URS

July 19, 2011

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: **Soil Vapor Extraction Pilot Test Report**
Roxana, Illinois
119115002 – Madison County
Equilon Enterprises LLC d/b/a Shell Oil Products US
Log No. B-43-CA-16 and 18

Dear Mr. Nightingale:

On behalf of Shell Oil Products US, URS Corporation is submitting the enclosed pilot test report for your review. This report was developed in response to the Agency's letter dated March 15, 2011.

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: RCRA Corrective Action Certification and Report (original plus 2 copies)

Cc: Kevin Dyer, SOPUS
Eric Petersen, ConocoPhillips
Jim Moore, IEPA

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

ILLINOIS EPA RCRA CORRECTIVE ACTION CERTIFICATION

This certification must accompany any document submitted to Illinois EPA in accordance with the corrective action requirements set forth in a facility's RCRA permit. The original and two copies of all documents submitted must be provided.

1.0 FACILITY IDENTIFICATION

Name: WRB Refining LP - Wood River Refinery

County: Madison

Street Address: 900 South Central Ave.

Site No. (IEPA): 1191150002

City: Roxana, IL 62084

Site No. (USEPA): ILD 080 012 305

2.0 OWNER INFORMATION

Name: Not Applicable

Mailing Address:

3.0 OPERATOR INFORMATION

Equilon Enterprises LLC d/b/a Shell Oil Products US

17 Junction Drive, PMB #399

Glen Carbon, IL 62034

Contact Name:

Kevin Dyer

Contact Title:

Principal Program Manager

Phone No.:

618-288-7237

4.0 TYPE OF SUBMISSION (check applicable item and provide requested information, as applicable)

☐ RFI Phase I Workplan/Report
☐ RFI Phase II Workplan/Report
☐ CMP Report; Phase ____
☒ Other (describe):
Soil Vapor Extraction Pilot Test Report

Date of Submittal July 19, 2011

IEPA Permit Log No. ____
Date of Last IEPA Letter on Project 6/16/11
Log No. of Last IEPA Letter on Project B-43R-CA-1; CA-3; CA5; CA-6; CA-7; CA-8; CA-10; CA-11; and PS11-032
Does this submittal include groundwater information: ☒ Yes ☐ No

5.0 DESCRIPTION OF SUBMITTAL: (briefly describe what is being submitted and its purpose)

Summary report of the March, 2011 SVE Pilot Test along the WRR west fenceline and the Roxana Public Works site in the Village of Roxana, Illinois.

6.0 DOCUMENTS SUBMITTED (identify all documents in submittal, including cover letter; give dates of all documents)

Cover letter, RCRA Corrective Action Certification, and Soil Vapor Extraction Pilot Test Report dated July, 2011

7.0 CERTIFICATION STATEMENT - ***(This statement is part of the overall certification being provided by the owner/operator, professional and laboratory in Items 7.1, 7.2 and 7.3 below).*** The activities described in the subject submittals have been carried out in accordance with procedures approved by Illinois EPA. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

7.1 **OWNER/OPERATOR CERTIFICATION** (Must be completed for all submittals. Certification and signature requirements are set forth in 35 IAC 702.126.) All submittals pertaining to the corrective action requirements set forth in a RCRA Permit must be signed by the person designated below (or by a duly authorized representative of that person):

1. For a Corporation, by a principal executive officer of at least the level of vice-president.
2. For a Partnership or Sole Proprietorship, by a general partner or the proprietor, respectively.
3. For a Governmental Entity, by either a principal executive officer or a ranking elected official.

A person is a duly authorized representative only if:

1. the authorization is made in writing by a person described above; and
2. the written authorization is provided with this submittal (a copy of a previously submitted authorization can be used).

Owner Signature: _____ _____ (Date)

Title: _____

Operator Signature: Kevin E Dwyer 7/15/11 (Date)

Title: Principal Program Manager

7.2 **PROFESSIONAL CERTIFICATION** *(if necessary)* - Work carried out in this submittal or the regulations may also be subject to other laws governing professional services, such as the Illinois Professional Land Surveyor Act of 1989, the Professional Engineering Practice Act of 1989, the Professional Geologist Licensing Act, and the Structural Engineering Licensing Act of 1989. No one is relieved from compliance with these laws and the regulations adopted pursuant to these laws. All work that falls within the scope and definitions of these laws must be performed in compliance with them. The Illinois EPA may refer any discovered violation of these laws to the appropriate regulating authority.

