	436.98	-0.28	60.00	376.70	35.00	60.00	401.70	376.70	25.00	NG	NG	NA	NA	NA	NE	33.38	NA	403.32	403.32
P-68	WRR - North Property	SU	4	445.07	441.81	3.26	67.00	378.07	42.00	67.00	403.07	378.07	25.00	NG	NG	NA	NA	NA	42.13	46.23	4.10	398.84	401.88
P-69	WRR - North Property	SU	4	443.18	440.86	2.32	63.50	379.68	38.50	63.50	404.68	379.68	25.00	NG	NG	NA	NA	NA	41.44	41.47	0.03	401.71	401.74
P-70	WRR - North Property	SU	4	442.83	441.16	1.67	68.00	374.83	43.00	68.00	399.83	374.83	25.00	NG	NG	NA	NA	NA	41.07	41.63	0.56	401.20	401.61
P-73	WRR - North Property	SU	4	443.76	442.17	1.59	65.00	378.76	40.00	65.00	403.76	378.76	25.00	NG	NG	NA	NA	NA	NE	41.17	NA	402.59	402.59
P-74	WRR - North Property	SU	4	442.63	441.20	1.43	68.00	374.63	43.00	68.00	399.63	374.63	25.00	NG	NG	NA	NA	NA	NE	40.71	NA	401.92	401.92
P-75	WRR - North Property	SU	4	446.32	444.19	2.13	66.00	380.32	41.00	66.00	405.32	380.32	25.00	NG	NG	NA	NA	NA	NE	42.96	NA	403.36	403.36
P-93A	WRR - North Property	SU	2	446.58	444.41	2.17	61.00	385.58	46.00	61.00	400.58	385.58	15.00	NE	44.47	NA	402.11	402.11	NE	43.73	NA	402.85	402.85
P-93B	WRR - North Property	SU	2	446.46	444.44	2.03	74.00	372.46	72.00	74.00	374.46	372.46	2.00	NE	44.38	NA	402.08	402.08	NE	43.63	NA	402.83	402.83
P-93C	WRR - North Property	SU	2	446.51	444.26	2.26	94.00	352.51	92.00	94.00	354.51	352.51	2.00	NE	44.41	NA	402.10	402.10	NE	43.67	NA	402.84	402.84
P-93D	WRR - North Property	SU	2	446.36	444.42	1.94	125.50	320.86	123.50	125.50	322.86	320.86	2.00	NE	44.30	NA	402.06	402.06	NE	43.58	NA	402.78	402.78
P-114	WRR - North Property	SU	2	432.41	429.73	2.67	50.00	382.41	30.00	50.00	402.41	382.41	20.00	NG	NG	NA	NA	NA	NE	28.46	NA	403.95	403.95
P-119	WRR - North Property	SU	2	431.92	430.26	1.66	44.00	387.92	28.07	44.00	403.85	387.92	15.93	NG	NG	NA	NA	NA	NE	27.79	NA	404.13	404.13
P-120	WRR - North Property	SU	2	432.78	430.57	2.21	45.00	387.78	29.07	45.00	403.71	387.78	15.93	NG	NG	NA	NA	NA	NE	27.96	NA	404.82	404.82
T-1	WRR - North Property	SU	6	443.55	442.18	1.37	70.55	373.00	46.63	70.55	396.92	373.00	23.92	NE	46.95	NA	396.60	396.60	NE	46.73	NA	396.82	396.82
T-2	WRR - North Property	SU	6	443.13	440.82	2.31	70.65	372.48	50.50	70.65	392.63	372.48	20.15	NG	NG	NA	NA	NA	NE	41.91	NA	401.22	401.22
T-6	WRR - North Property	SU	6	446.55	444.62	1.93	66.01	380.54	51.76	66.01	394.79	380.54	14.25	NE	44.57	NA	401.98	401.98	NE	43.87	NA	402.68	402.68
T-12	WRR - North Property	SU	6	444.69	442.49	2.20	72.15	372.54	46.15	72.15	398.54	372.54	26.00	NE	43.59	NA	401.10	401.10	NE	42.76	NA	401.93	401.93
T-13	WRR - North Property	SU	6	443.46	442.64	0.82	73.00	370.46	47.00	73.00	396.46	370.46	26.00	NG	NG	NA	NA	NA	NE	41.60	NA	401.86	401.86
T-24	WRR - North Property	SU	6	443.72	441.31	2.41	67.15	376.57	41.50	67.15	402.22	376.57	25.65	NG	NG	NA	NA	NA	42.44	42.79	0.35	400.93	401.19
T-62	WRR - North Property	SU	4	431.73	429.83	1.90	47.50	384.23	17.50	47.50	414.23	384.23	30.00	NG	NG	NA	NA	NA	NE	27.29	NA	404.44	404.44
T-63	WRR - North Property	SU	4	431.24	429.26	1.98	48.00	383.24	18.00	48.00	413.24	383.24	30.00	NG	NG	NA	NA	NA	NE	26.87	NA	404.37	404.37

NOTES:

1) * Well MW-7 was installed on 7/9/2009, and Well MW-8 was installed on 7/6/2009.
2) Elevations are relative to the 1988 USGS datum.
3) FM = Flush Mounted Surface Completion; SU = Stick Up Surface Completion
4) NE = Not Encountered; NA = Not Applicable
5) The Corrected W.L. Elevations presented in this table were corrected by a specific gravity of 0.74 for the wells in which product was identified.

TABLE 7
SUMMARY OF SOIL ANALYTICAL DETECTIONS AND SCREENING

SEE LAST PAGE OF TABLE FOR NOTES.

				Benzene			Ethylbenzene			Toluene			m,p-Xylene			o-Xylene			n-Butylbenzene			sec-Butylbenzene		
			Industrial Ingestion Criteria	100			200000			410000(160000)			410000			410000								
			Industrial Inhalation Criteria	1.6 (1.5)			400 (350)			650			420 (330)			410 (370)								
			Soil to GW Class I Criteria	0.03 (0.032)			13 (12)			12 (11)			200 (170)			190 (170)								
Location	**Sample ID**	**Depth**	**Sample Date**	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
GP-1	GP-1-22.5	22.5 ft	9/2/2009	< 0.004	U		< 0.004	U		< 0.004	U		< 0.009	U		< 0.004	U		< 0.004	U		**0.001**	**J**	
	GP-1-31	31 ft	9/2/2009	< 0.004	U		< 0.004	U		< 0.004	U		< 0.009	U		< 0.004	U		< 0.004	U		< 0.004	U	
	GP-1-31D	31 ft	9/2/2009	< 0.004	U		< 0.004	U		< 0.004	U		< 0.008	U		< 0.004	U		< 0.004	U		< 0.004	U	
GP-2	GP-2-17	17 ft	8/31/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GP-2-23.5	23.5 ft	8/31/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GP-2-23.5D	23.5 ft	8/31/2009	< 0.004	U		< 0.004	U		< 0.004	U		< 0.009	U		< 0.004	U		< 0.004	U		< 0.004	U	
GP-4	GP-4-11	11 ft	8/31/2009	**0.002**	**J**		**0.002**	**J**		< 0.009	U		**0.005**	**J**		**0.002**	**J**		< 0.009	U		< 0.009	U	
	GP-4-22.5	22.5 ft	8/31/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.009	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GP-4-33	33 ft	8/31/2009	**0.003**	**J**		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U	
GP-7	GP-7-25	25 ft	8/26/2009	< 0.005	U		**0.002**	**J**		< 0.005	U		**0.004**	**J**		**0.002**	**J**		< 0.005	U		< 0.005	U	
	GP-7-37	37 ft	8/26/2009	**0.987**		**J**	**5.37**		**J**	**3.45**		**J**	**16.1**		**J**	**7.99**		**J**	**0.586**		**J**	**0.121**	**J**	**J**
	GP-7-37D	37 ft	8/26/2009	**0.878**		**J**	**4.75**		**J**	**3.05**		**J**	**14.1**		**J**	**7.12**		**J**	**0.491**		**J**	**0.103**	**J**	**J**
	GP-7-41	41 ft	8/26/2009	**2.18**		**J**	**12.8**		**J**	**1.86**		**J**	**39.4**		**J**	**16.4**		**J**	**0.997**		**J**	**0.276**	**J**	**J**
GP-8	GP-8-13	13 ft	8/26/2009	**0.002**	**J**		**0.005**			< 0.005	U		**0.006**	**J**		< 0.005	U		**0.005**			**0.002**	**J**	
	GP-8-35	35 ft	8/26/2009	**0.006**			**0.007**			**0.001**	**J**		**0.003**	**J**		< 0.005	U		< 0.005	U		< 0.005	U	
	GP-8-47	47 ft	8/26/2009	< 0.006	U	UJ	**0.002**	**J**	**J**	< 0.006	U	UJ	**0.003**	**J**	**J**	< 0.006	U	UJ	**0.005**	**J**	**J**	< 0.006	U	UJ
	GP-8-47D	47 ft	8/26/2009	**1.48**		**J**	**1.88**		**J**	**0.059**	**J**	**J**	**1.98**		**J**	**0.137**	**J**	**J**	**0.235**		**J**	**0.063**	**J**	**J**
GP-9	GP-9-18	18 ft	8/25/2009	**2.78**	**J**		**60.6**			**94.2**			**162**			**69.2**			**10**			**2.08**	**J**	
	GP-9-37	37 ft	8/25/2009	**0.004**	**J**		**0.241**			**0.008**			**1.04**	**D**		**0.395**	**D**		**0.089**			**0.031**		

TABLE 7
SUMMARY OF SOIL ANALYTICAL DETECTIONS AND SCREENING

Location	Sample ID	Depth	Sample Date	tert-Butylbenzene			Isopropylbenzene			p-Isopropyltoluene			Methyl tert-Butyl Ether			n-Propylbenzene			1,2,4-Trimethylbenzene			1,3,5-Trimethylbenzene		
			Industrial Ingestion Criteria				(200000)						20000									100000*		
			Industrial Inhalation Criteria				(800)						8800 (8400)						140*			73*		
			Soil to GW Class I Criteria				(91)						0.32 (0.31)									10*		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
GP-1	GP-1-22.5	22.5 ft	9/2/2009	**0.002**	**J**		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U	
	GP-1-31	31 ft	9/2/2009	< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U	
	GP-1-31D	31 ft	9/2/2009	< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U	
GP-2	GP-2-17	17 ft	8/31/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GP-2-23.5	23.5 ft	8/31/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GP-2-23.5D	23.5 ft	8/31/2009	< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U		< 0.004	U	
GP-4	GP-4-11	11 ft	8/31/2009	**0.005**	**J**		< 0.009	U		< 0.009	U		**0.005**	**J**		**0.003**	**J**		**0.011**			**0.003**	**J**	
	GP-4-22.5	22.5 ft	8/31/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GP-4-33	33 ft	8/31/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		**0.002**	**J**		< 0.005	U	
GP-7	GP-7-25	25 ft	8/26/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		**0.004**	**J**		< 0.005	U	
	GP-7-37	37 ft	8/26/2009	< 0.341	U	UJ	**0.504**		**J**	**0.07**	**J**	**J**	< 0.341	U	UJ	**1.62**		**J**	**8.49**		**J**	**2.32**		**J**
	GP-7-37D	37 ft	8/26/2009	< 0.318	U	UJ	**0.442**		**J**	< 0.318	U	UJ	< 0.318	U	UJ	**1.39**		**J**	**7.32**		**J**	**2.04**		**J**
	GP-7-41	41 ft	8/26/2009	< 0.657	U	UJ	**0.878**		**J**	**0.141**	**J**	**J**	< 0.657	U	UJ	**3.02**		**J**	**17.6**		**J**	**4.83**		**J**
GP-8	GP-8-13	13 ft	8/26/2009	< 0.005	U		**0.003**	**J**		**0.002**	**J**		< 0.005	U		**0.006**			**0.004**	**J**		**0.001**	**J**	
	GP-8-35	35 ft	8/26/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		**0.001**	**J**		**0.002**	**J**		**< 0.005**	**U**	
	GP-8-47	47 ft	8/26/2009	< 0.006	U		< 0.006	U	UJ	< 0.006	U	UJ	< 0.006	U		**0.002**	**J**	**J**	**0.006**		**J**	**0.002**	**J**	**J**
	GP-8-47D	47 ft	8/26/2009	< 0.235	U		**0.228**	**J**	**J**	**0.049**	**J**	**J**	< 0.235	U		**0.543**		**J**	**1.3**		**J**	**0.458**		**J**
GP-9	GP-9-18	18 ft	8/25/2009	< 5.07	U		**7.07**			**1.51**	**J**		< 5.07	U		**19.9**			**93.4**			**26.0**		
	GP-9-37	37 ft	8/25/2009	< 0.006	U		**0.059**			**0.042**			< 0.006	U		**0.136**			**1.31**	**D**		**0.206**		

NOTES:
1) Screening criteria taken from Illinois Approach to Corrective Action Objectives (TACO), 35 IAC Part 742.
2) * Screening criteria taken from the Chemicals Not in TACO Tier 1 Tables dated 1/9/2009.
3) (#) Proposed screening criteria taken from IPCB Notice of Proposed Amendments for TACO dated 9/2/2008.

Exceedances of the Inhalation, and Soil to Groundwater Screening Criteria
Exceedances of the Soil to Groundwater Screening Criteria
Exceedances of proposed screening criteria

LAB QUALIFIERS:
D = Results from a diluted sample. Dilution factors are included in the result.
J = The target analyte was detected below the reporting limit and the result is estimated.
U = Not detected.

URS QUALIFIERS:
J = The results is estimated.
U = The analyte was not detected below the reporting limit.

TABLE 8
SUMMARY OF GROUNDWATER ANALYTICAL DETECTIONS AND SCREENING

SEE LAST PAGE OF TABLE FOR NOTES.

				Benzene			Ethylbenzene			Toluene			m,p-Xylene			o-Xylene			n-Butylbenzene			sec-Butylbenzene			tert-Butylbenzene			Chlorobenzene			Isopropylbenzene			p-Isopropyltoluene			Methyl tert-Butyl Ether		
			TACO Class I Screening Criteria	0.005 mg/L			0.7 mg/L			1.0 mg/L			10 mg/L															0.1 mg/L			(0.7) mg/L						0.07 mg/L		
				Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals
Location	**Sample ID**	**Depth**	**Sample Date**																																				
GP-1	GP-1-34	34 ft	9/2/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GP-1-42	42 ft	9/2/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		**0.00192**	**J**	
GP-4	GP-4-34	34 ft	9/1/2009	**0.0635**			< 0.005	U		**0.00492**	**J**		**0.00649**	**J**		**0.00253**	**J**		< 0.005	U		**0.00387**	**J**		**0.00838**			< 0.005	U		**0.0166**			< 0.005	U		**0.00875**		
	GP-4-34D	34 ft	9/1/2009	**0.0669**			< 0.005	U		**0.00512**			**0.00622**	**J**		**0.00241**	**J**		< 0.005	U		**0.00386**	**J**		**0.00822**			< 0.005	U		**0.0163**			< 0.005	U		**0.00928**		
	GP-4-42	42 ft	9/1/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		**0.00125**	**J**		**0.00176**	J		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-01	GWP-1-50	50 ft	7/27/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-1-58	58 ft	7/27/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-02	GWP-2-50	50 ft	7/28/2009	**0.0293**			< 0.005	U		**0.00635**			**0.0182**			**0.0141**			< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		**0.00227**	**J**		< 0.005	U		< 0.005	U	
	GWP-2-58	58 ft	7/28/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-03	GWP-3-50	50 ft	7/28/2009	**0.175**			**1.29**			**0.14**			**1.97**			**0.244**			**0.0219**	**J**		**0.0115**	**J**		< 0.05	U		< 0.05	U		**0.0984**			< 0.05	U		< 0.05	U	
	GWP-3-58	58 ft	7/28/2009	**0.0264**	**J**		**1.88**			**1.54**			**3.99**			**1.55**			< 0.1	U		< 0.1	U		< 0.1	U		< 0.1	U		**0.0748**	**J**		< 0.1	U		< 0.1	U	
GWP-04	GWP-4-50	50 ft	7/29/2009	**0.0258**	**J**		**1.02**			**0.0169**	**J**		**2.33**			**0.351**			< 0.05	U		< 0.05	U		< 0.05	U		< 0.05	U		**0.071**			< 0.05	U		< 0.05	U	
	GWP-4-58	58 ft	7/29/2009	< 0.005	U		**0.0537**			**0.00117**	**J**		**0.126**			**0.0413**			**0.00153**	**J**		**0.00113**	**J**		< 0.005	U		< 0.005	U		**0.00486**	**J**		< 0.005	U		**0.0016**	**J**	
GWP-05	GWP-5-50	50 ft	7/30/2009	**3.82**	**D**		**0.287**			**0.0604**	**J**		**0.524**			**0.0368**	**J**		< 0.1	U		< 0.1	U		< 0.1	U		< 0.1	U		< 0.1	U		< 0.1	U		< 0.1	U	
	GWP-5-58	58 ft	7/30/2009	**1.41**			**2.58**			**0.217**			**5.81**			**2.88**			< 0.125	U		< 0.125	U		< 0.125	U		< 0.125	U		**0.0603**	**J**		< 0.125	U		< 0.125	U	
GWP-06	GWP-6-50	50 ft	7/29/2009	**6.34**			**3.2**			**24.6**	**D**		**7.23**			**3.66**			< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U	
	GWP-6-50-D	50 ft	7/29/2009	**6.34**			**3.05**			**23.7**	**D**		**6.93**			**3.37**			< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U	
	GWP-6-58	58 ft	7/29/2009	**7.42**			**2.15**			**10**			**4.67**			**1.4**			< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U	
GWP-07	GWP-7-50	50 ft	7/30/2009	**10.1**			**2.98**			**17.2**			**6.13**			**3.16**			< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U	
	GWP-7-58	58 ft	7/30/2009	**16.3**			**2.34**			**12.2**			**4.96**			**1.93**			< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U		< 0.5	U	
GWP-08	GWP-8-50	50 ft	7/31/2009	**4.82**			**1.29**			**0.257**			**2.65**			**0.392**			< 0.125	U		< 0.125	U		< 0.125	U		< 0.125	U		**0.0855**	**J**		< 0.125	U		< 0.125	U	
	GWP-8-58	58 ft	7/31/2009	**0.702**			**0.519**			**0.715**			**1.03**			**0.422**			< 0.025	U		< 0.025	U		< 0.025	U		< 0.025	U		**0.0501**			**0.00615**	**J**		< 0.025	U	
GWP-09	GWP-9-50	50 ft	8/3/2009	**0.164**			**0.00378**	**J**		**0.00647**			**0.0178**			**0.00289**	**J**		**0.00115**	**J**		**0.00116**	**J**		< 0.005	U		< 0.005	U		**0.00423**	**J**		< 0.005	U		< 0.005	U	
	GWP-9-58	58 ft	8/3/2009	**0.00281**	**J**		**0.0882**			**0.00104**	**J**		**0.273**			**0.0265**			**0.00258**	**J**		**0.00154**	**J**		< 0.005	U		< 0.005	U		**0.0386**			**0.00221**	**J**		< 0.005	U	
GWP-10	GWP-10-50	50 ft	8/3/2009	**0.0213**	**J**		**1.39**	**D**		**0.0242**	**J**		**1.08**			**0.0943**			**0.0144**	**J**		**0.00565**	**J**		< 0.025	U		**0.00502**	**J**		**0.0665**			**0.00701**	**J**		< 0.025	U	
	GWP-10-58	58 ft	8/3/2009	**0.0137**	**J**		**2.88**	**D**		**0.482**			**3.55**			**1.12**			< 0.05	U		**0.356**			< 0.05	U		< 0.05	U		**0.0578**			< 0.05	U		< 0.05	U	
GWP-11	GWP-11-50	50 ft	8/6/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-11-58	58 ft	8/6/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-12	GWP-12-50	50 ft	8/4/2009	**0.0221**			< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-12-58	58 ft	8/4/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-13	GWP-13-50	50 ft	8/5/2009	**0.0854**			**0.0798**			**0.124**			**0.0923**			**0.036**			**0.00196**	**J**		**0.00114**	**J**		< 0.005	U		< 0.005	U		**0.00426**	**J**		< 0.005	U		< 0.005	U	
	GWP-13-58	58 ft	8/5/2009	< 0.01	U		**2.04**	**D**		**0.33**			**4.19**	**D**		**1.81**	**D**		**0.0171**			**0.00581**	**J**		**0.00622**	**J**		< 0.01	U		**0.0688**			**0.00516**	**J**		< 0.01	U	
GWP-14	GWP-14-50	50 ft	8/5/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-14-58	58 ft	8/5/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-15	GWP-15-50	50 ft	8/6/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-15-58	58 ft	8/6/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-16	GWP-16-50	50 ft	8/7/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-16-58	58 ft	8/7/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-17	GWP-17-50	50 ft	8/10/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-17-58	58 ft	8/10/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-18	GWP-18-50	50 ft	8/11/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-18-58	58 ft	8/11/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-18-58D	58 ft	8/11/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-19	GWP-19-50	50 ft	8/12/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-19-58	58 ft	8/12/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
GWP-20	GWP-20-50	50 ft	8/12/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U	
	GWP-20-58	58 ft	8/12/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		**0.00237**	**J**	
GWP-21	GWP-21-34	34 ft	9/3/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		**0.00184**	**J**	
	GWP-21-42	42 ft	9/3/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		**0.0054**		
	GWP-21-42D	42 ft	9/3/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		**0.00537**		
MW-07	MW-7-102309		10/23/2009	**684**			< 25	U		< 25	U		< 50	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U	
MW-08	MW-8-102209		10/22/2009	**1130**	**D**		< 25	U		< 25	U		< 50	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U	
	MW-8-102209D		10/22/2009	**1010**	**D**		< 25	U		< 25	U		< 50	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U		< 25	U	

TABLE 8
SUMMARY OF GROUNDWATER ANALYTICAL DETECTIONS AND SCREENING

SEE LAST PAGE OF TABLE FOR NOTES.