Professional's Signature: Robert B Billman 7/19/11 Date

Professional's Name: Robert B. Billman

Professional's Address: URS Corporation
1001 Highlands Plaza Drive West
St. Louis, MO 63110

Professional's Phone No.: 314-743-4108

Professional's Seal: LICENSED PROFESSIONAL GEOLOGIST ROBERT B BILLMAN 196-000046 ILLINOIS

7.3 **LABORATORY CERTIFICATION** *(if necessary)* - The sample collection, handling, preservation, preparation and analysis efforts for which this laboratory was responsible were carried out in accordance with procedures approved by Illinois EPA.

Name of Laboratory _____

Accutest Laboratories
495 Technology Center West
Building One
Marlboro, MA 01752
(508) 481-6200

7.19.11
Signature of Laboratory Responsible Officer Date

BRAD MADADIAN Regional General MANAGER
Name and Title of Laboratory Responsible Officer

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Contact Name:

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Phone No.:

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Professional's Signature: Robert B Billman 7/19/11 Date

Professional's Name: Robert B. Billman

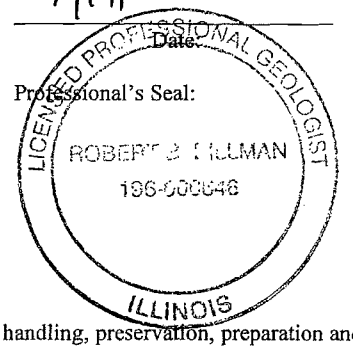
Professional's Address: URS Corporation

1001 Highlands Plaza Drive West

St. Louis, MO 63110

Professional's Phone No.: 314-743-4108

Professional's Seal:



7.3 **LABORATORY CERTIFICATION** *(if necessary)* - The sample collection, handling, preservation, preparation and analysis efforts for which this laboratory was responsible were carried out in accordance with procedures approved by Illinois EPA.

Name of Laboratory Air Toxics Ltd

Signature of Laboratory Responsible Officer 7/19/11 Date

Mailing Address of Laboratory

1180 Blue Ravine Rd. Ste B

Folsom, CA

95630

Heidi Hayes, Technical Director

Name and Title of Laboratory Responsible Officer

REPORT

SOIL VAPOR EXTRACTION PILOT TEST REPORT

WRB REFINING, LP
WOOD RIVER REFINERY
ROXANA, ILLINOIS

Prepared for

Shell Oil Products US
17 Junction Drive
PMB #399
Glen Carbon, IL 62034

July 2011

URS Corporation
1001 Highlands Plaza Drive West, Suite 300
St. Louis, MO 63110
314.429.0100
Project #21562593

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SECTIONONE Introduction

Shell Oil Products US (SOPUS) is currently addressing historical petroleum releases inside the WRB Refining LP Wood River Refinery (WRR) (which was formerly owned/operated by Shell or predecessors); and in the Village of Roxana in the area generally bounded by Illinois Route 111 and the west property boundary (aka west fenceline) of the WRR (**Figure 1**).

In September of 2010, SOPUS submitted a *Vapor Intrusion Investigation Workplan*, in which the installation of a soil vapor extraction (SVE) system was first proposed. The Illinois Environmental Protection Agency (IEPA) approved the work plan in a letter to SOPUS dated November 15, 2010 and condition 19 of that letter requested the submittal of a pilot test work plan.

In December of 2010, URS Corporation (URS), on behalf of SOPUS, submitted a *Soil Vapor Extraction Pilot Test Work Plan*, which proposed SVE pilot test activities at two separate locations, the west fenceline area of the WRR and the Village of Roxana Public Works Yard (Public Works). The IEPA approved the work plan in a letter to SOPUS dated March 16, 2011.

SVE pilot test field activities at the Public Works site and the WRR west fenceline site were initiated on March 14, 2011 and concluded on March 24, 2011.

As requested by condition 8 in the Agency's March 16, 2011 letter, this report summarizes the results of the pilot tests.

SECTION TWO Site Background

Releases of petroleum products at the WRR have resulted in a dissolved phase groundwater plume along the west fenceline and extending beneath the eastern edge of the Village. In addition, an Light Non-Aqueous Phase Liquids (LNAPL) plume exists within certain areas within the WRR. The primary objective of groundwater pumping at the WRR as required by SOPUS' Resource Conservation and Recovery Act (RCRA) Part B Permit for the site are to contain (and eventually capture, recover, and treat) LNAPL and dissolved phase impacts.

In 1986 a benzene release occurred from a pipeline on the northwest corner of the intersection of Rand Avenue and Highway 111, near a commercial/industrial area across the highway from the Public Works. The groundwater flow direction, as a result of pumping the existing groundwater extraction wells, has caused the benzene impacted groundwater to migrate toward the refinery pumping centers and now exits beneath the Public Works site on its path to the pump's pumping centers.

Petroleum vapors (if any) in the eastern portion of the Village, would most likely be primarily associated with the LNAPL beneath the WRR, and to a lesser extent, the dissolved phase impact beneath the eastern edge of the Village. Any vapors in the southern portion of the Village would most likely be primarily associated with the benzene release.

SECTION THREE Pilot Test Activities

The following section describes the field activities which took place both prior to and during the pilot test.

3.1 EXTRACTION WELL, VAPOR MONITORING POINT AND SOIL BORING INSTALLATION

The drilling associated with the pilot test was conducted from February 28th through March 7th, 2011, and included two extraction wells (SVE-1 and SVE-2), five vapor monitoring points (VMPs) (VMP-26 through VMP-30), and six geoprobe borings (GP-14 through GP-19). Extraction points SVE-1 and SVE-2 were installed for use during pilot test activities at WRR and Public Works, respectively. VMPs were installed at distances of 30, 60, and 90 feet from each extraction well and contained points at the top of the sand unit, one at or near the existing water table, and one in the middle of the vadose zone. At the Public Works location, previously installed VMP-10 was utilized as the 60 foot monitoring point for pilot test activities. The six geoprobe borings GP-14 through GP-19 were located along the west fenceline at the WRR and were installed to further delineate the sub-surface petroleum concentration. The above locations are illustrated on **Figure 2** through **Figure 6**.

The SVE extraction wells were first air knifed to a depth of 10 feet below ground surface (bgs) to ensure underground utilities were cleared and then were drilled by Boart Longyear using rotosonic drilling technology. Once the bore holes were drilled, the wells were installed with 4-inch diameter PVC and the base of the screens were set at a depth at or near the water table under low water level conditions (approximately 55 and 45 feet bgs along the west fence line and at Public Works respectively). The filter pack was installed in one foot lifts that extends to approximately 2-feet above the top of the screen. A three foot thick bentonite chip seal was installed immediately above the sand pack in one foot lifts with each lift being hydrated and the remaining annular space was filled with a cement bentonite grout. During SVE extraction well installation activities soil samples were collected from SVE-1 (11-12 ft. and 53-54 ft. bgs) and SVE-2 (11-12 ft. and 33-34 ft. bgs) for analytical testing.

Three associated VMPs were installed at the pre-determined distances from the SVE-1 location. VMP-26, installed 30 feet north, VMP-27, 60 feet east, and VMP-28, 90 feet south of SVE-1 (**Figure 3**). Two associated VMPs were installed at the predetermined distances from the SVE-2 location. VMP-29 was installed 30 feet southwest and VMP-30 installed 90 feet southeast of SVE-2. Previously installed VMP-10, located northwest of SVE-2, was utilized as the 60 foot

monitoring point for pilot test activities. A site map illustrating the points associated with the Public Works pilot test is included as **Figure 4**.

Each VMP consisted of nested multiple vapor sampling depth intervals. In general, each of the nested vapor points consists of a 1/2-inch diameter PVC pipe extending to the ground surface. A sand pack was placed in the annular space from approximately six inches below and above each vapor point sampling PVC screen. Granular bentonite seals were placed between individual vapor monitoring port screen/sand pack intervals. The annular space above the filter pack of the last screened interval was filled with cement bentonite grout to the ground surface and completed at the surface with a flush-mounted protective cover. During the VMP installation, soil samples were collected from VMP-26 (11-12 ft. and 31-32 ft. bgs) for analysis of VOCs and TPH.

Geoprobe soil borings GP-14 through GP-19 were performed by Roberts Environmental Drilling Inc. and soil sampling was conducted 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 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 ft. to 44 ft. bgs.

Upon completion of GP borings GP-14 through GP-19, the boreholes were backfilled with bentonite grout through the outer casing and the ground surface was returned to its original condition.

The subsurface stratigraphy for the SVE, VMP, and GP points 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.

The nine samples collected from the SVE, VMP-26, and GP points were delivered, under the proper COC documentation, to Accutest Laboratories in Marlborough, Massachusetts for analysis of VOCs via USEPA Method 8260B and TPH via USEPA Method 8015.

Boring logs and well construction diagrams developed for points utilized during pilot test studies at both locations are included in **Appendix A**.

3.2 SOIL VAPOR EXTRACTION PILOT TEST

SVE Pilot Test Equipment

Test equipment used during the pilot test was rented from, and operated by ProAct Services Corporation (ProAct), located in Ludington, Michigan, and included the following:

- A trailer mounted internal combustion engine (ICE) system capable of treating approximately 100 cfm of airflow @ 20 inches Hg vacuum. The engine apparatus consisted of a 4.6 Liter 8 cylinder Ford engine with a flame arrestor and a catalytic converter. The unit was controlled by a program logic controller (PLC) (Phoenix 1,000 Controller) maintaining and monitoring all aspects of air flow, temperature and concentration data. Two mufflers were utilized to reduce noise due to the nearby residential neighborhood. Propane gas was utilized for supplemental fuel to avoid shutdowns during testing.