Location	Sample ID	Depth	Sample Date	n-Propylbenzene			Styrene			1,2,4-Trimethylbenzene			1,3,5-Trimethylbenzene			Acenaphthene			Dibenzofuran			Diethyl phthalate			2,4-Dimethylphenol			Fluorene			2-Methylnaphthalene			2-Methylphenol			3-Methylphenol & 4-Methylphenol		
	TACO Class I Screening Criteria						0.1 mg/L						0.35 mg/L*			0.42 mg/L						5.6 mg/L			0.14 mg/L			0.28 mg/L			(0.028) mg/L			0.35 mg/L			0.35 mg/L* & 0.035 mg/L*		
				Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals
GP-1	GP-1-34	34 ft	9/2/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.01	U	
	GP-1-42	42 ft	9/2/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.01	U	
GP-4	GP-4-34	34 ft	9/1/2009	0.0061			< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.01	U	
	GP-4-34D	34 ft	9/1/2009	0.00591			< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.01	U	
	GP-4-42	42 ft	9/1/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.01	U	
GWP-01	GWP-1-50	50 ft	7/27/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U				
	GWP-1-58	58 ft	7/27/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U				
GWP-02	GWP-2-50	50 ft	7/28/2009	0.00169	J		< 0.005	U		0.00267	J		0.00167	J		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U				
	GWP-2-58	58 ft	7/28/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.006	U		< 0.011	U		< 0.006	U		< 0.011	U		< 0.006	U		< 0.006	U		< 0.011	U				
GWP-03	GWP-3-50	50 ft	7/28/2009	0.133			< 0.05	U		0.508			0.172			< 0.005	U		0.002	J		< 0.005	U		< 0.01	U		0.002	J		0.101	D		< 0.01	U				
	GWP-3-58	58 ft	7/28/2009	0.118			< 0.1	U		0.611			0.152			< 0.005	U		0.02			< 0.005	U		< 0.01	U		< 0.005	U		0.321	D		< 0.01	U				
GWP-04	GWP-4-50	50 ft	7/29/2009	0.119			< 0.05	U		0.703			0.158			< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		0.028			< 0.01	U		< 0.01	U	
	GWP-4-58	58 ft	7/29/2009	0.0113			< 0.005	U		0.0544			0.0129			< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		0.003	J		< 0.01	U		< 0.01	U	
GWP-05	GWP-5-50	50 ft	7/30/2009	< 0.1	U		< 0.1	U		0.0864	J		< 0.1	U		0.001	J		< 0.011	U		< 0.005	U		0.003	J		< 0.005	U		0.05			< 0.011	U		< 0.011	U	
	GWP-5-58	58 ft	7/30/2009	0.127			< 0.125	U		0.836			0.185			< 0.006	U		< 0.011	U		< 0.006	U		0.008	J		< 0.006	U		0.048			< 0.011	U		0.002	J	
GWP-06	GWP-6-50	50 ft	7/29/2009	0.175	J		< 0.5	U		1.13			0.258	J		< 0.005	U		< 0.01	U		< 0.005	U		0.004	J		< 0.005	U		0.038			0.012			0.02		
	GWP-6-50-D	50 ft	7/29/2009	0.14	J		< 0.5	U		0.956			0.214	J		< 0.005	U		< 0.01	U		< 0.005	U		0.004	J		< 0.005	U		0.043			0.013			0.021		
	GWP-6-58	58 ft	7/29/2009	< 0.5	U		< 0.5	U		0.557			0.137	J		< 0.005	U		< 0.01	U		< 0.005	U		0.005	J		< 0.005	U		0.015			0.011			0.018		
GWP-07	GWP-7-50	50 ft	7/30/2009	0.132	J		< 0.5	U		0.769			0.177	J		< 0.005	U		< 0.011	U		< 0.005	U		0.01	J		< 0.005	U		0.04			0.018			0.042		
	GWP-7-58	58 ft	7/30/2009	< 0.5	U		< 0.5	U		0.563			0.131	J		< 0.005	U	UJ	< 0.011	U	UJ	< 0.005	U	UJ	< 0.011	U	UJ	< 0.005	U	UJ	< 0.005	U	UJ	< 0.011	U	UJ	< 0.011	U	UJ
GWP-08	GWP-8-50	50 ft	7/31/2009	0.138			< 0.125	U		0.83			0.216			< 0.005	U		0.001	J		< 0.005	U		0.005	J		0.002	J		0.055			< 0.011	U		0.003	J	
	GWP-8-58	58 ft	7/31/2009	0.0411			0.0128	J		0.265			0.0687			< 0.005	U		< 0.01	U		< 0.005	U		0.002	J		0.001	J		0.054			< 0.01	U		0.002	J	
GWP-09	GWP-9-50	50 ft	8/3/2009	0.00431	J		< 0.005	U		0.00144	J		0.00191	J		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		0.001	J		0.003	J		< 0.01	U		< 0.01	U	
	GWP-9-58	58 ft	8/3/2009	0.0212			< 0.005	U		0.0191			0.0158			0.003	J		0.003	J		< 0.005	U		< 0.01	U		0.003	J		0.035			< 0.01	U		< 0.01	U	
GWP-10	GWP-10-50	50 ft	8/3/2009	0.068			< 0.025	U		0.406			0.0885			< 0.005	U		< 0.01	U		< 0.005	U		0.009	J		< 0.005	U		0.025			< 0.01	U		< 0.01	U	
	GWP-10-58	58 ft	8/3/2009	0.067			< 0.05	U		0.429			0.113			< 0.005	U		< 0.01	U		0.001	J		0.005	J		< 0.005	U		0.027			< 0.01	U		0.002	J	
GWP-11	GWP-11-50	50 ft	8/6/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
	GWP-11-58	58 ft	8/6/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
GWP-12	GWP-12-50	50 ft	8/4/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.006	U		< 0.013	U		< 0.006	U		< 0.013	U		< 0.006	U		< 0.006	U		< 0.013	U		< 0.013	U	
	GWP-12-58	58 ft	8/4/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.01	U	
GWP-13	GWP-13-50	50 ft	8/5/2009	0.00932			< 0.005	U		0.00462	J		0.00343	J		< 0.006	U		< 0.011	U		< 0.006	U		< 0.011	U		< 0.006	U		< 0.006	U		< 0.011	U		< 0.011	U	
	GWP-13-58	58 ft	8/5/2009	0.116			< 0.01	U		0.737	D		0.168			< 0.005	U		< 0.011	U		< 0.005	U		0.005	J		< 0.005	U		0.052			< 0.011	U		< 0.011	U	
GWP-14	GWP-14-50	50 ft	8/5/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.011	U		< 0.005	U		< 0.011	U		< 0.005	U		< 0.005	U		< 0.011	U		< 0.011	U	
	GWP-14-58	58 ft	8/5/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
GWP-15	GWP-15-50	50 ft	8/6/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.011	U		< 0.005	U		< 0.011	U		< 0.005	U		< 0.005	U		< 0.011	U		< 0.011	U	
	GWP-15-58	58 ft	8/6/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.01	U	
GWP-16	GWP-16-50	50 ft	8/7/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
	GWP-16-58	58 ft	8/7/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
GWP-17	GWP-17-50	50 ft	8/10/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
	GWP-17-58	58 ft	8/10/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
GWP-18	GWP-18-50	50 ft	8/11/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.011	U		< 0.005	U		< 0.011	U		< 0.005	U		< 0.005	U		< 0.011	U		< 0.011	U	
	GWP-18-58	58 ft	8/11/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.011	U		< 0.005	U		< 0.011	U		< 0.005	U		< 0.005	U		< 0.011	U		< 0.011	U	
	GWP-18-58D	58 ft	8/11/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.011	U		< 0.005	U		< 0.011	U		< 0.005	U		< 0.005	U		< 0.011	U		< 0.011	U	
GWP-19	GWP-19-50	50 ft	8/12/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
	GWP-19-58	58 ft	8/12/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
GWP-20	GWP-20-50	50 ft	8/12/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
	GWP-20-58	58 ft	8/12/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U																										
GWP-21	GWP-21-34	34 ft	9/3/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.01	U	
	GWP-21-42	42 ft	9/3/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.01	U	
	GWP-21-42D	42 ft	9/3/2009	< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.01	U		< 0.005	U		< 0.005	U		< 0.01	U		< 0.01	U	
MW-07	MW-7-102309		10/23/2009	< 25	U		< 25	U		< 25	U		< 25	U		< 0.005	U		< 0.01	U		< 0.005	U		0.006	J		< 0.005	U		0.001	J		< 0.01	U		0.002	J	
MW-08	MW-8-102209		10/22/2009	< 25	U		< 25	U		< 25	U		< 25	U		< 0.005	U		< 0.01	U		< 0.005	U		0.004	J		< 0.005	U		0.01			< 0.01	U		0.002	J	
	MW-8-102209D		10/22/2009	< 25	U		< 25	U		< 25	U		< 25	U		< 0.006	U		< 0.011	U		< 0.006	U		0.004	J		< 0.006	U		0.009			< 0.011	U		0.002	J	

TABLE 8
SUMMARY OF GROUNDWATER ANALYTICAL DETECTIONS AND SCREENING

Location	Sample ID	Depth	Sample Date	Naphthalene			Phenanthrene			Phenol		
			TACO Class I Screening Criteria	0.14 mg/L			0.21 mg/L*			0.1 mg/L		
				Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals	Result (mg/L)	Lab Quals	URS Quals
GP-1	GP-1-34	34 ft	9/2/2009	< 0.005	U		< 0.005	U		< 0.01	U	
	GP-1-42	42 ft	9/2/2009	< 0.005	U		< 0.005	U		< 0.01	U	
GP-4	GP-4-34	34 ft	9/1/2009	< 0.005	U		< 0.005	U		< 0.01	U	
	GP-4-34D	34 ft	9/1/2009	**0.001**	**J**		< 0.005	U		< 0.01	U	
	GP-4-42	42 ft	9/1/2009	< 0.005	U		< 0.005	U		< 0.01	U	
GWP-01	GWP-1-50	50 ft	7/27/2009	< 0.005	U		< 0.005	U		< 0.01	U	
	GWP-1-58	58 ft	7/27/2009	< 0.005	U		< 0.005	U		< 0.01	U	
GWP-02	GWP-2-50	50 ft	7/28/2009	< 0.005	U		< 0.005	U		< 0.01	U	
	GWP-2-58	58 ft	7/28/2009	< 0.006	U		< 0.006	U		< 0.011	U	
GWP-03	GWP-3-50	50 ft	7/28/2009	**0.186**	**D**		< 0.005	U		< 0.01	U	
	GWP-3-58	58 ft	7/28/2009	**0.294**	**D**		**0.029**			< 0.01	U	
GWP-04	GWP-4-50	50 ft	7/29/2009	**0.061**			< 0.005	U		< 0.01	U	
	GWP-4-58	58 ft	7/29/2009	**0.004**	**J**		< 0.005	U		< 0.01	U	
GWP-05	GWP-5-50	50 ft	7/30/2009	**0.065**			**0.004**	**J**		**0.014**		
	GWP-5-58	58 ft	7/30/2009	**0.211**	**D**		< 0.006	U		**0.004**	**J**	
GWP-06	GWP-6-50	50 ft	7/29/2009	**0.182**	**D**		< 0.005	U		**0.007**	**J**	
	GWP-6-50-D	50 ft	7/29/2009	**0.194**	**D**		< 0.005	U		**0.007**	**J**	
	GWP-6-58	58 ft	7/29/2009	**0.081**			< 0.005	U		**0.012**		
GWP-07	GWP-7-50	50 ft	7/30/2009	**0.225**	**D**		< 0.005	U		**0.022**		
	GWP-7-58	58 ft	7/30/2009	**0.002**	**J**	**J**	< 0.005	U	UJ	< 0.011	U	UJ
GWP-08	GWP-8-50	50 ft	7/31/2009	**0.209**	**D**		**0.003**	**J**		**0.013**		
	GWP-8-58	58 ft	7/31/2009	**0.184**	**D**		**0.002**	**J**		**0.002**	**J**	
GWP-09	GWP-9-50	50 ft	8/3/2009	**0.003**	**J**		**0.004**	**J**		**0.002**	**J**	
	GWP-9-58	58 ft	8/3/2009	**0.072**			**0.006**			< 0.01	U	
GWP-10	GWP-10-50	50 ft	8/3/2009	**0.075**			< 0.005	U		< 0.01	U	
	GWP-10-58	58 ft	8/3/2009	**0.146**	**D**		< 0.005	U		< 0.01	U	
GWP-11	GWP-11-50	50 ft	8/6/2009									
	GWP-11-58	58 ft	8/6/2009									
GWP-12	GWP-12-50	50 ft	8/4/2009	< 0.006	U		< 0.006	U		< 0.013	U	
	GWP-12-58	58 ft	8/4/2009	< 0.005	U		< 0.005	U		< 0.01	U	
GWP-13	GWP-13-50	50 ft	8/5/2009	< 0.006	U		< 0.006	U		< 0.011	U	
	GWP-13-58	58 ft	8/5/2009	**0.236**	**D**		< 0.005	U		< 0.011	U	
GWP-14	GWP-14-50	50 ft	8/5/2009	< 0.005	U		< 0.005	U		< 0.011	U	
	GWP-14-58	58 ft	8/5/2009									
GWP-15	GWP-15-50	50 ft	8/6/2009	< 0.005	U		< 0.005	U		< 0.011	U	
	GWP-15-58	58 ft	8/6/2009	< 0.005	U		< 0.005	U		< 0.01	U	
GWP-16	GWP-16-50	50 ft	8/7/2009									
	GWP-16-58	58 ft	8/7/2009									
GWP-17	GWP-17-50	50 ft	8/10/2009									
	GWP-17-58	58 ft	8/10/2009									
GWP-18	GWP-18-50	50 ft	8/11/2009	< 0.005	U		< 0.005	U		< 0.011	U	
	GWP-18-58	58 ft	8/11/2009	< 0.005	U		< 0.005	U		< 0.011	U	
	GWP-18-58D	58 ft	8/11/2009	< 0.005	U		< 0.005	U		< 0.011	U	
GWP-19	GWP-19-50	50 ft	8/12/2009									
	GWP-19-58	58 ft	8/12/2009									
GWP-20	GWP-20-50	50 ft	8/12/2009									
	GWP-20-58	58 ft	8/12/2009									
GWP-21	GWP-21-34	34 ft	9/3/2009	< 0.005	U		< 0.005	U		< 0.01	U	
	GWP-21-42	42 ft	9/3/2009	< 0.005	U		< 0.005	U		< 0.01	U	
	GWP-21-42D	42 ft	9/3/2009	< 0.005	U		< 0.005	U		< 0.01	U	
MW-07	MW-7-102309		10/23/2009	**0.006**			< 0.005	U		**0.023**		**J**
MW-08	MW-8-102209		10/22/2009	**0.032**			< 0.005	U		**0.05**		**J**
	MW-8-102209D		10/22/2009	**0.031**			< 0.006	U		**0.124**	**D**	

NOTES:

1) Screening criteria taken from Illinois Tiered Approach to Corrective Action Objectives (TACO), 35 IAC Part 742.

2) * Screening criteria taken from the Chemicals not in TACO Tier 1 Tables dated 1/9/2009.

3) (#) Proposed screening criteria taken from IPCB Notice of Proposed Amendments for TACO (dated 9/2/2008).

(yellow) Exceedance of the Groundwater Class I Screening Criteria

(green) Exceedance of proposed screening criteria

LABORATORY QUALIFIERS:

D = The result is from a diluted sample.

J = The target analyte was detected below the reporting limit and the result is estimated.

U = Not detected.

URS QUALIFIERS:

J = The results is estimated.

U = The analyte was not detected below the reporting limit.

TABLE 9
SUMMARY OF SOIL VAPOR ANALYTICAL DETECTIONS

SEE LAST PAGE OF TABLE FOR NOTES.