- Vapor Liquid Separator to remove water from the vapor stream.

- Miscellaneous ancillary equipment including but not limited to health and safety monitoring equipment, water level meters, air sampling and monitoring equipment, and flow meters.

Photographs of the pilot test equipment are included in **Appendix B**.

Pilot Test Operation

The ICE operation is controlled by several site specific factors including: soil moisture, O_2 and CO_2 content in the soil, and soil vapor constituent concentrations available from the extraction well. The PLC controls the air flow from well based on a maximum hydrocarbon influent flow rate of 36 lb/hr.

SVE Pilot Test Field Activities

As discussed above, an extraction test was planned on the two SVE extraction wells (SVE-1 at the WRR property and SVE-2 at the Village of Roxana Public Works Yard).

Public Works Test Location

The test at Public Works began on March 14, 2011 with SVE-2 as the extraction well and with VMP-29, VMP-10, and VMP-30 measuring the influence of test activities at distances of 30, 60, and 90 feet respectively. The groundwater elevation in the area near SVE-2 was measured at 404.63 feet above mean sea level (msl). The ICE system was connected to SVE-2 by means of a 3-inch diameter hose, which is shown in a diagram illustrating pilot testing piping and equipment orientation associated with the Public Works pilot test (**Figure 5)**.

Manual and automatic data collection methods were utilized depending on the specific information desired. Temperature readings, extraction well air flow, and concentrations from the extraction well were collected directly from the ICE unit. The vapor temperature, pressure, and air flow was routinely monitored by manual means at the extraction well. Vacuum / pressure readings were collected at the VMP locations utilizing magnahelic gauges with varying ranges. Readings were recorded at approximately the first 2, 5, 10, and 15 minutes and then every 15 minutes for the next three hours. The readings were then collected once an hour for the remainder of the test.

As described in the *Vapor Intrusion Investigation Workplan,* the ICE was to run at airflow rates of 50, 75, and 90 cfm over a period of three days. Following the tests at the three airflow rates, a sustainability test would then be initiated for an additional three days.

The first test on March 14th, 2011, was initiated by attempting to run the unit at approximately 50 cfm, however due to elevated initial concentrations; 50 cfm could not be achieved. Due to these elevated initial concentrations being pulled into the ICE unit, the ICE unit was indicating high temperature readings at the exhaust sensor and shutting down.

On March 15, 2011, pilot test activities resumed with 25 cfm as a projected operational setting in order to mitigate the measured elevated vapor hydrocarbon concentrations being pulled into the ICE unit. The unit began at approximately 25 cfm and after approximately six hours, a flow rate of 27 cfm was achieved. The test was conducted for a period of eight hours (without automatic shutdown conditions being encountered) and measured influent data of the vapor pulled into the ICE unit demonstrated a reduction in benzene concentrations at the SVE-2 location.

On March 16th, 2011, a successful daily test was again performed at a flow rate that ranged from 40-50 cfm. The test ran for approximately ten hours with results again indicating increased air flow and reduced concentrations of hydrocarbons being pulled into the ICE unit.

Based on pilot test performance on March 15th and 16th, 2011, including the ICE unit maintaining operational temperatures and increasing air flow readings, it was decided that a sustainability test would be initiated on March 17th, 2011. The sustainability test was performed for approximately 70 hours, initiated at 8:42 AM on March 17th, 2011, and concluded at 6:40 AM on March 20, 2011. The flow rates during the test ranged from 50-65 cfm.

During daily pilot testing activities as well as the sustainability test, influence was observed in all VMPs indicating a radius of influence of at least 90 feet. On March 19th, 2011, one field vapor sample from the SVE-2 wellhead was collected during the sustainability test and submitted for laboratory analysis. Data collected during the pilot testing activities at the Public Works location are presented on **Table 1**.

WRR Test Location

The test at the WRR location began on March 21, 2011 with SVE-1 as the extraction wells and subsequent tests were conducted at P-56, and P-60-11. The induced vacuum and/or pressure at the outlying monitoring points were measured with magnahelic gauges of varying ranges. A diagram illustrating pilot testing piping and equipment orientation associated with the WRR pilot test is included as **Figure 6**.

The hydrocarbon vapor concentrations being pulled from at SVE-1, as measured by the ICE unit increased from 120,000 to 392,000 ppm over the interval of the first eight hour test. Due to increasing hydrocarbon concentrations being pulled into the ICE unit, additional dilution air was required by the unit to maintain operating conditions. ICE unit readings indicated that extraction well air flow ranged from 5 cfm at the start of the test to a flow that was too low to measure with the instruments on the ICE unit within four hours of start-up. During the test, vacuum measurements were taken at VMP-26, VMP-27, and VMP-28 at distances of 30, 60, and 90 feet respectively from SVE-1. The VMPs being monitored did not display vacuum pressure at this time nor during the remainder of the test.