				Benzene			Ethylbenzene			Toluene			m,p-Xylene			o-Xylene			Acetone			1,3-Butadiene			2-Butanone			Carbon disulfide			Chloroform			Cyclohexane			Ethanol		
				Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals
Location	**Sample ID**	**Depth**	**Sample Date**																																				
VMP-1	VMP-1-5	5 ft	11/2/2009	<0.38	ND		<0.52	ND		**0.63**			<0.52	ND		<0.52	ND		<1.1	ND		<0.26	ND		<0.35	ND		<0.37	ND		<0.58	ND		**18**			<0.9	ND	
	VMP-1-8.5	8.5 ft	11/2/2009	<0.52	ND		<0.71	ND		<0.62	ND		<0.71	ND		<0.71	ND		<1.6	ND		<0.36	ND		<0.48	ND		<0.51	ND		<0.8	ND		**14**			<1.2	ND	
	VMP-1-23.5	23.5 ft	11/2/2009	<1.3	ND		<1.7	ND		<1.5	ND		<1.7	ND		<1.7	ND		<3.8	ND		<0.88	ND		<1.2	ND		<1.2	ND		<1.9	ND		**66**			<3	ND	
	VMP-1-38.5	38.5 ft	11/2/2009	**3.8**			<4.9	ND		<4.2	ND		<4.9	ND		<4.9	ND		<11	ND		**420**			<3.3	ND		<3.5	ND		<5.5	ND		**380**			<8.4	ND	
VMP-2	VMP-2-5	5 ft	11/2/2009	<0.46	ND		<0.63	ND		<0.55	ND		<0.63	ND		<0.63	ND		<1.4	ND		<0.32	ND		<0.43	ND		<0.45	ND		<0.71	ND		**8**			<1.1	ND	
	VMP-2-8.5	8.5 ft	11/3/2009	<0.16	ND		<0.22	ND		<0.19	ND		<0.22	ND		<0.22	ND		<0.48	ND		<0.11	ND		<0.15	ND		<0.16	ND		<0.25	ND		**0.24**			<0.38	ND	
	VMP-2-8.5-D	8.5 ft	11/3/2009	<0.17	ND		<0.23	ND		<0.2	ND		<0.23	ND		<0.23	ND		<0.51	ND		<0.12	ND		<0.16	ND		<0.17	ND		<0.26	ND		**0.29**			<0.41	ND	
	VMP-2-22	22 ft	11/3/2009	<0.89	ND		<1.2	ND		<1	ND		<1.2	ND		<1.2	ND		<2.7	ND		<0.62	ND		<0.82	ND		<0.87	ND		<1.4	ND		**11**			<2.1	ND	
	VMP-2-42	42 ft	11/3/2009	**84**			**130**			**59**			**160**			**58**			<52	ND		<12	ND		<16	ND		<17	ND		<27	ND		**920**			<41	ND	UJ
VMP-3	VMP-3-5	5 ft	11/3/2009	<0.017	ND		**0.065**			<0.02	ND		**0.1**			**0.045**			<0.051	ND		<0.012	ND		<0.016	ND		<0.017	ND		<0.026	ND		**0.23**			<0.041	ND	
	VMP-3-22	22 ft	11/4/2009	**52**			<17	ND		<15	ND		**22**			<17	ND		<37	ND		<8.6	ND		<11	ND		<12	ND		<19	ND		**980**			<29	ND	UJ
	VMP-3-31.5	31.5 ft	11/4/2009	**240**			**78**			**25**			**130**			<27	ND		<59	ND		<14	ND		<18	ND		<19	ND		<30	ND		**920**			<47	ND	
	VMP-3-39	39 ft	11/4/2009	**240**			**70**			<46	ND		**110**			<54	ND		<120	ND		<27	ND		<36	ND		<38	ND		<60	ND		**790**			<93	ND	
VMP-4	VMP-4-5	5 ft	11/5/2009	<0.04	ND		<0.055	ND		<0.048	ND		<0.055	ND		<0.055	ND		<0.12	ND		<0.028	ND		<0.037	ND		<0.039	ND		<0.062	ND		**5.7**			<0.095	ND	
	VMP-4-12	12 ft	11/5/2009	**3.2**			<0.92	ND		<0.8	ND		**1.5**			<0.92	ND		<2	ND		<0.47	ND		<0.62	ND		<0.66	ND		<1	ND		**170**			<1.6	ND	
	VMP-4-23.5	23.5 ft	11/5/2009	**540**			**720**			**1400**			**1300**			**410**			<92	ND		<21	ND		<29	ND		<30	ND		<47	ND		**2500**			<73	ND	
	VMP-4-39	39 ft	11/5/2009	**660**			**620**			**420**			**1100**			**320**			<71	ND		<16	ND		<22	ND		<23	ND		<36	ND		**2400**			<56	ND	
VMP-5	VMP-5-5	5 ft	11/5/2009	**1.5**			<0.97	ND		<0.84	ND		<0.97	ND		<0.97	ND		<2.1	ND		<0.5	ND		<0.66	ND		<0.7	ND		<1.1	ND		**78**			<1.7	ND	
	VMP-5-12.5	12.5 ft	11/6/2009	**5.8**			<1.1	ND		<0.97	ND		<1.1	ND		<1.1	ND		<2.4	ND		<0.57	ND		<0.76	ND		<0.8	ND		<1.2	ND		**240**			<1.9	ND	
	VMP-5-12.5-D	12.5 ft	11/6/2009	**6**			<2.5	ND		<2.2	ND		<2.5	ND		<2.5	ND		<5.5	ND		<1.3	ND		<1.7	ND		<1.8	ND		<2.8	ND		**240**			<4.4	ND	
	VMP-5-31	31 ft	11/6/2009	**160**			<10	ND		<9	ND		<10	ND		<10	ND		<23	ND		<5.3	ND		<7	ND		<7.4	ND		<12	ND		**1600**			<18	ND	
	VMP-5-40	40 ft	11/6/2009	**170**			<14	ND		<12	ND		<14	ND		<14	ND		<31	ND		<7.2	ND		<9.7	ND		<10	ND		<16	ND		**1400**			<25	ND	
VMP-6	VMP-6-5	5 ft	11/6/2009	**5.8**		**J**	**6.5**		**J**	<1.5	ND		**3.1**		**J**	<1.7	ND		<3.8	ND		<0.88	ND		<1.2	ND		<1.2	ND		<1.9	ND		**380**		**J**	<3	ND	
	VMP-6-10	10 ft	11/6/2009	**6.4**			**5.2**			<1.6	ND		**3.4**			<1.9	ND		<4.1	ND		<0.95	ND		<1.3	ND		<1.3	ND		<2.1	ND		**470**			<3.2	ND	
	VMP-6-31.5	31.5 ft	11/9/2009	**28**			**180**			<10	ND		**66**			<12	ND		<27	ND		<6.2	ND		<8.2	ND		<8.7	ND		<14	ND		**970**			<21	ND	
	VMP-6-39	39 ft	11/9/2009	**40**			**290**			<12	ND		**150**			<14	ND		<30	ND		<7	ND		<9.4	ND		<9.9	ND		<16	ND		**1200**			<24	ND	
VMP-7	VMP-7-5	5 ft	11/9/2009	**0.015**			**0.012**			**0.0071**			**0.0079**			<0.005	ND		**0.041**			<0.002	ND		<0.003	ND		<0.003	ND		<0.005	ND		**0.041**			**0.11**		**J**
	VMP-7-13.5	13.5 ft	11/9/2009	<0.028	ND		<0.039	ND		<0.034	ND		<0.039	ND		<0.039	ND		<0.085	ND		<0.02	ND		<0.026	ND		<0.028	ND		<0.044	ND		**0.087**			<0.067	ND	
	VMP-7-29.5	29.5 ft	11/9/2009	**120**		**J**	<0.83	ND		**1.1**		**J**	**2.2**		**J**	<0.83	ND		<1.8	ND		<0.42	ND		<0.56	ND		<0.59	ND		<0.93	ND		**610**		**J**	<1.4	ND	
	VMP-7-38	38 ft	11/9/2009	**54**		**J**	<0.29	ND		**0.55**		**J**	**1**		**J**	<0.29	ND		<0.63	ND		<0.15	ND		<0.19	ND		<0.2	ND		<0.32	ND		**220**		**J**	<0.5	ND	
VMP-8	VMP-8-5	5 ft	11/10/2009	<0.003	ND		<0.005	ND		<0.004	ND		<0.005	ND		<0.005	ND		**0.015**			<0.002	ND		**0.0043**			<0.003	ND		<0.005	ND		**0.0083**			**0.023**		**J**
	VMP-8-9.5	9.5 ft	11/10/2009	<0.003	ND		<0.004	ND		<0.004	ND		<0.004	ND		<0.004	ND		<0.011	ND		<0.002	ND		<0.003	ND		<0.003	ND		<0.005	ND		<0.003	ND		**0.03**		**J**
	VMP-8-23.5	23.5 ft	11/10/2009	<0.003	ND		<0.005	ND		<0.004	ND		<0.005	ND		<0.005	ND		<0.011	ND		<0.002	ND		<0.003	ND		<0.003	ND		<0.005	ND		<0.004	ND		**0.023**		**J**
VMP-9	VMP-9-5	5 ft	11/11/2009	<0.003	ND		<0.004	ND		<0.004	ND		<0.004	ND		<0.004	ND		**0.012**			<0.002	ND		**0.0035**			<0.003	ND		<0.005	ND		<0.003	ND		**0.018**		
	VMP-9-11.5	11.5 ft	11/11/2009	<0.004	ND		<0.006	ND		**0.032**			<0.006	ND		<0.006	ND		**0.017**			<0.003	ND		**0.0045**			<0.004	ND		<0.006	ND		<0.004	ND		**0.014**		
	VMP-9-25.5	25.5 ft	11/10/2009	**12**		**J**	<1.2	ND		<1	ND		<1.2	ND		<1.2	ND		<2.6	ND		<0.61	ND		<0.81	ND		<0.86	ND		<1.3	ND		**54**		**J**	<2.1	ND	
	VMP-9-25.5-D	25.5 ft	11/10/2009	**4.9**		**J**	<1.1	ND		<0.93	ND		<1.1	ND		<1.1	ND		<2.3	ND		<0.55	ND		<0.73	ND		<0.77	ND		<1.2	ND		**52**		**J**	<1.9	ND	
	VMP-9-38.5	38.5 ft	11/10/2009	**1300**		**J**	<2.4	ND		<2.1	ND		<2.4	ND		<2.4	ND		<5.2	ND		<1.2	ND		<1.6	ND		<1.7	ND		<2.7	ND		**110**		**J**	<4.1	ND	
VMP-10	VMP-10-5	5 ft	11/11/2009	**0.02**			<0.004	ND		**0.0046**			<0.004	ND		<0.004	ND		**0.033**			<0.002	ND		**0.0032**			<0.003	ND		<0.005	ND		<0.003	ND		**0.18**		**J**
	VMP-10-10	10 ft	11/11/2009	<0.003	ND		<0.005	ND		<0.004	ND		<0.005	ND		<0.005	ND		<0.011	ND		<0.002	ND		<0.003	ND		<0.003	ND		<0.005	ND		<0.003	ND		**0.046**		**J**
	VMP-10-20	20 ft	11/11/2009	<0.003	ND		<0.004	ND		**0.0052**			<0.004	ND		<0.004	ND		**0.014**			<0.002	ND		<0.003	ND		<0.003	ND		<0.005	ND		<0.003	ND		**0.036**		**J**
	VMP-10-20-D	20 ft	11/11/2009	<0.003	ND		<0.005	ND		**0.0058**			<0.005	ND		<0.005	ND		**0.026**			<0.002	ND		**0.0058**			<0.003	ND		<0.006	ND		<0.004	ND		**0.22**		**J**
	VMP-10-30	30 ft	11/13/2009	**0.19**			<0.005	ND		<0.004	ND		<0.005	ND		<0.005	ND		<0.012	ND		<0.002	ND		<0.003	ND		<0.003	ND		**0.016**			<0.004	ND		<0.009	ND	
VMP-11	VMP-11-5	5 ft	11/17/2009	**4.9**			<0.039	ND		<0.034	ND		<0.039	ND		<0.039	ND		<0.085	ND		<0.02	ND		<0.026	ND		<0.028	ND		<0.044	ND		<0.031	ND		<0.067	ND	
	VMP-11-8	8 ft	11/17/2009	**0.46**			<0.005	ND		<0.004	ND		<0.005	ND		<0.005	ND		**0.04**			<0.002	ND		**0.0069**			<0.003	ND		<0.006	ND		<0.004	ND		**0.14**		**J**
	VMP-11-29	29 ft	11/18/2009	**8600**			<37	ND		<32	ND		<37	ND		<37	ND		<81	ND		<19	ND		<25	ND		<26	ND		<42	ND		<29	ND		<64	ND	
	VMP-11-38	38 ft	11/18/2009	**31000**			<110	ND		<93	ND		<110	ND		<110	ND		<230	ND		<54	ND		<73	ND		<77	ND		<120	ND		<85	ND		<180	ND	
VMP-12	VMP-12-5	5 ft	11/13/2009	**7500**			<14	ND		<12	ND		<14	ND		<14	ND		<30	ND		<7	ND		<9.3	ND		<9.8	ND		<15	ND		**570**			<24	ND	
	VMP-12-11.5	11.5 ft	11/13/2009	**8400**			<24	ND		<21	ND		<24	ND		<24	ND		<52	ND		<12	ND		<16	ND		<17	ND		<27	ND		**560**			<41	ND	
	VMP-12-25	25 ft	11/13/2009	**18000**			<49	ND		<42	ND		<49	ND		<49	ND		<110	ND		<25	ND		<33	ND		<35	ND		<55	ND		**680**			<85	ND	
	VMP-12-39	39 ft	11/13/2009	**26000**			**71**			<45	ND		<51	ND		<51	ND		<110	ND		<26	ND		<35	ND		<37	ND		<58	ND		**710**			<89	ND	
VMP-13	VMP-13-5	5 ft	11/16/2009	**5900**			<10	ND		<9.1	ND		<10	ND		<10	ND		<23	ND		<5.4	ND		<7.1	ND		<7.5	ND		<12	ND		<8.3	ND		<18	ND	
	VMP-13-10.5	10.5 ft	11/17/2009	**500**			<1.3	ND		<1.1	ND		<1.3	ND		<1.3	ND		<2.8	ND		<0.66	ND		<0.88	ND		<0.93	ND		<1.4	ND		<1	ND		<2.2	ND	
	VMP-13-10.5-D	10.5 ft	11/17/2009	**570**			<1.3	ND		<1.2	ND		<1.3	ND		<1.3	ND		<2.9	ND		<0.68	ND		<0.91	ND		<0.96	ND		<1.5	ND		<1.1	ND		<2.3	ND	
	VMP-13-21.5	21.5 ft	11/17/2009	**24000**			<66	ND		<57	ND		<66	ND		<66	ND		<140	ND		<34	ND		<45	ND		<47	ND		<74	ND		<52	ND		<110	ND	
	VMP-13-29.5	29.5 ft	11/17/2009	**90000**			<130	ND		**120**			<130	ND		<130	ND		<280	ND		<66	ND		<88	ND		<93	ND		<140	ND		<100	ND		<220	ND	
VMP-14	VMP-14-5	5 ft	11/20/2009	**0.021**			<0.011	ND		<0.009	ND		<0.011	ND		<0.011	ND		<0.024	ND		<0.005	ND		<0.007	ND		<0.008	ND		<0.012	ND		<0.008	ND		<0.019	ND	
	VMP-14-11.5	11.5 ft	11/16/2009	**550**			<1.3	ND		<1.2	ND		<1.3	ND		<1.3	ND		<2.9	ND		<0.68	ND		<0.91	ND		<0.96	ND		<1.5	ND		**180**			<2.3	ND	
	VMP-14-20	20 ft	11/16/2009	**26000**			<52	ND		<45	ND		<52	ND		<52	ND		<110	ND		<26	ND		<35	ND		<37	ND		<58	ND		**160**			<90	ND	
	VMP-14-29	29 ft	11/16/2009	**79000**			<200	ND		<180	ND		<200	ND		<200	ND		<440	ND		<100	ND		<140	ND		<140	ND		<230	ND		**350**			<350	ND	
VMP-15	VMP-15-5	5 ft	11/18/2009	**0.55**		**J**	<0.005	ND		<0.004	ND		<0.005	ND		<0.005	ND		<0.012	ND		<0.002	ND		<0.003	ND		<0.003	ND		<0.006	ND		<0.004	ND		**0.011**		**J**
	VMP-15-5-D	5 ft	11/18/2009	**0.26**		**J**	<0.005	ND		<0.004	ND		<0.005	ND		<0.005	ND		<0.012	ND		<0.002	ND		<0.003	ND		**0.0063**			<0.006	ND		<0.004	ND		**0.018**		**J**
	VMP-15-21.5	21.5 ft	11/18/2009	**11**			<2.5	ND		<2.1	ND		<2.5	ND		<2.5	ND		<5.4	ND		<1.3	ND		<1.7	ND		<1.8	ND		<2.8	ND		**460**			<4.3	ND	
	VMP-15-25.5	25.5 ft	11/18/2009	**18**			<2.6	ND		<2.2	ND		<2.6	ND		<2.6	ND		<5.6	ND		<1.3	ND		<1.8	ND		<1.8	ND		<2.9	ND		**560**			<4.5	ND	
	VMP-15-29	29 ft	11/19/2009	**30**			<3.2	ND		<2.8	ND		<3.2	ND		<3.2	ND		<7.1	ND		<1.6	ND		<2.2	ND		<2.3	ND		<3.6	ND		**640**			<5.6	ND	
VMP-16	VMP-16-5	5 ft	11/20/2009	**0.13**			<0.073	ND		**0.12**			<0.073	ND		<0.073	ND		<0.16	ND		<0.037	ND		<0.05	ND		<0.052	ND		<0.082	ND		<0.058	ND		<0.13	ND	
	VMP-16-13.5	13.5 ft	11/19/2009	**0.69**			<0.32	ND		**0.46**			<0.32	ND		<0.32	ND		<0.71	ND		<0.16	ND		<0.22	ND		<0.23	ND		<0.36	ND		**1**			<0.56	ND	
	VMP-16-19	19 ft	11/19/2009	**4.6**			<2.8	ND		<2.4	ND		<2.8	ND		<2.8	ND		<6.1	ND		<1.4	ND		<1.9	ND		<2	ND		<3.1	ND		**8.2**			<4.9	ND	
	VMP-16-31	31 ft	11/19/2009	<3.1	ND		<4.2	ND		<3.6	ND		<4.2	ND		<4.2	ND		<9.2	ND		<2.1	ND		<2.9	ND		<3	ND		<4.7	ND		**15**		**J**	<7.3	ND	
	VMP-16-31-D	31 ft	11/19/2009	<3.1	ND		<4.2	ND		<3.6	ND		<4.2	ND		<4.2	ND		<9.2	ND		<2.1	ND		<2.9	ND		<3	ND		<4.7	ND		<3.3	ND	UJ	<7.3	ND	