The following day of testing, March 22, 2011, yielded similar test results with increasingly elevated hydrocarbon concentrations being pulled from SVE-1 into the ICE unit. Initial readings

of hydrocarbons being pulled into the ICE unit indicated concentrations of 381,900 ppm, increasing over a four hour period to 501,000 ppm. The test again indicated diminished air flow at the extraction well due to elevated hydrocarbon concentrations being pulled into the ICE unit, and positive pressure was indicated at each of the three VMPs initial readings and maintained throughout the pilot test. Due to the trend of increasing hydrocarbon concentrations being pulled into the ICE unit and minimal extraction well air flow, the test was stopped at the SVE-1 location at the approximate time of 1400.

In an effort to still conduct the pilot test in the general area of the West Fenceline, it was decided to utilize monitoring well P-56 as the extraction well. Monitoring well P-56 is a 2-inch diameter monitoring well located approximately 240 feet south of extraction well SVE-1. This well is screened from approximately 38.5 to 63.5 ft. bgs. Based on the water levels at the time of testing, there was approximately 2.16 feet of open (unsaturated) well screen. No VMPs were available in the vicinity of P-56 for influence monitoring. Monitoring well P-56 exhibited similar results to SVE-1 with elevated hydrocarbon concentrations being pulled into the ICE unit and inhibiting air flow. In addition, during the testing the vacuum produced enough suction to lift the water level above the screen thereby occluding the screen and preventing the pilot test from continuing.

On March 23, 2011, a third location (P-60-11) was attempted north of SVE-1. Monitoring well P-60-11 is a 4-inch diameter well located approximately 200 feet north of extraction well SVE-1. This well is screened from approximately 30 to 60 ft. bgs. Based on the water level at the time of testing, there was approximately 9.69 feet of open (unsaturated) well screen. Similar conditions to the previous two locations were encountered with P-60-11 exhibiting elevated hydrocarbon concentrations being pulled into the ICE unit that inhibited flow rate.

Data collected during the above pilot testing activities at the WRR location is presented on **Table 2**.

3.3 WASTEWATER AND AIR PERMITTING INFORMATION

A total of two gallons of water were recovered from the vapor liquid separator during the pilot test activities at the Public Works location. No water was recovered during activities at the WRR location. The water was be managed with similar waste streams from the public works area.

For the pilot test with the ICE unit, a permit application for a federally enforceable state operating permit (FESOP) for construction was submitted to the IEPA on January 27, 2011and approved on March 1, 2011. Per the requirements of the FESOP air permit, one summa canister was collected from the exhaust sample port of the ICE unit during each day of activity for VOCs via USEPA method TO-15. A total of eight emission samples were collected and were identified as AE#1 through AE#8 (a ninth sample, Influent PT/PW, was an influent sample collected at the public works test location, but was not required by the FESOP permit). Results of air samples collected during pilot test activities are presented in **Table 3**; a copy of the laboratory analytical report is attached as **Appendix C**.

3.4 DATA QUALITY REVIEW AND DATA MANAGEMENT

Laboratory data were provided in electronic form. An independent Level III review was performed by URS on the analytical data following procedures outlined in the USEPA National Functional Guidelines for Superfund Organic Methods Data Review (2008). Specific criteria reviewed included sample receipt condition and holding times, method blanks, surrogate spike recoveries, laboratory control samples, and results reported from dilutions. The laboratory assigned data qualifiers on the basis of their quality control or to indicate sample analysis information (e.g., dilutions). Data qualifiers were also added by URS, as appropriate, and are included on the data tables and laboratory result pages. Laboratory data reports along with data reviews (Level III) are included in **Appendix C.**

For the SVE Pilot study, a total of 9 samples were prepared and analyzed by the laboratory, Air Toxics, for VOCs (TO-15 analytes).

Laboratory method blanks were analyzed to evaluate for the existence and magnitude of any contamination that might result from field and/or laboratory activities. No compounds were detected in the method blanks; therefore, no qualification of data was required.

Surrogate spike recoveries are used by the laboratory to evaluate overall laboratory performance for sample preparation efficiency on a per sample basis. Vapor samples analyzed were spiked with surrogate compounds during sample preparation. No surrogate recoveries were outside evaluation criteria; therefore, no qualification of data was required.