TABLE 9

SUMMARY OF SOIL VAPOR ANALYTICAL DETECTIONS

Location	Sample ID	Depth	Sample Date	4-Ethyltoluene Result (mg/m^3)	Lab Quals	URS Quals	Heptane Result (mg/m^3)	Lab Quals	URS Quals	Hexane Result (mg/m^3)	Lab Quals	URS Quals	Isopropylbenzene Result (mg/m^3)	Lab Quals	URS Quals	2-Propanol Result (mg/m^3)	Lab Quals	URS Quals	n-Propylbenzene Result (mg/m^3)	Lab Quals	URS Quals	1,2,4-Trimethylbenzene Result (mg/m^3)	Lab Quals	URS Quals	1,3,5-Trimethylbenzene Result (mg/m^3)	Lab Quals	URS Quals	2,2,4-Trimethylpentane Result (mg/m^3)	Lab Quals	URS Quals
VMP-1	VMP-1-5	5 ft	11/2/2009	<0.58	ND		**3.8**			**53**			<0.58	ND		<1.2	ND		<0.58	ND		<0.58	ND		<0.58	ND		**220**		
	VMP-1-8.5	8.5 ft	11/2/2009	<0.8	ND		**1.7**			**16**			<0.8	ND		<1.6	ND		<0.8	ND		<0.8	ND		<0.8	ND		**370**		
	VMP-1-23.5	23.5 ft	11/2/2009	<1.9	ND		**24**			**140**			<1.9	ND		<3.9	ND		<1.9	ND		<1.9	ND		<1.9	ND		**920**		
	VMP-1-38.5	38.5 ft	11/2/2009	<5.5	ND		**130**			**1000**			<5.5	ND		<11	ND		<5.5	ND		<5.5	ND		<5.5	ND		**2400**		
VMP-2	VMP-2-5	5 ft	11/2/2009	<0.72	ND		**1.3**			**13**			<0.72	ND		<1.4	ND		<0.72	ND		<0.72	ND		<0.72	ND		**270**		
	VMP-2-8.5	8.5 ft	11/3/2009	<0.25	ND		<0.21	ND		<0.18	ND		<0.25	ND		<0.5	ND		<0.25	ND		<0.25	ND		<0.25	ND		**74**		
	VMP-2-8.5-D	8.5 ft	11/3/2009	<0.26	ND		<0.22	ND		<0.19	ND		<0.26	ND		<0.53	ND		<0.26	ND		<0.26	ND		<0.26	ND		**82**		
	VMP-2-22	22 ft	11/3/2009	<1.4	ND		**1.6**			**13**			<1.4	ND		<2.8	ND		<1.4	ND		<1.4	ND		<1.4	ND		**600**		
	VMP-2-42	42 ft	11/3/2009	<27	ND		**1800**			**7000**			<27	ND		<54	ND		<27	ND		<27	ND		<27	ND		**1700**		
VMP-3	VMP-3-5	5 ft	11/3/2009	**0.035**			**0.16**			**0.58**			<0.026	ND		<0.053	ND		<0.026	ND		<0.026	ND		<0.026	ND		**6.4**		
	VMP-3-22	22 ft	11/4/2009	<19	ND		**310**			**4900**			<19	ND		<38	ND		**24**			<19	ND		<19	ND		**3800**		
	VMP-3-31.5	31.5 ft	11/4/2009	<30	ND		**870**			**18000**	E	J	<30	ND		<61	ND		<30	ND		<30	ND		<30	ND		**6800**		
	VMP-3-39	39 ft	11/4/2009	<61	ND		**780**			**18000**			<61	ND		<120	ND		<61	ND		<61	ND		<61	ND		**7100**		
VMP-4	VMP-4-5	5 ft	11/5/2009	<0.062	ND		<0.052	ND		**0.54**			<0.062	ND		<0.12	ND		<0.062	ND		<0.062	ND		<0.062	ND		**20**		
	VMP-4-12	12 ft	11/5/2009	**1.2**			**35**			**130**			<1	ND		<2.1	ND		<1	ND		<1	ND		<1	ND		**300**		
	VMP-4-23.5	23.5 ft	11/5/2009	**110**			**3600**			**14000**			<48	ND		<95	ND		<48	ND		**78**			<48	ND		**4700**		
	VMP-4-39	39 ft	11/5/2009	**120**			**3500**			**14000**			<37	ND		<73	ND		**39**			**83**			<37	ND		**4500**		
VMP-5	VMP-5-5	5 ft	11/5/2009	<1.1	ND		**9.1**			**170**			<1.1	ND		<2.2	ND		<1.1	ND		<1.1	ND		<1.1	ND		**370**		
	VMP-5-12.5	12.5 ft	11/6/2009	<1.3	ND		**46**			**650**			<1.3	ND		<2.5	ND		<1.3	ND		<1.3	ND		<1.3	ND		**960**		
	VMP-5-12.5-D	12.5 ft	11/6/2009	<2.8	ND		**47**			**640**			<2.8	ND		<5.7	ND		<2.8	ND		<2.8	ND		<2.8	ND		**1000**		
	VMP-5-31	31 ft	11/6/2009	<12	ND		**910**			**4900**			<12	ND		<23	ND		<12	ND		<12	ND		<12	ND		**4000**		
	VMP-5-40	40 ft	11/6/2009	<16	ND		**810**			**4400**			<16	ND		<32	ND		<16	ND		<16	ND		<16	ND		**3400**		
VMP-6	VMP-6-5	5 ft	11/6/2009	<1.9	ND		**380**		J	**720**		J	**2.7**		J	<3.9	ND		**5.8**		J	<1.9	ND		<1.9	ND		**1400**		J
	VMP-6-10	10 ft	11/6/2009	<2.1	ND		**480**			**900**			**3.6**			<4.2	ND		**8**			<2.1	ND		<2.1	ND		**1800**		
	VMP-6-31.5	31.5 ft	11/9/2009	**37**			**1800**			**3100**			**18**			<28	ND		**44**			**29**			<14	ND		**2500**		
	VMP-6-39	39 ft	11/9/2009	**82**			**2400**			**4200**			**24**			<31	ND		**60**			**79**			**29**			**2800**		
VMP-7	VMP-7-5	5 ft	11/9/2009	<0.005	ND		**0.091**			**0.11**			<0.005	ND		**0.55**			<0.005	ND		<0.005	ND		<0.005	ND		**0.21**		
	VMP-7-13.5	13.5 ft	11/9/2009	<0.044	ND		<0.037	ND		**0.052**			<0.044	ND		<0.088	ND		<0.044	ND		<0.044	ND		<0.044	ND		**22**	E	J
	VMP-7-29.5	29.5 ft	11/9/2009	<0.94	ND		**460**		J	**420**		J	**7.5**		J	<1.9	ND		**6.5**		J	<0.94	ND		<0.94	ND		**1200**	E	J
	VMP-7-38	38 ft	11/9/2009	<0.32	ND		**170**		J	**140**		J	**4**		J	<0.65	ND		**3.5**		J	<0.32	ND		<0.32	ND		**410**	E	J
VMP-8	VMP-8-5	5 ft	11/10/2009	<0.005	ND		**0.016**			**0.016**			<0.005	ND		<0.011	ND		<0.005	ND		<0.005	ND		<0.005	ND		**0.031**		
	VMP-8-9.5	9.5 ft	11/10/2009	<0.005	ND		**0.0046**			**0.0042**			<0.005	ND		<0.011	ND		<0.005	ND		<0.005	ND		<0.005	ND		<0.005	ND	
	VMP-8-23.5	23.5 ft	11/10/2009	<0.005	ND		<0.004	ND		<0.004	ND		<0.005	ND		<0.012	ND		<0.005	ND		<0.005	ND		<0.005	ND		<0.005	ND	
VMP-9	VMP-9-5	5 ft	11/11/2009	<0.005	ND		<0.004	ND		<0.003	ND		<0.005	ND		<0.011	ND		<0.005	ND		<0.005	ND		<0.005	ND		<0.005	ND	
	VMP-9-11.5	11.5 ft	11/11/2009	<0.006	ND		<0.005	ND		<0.004	ND		<0.006	ND		<0.014	ND		<0.006	ND		<0.006	ND		<0.006	ND		<0.006	ND	
	VMP-9-25.5	25.5 ft	11/10/2009	<1.4	ND		**1.5**		J	**6.6**		J	<1.4	ND		<2.7	ND		<1.4	ND		<1.4	ND		<1.4	ND		**710**		J
	VMP-9-25.5-D	25.5 ft	11/10/2009	<1.2	ND		**1.5**		J	**5.9**		J	<1.2	ND		<2.4	ND		<1.2	ND		<1.2	ND		<1.2	ND		**680**		J
	VMP-9-38.5	38.5 ft	11/10/2009	<2.7	ND		**4.6**		J	**25**		J	<2.7	ND		<5.4	ND		<2.7	ND		<2.7	ND		<2.7	ND		**640**		J
VMP-10	VMP-10-5	5 ft	11/11/2009	<0.005	ND		<0.004	ND		<0.003	ND		<0.005	ND		**0.87**			<0.005	ND		<0.005	ND		<0.005	ND		<0.005	ND	
	VMP-10-10	10 ft	11/11/2009	<0.005	ND		<0.004	ND		<0.004	ND		<0.005	ND		<0.011	ND		<0.005	ND		<0.005	ND		<0.005	ND		<0.005	ND	
	VMP-10-20	20 ft	11/11/2009	<0.005	ND		**0.0049**			**0.0068**			<0.005	ND		<0.011	ND		<0.005	ND		<0.005	ND		<0.005	ND		<0.005	ND	
	VMP-10-20-D	20 ft	11/11/2009	<0.006	ND		<0.005	ND		<0.004	ND		<0.006	ND		<0.012	ND		<0.006	ND		<0.006	ND		<0.006	ND		<0.005	ND	
	VMP-10-30	30 ft	11/13/2009	<0.006	ND		<0.005	ND		**0.0052**			<0.006	ND		<0.012	ND		<0.006	ND		<0.006	ND		<0.006	ND		<0.005	ND	
VMP-11	VMP-11-5	5 ft	11/17/2009	<0.044	ND		<0.037	ND		<0.032	ND		<0.044	ND		<0.088	ND		<0.044	ND		<0.044	ND		<0.044	ND		<0.042	ND	
	VMP-11-8	8 ft	11/17/2009	<0.006	ND		<0.005	ND		<0.004	ND		<0.006	ND		**0.032**			<0.006	ND		<0.006	ND		<0.006	ND		<0.005	ND	
	VMP-11-29	29 ft	11/18/2009	<42	ND		<35	ND		<30	ND		<42	ND		<84	ND		<42	ND		<42	ND		<42	ND		<40	ND	
	VMP-11-38	38 ft	11/18/2009	<120	ND		<100	ND		<87	ND		<120	ND		<240	ND		<120	ND		<120	ND		<120	ND		<120	ND	
VMP-12	VMP-12-5	5 ft	11/13/2009	<16	ND		**17**			**200**			<16	ND		<31	ND		<16	ND		<16	ND		<16	ND		**1500**		
	VMP-12-11.5	11.5 ft	11/13/2009	<27	ND		<22	ND		**230**			<27	ND		<54	ND		<27	ND		<27	ND		<27	ND		**1500**		
	VMP-12-25	25 ft	11/13/2009	<56	ND		**220**			**1200**			<56	ND		<110	ND		<56	ND		<56	ND		<56	ND		**1600**		
	VMP-12-39	39 ft	11/13/2009	<58	ND		**370**			**1400**			<58	ND		<120	ND		<58	ND		<58	ND		<58	ND		**1500**		
VMP-13	VMP-13-5	5 ft	11/16/2009	<12	ND		<9.9	ND		<8.5	ND		<12	ND		<24	ND		<12	ND		<12	ND		<12	ND		**28**		
	VMP-13-10.5	10.5 ft	11/17/2009	<1.5	ND		<1.2	ND		<1	ND		<1.5	ND		<2.9	ND		<1.5	ND		<1.5	ND		<1.5	ND		**2.6**		
	VMP-13-10.5-D	10.5 ft	11/17/2009	<1.5	ND		<1.3	ND		<1.1	ND		<1.5	ND		<3	ND		<1.5	ND		<1.5	ND		<1.5	ND		**2.8**		
	VMP-13-21.5	21.5 ft	11/17/2009	<75	ND		<62	ND		<54	ND		<75	ND		<150	ND		<75	ND		<75	ND		<75	ND		<71	ND	
	VMP-13-29.5	29.5 ft	11/17/2009	<150	ND		<120	ND		<100	ND		<150	ND		<290	ND		<150	ND		<150	ND		<150	ND		<140	ND	
VMP-14	VMP-14-5	5 ft	11/20/2009	<0.013	ND		<0.01	ND		**0.015**			<0.013	ND		<0.025	ND		<0.013	ND		<0.013	ND		<0.013	ND		**0.88**		
	VMP-14-11.5	11.5 ft	11/16/2009	<1.5	ND		**43**			**380**			<1.5	ND		<3	ND		<1.5	ND		<1.5	ND		<1.5	ND		**200**		
	VMP-14-20	20 ft	11/16/2009	<58	ND		**67**			**350**			<58	ND		<120	ND		<58	ND		<58	ND		<58	ND		**160**		
	VMP-14-29	29 ft	11/16/2009	<230	ND		**220**			**900**			<230	ND		<460	ND		<230	ND		<230	ND		<230	ND		**370**		
VMP-15	VMP-15-5	5 ft	11/18/2009	<0.006	ND		<0.005	ND		<0.004	ND		<0.006	ND		<0.012	ND		<0.006	ND		<0.006	ND		<0.006	ND		<0.005	ND	
	VMP-15-5-D	5 ft	11/18/2009	<0.006	ND		<0.005	ND		<0.004	ND		<0.006	ND		<0.012	ND		<0.006	ND		<0.006	ND		<0.006	ND		<0.005	ND	
	VMP-15-21.5	21.5 ft	11/18/2009	<2.8	ND		**30**			**96**			<2.8	ND		<5.6	ND		<2.8	ND		<2.8	ND		<2.8	ND		**1000**		
	VMP-15-25.5	25.5 ft	11/18/2009	<2.9	ND		**22**			**86**			<2.9	ND		<5.8	ND		<2.9	ND		<2.9	ND		<2.9	ND		**850**		
	VMP-15-29	29 ft	11/19/2009	<3.7	ND		**32**			**110**			<3.7	ND		<7.3	ND		<3.7	ND		<3.7	ND		<3.7	ND		**880**		
VMP-16	VMP-16-5	5 ft	11/20/2009	<0.083	ND		<0.069	ND		<0.059	ND		<0.083	ND		<0.16	ND		<0.083	ND		<0.083	ND		<0.083	ND		**16**		
	VMP-16-13.5	13.5 ft	11/19/2009	<0.37	ND		<0.3	ND		<0.26	ND		<0.37	ND		<0.73	ND		<0.37	ND		<0.37	ND		<0.37	ND		**82**		
	VMP-16-19	19 ft	11/19/2009	<3.2	ND		<2.6	ND		<2.3	ND		<3.2	ND		<6.3	ND		<3.2	ND		<3.2	ND		<3.2	ND		**910**		
	VMP-16-31	31 ft	11/19/2009	<4.8	ND		<4	ND		<3.4	ND		<4.8	ND		<9.5	ND		<4.8	ND		<4.8	ND		<4.8	ND		**2400**	E	J
	VMP-16-31-D	31 ft	11/19/2009	<4.8	ND		<4	ND		<3.4	ND		<4.8	ND		<9.5	ND		<4.8	ND		<4.8	ND		<4.8	ND		**2300**	E	J

LABORATORY QUALIFIERS:
E = Exceeds instrument calibration range.
ND = Not detected.

URS QUALIFIERS:
J = The results is estimated.
U = The analyte was not detected below the reporting limit.

TABLE 10
SUMMARY OF SOIL VAPOR FIXED GAS DETECTIONS

Location	Sample ID	Sample Date	Carbon Dioxide			Ethane			Helium			Methane			Nitrogen			Oxygen		
			Result (ppbV)	Lab Quals	URS Quals	Result (ppbV)	Lab Quals	URS Quals	Result (ppbV)	Lab Quals	URS Quals	Result (ppbV)	Lab Quals	URS Quals	Result (ppbV)	Lab Quals	URS Quals	Result (ppbV)	Lab Quals	URS Quals
VMP-1	VMP-1-5	11/2/2009	4.5			<0.0024	ND		1.6			1.4			81			11		
	VMP-1-8.5	11/2/2009	12			<0.0023	ND		<0.11	ND		1.5			85			1.5		
	VMP-1-23.5	11/2/2009	9.8			0.0038			<0.12	ND		7.4			80			1.3		
	VMP-1-38.5	11/2/2009	5.6			0.017			0.23			33			54			1.4		
VMP-2	VMP-2-5	11/2/2009	7.8			<0.0023	ND		2.4			0.0078			79			11		
	VMP-2-8.5	11/3/2009	2.5			<0.002	ND		1.2			<0.0002	ND		78			18		
	VMP-2-8.5-D	11/3/2009	2.7			<0.0022	ND		1.3			<0.00022	ND		78			18		
	VMP-2-22	11/3/2009	10			<0.0022	ND		<0.11	ND		0.54			85			4		
	VMP-2-42	11/3/2009	5			0.02			<0.11	ND		64			16			0.92		
VMP-3	VMP-3-5	11/3/2009	8.5			<0.0027	ND		0.18			0.037			86			5		
	VMP-3-22	11/4/2009	8.7			0.012			<0.12	ND		25			58			1.1		
	VMP-3-31.5	11/4/2009	5.6			0.02			<0.12	ND		43			36			0.77		
	VMP-3-39	11/4/2009	5.6			0.021			<0.12	ND		45			33			0.79		
VMP-4	VMP-4-5	11/5/2009	0.69			<0.0025	ND		34			0.029			51			14		
	VMP-4-12	11/5/2009	9.6			<0.0025	ND		0.26			2.2			84			3.8		
	VMP-4-23.5	11/5/2009	6.7			0.021			<0.12	ND		46			32			0.75		
	VMP-4-39	11/5/2009	6.6			0.02			<0.12	ND		44			34			1.1		
VMP-5	VMP-5-5	11/5/2009	14			<0.0022	ND		<0.11	ND		2.8			81			1.3		
	VMP-5-12.5	11/6/2009	13			0.004			<0.13	ND		6.3			78			1.3		
	VMP-5-12.5-D	11/6/2009	13			0.004			<0.12	ND		6.3			77			1.6		
	VMP-5-31	11/6/2009	10			0.014			<0.12	ND		24			58			1		
	VMP-5-40	11/6/2009	9.2			0.012			<0.16	ND		22			60			2.7		
VMP-6	VMP-6-5	11/6/2009	13			<0.0024	ND		<0.12	ND		3.7			79			3.3		
	VMP-6-10	11/6/2009	14			<0.0026	ND		<0.13	ND		4.2			78			2.7		
	VMP-6-31.5	11/9/2009	14			0.003			<0.11	ND		7.7			75			1.4		
	VMP-6-39	11/9/2009	15			0.0033			<0.11	ND		8.3			73			1.3		
VMP-7	VMP-7-5	11/9/2009	1.7			<0.0023	ND		2.7			<0.00023	ND		78			18		
	VMP-7-13.5	11/9/2009	16			<0.0022	ND		<0.11	ND		0.1			82			2.1		
	VMP-7-29.5	11/9/2009	17			<0.0023	ND		<0.11	ND		4.4			77			1.3		
	VMP-7-38	11/9/2009	3.2			<0.0024	ND		<0.12	ND		0.95			79			17		
VMP-8	VMP-8-5	11/10/2009	5.1			<0.0023	ND		<0.12	ND		<0.00023	ND		79			16		
	VMP-8-9.5	11/10/2009	9			<0.0022	ND		0.79			<0.00022	ND		78			12		
	VMP-8-23.5	11/10/2009	10			<0.0024	ND		<0.12	ND		<0.00024	ND		79			11		
VMP-9	VMP-9-5	11/11/2009	3.8			<0.0022	ND		11			<0.00022	ND		69			16		
	VMP-9-11.5	11/11/2009	12			<0.0028	ND		2.5			<0.00028	ND		79			6.5		
	VMP-9-25.5	11/10/2009	17			<0.0022	ND		<0.11	ND		3.8			78			1.2		
	VMP-9-25.5-D	11/10/2009	16			<0.0025	ND		<0.12	ND		3.8			79			1.3		
	VMP-9-38.5	11/10/2009	17			<0.0022	ND		<0.11	ND		3.2			78			1.2		
VMP-10	VMP-10-5	11/11/2009	3.9			<0.0022	ND		<0.11	ND		<0.00022	ND		78			18		
	VMP-10-10	11/11/2009	9.9			<0.0023	ND		<0.11	ND		<0.00023	ND		79			11		
	VMP-10-20	11/11/2009	0.15		J	<0.0022	ND		<0.11	ND		<0.00022	ND		78			22		
	VMP-10-20-D	11/11/2009	0.23		J	<0.0025	ND		0.58			<0.00025	ND		78			21		
	VMP-10-30	11/13/2009	16			<0.0025	ND		<0.12	ND		<0.00025	ND		81			3.4		

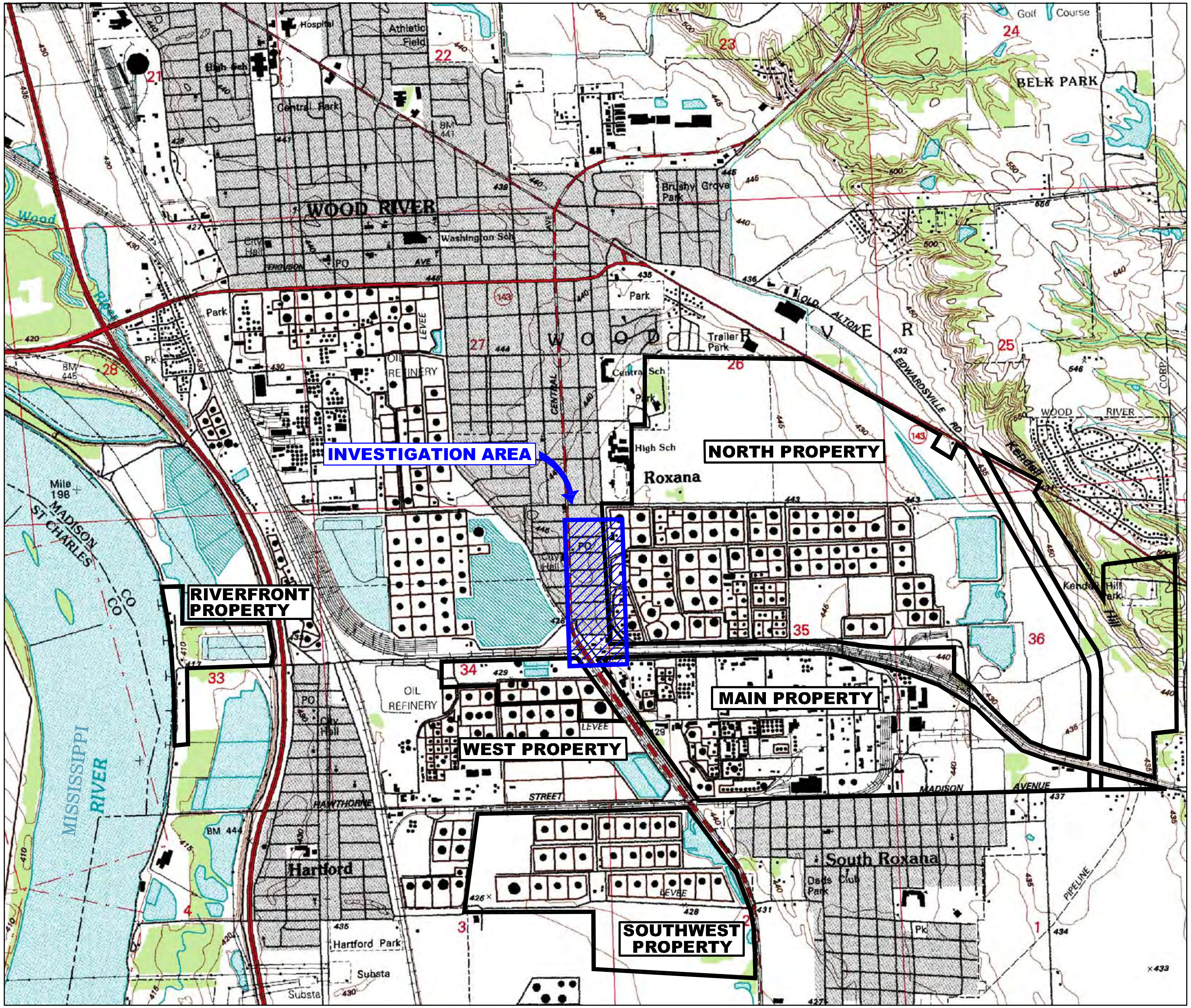
TABLE 10
SUMMARY OF SOIL VAPOR FIXED GAS DETECTIONS

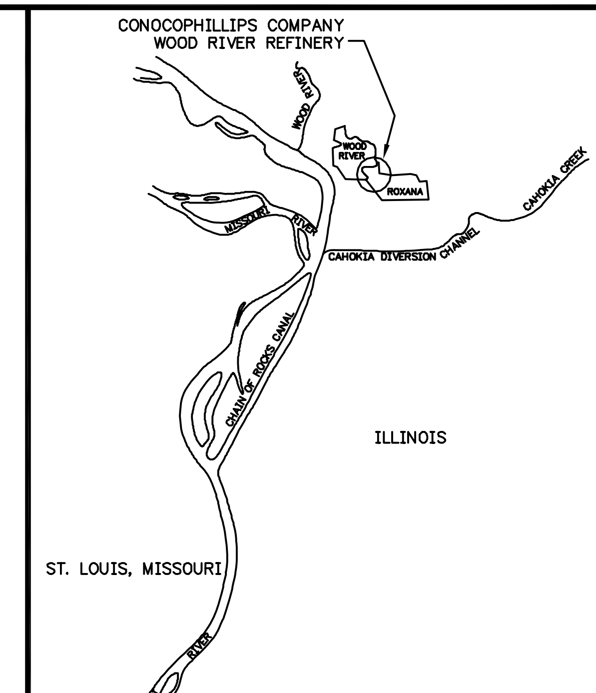
			Carbon Dioxide			Ethane			Helium			Methane			Nitrogen			Oxygen		
Location	**Sample ID**	**Sample Date**	Result (ppbV)	Lab Quals	URS Quals	Result (ppbV)	Lab Quals	URS Quals	Result (ppbV)	Lab Quals	URS Quals	Result (ppbV)	Lab Quals	URS Quals	Result (ppbV)	Lab Quals	URS Quals	Result (ppbV)	Lab Quals	URS Quals
VMP-11	VMP-11-5	11/17/2009	**7.8**			<0.0022	ND		<0.11	ND		**1**			**87**			**4.4**		
	VMP-11-8	11/17/2009	**11**			<0.0025	ND		**0.21**			**0.01**			**84**			**5.1**		
	VMP-11-29	11/18/2009	**17**			<0.0024	ND		<0.12	ND		**0.14**			**80**			**2.4**		
	VMP-11-38	11/18/2009	**16**			<0.003	ND		<0.15	ND		**0.35**			**81**			**1.8**		
VMP-12	VMP-12-5	11/13/2009	**14**			<0.0025	ND		<0.13	ND		**33**			**50**			**0.9**		
	VMP-12-11.5	11/13/2009	**14**			<0.0022	ND		<0.11	ND		**34**			**49**			**0.84**		
	VMP-12-25	11/13/2009	**14**			<0.0023	ND		<0.11	ND		**33**			**49**			**0.84**		
	VMP-12-39	11/13/2009	**14**			<0.0024	ND		<0.12	ND		**32**			**50**			**0.95**		
VMP-13	VMP-13-5	11/16/2009	**14**			<0.0024	ND		<0.12	ND		**0.82**			**82**			**2.5**		
	VMP-13-10.5	11/17/2009	**0.14**		**J**	<0.0024	ND		<0.12	ND		**0.0079**		**J**	**80**			**20**		
	VMP-13-10.5-D	11/17/2009	**0.23**		**J**	<0.0025	ND		<0.12	ND		**0.015**		**J**	**79**			**21**		
	VMP-13-21.5	11/17/2009	**15**			<0.0021	ND		<0.11	ND		**1.6**			**81**			**1.3**		
	VMP-13-29.5	11/17/2009	**13**			<0.0024	ND		<0.12	ND		**1.6**			**81**			**1.7**		
VMP-14	VMP-14-5	11/20/2009	**2**			<0.0026	ND		**0.13**			**0.0013**			**87**			**11**		
	VMP-14-11.5	11/16/2009	**12**			**0.005**			<0.12	ND		**15**			**71**			**1.4**		
	VMP-14-20	11/16/2009	**18**			**0.0062**			<0.12	ND		**18**			**60**			**1.3**		
	VMP-14-29	11/16/2009	**17**			**0.0073**			<0.12	ND		**18**			**60**			**1**		
VMP-15	VMP-15-5	11/18/2009	**13**			<0.0025	ND		<0.13	ND		<0.00025	ND		**82**			**4.8**		
	VMP-15-5-D	11/18/2009	**13**			<0.0025	ND		<0.13	ND		<0.00025	ND		**82**			**4.8**		
	VMP-15-21.5	11/18/2009	**18**			**0.012**			<0.11	ND		**19**			**60**			**1.2**		
	VMP-15-25.5	11/18/2009	**17**			**0.014**			<0.12	ND		**20**			**60**			**1.1**		
	VMP-15-29	11/19/2009	**17**			**0.014**			<0.12	ND		**20**			**60**			**1.2**		
VMP-16	VMP-16-5	11/20/2009	**0.12**			<0.0025	ND		**38**			<0.00025	ND		**49**			**13**		
	VMP-16-13.5	11/19/2009	**0.79**			<0.0024	ND		**24**			**0.1**			**58**			**17**		
	VMP-16-19	11/19/2009	**2.2**			<0.0026	ND		**14**			**3.9**			**65**			**15**		
	VMP-16-31	11/19/2009	**4**			<0.0023	ND		**8.7**			**12**			**66**			**9.2**		
	VMP-16-31-D	11/19/2009	**3.7**			<0.0023	ND		**8.4**			**11**			**67**			**9.4**		

NOTES:
1) All samples including tedlar bags contaning vapor were collected using a helium leak-check shroud .