Laboratory control standard (LCS) and laboratory control standard duplicates (LCSD) are analyzed with each analytical batch to assess the accuracy of the analytical process. LCS/LCSD

recoveries were above evaluation criteria for chloromethane in sample delivery groups (SDGs) 1103537, 1103591, and 1104017 as specified in the data reviews. Analytical data which were reported as non-detect and associated with LCS/LCSD recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. Chloromethane was non-detect in samples associated with LCS/LCSD recoveries above evaluation criteria; therefore, no qualification of data was required.

Samples AE #5, AE #8, and Influent PT/PW were analyzed at dilution due to high levels of target analytes. Samples AE #1, AE # 2, AE #3, AE #4, AE #6, and AE #7 were analyzed at dilution due to high levels of non-target analytes. The laboratory analytical results are discussed in **Sections 4.3.2 and 4.4** of this report

The TO-15 VOC compound, chloromethane had continuing calibration recoveries above evaluation criteria in SDGs 1103537, 1103591, and 1104017. Analytical data which were reported as non-detect and associated with CCV recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. Chloromethane was non-detect in samples associated with LCS/LCSD recoveries above evaluation criteria; therefore, no qualification of data was required.

Additionally, sample AE #2 was leaking during sample analysis and had to be re-pressurized. Professional judgment was used to qualify results from this sample as estimated.

Based on the review criteria, vapor results reported for the analyses performed were accepted for their intended use. Acceptable levels of accuracy and precision, based on laboratory control sample (LCS) and surrogate data were achieved for these sample delivery groups (SDGs) to meet the project objectives.

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, and the database management system.

The following documentation was completed and supplements the COC records:

- Field logbooks
- Field sample collection sheets
- Safety Documentation

SECTION FOUR Test Results

The results of the each of the SVE tests and soil borings are presented below.

4.1 PUBLIC WORKS SITE

Pilot test activities were successfully performed over the course of 5 days at the following flow rates:

- March 15, 2011 – flow rate range of 0 cfm to 27 cfm
- March 16, 2011 – flow rate range of 18 cfm to 50 cfm
- March 17, 2011 – flow rate range of 12 cfm to 55 cfm
- March 18, 2011 – flow rate range of 61 cfm to 63 cfm
- March 19, 2011 – flow rate range of 63 cfm to 65 cfm
- March 20, 2011 – flow rate averaged 64 cfm

Elevated hydrocarbon concentrations being pulled into the ICE unit were encountered on initiating the pilot test on the first day (March 14, 2011). The ICE unit emergency shut off system was activated due to elevated hydrocarbon concentrations causing high temperature conditions at the exhaust. By operating the ICE unit primarily at lower cfm levels, the higher concentrations being pulled into the ICE unit dissipated and operating conditions were greatly enhanced.

A sustainability test was performed successfully for a period of 72 hours. The following presents a summary of the results from **Table 1**:

- Operated at 50-65 scfm (increasing over the duration of test)
- Concentrations of vapors being pulled into the ICE unit during test period ranged from 10,000 to 15,000 ppm
- Documented radius of influence (> 0.1 inches of water) of 90 feet. However, vacuum was measured up to 130 feet from extraction well.
- System vacuum measurements collected at ICE unit ranged from 10-25 inches of water.

4.2 WRR SITE

4.2.1 SVE-1 Location

Daily pilot test activities were performed for 8 hours on the first day of testing and 5 hours the second. The following presents a summary of the results from **Table 2**:

- ICE unit operated at a range of 0-6 scfm.
- Initial indication of minor vacuum was measured at VMP-26, VMP-27, and VMP-28 after the start of the test but no consistent system effects were observed.
- Initial hydrocarbon concentrations being pulled into the ICE unit were approximately 120,000 ppm and increased over the duration of the test to 501,000 ppm.
- Maximum system vacuum as measured at the ICE unit was indicated as approximately 15 inches of water.
- Hydrocarbon concentrations being pulled into the ICE unit from SVE-1 are too elevated for the ICE unit to increase air flow to desired testing rates.

4.2.2 P-56 Location

Pilot test activities were performed at the monitoring well P-56 location after encountering unsuitable conditions at the SVE-1 location. Testing was performed for 4 hours. The following presents a summary of the results from **Table 2**:

- Recent groundwater gauging data indicated that only 2 feet of screen was open (above the water table).
- Hydrocarbon concentrations increased over the duration of the test, while the well screen was open to 550,000 ppm.
- The ICE unit indicated 1-2 scfm.
- Well vacuum measured at P-56 ranged from 5-10 inches of water.
- As observed at the SVE-1 location, hydrocarbon concentrations being pulled into the ICE unit from P-56 are too elevated for the ICE to perform as intended.
- After 4 hours of operation, the vacuum pulled the water the up enough to occlude the screen.

4.2.3 P-60-11 Location

Pilot test activities were performed at the monitoring well P-60-11 location after encountering unsuitable conditions at the SVE-1 and P-56 locations. Testing was performed for 4 hours. The following presents a summary of the results from **Table 2**:

- Recent groundwater gauging data indicated 10 feet of screen was open (above the water table).
- Hydrocarbon concentrations being pulled into the ICE unit increased over the duration of the test to 379,000 ppm.
- The ICE unit indicated 1-10 scfm.
- Well vacuum measured at P-60-11 ranged from 5-10 inches of water.
- As observed at the two previous locations, concentrations at the P-60-11 location are too elevated for the ICE to perform as intended.

4.3 SOIL BORINGS

4.3.1 Stratigraphy

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 surface up to approximately six feet bgs.
- Clay/Silt - Primarily silty clay. Where present, the clay generally extends from the base of the fill to approximately 12 feet bgs.
- Sand - Consisting primarily of fine to medium grained (which coarsens with depth) sand with some silt and clay, especially at the shallower depths. The sand begins at the base of the clay (or base of the fill if the clay is not present) and extends to the total depth of the borings.

Discontinuous lower permeability lenses of clay with some silt and sand are occasionally present. These lenses vary in thickness from 1 inch to a few feet and do not appear to be laterally (or vertically) extensive. The boring logs are presented in **Appendix A**.

4.3.2 Laboratory Results

The laboratory analytical results for the soil samples collected during this investigation can be viewed in **Table 4**.

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

Acetone	Dichloromethane
Benzene	tert-Butylbenzene
Ethylbenzene	Isopropylbenzene
Toluene	p-Isopropyltoluene
m,p-Xylenes	Methyl tert-Butyl Ether
o-Xylenes	n-Propylbenzene
n-Butylbenzene	1,2,4-Trimethylbenzene
sec-Butylbenzene	1,3,5-Trimethylbenzene
TPH (C10-C28)	TPH-GRO (VOA)
TPH (>C28-C40)	

4.4 AIR EMISSION RESULTS

The laboratory analytical results for the ICE emission samples collected during this investigation can be viewed in **Table 3**. All results were within the limits permitted by the March 1, 2011 FESOP air permit. The following VOCs were detected in the ICE emission samples during this investigation:

Acetone	Dichloromethane
Benzene	Styrene
Ethylbenzene	Isopropylbenzene
Toluene	Tetrachloroethane
m,p-Xylenes	2-Butanone
o-Xylenes	Tetrahydrofuran
1,3-Butadiene	2,2,4-Trimethylpentane
Ethanol	1,2,4-Trimethylbenzene
Cyclohexane	2-Propanol
Hexane	4-Ethyltoluene
Heptane	4-Methyl-2-pentanone

SECTION FIVE Conclusions

Pilot test activities at the Public Works location indicate a range of influence of at least 90 feet and demonstrated air flow readings of 65 cfm following the decrease in initial concentrations. Potential air flow and range of influence information could not be obtained at the WRR site due to site conditions. Air flow potential at the WRR was measured during testing activities, but unlike the Public Works site, sustained elevated concentrations being pulled into the ICE unit did not decrease sufficiently to determine air flow potential under a sustained test. Based on boring logs, data collected at both sites, and the close proximity of the two site locations, assumptions can be made that air flow responses to SVE treatment at both sites should be similar.

The information from the above pilot testing is being incorporated into the full scale SVE design.