LABORATORY QUALIFIERS:
ND = Not detected.

URS QUALIFIERS:
J = The results is estimated.





SITE VICINITY MAP

SCALE: 1IN = 8 MILES

LEGEND

WOOD RIVER REFINERY PROPERTY BOUNDARY

INVESTIGATION AREA

SOURCE: MAP TAKEN FROM ELECTRONIC USGS DIGITAL RASTER GRAPHIC 7.5 MINUTE TOPOGRAPHIC MAP OF WOOD RIVER, ILL-MO REVISED 1994.

CONTOUR INTERVAL = 5 FT

0 2000

SCALE FEET

SHELL OIL PRODUCTS US ROXANA, ILLINOIS	PROJECT NO. 21562289
URS	
DRN. BY: djd 2/16/10 DSGN. BY: djd CHKD. BY: wmp	Site Location Map — FIG. NO. 1

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562175-DISSOLVED PHASE INVESTIGATION\G-REPORT\C-FIGURES\FIGURE 1 SITE LOCATION MAP.DWG Last edited: 02/16/10 @ 3:32 p.m. © WCC-ST.LOUIS

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562175-DISSOLVED PHASE INVESTIGATION\G-REPORT\C-FIGURES\FIGURE 2 SITE AERIAL PHOTOGRAPH.DWG Last edited: FEB. 16, 10 @ 3:35 p.m. by: David_Deguire

LEGEND

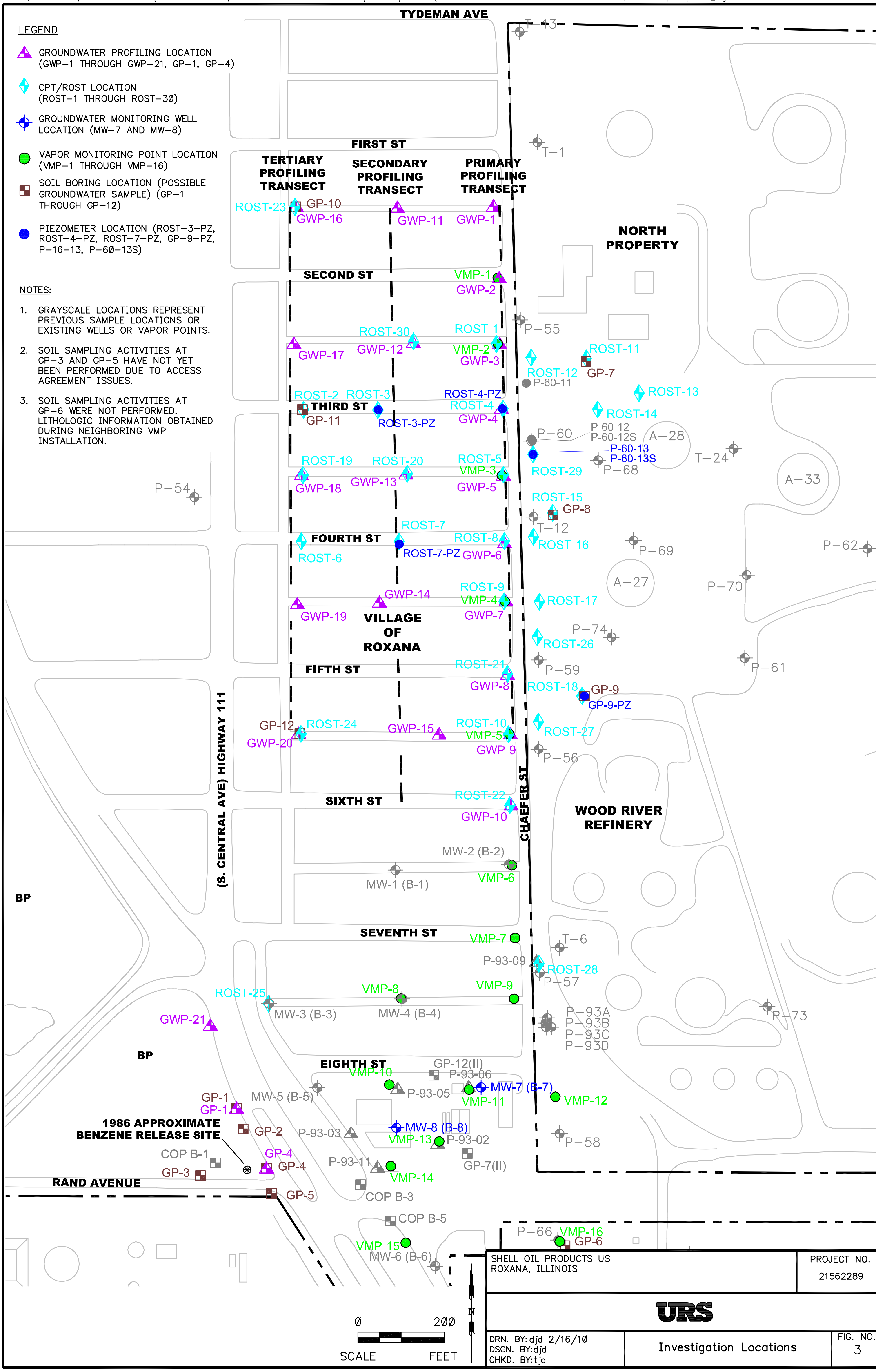
- APPROXIMATE VILLAGE OF HARTFORD BOUNDARY
- APPROXIMATE VILLAGE OF ROXANA BOUNDARY
- APPROXIMATE VILLAGE OF WOOD RIVER BOUNDARY

0 200
SCALE FEET

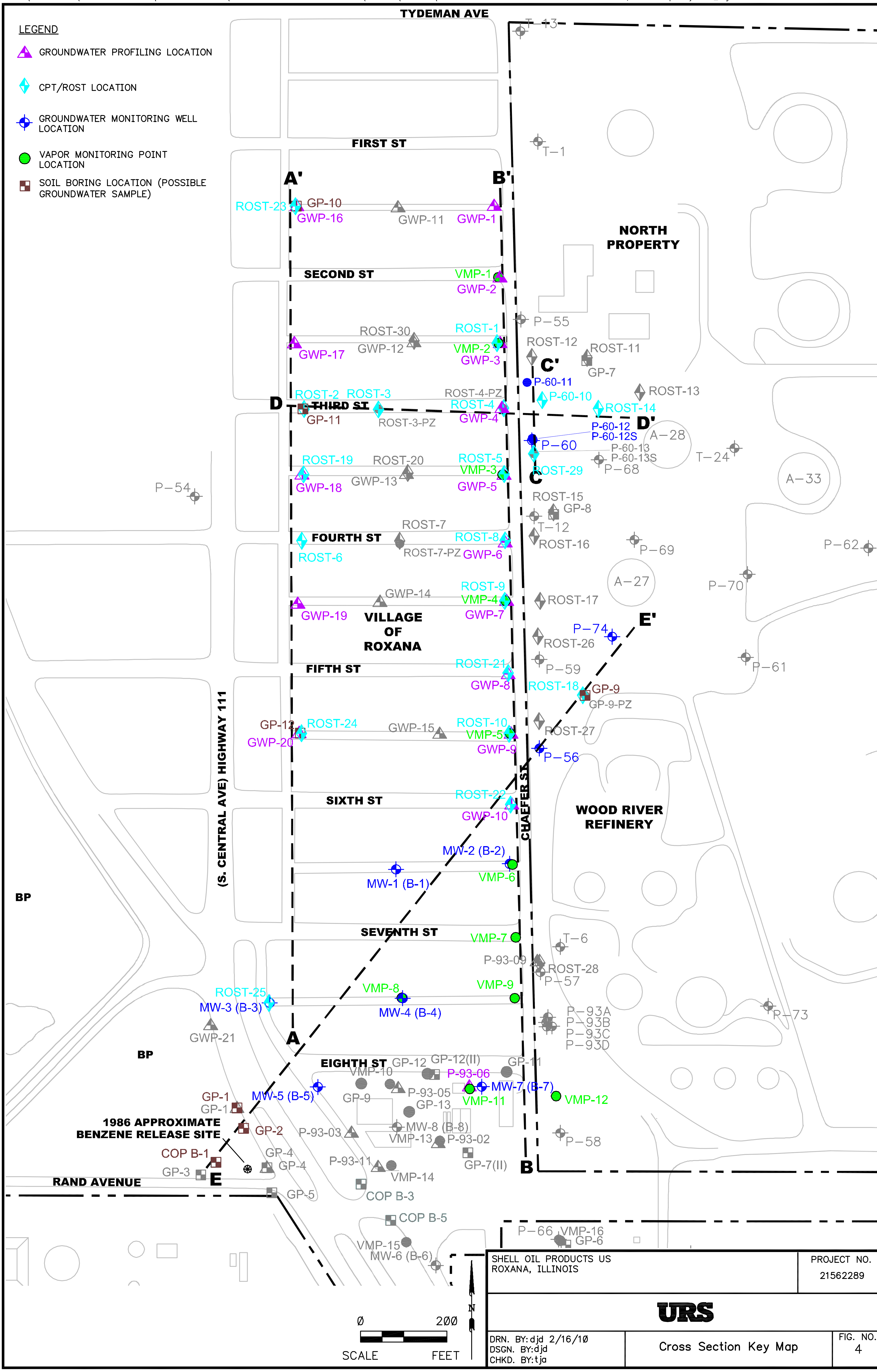
SOURCE:
AERIAL PHOTO PROVIDED BY SURDEX CORORATION 2007.

SHELL OIL PRODUCTS US ROXANA, ILLINOIS	PROJECT NO. 21562289
URS	
DRN. BY: djd 2/16/10 DSGN. BY: djd CHKD. BY: tja	Site Aerial Photograph — FIG. NO. 2

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562175-DISSOLVED PHASE INVESTIGATION\G-REPORT\C-FIGURES\FIGURE 3 INVESTIGATION LOCATIONS.DWG Last edited: FEB. 16, 10 @ 3:37 p.m. by: David_Deguire



File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562175-DISSOLVED PHASE INVESTIGATION\G-REPORT\C-FIGURES\FIGURE 4 CROSS SECTION KEY MAP.DWG Last edited: FEB. 16, 10 @ 3:38 p.m. by: David_Deguire



SHELL OIL PRODUCTS US
ROXANA, ILLINOIS

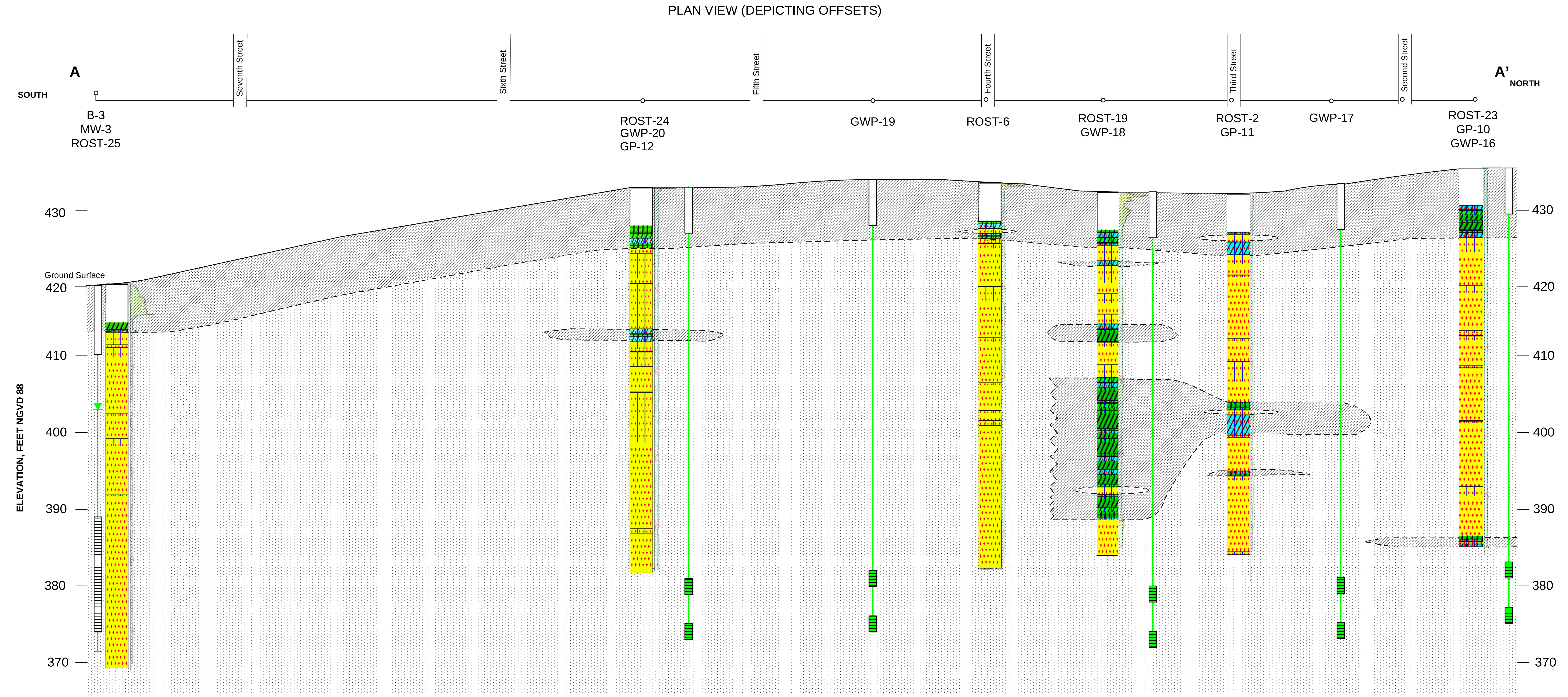
PROJECT NO.
21562289

URS

DRN. BY: djd 2/16/10
DSGN. BY: djd
CHKD. BY: tja

Cross Section Key Map

FIG. NO.
4



NOTES:

1) This cross section is primarily based on the interpretation of CPT data collected by URS during the 2006 and 2009 investigation activities. The CPT logs are shown in color on the cross section. Boring logs developed during other drilling techniques (e.g. auger and Geoprobe) were used to supplement CPT data.

2) The depth and the thickness of individual strata observed in the borings (non-CPT) may vary slightly from what was observed in CPT logs generated at nearby locations. Therefore, well screens may appear to be partially within clay layers or shallower/deeper within a permeable stratum than actual conditions due to map projections.

3) Cross section trace line shows distance and direction each point was projected to construct this cross section.

4) Groundwater profiling points GWP-16, GWP-17, GWP-18, GWP-19, and GWP-20 present groundwater profile sampling depths only and were not used for geologic interpretations shown on this cross section.

5) Groundwater elevations shown on this cross section are based on gauging data collected on January 6, 2010

6) All VMP, ROST, soil boring, and groundwater profiling locations were air knifed prior to commencing drilling activities.

7) ROST responses shown on this cross section are copied from ROST logs provided in Appendix C. ROST logs can be viewed in greater detail in this Appendix.

LEGEND:

- Stratum Boundary Assumed
- CLAY projected between points (Includes Sandy CLAY, Silty CLAY)
- SAND projected between points (Includes Silty SAND and Clayey SAND)
- Water Level
- Well Screen
- Groundwater Profiling Interval
- CPT interpreted CLAY
- CPT interpreted Sandy CLAY
- CPT interpreted SAND

Vertical Scale: (Feet) 0 10

Plan View and Horizontal Scale: (Feet) 0 100

SHELL OIL PRODUCTS US
ROXANA, ILLINOIS

PROJECT NO. 21562289

URS

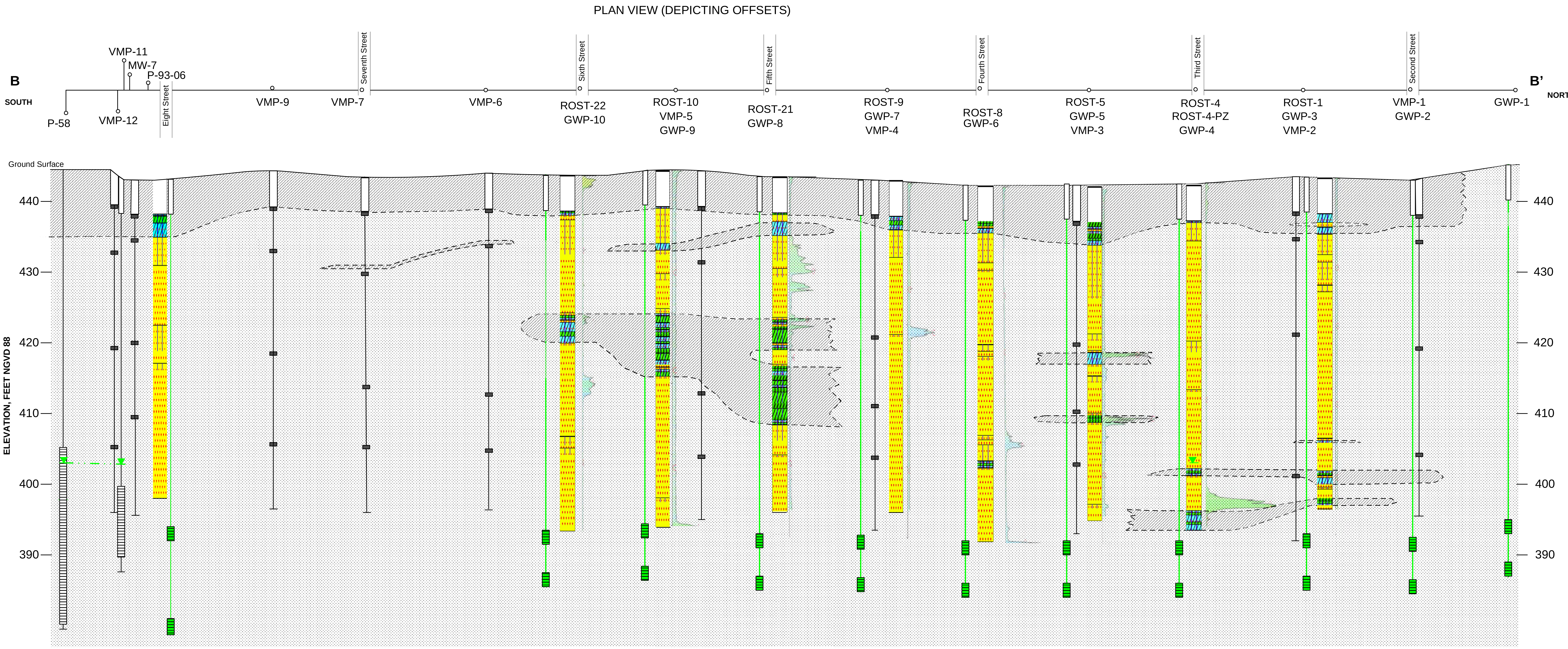
DRN. BY: mpm
DSGN. BY: nrs 02/26/2010
CHKD. BY: ekf

Cross Section A-A'

FIG. NO. 5

P:\Environmental\Shell Oil Product US\B-Roxana-Route 111\21562175-Dissolved Phase Investigation\G-Report\C-Figures\Figure 5- Cross Section A-A'.vsd

Last edit: 2/17/2010 8:42:45 AM



LEGEND:

- Stratum Boundary Assumed
- CLAY projected between points (Includes Silty CLAY and Sandy CLAY)
- SAND projected between points (Includes Silty SAND and Clayey SAND)
- Vapor Port Screens installed during 2009 investigation
- Water Level
- Potentiometric Surface - estimated
- Well Screen
- Groundwater Profiling Interval
- CPT interpreted CLAY
- CPT interpreted Sandy CLAY
- CPT interpreted SAND

NOTES:

1) This cross section is primarily based on the interpretation of CPT data collected by URS during the 2006 and 2009 investigation activities. The CPT logs are shown in color on the cross section. Boring logs developed during other drilling techniques (e.g. auger and Geoprobe) were used to supplement CPT data.

2) The depth and the thickness of individual strata observed in the borings (non-CPT) may vary slightly from what was observed in CPT logs generated at nearby locations. Therefore, well screens may appear to be partially within clay layers or shallower/deeper within a permeable stratum than actual conditions due to map projections.

3) Cross section trace line shows distance and direction each point was projected to construct this cross section.

4) Groundwater profiling points GWP-1, GWP-2, GWP-3, GWP-4, GWP-5, GWP-6, GWP-7, GWP-8, GWP-9, GWP-10 and P-93-06 present groundwater profile sampling depths only and were not used for geologic interpretations shown on this cross section.

5) Groundwater elevations shown on this cross section are based on gauging data collected on January 6, 2010

6) All VMP, ROST, soil boring, and groundwater profiling locations were air knifed prior to commencing drilling activities.

7) ROST responses shown on this cross section are copied from ROST logs provided in Appendix C. ROST logs can be viewed in greater detail in this Appendix.

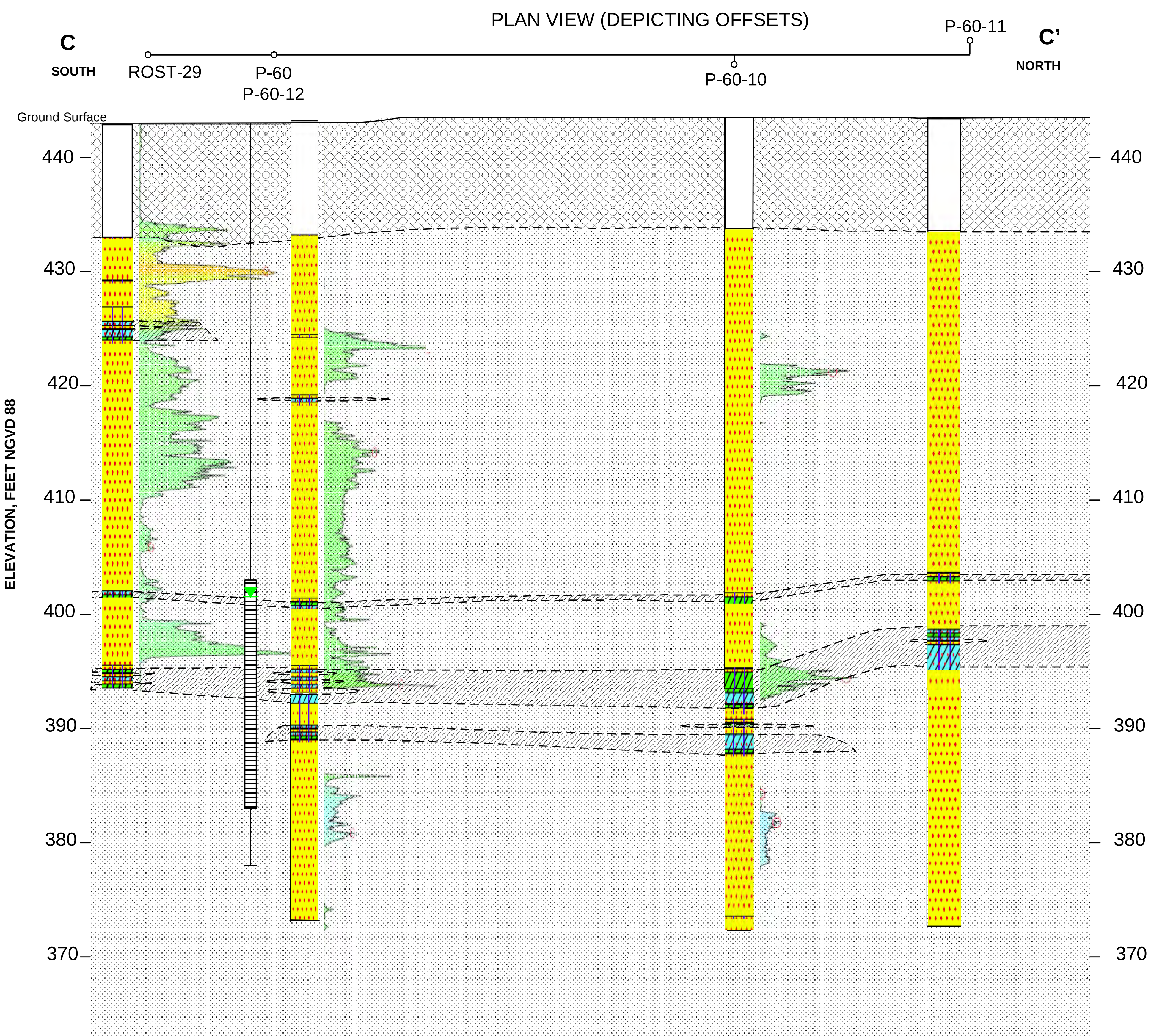
Vertical Scale: (Feet) 0 — 10

Plan View and Horizontal Scale: (Feet) 0 — 100

SHELL OIL PRODUCTS US ROXANA, ILLINOIS	PROJECT NO. 21562289
URS	
DRN. BY: mpm DSGN. BY: nrs CHKD. BY: ekf 02/26/2010	Cross Section B - B' — FIG. NO. 6

P:\Environmental\Shell Oil Product US\B-Roxana-Route 111\21562175-Dissolved Phase Investigation\G-Report\C-Figures\Figure 6- Cross Section B-B'.vsd

Last edit: 2/17/2010 8:51:55 AM



LEGEND:

- Stratum Boundary Assumed
- FILL (gravel, clay, etc.) projected between points
- CLAY projected between points Includes Sandy CLAY and Silty CLAY)
- SAND projected between points (Includes Clayey SAND and Silty SAND)
- Water Level
- Well Screen
- CPT interpreted CLAY
- CPT interpreted Sandy CLAY
- CPT interpreted SAND

NOTES:

1) This cross section is primarily based on the interpretation of CPT data collected by URS during the 2006 and 2009 investigation activities. The CPT logs are shown in color on the cross section. Boring logs developed during other drilling techniques (e.g. auger and Geoprobe) were used to supplement CPT data.

2) The depth and the thickness of individual strata observed in the borings (non-CPT) may vary slightly from what was observed in CPT logs generated at nearby locations. Therefore, well screens may appear to be partially within clay layers or shallower/deeper within a permeable stratum than actual conditions due to map projections.

3) Cross section trace line shows distance and direction each point was projected to construct this cross section.

4) Groundwater elevations shown on this cross section are based on gauging data collected on January 6, 2010.

5) All ROST and soil boring locations were air knifed prior to commencing drilling activities.

6) ROST responses shown on this cross section are copied from ROST logs provided in Appendix C. ROST logs can be viewed in greater detail in this Appendix.

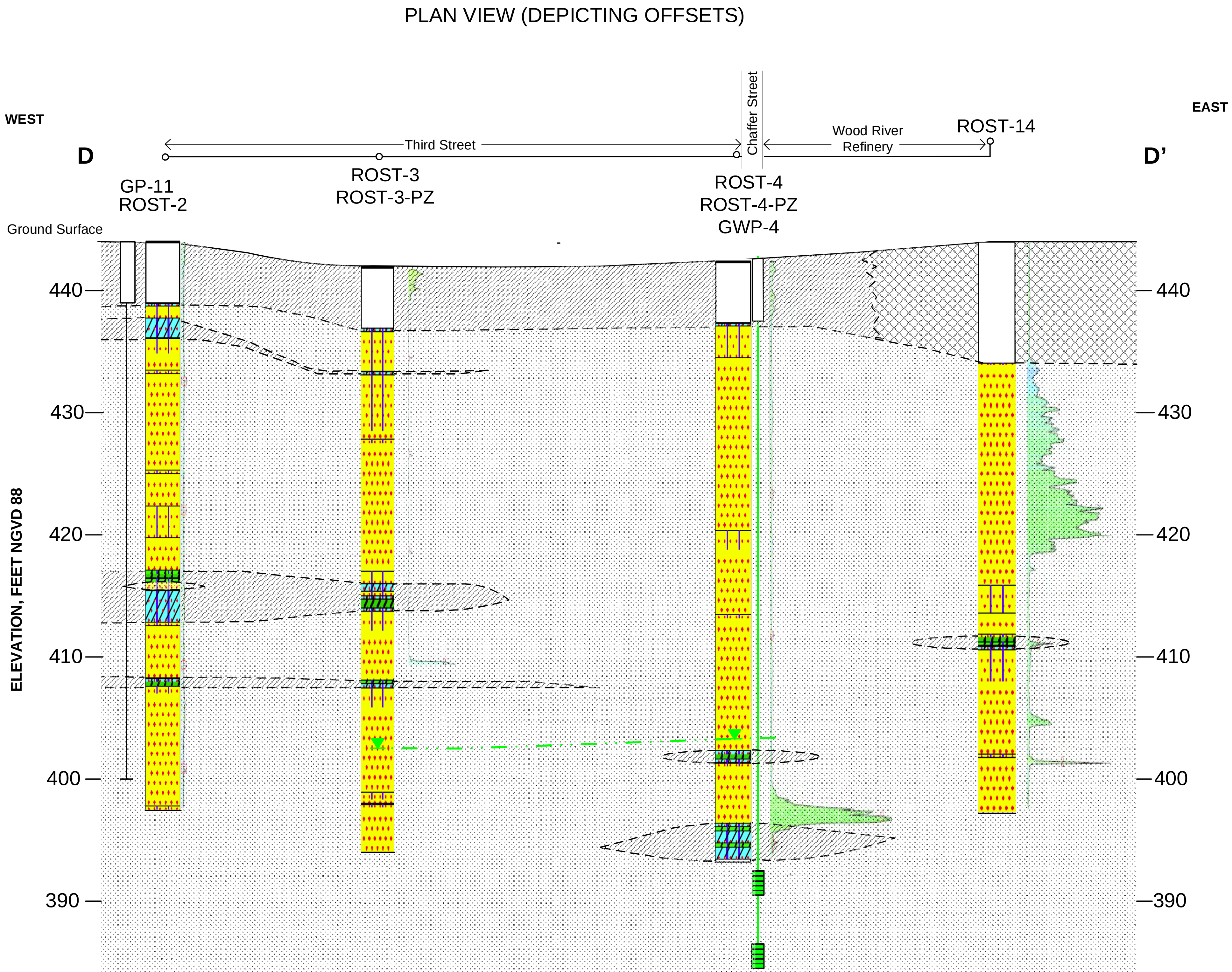
Vertical Scale: (Feet) 0 — 10

Plan View and Horizontal Scale: (Feet) 0 — 25

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562289
URS		
DRN. BY: mpm DSGN. BY: nrs CHKD. BY: ekf 02/16/2010	Cross Section C-C'	FIG. NO. 7

P:\Environmental\Shell Oil Product US\B-Roxana-Route 111\21562175-Dissolved Phase Investigation\G-Report\C-Figures\Figure 7- Cross Section C-C'.vsd

Last edit: 2/17/2010 10:27:26 AM



NOTES:
1) This cross section is primarily based on the interpretation of CPT data collected by URS during the 2006 and 2009 investigation activities. The CPT logs are shown in color on the cross section. Boring logs developed during other drilling techniques (e.g. auger and Geoprobe) were used to supplement CPT data.

2) The depth and the thickness of individual strata observed in the borings (non-CPT) may vary slightly from what was observed in CPT logs generated at nearby locations. Therefore, well screens may appear to be partially within clay layers or shallower/deeper within a permeable stratum than actual conditions due to map projections.

3) Cross section trace line shows distance and direction each point was projected to construct this cross section.

4) Groundwater profiling point GWP-4 presents groundwater profile sampling depths only and was not used for geologic interpretations shown on this cross section.

5) All ROST, soil boring, and groundwater profiling locations were air knifed prior to commencing drilling activities.

6) ROST responses shown on this cross section are copied from ROST logs provided in Appendix C. ROST logs can be viewed in greater detail in this Appendix.

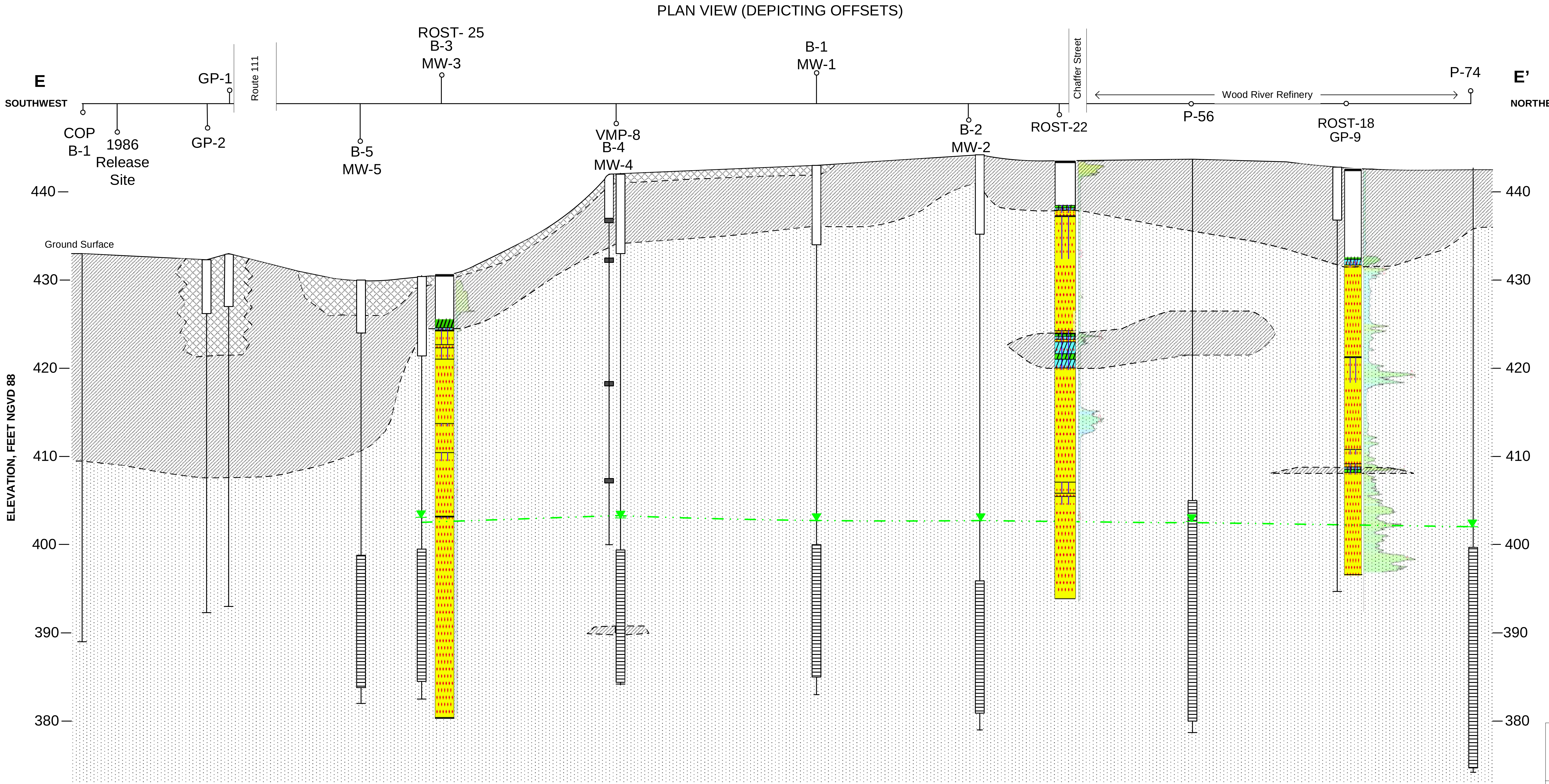
LEGEND:
- Stratum Boundary Assumed
- FILL (gravel, clay, etc.) projected between points
- CLAY projected between points (Includes Silty CLAY and Sandy CLAY)
- SAND projected between points (Includes Silty SAND and Clayey SAND)
- Potentiometric Surface - estimated
- Water Level
- CPT interpreted CLAY
- CPT interpreted Sandy CLAY
- CPT interpreted SAND

Vertical Scale: (Feet) 0 — 10

Plan View and Horizontal Scale: (Feet) 0 — 100

SHELL OIL PRODUCTS US ROXANA, ILLINOIS	PROJECT NO. 21562289
URS	
DRN. BY: mpm DSGN. BY: nrs 02/16/2010 CHKD. BY: ekf	Cross Section D-D' — FIG. NO. 8

P:\Environmental\Shell Oil Product US\B-Roxana-Route 111\21562175-Dissolved Phase Investigation\G-Report\C-Figures\Figure 8- Cross Section D-D'.vsd Last edit: 2/17/2010 8:59:14 AM



LEGEND:

- Stratum Boundary Assumed
- FILL (gravel, clay, etc.) projected between points
- CLAY projected between points (Includes Sandy CLAY and Silty CLAY)
- SAND projected between points (Includes Silty SAND and Clayey SAND)
- Vapor Port Screens installed during 2009 investigation
- Water Level
- Potentiometric Surface - estimated
- Well Screen
- CPT interpreted CLAY
- CPT interpreted Sandy CLAY
- CPT interpreted SAND

Vertical Scale: (Feet) 0 — 10

Plan View and Horizontal Scale: (Feet) 0 — 100

NOTES:

1) This cross section is primarily based on the interpretation of CPT data collected by URS during the 2006 and 2009 investigation activities. The CPT logs are shown in color on the cross section. Boring logs developed during other drilling techniques (e.g. auger and Geoprobe) were used to supplement CPT data.

2) The depth and the thickness of individual strata observed in the borings (non-CPT) may vary slightly from what was observed in CPT logs generated at nearby locations. Therefore, well screens may appear to be partially within clay layers or shallower/deeper within a permeable stratum than actual conditions due to map projections.

3) Boring logs and well construction diagrams of historic points (e.g. P-56, P-74, and COP B-1) shown on this cross section are based on documents supplied to URS.

4) Cross section trace line shows distance and direction each point was projected to construct this cross section.

5) The ground surface for boring COP B-1 was estimated based on nearby elevation information.

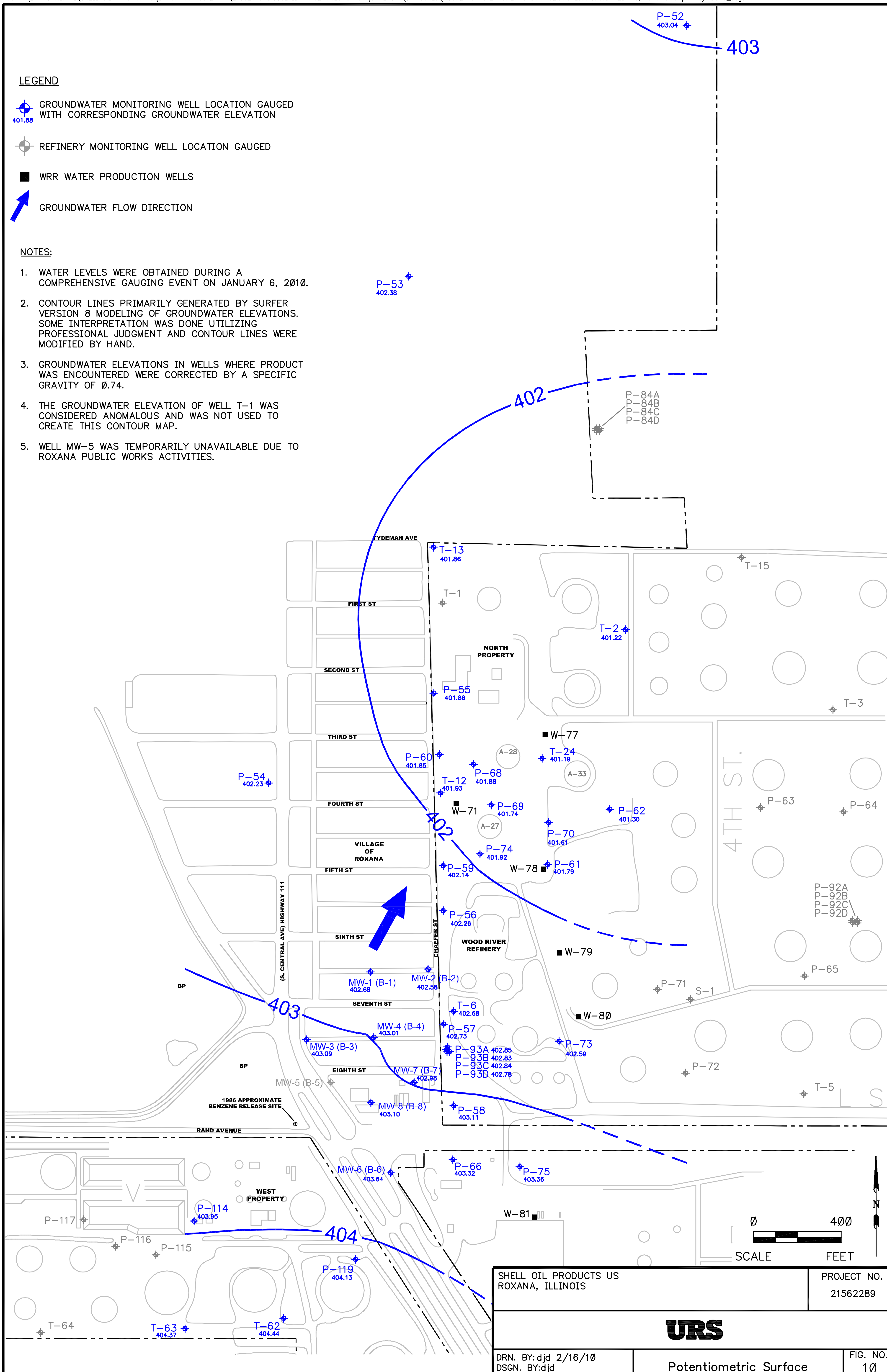
6) Groundwater elevations shown on this cross section are based on gauging data collected on January 6, 2009. Depth to groundwater was not measured at monitoring MW-5 during this round of well gauging.

7) All VMP, ROST, soil boring, and groundwater profiling locations were air knifed prior to commencing drilling activities.

8) ROST responses shown on this cross section are copied from ROST logs provided in Appendix C. ROST logs can be viewed in greater detail in this Appendix.

SHELL OIL PRODUCTS US ROXANA, ILLINOIS	PROJECT NO. 215621289
URS	
DRN. BY: nrs DSGN. BY: mpm 02/16/2010 CHKD. BY: ekf	Cross Section E-E' — FIG. NO. 9

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562175-DISSOLVED PHASE INVESTIGATION\G-REPORT\C-FIGURES\FIGURE 10 POTENTIOMETRIC SURFACE.DWG Last edited: FEB. 16, 10 @ 3:39 p.m. by: David_Deguire



LEGEND

GROUNDWATER MONITORING WELL LOCATION GAUGED WITH CORRESPONDING GROUNDWATER ELEVATION (401.88)

REFINERY MONITORING WELL LOCATION GAUGED

WRR WATER PRODUCTION WELLS

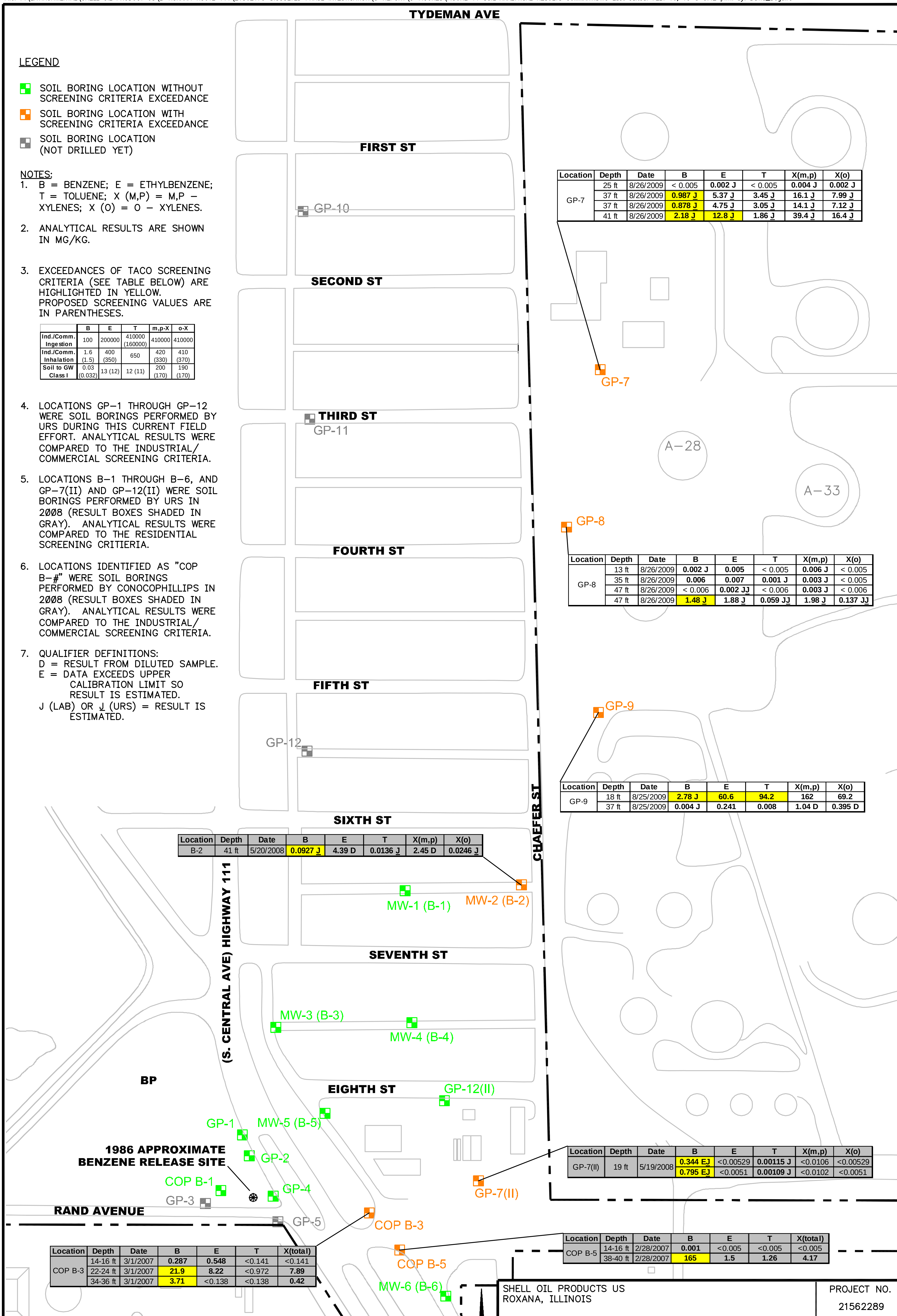
GROUNDWATER FLOW DIRECTION

NOTES:

1. WATER LEVELS WERE OBTAINED DURING A COMPREHENSIVE GAUGING EVENT ON JANUARY 6, 2010.
2. CONTOUR LINES PRIMARILY GENERATED BY SURFER VERSION 8 MODELING OF GROUNDWATER ELEVATIONS. SOME INTERPRETATION WAS DONE UTILIZING PROFESSIONAL JUDGMENT AND CONTOUR LINES WERE MODIFIED BY HAND.
3. GROUNDWATER ELEVATIONS IN WELLS WHERE PRODUCT WAS ENCOUNTERED WERE CORRECTED BY A SPECIFIC GRAVITY OF 0.74.
4. THE GROUNDWATER ELEVATION OF WELL T-1 WAS CONSIDERED ANOMALOUS AND WAS NOT USED TO CREATE THIS CONTOUR MAP.
5. WELL MW-5 WAS TEMPORARILY UNAVAILABLE DUE TO ROXANA PUBLIC WORKS ACTIVITIES.

SHELL OIL PRODUCTS US ROXANA, ILLINOIS	PROJECT NO. 21562289
URS	
DRN. BY: djd 2/16/10 DSGN. BY: djd CHKD. BY: tja	Potentiometric Surface — FIG. NO. 10

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562175-DISSOLVED PHASE INVESTIGATION\G-REPORT\C-FIGURES\FIGURE 11 SOIL ANALYTICAL RESULTS SUMMARY.DWG Last edited: FEB. 16, 10 @ 3:42 p.m. by: David_Deguire



LEGEND

- SOIL BORING LOCATION WITHOUT SCREENING CRITERIA EXCEEDANCE
- SOIL BORING LOCATION WITH SCREENING CRITERIA EXCEEDANCE
- SOIL BORING LOCATION (NOT DRILLED YET)

NOTES:

1. B = BENZENE; E = ETHYLBENZENE; T = TOLUENE; X (M,P) = M,P – XYLENES; X (O) = O – XYLENES.
2. ANALYTICAL RESULTS ARE SHOWN IN MG/KG.
3. EXCEEDANCES OF TACO SCREENING CRITERIA (SEE TABLE BELOW) ARE HIGHLIGHTED IN YELLOW. PROPOSED SCREENING VALUES ARE IN PARENTHESES.

	B	E	T	m,p-X	o-X
Ind./Comm. Ingestion	100	200000	410000 (160000)	410000	410000
Ind./Comm. Inhalation	1.6 (1.5)	400 (350)	650	420 (330)	410 (370)
Soil to GW Class I	0.03 (0.032)	13 (12)	12 (11)	200 (170)	190 (170)

4. LOCATIONS GP–1 THROUGH GP–12 WERE SOIL BORINGS PERFORMED BY URS DURING THIS CURRENT FIELD EFFORT. ANALYTICAL RESULTS WERE COMPARED TO THE INDUSTRIAL/ COMMERCIAL SCREENING CRITERIA.
5. LOCATIONS B–1 THROUGH B–6, AND GP–7(II) AND GP–12(II) WERE SOIL BORINGS PERFORMED BY URS IN 2008 (RESULT BOXES SHADED IN GRAY). ANALYTICAL RESULTS WERE COMPARED TO THE RESIDENTIAL SCREENING CRITIERIA.
6. LOCATIONS IDENTIFIED AS "COP B–#" WERE SOIL BORINGS PERFORMED BY CONOCOPHILLIPS IN 2008 (RESULT BOXES SHADED IN GRAY). ANALYTICAL RESULTS WERE COMPARED TO THE INDUSTRIAL/ COMMERCIAL SCREENING CRITERIA.
7. QUALIFIER DEFINITIONS:
   D = RESULT FROM DILUTED SAMPLE.
   E = DATA EXCEEDS UPPER CALIBRATION LIMIT SO RESULT IS ESTIMATED.
   J (LAB) OR J (URS) = RESULT IS ESTIMATED.

Location	Depth	Date	B	E	T	X(m,p)	X(o)
GP-7	25 ft	8/26/2009	< 0.005	0.002 J	< 0.005	0.004 J	0.002 J
	37 ft	8/26/2009	0.987 J	5.37 J	3.45 J	16.1 J	7.99 J
	37 ft	8/26/2009	0.878 J	4.75 J	3.05 J	14.1 J	7.12 J
	41 ft	8/26/2009	2.18 J	12.8 J	1.86 J	39.4 J	16.4 J

Location	Depth	Date	B	E	T	X(m,p)	X(o)
GP-8	13 ft	8/26/2009	0.002 J	0.005	< 0.005	0.006 J	< 0.005
	35 ft	8/26/2009	0.006	0.007	0.001 J	0.003 J	< 0.005
	47 ft	8/26/2009	< 0.006	0.002 JJ	< 0.006	0.003 J	< 0.006
	47 ft	8/26/2009	1.48 J	1.88 J	0.059 JJ	1.98 J	0.137 JJ

Location	Depth	Date	B	E	T	X(m,p)	X(o)
GP-9	18 ft	8/25/2009	2.78 J	60.6	94.2	162	69.2
	37 ft	8/25/2009	0.004 J	0.241	0.008	1.04 D	0.395 D

Location	Depth	Date	B	E	T	X(m,p)	X(o)
B-2	41 ft	5/20/2008	0.0927 J	4.39 D	0.0136 J	2.45 D	0.0246 J

Location	Depth	Date	B	E	T	X(m,p)	X(o)
GP-7(II)	19 ft	5/19/2008	0.344 EJ	<0.00529	0.00115 J	<0.0106	<0.00529
			0.795 EJ	<0.0051	0.00109 J	<0.0102	<0.0051

Location	Depth	Date	B	E	T	X(total)
COP B-5	14-16 ft	2/28/2007	0.001	<0.005	<0.005	<0.005
	38-40 ft	2/28/2007	165	1.5	1.26	4.17

Location	Depth	Date	B	E	T	X(total)
COP B-3	14-16 ft	3/1/2007	0.287	0.548	<0.141	<0.141
	22-24 ft	3/1/2007	21.9	8.22	<0.972	7.89
	34-36 ft	3/1/2007	3.71	<0.138	<0.138	0.42

SHELL OIL PRODUCTS US
ROXANA, ILLINOIS

PROJECT NO. 21562289

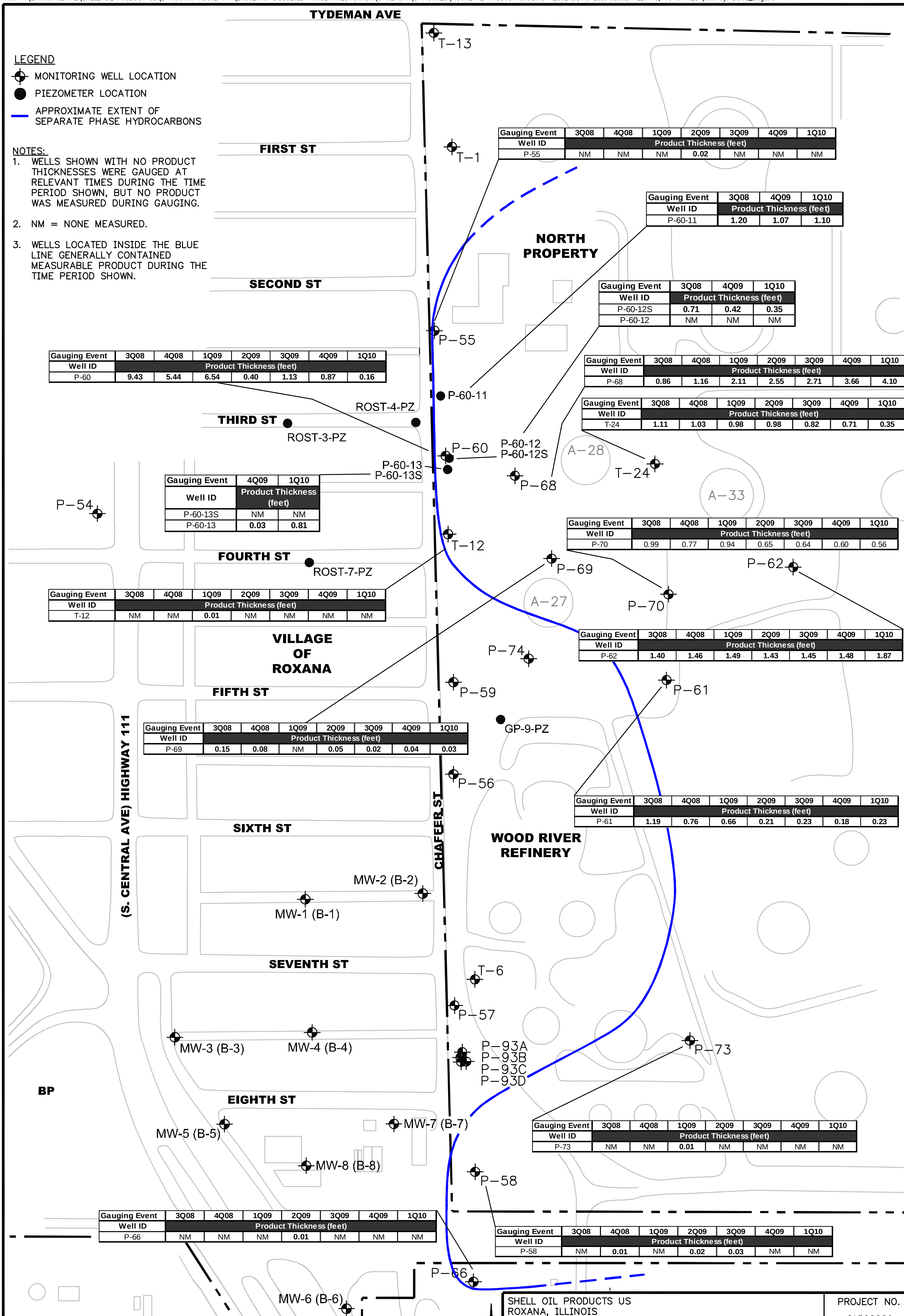
URS

DRN. BY: djd 2/16/10
DSGN. BY: djd
CHKD. BY: tja

Soil Analytical Results Summary

FIG. NO. 11

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562175-DISSOLVED PHASE INVESTIGATION\G-REPORT\C-FIGURES\FIGURE 12 PRODUCT GAUGING RESULTS.DWG Last edited: FEB. 16, 10 @ 4:23 p.m. by: David_Deguire



LEGEND

- MONITORING WELL LOCATION
- PIEZOMETER LOCATION
- APPROXIMATE EXTENT OF SEPARATE PHASE HYDROCARBONS

NOTES:

1. WELLS SHOWN WITH NO PRODUCT THICKNESSES WERE GAUGED AT RELEVANT TIMES DURING THE TIME PERIOD SHOWN, BUT NO PRODUCT WAS MEASURED DURING GAUGING.
2. NM = NONE MEASURED.
3. WELLS LOCATED INSIDE THE BLUE LINE GENERALLY CONTAINED MEASURABLE PRODUCT DURING THE TIME PERIOD SHOWN.

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
P-55	NM	NM	NM	0.02	NM	NM	NM

Gauging Event	3Q08	4Q09	1Q10
Well ID	Product Thickness (feet)		
P-60-11	1.20	1.07	1.10

Gauging Event	3Q08	4Q09	1Q10
Well ID	Product Thickness (feet)		
P-60-12S	0.71	0.42	0.35
P-60-12	NM	NM	NM

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
P-60	9.43	5.44	6.54	0.40	1.13	0.87	0.16

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
P-68	0.86	1.16	2.11	2.55	2.71	3.66	4.10

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
T-24	1.11	1.03	0.98	0.98	0.82	0.71	0.35

Gauging Event	4Q09	1Q10
Well ID	Product Thickness (feet)	
P-60-13S	NM	NM
P-60-13	0.03	0.81

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
P-70	0.99	0.77	0.94	0.65	0.64	0.60	0.56

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
T-12	NM	NM	0.01	NM	NM	NM	NM

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
P-62	1.40	1.46	1.49	1.43	1.45	1.48	1.87

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
P-69	0.15	0.08	NM	0.05	0.02	0.04	0.03

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
P-61	1.19	0.76	0.66	0.21	0.23	0.18	0.23

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
P-73	NM	NM	0.01	NM	NM	NM	NM

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
P-66	NM	NM	NM	0.01	NM	NM	NM

Gauging Event	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10
Well ID	Product Thickness (feet)						
P-58	NM	0.01	NM	0.02	0.03	NM	NM

SHELL OIL PRODUCTS US
ROXANA, ILLINOIS

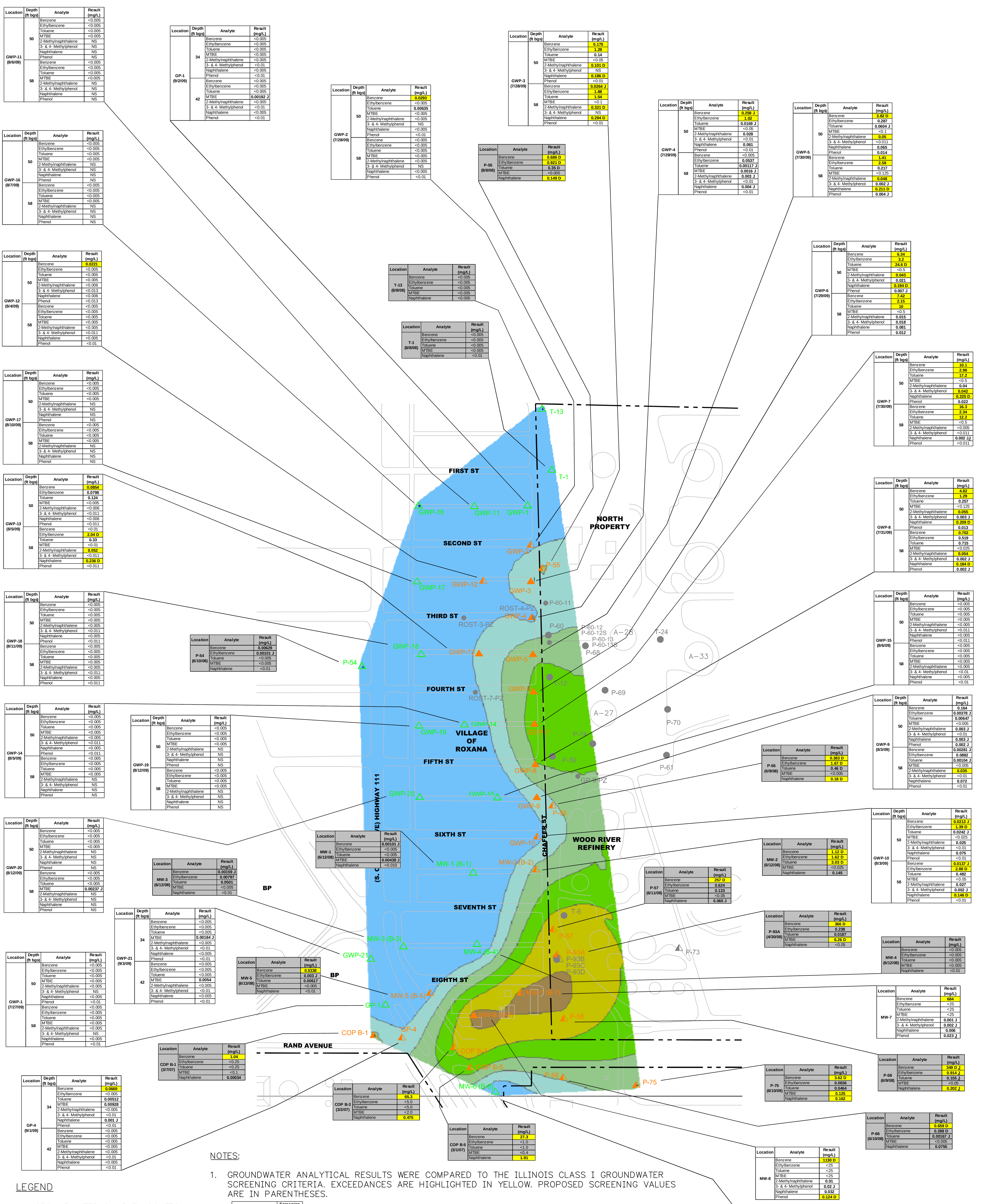
PROJECT NO. 21562289

URS

DRN. BY: djd 2/16/10
DSGN. BY: djd
CHKD. BY: tja

Product Gauging Results

FIG. NO. 12



LEGEND

- GROUNDWATER SAMPLE LOCATION WITH EXCEEDANCE OF VOC AND SVOC SCREENING CRITERIA
- GROUNDWATER SAMPLE LOCATION WITH EXCEEDANCE OF ONLY VOC SCREENING CRITERIA
- GROUNDWATER SAMPLE LOCATION WITHOUT EXCEEDANCE OF SCREENING CRITERIA
- MONITORING WELL OR PIEZOMETER LOCATION NOT SAMPLED
- < 0.05 mg/L
- 0.05 – 0.5 mg/L
- 0.5 – 5 mg/L
- 5 – 50 mg/L
- 50 – 500 mg/L
- > 500 mg/L

NOTES:

1. GROUNDWATER ANALYTICAL RESULTS WERE COMPARED TO THE ILLINOIS CLASS I GROUNDWATER SCREENING CRITERIA. EXCEEDANCES ARE HIGHLIGHTED IN YELLOW. PROPOSED SCREENING VALUES ARE IN PARENTHESES.

Analyte	Screening (mg/L)
Benzene	0.005
Ethylbenzene	0.7
Toluene	1.0
MTBE	0.07
2-Methylnaphthalene	(0.028)
3- & 4- Methylphenol	0.35 & 0.035
Naphthalene	0.14
Phenol	0.1

2. LOCATIONS IDENTIFIED AS "GWP–##" AND MONITORING WELLS MW–7 THROUGH MW–8 WERE SAMPLED BY URS IN FALL 2009.
3. REFINERY MONITORING WELLS (P–##) AND MONITORING WELLS MW–1 THROUGH MW–6 WERE SAMPLED BY URS IN 2008 (RESULT BOXES SHADED IN GRAY).
4. LOCATIONS IDENTIFIED AS "COP "B–#" WERE GROUNDWATER PROFILE LOCATIONS SAMPLED BY CONOCOPHILLIPS IN 2007 (RESULT BOXES SHADED IN GRAY).
5. QUALIFIER DEFINITIONS:
   D = RESULT FROM DILUTED SAMPLE.
   J = (LAB) OR J (URS) = RESULT IS ESTIMATED.
6. THIS FIGURE WAS DEVELOPED USING ENVIRONMENTAL VISUALIZATION SOFTWARE (EVS PRO 9.13).
7. THIS FIGURE DEPICTS A CROSS SECTION OF THE GENERALIZED DISTRIBUTION OF BENZENE IN SOIL VAPOR.
8. AT LOCATIONS WHERE A DUPLICATE SAMPLE WAS ANALYZED, THE HIGHER OF THE TWO ANALYTE RESULTS WAS USED FOR MODELING PURPOSES.
9. NON–DETECTS FOR THE DEPICTED ANALYTE ARE SHOWN AT HALF OF THEIR REPORTING LIMITS.

N

0 200
SCALE FEET

SHELL OIL PRODUCTS US
ROXANA, ILLINOIS

Groundwater Analytical Results Summary

Date: 1/13/10	Project Number: 21562289	Drawing Number: 13
Drawn by: wmp	Design by: wmp	Checked by:

URS

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B–ROXANA–ROUTE 111\21562175–DISSOLVED PHASE INVESTIGATION\G–REPORT\C–FIGURES\FIGURE 13 GW ANALYTICAL DETECTIONS.DWG Last edited: FEB. 16, 10 @ 4:40 p.m. by: David_Deguire

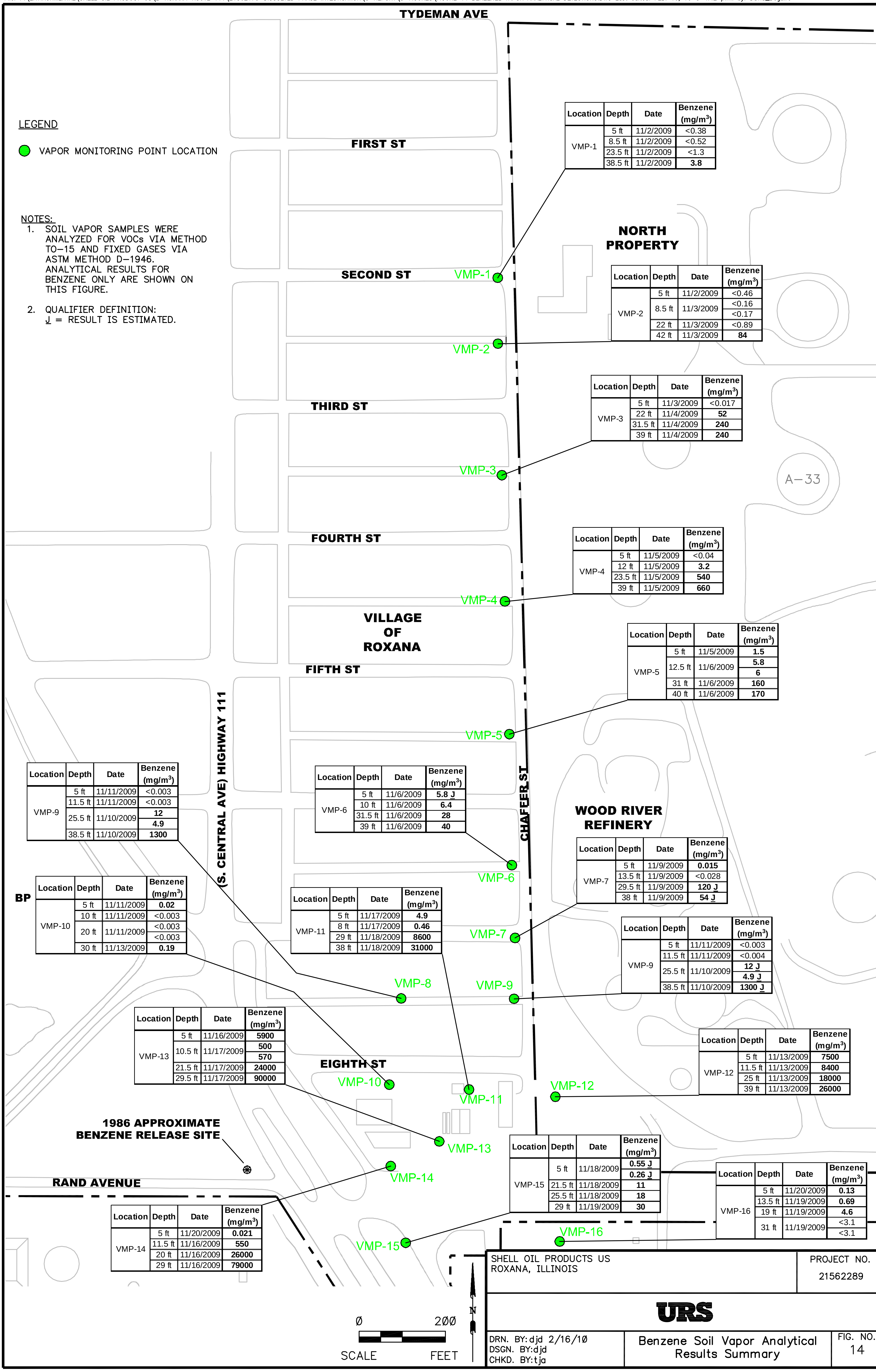
File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562175-DISSOLVED PHASE INVESTIGATION\G-REPORT\C-FIGURES\FIGURE 14 BENZENEL VAPOR ANALYTICAL DETECTIONS.DWG Last edited: FEB. 16, 10 @ 4:42 p.m. by: David_Deguire

LEGEND

VAPOR MONITORING POINT LOCATION

NOTES:

1. SOIL VAPOR SAMPLES WERE ANALYZED FOR VOCs VIA METHOD TO-15 AND FIXED GASES VIA ASTM METHOD D-1946. ANALYTICAL RESULTS FOR BENZENE ONLY ARE SHOWN ON THIS FIGURE.
2. QUALIFIER DEFINITION: J = RESULT IS ESTIMATED.



Location	Depth	Date	Benzene (mg/m^3)
VMP-1	5 ft	11/2/2009	<0.38
	8.5 ft	11/2/2009	<0.52
	23.5 ft	11/2/2009	<1.3
	38.5 ft	11/2/2009	**3.8**

Location	Depth	Date	Benzene (mg/m^3)
VMP-2	5 ft	11/2/2009	<0.46
	8.5 ft	11/3/2009	<0.16
			<0.17
	22 ft	11/3/2009	<0.89
	42 ft	11/3/2009	**84**

Location	Depth	Date	Benzene (mg/m^3)
VMP-3	5 ft	11/3/2009	<0.017
	22 ft	11/4/2009	**52**
	31.5 ft	11/4/2009	**240**
	39 ft	11/4/2009	**240**

Location	Depth	Date	Benzene (mg/m^3)
VMP-4	5 ft	11/5/2009	<0.04
	12 ft	11/5/2009	**3.2**
	23.5 ft	11/5/2009	**540**
	39 ft	11/5/2009	**660**

Location	Depth	Date	Benzene (mg/m^3)
VMP-5	5 ft	11/5/2009	**1.5**
	12.5 ft	11/6/2009	**5.8**
			6
	31 ft	11/6/2009	**160**
	40 ft	11/6/2009	**170**

Location	Depth	Date	Benzene (mg/m^3)
VMP-9	5 ft	11/11/2009	<0.003
	11.5 ft	11/11/2009	<0.003
	25.5 ft	11/10/2009	**12**
			4.9
	38.5 ft	11/10/2009	**1300**

Location	Depth	Date	Benzene (mg/m^3)
VMP-6	5 ft	11/6/2009	**5.8 J**
	10 ft	11/6/2009	**6.4**
	31.5 ft	11/6/2009	**28**
	39 ft	11/6/2009	**40**

Location	Depth	Date	Benzene (mg/m^3)
VMP-7	5 ft	11/9/2009	**0.015**
	13.5 ft	11/9/2009	<0.028
	29.5 ft	11/9/2009	**120 J**
	38 ft	11/9/2009	**54 J**

Location	Depth	Date	Benzene (mg/m^3)
VMP-10	5 ft	11/11/2009	**0.02**
	10 ft	11/11/2009	<0.003
	20 ft	11/11/2009	<0.003
			<0.003
	30 ft	11/13/2009	**0.19**

Location	Depth	Date	Benzene (mg/m^3)
VMP-11	5 ft	11/17/2009	**4.9**
	8 ft	11/17/2009	**0.46**
	29 ft	11/18/2009	**8600**
	38 ft	11/18/2009	**31000**

Location	Depth	Date	Benzene (mg/m^3)
VMP-9	5 ft	11/11/2009	<0.003
	11.5 ft	11/11/2009	<0.004
	25.5 ft	11/10/2009	**12 J**
			4.9 J
	38.5 ft	11/10/2009	**1300 J**

Location	Depth	Date	Benzene (mg/m^3)
VMP-13	5 ft	11/16/2009	**5900**
	10.5 ft	11/17/2009	**500**
			570
	21.5 ft	11/17/2009	**24000**
	29.5 ft	11/17/2009	**90000**

Location	Depth	Date	Benzene (mg/m^3)
VMP-12	5 ft	11/13/2009	**7500**
	11.5 ft	11/13/2009	**8400**
	25 ft	11/13/2009	**18000**
	39 ft	11/13/2009	**26000**

Location	Depth	Date	Benzene (mg/m^3)
VMP-15	5 ft	11/18/2009	**0.55 J**
			0.26 J
	21.5 ft	11/18/2009	**11**
	25.5 ft	11/18/2009	**18**
	29 ft	11/19/2009	**30**

Location	Depth	Date	Benzene (mg/m^3)
VMP-16	5 ft	11/20/2009	**0.13**
	13.5 ft	11/19/2009	**0.69**
	19 ft	11/19/2009	**4.6**
	31 ft	11/19/2009	<3.1
			<3.1

Location	Depth	Date	Benzene (mg/m^3)
VMP-14	5 ft	11/20/2009	**0.021**
	11.5 ft	11/16/2009	**550**
	20 ft	11/16/2009	**26000**
	29 ft	11/16/2009	**79000**

SHELL OIL PRODUCTS US
ROXANA, ILLINOIS

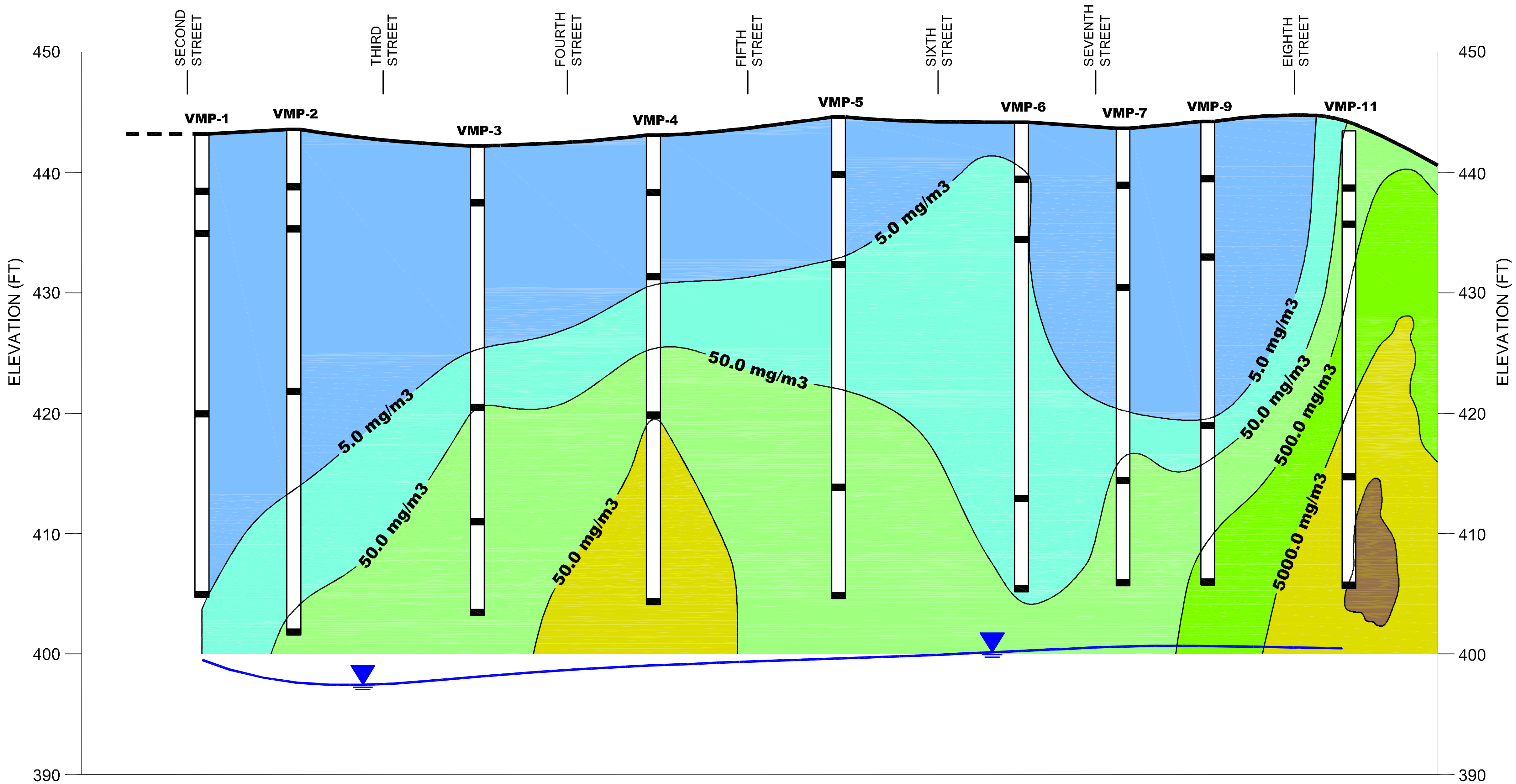
PROJECT NO. 21562289

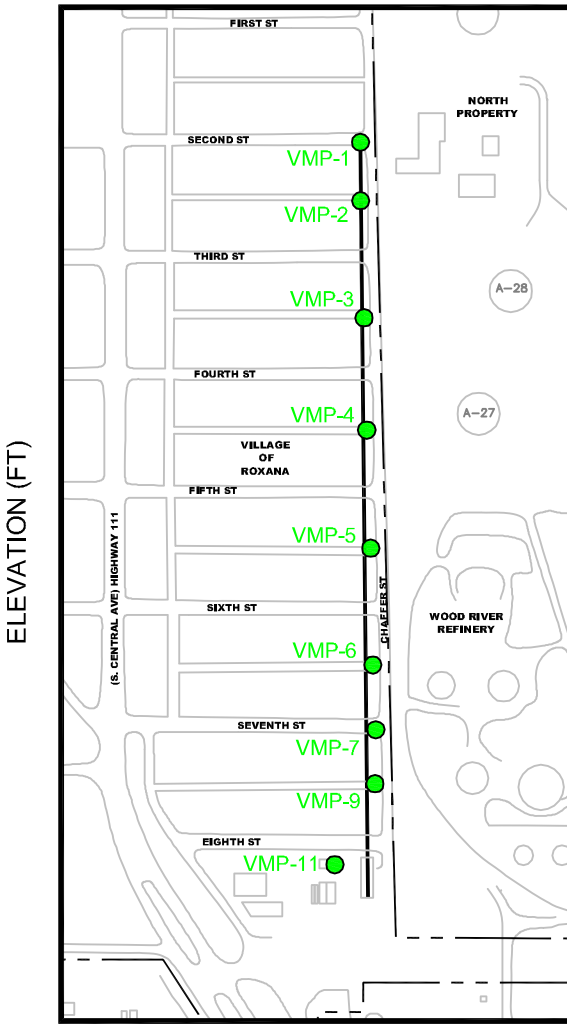
URS

DRN. BY: djd 2/16/10
DSGN. BY: djd
CHKD. BY: tja

Benzene Soil Vapor Analytical Results Summary

FIG. NO. 14





KEYMAP
1" = 500'

N

BENZENE

- **5 mg/m3**
- **50 mg/m3**
- **500 mg/m3**
- **5,000 mg/m3**
- **50,000 mg/m3**

LEGEND

- GROUND SURFACE
- VAPOR PORT SCREEN LOCATION
- APPROXIMATE POTENTIOMETRIC SURFACE

NOTES:

1. THIS FIGURE WAS DEVELOPED USING ENVIRONMENTAL VISUALIZATION SOFTWARE (EVS PRO 9.13).
2. THIS FIGURE DEPICTS A CROSS SECTION OF THE GENERALIZED DISTRIBUTION OF BENZENE IN SOIL VAPOR.
3. AT LOCATIONS WHERE A DUPLICATE SAMPLE WAS ANALYZED, THE HIGHER OF THE TWO ANALYTE RESULTS WAS USED FOR MODELING PURPOSES.
4. NON-DETECTS FOR THE DEPICTED ANALYTE ARE SHOWN AT HALF OF THEIR REPORTING LIMITS.

0 10
VERTICAL SCALE FEET

0 200
HORIZONTAL SCALE FEET

SHELL OIL PRODUCTS US ROXANA, ILLINOIS	PROJECT NO. 21562289
URS	
DRN. BY: djd 2/16/10 DSGN. BY: djd CHKD. BY: wmp	Benzene Soil Vapor Analytical Results Cross Section
FIG. NO.	15