TABLES

TABLE 1
SVE PILOT TEST FIELD DATA - PUBLIC WORKS FACILITY
ROXANA, ILLINOIS
March 15, 2011

ICE Unit Data					VMP-10				VMP-29				VMP-30			
Time	SVE Test Well: SVE-2				5-5.5 feet	10-10.5 feet	20-20.5 feet	30-30.5 feet	11 feet	19 feet	28 feet	41 feet	10.5 feet	18 feet	27.5 feet	41 feet
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
8:50am	0	0	0.0	0	0.0	0.0	0.0	0.05	0.5	0.0	0.0	0.0	0.0	0.06	>.25	0.0
8:52am	675	5	0.5	10,100	0.0	0.0	0.1	0.08	0.0	0.1	0.15	0.0	0.0	0.06	0.055	0.0
8:55am	755	10	1.5	17,500	0.0	0.0	0.1	0.09	0.0	0.18	0.21	0.0	0.0	0.06	0.065	0.0
9:00am	815	15	2.5	16,500	0.0	0.0	0.2	0.10	0.4	0.19	0.21	0.0	0.0	0.07	0.07	0.0
9:05am	920	25	3.0	19,000	0.0	0.0	0.4	0.10	0.5	0.2	0.22	0.0	0.0	0.05	0.05	0.0
9:20am	950	24	4.0	20,000	0.0	0.0	0.5	0.12	0.4	0.18	0.19	0.0	0.0	0.02	0.035	0.1
9:35am	950	19	3.0	17,500	0.0	0.0	0.4	0.08	0.5	0.19	0.21	0.0	0.0	0.01	0.005	0.3
9:50am	968	20	4.0	18,000	0.0	0.0	0.4	0.10	0.5	0.2	0.22	0.0	0.0	0.035	0.04	0.4
10:05am	968	23	3.0	20,000	0.0	0.0	0.5	0.14	0.5	0.5	0.24	0.0	0.0	0.08	0.085	0.35
10:20am	968	20	3.0	21,000	0.0	0.0	0.5	0.14	0.5	0.4	0.28	0.0	0.0	0.12	0.12	0.35
10:35am	960	18	3.0	13,500	0.0	0.0	0.6	0.17	0.5	0.5	0.31	0.0	0.0	0.14	0.15	0.2
10:50am	960	20	3.0	7,500	0.0	0.0	0.6	0.16	0.5	0.5	0.29	0.0	0.0	0.12	0.13	0.2
11:05am	965	20	3.0	5,000	0.0	0.0	0.5	0.16	0.5	0.5	0.28	0.0	0.0	0.1	0.11	0.2
11:20am	975	20	3.0	9,500	0.0	0.0	0.5	0.14	0.5	0.5	0.28	0.0	0.0	0.08	0.08	0.2
11:35am	965	20	3.0	9,000	0.0	0.0	0.6	0.17	0.6	0.6	0.30	0.0	0.0	0.13	0.14	0.2
11:50am	968	18	3.0	10,000	0.0	0.0	0.6	0.17	0.5	0.6	0.29	0.0	0.0	0.13	0.145	0.2
12:50pm	968	20	3.0	11,000	0.0	0.0	0.3	0.12	0.4	0.5	0.25	0.0	0.0	0.05	0.06	0.2
1:50pm	960	17	3.0	51,000	0.0	0.0	0.3	0.14	0.3	0.7	0.25	0.0	0.0	0.09	0.1	0.5
2:50pm	952	27	3.0	104,000	0.0	0.0	0.25	0.14	0.23	0.6	0.28	0.0	0.0	0.09	0.095	0.5
3:50pm	952	27	3.0	9,900	0.0	0.0	0.25	0.16	0.26	0.6	0.30	0.0	0.0	0.14	0.15	0.3
4:50pm	944	27	3.0	5,000	0.0	0.0	0.25	0.14	0.22	0.6	0.27	0.0	0.0	0.08	0.095	0.0

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

TABLE 1
SVE PILOT TEST FIELD DATA - PUBLIC WORKS FACILITY
ROXANA, ILLINOIS
March 16, 2011

ICE Unit Data					VMP-10				VMP-29				VMP-30			
Time	SVE Test Well: SVE-2				5-5.5 feet	10-10.5 feet	20-20.5 feet	30-30.5 feet	11 feet	19 feet	28 feet	41 feet	10.5 feet	18 feet	27.5 feet	41 feet
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
9:00am	NA	18	2.0	NA	0.0	0.0	0.0	0.05	0.044	0.25	0.0	0.0	0.0	0.1	0.09	0.0
9:02am	NA	NA	NA	NA	0.0	0.0	0.0	0.10	0.183	0.3	0.15	0.0	0.0	0.1	0.105	0.0
9:05am	850	27	5.0	<2,000	0.0	0.0	0.0	0.12	0.246	0.5	0.20	0.0	0.0	0.1	0.115	0.0
9:10am	970	35	5.5	<2,000	0.0	0.0	0.0	0.14	0.32	0.5	0.28	0.0	0.0	0.11	0.14	0.0
9:15am	1050	40	6.0	<2,000	0.0	0.0	0.05	0.20	0.43	0.5	0.4	0.0	0.0	0.17	0.18	0.0
9:30am	NA	41.5	6.0	<2,000	0.0	0.0	0.16	0.22	0.48	0.4	0.4	0.0	0.0	0.2	0.21	0.0
9:45am	NA	41	6.0	<2,000	0.0	0.0	0.16	0.18	0.4	0.4	0.4	0.0	0.0	0.1	0.165	0.0
10:00am	1,050	41	6.0	3,900	0.0	0.0	0.18	0.20	0.42	0.4	0.4	0.0	0.0	0.15	0.155	0.0
10:15am	1,060	42	6.0	<2,000	0.0	0.0	0.16	0.18	0.436	0.42	0.4	0.0	0.0	0.17	0.16	0.0
10:30am	1,075	41.5	6.0	<2,000	0.0	0.0	0.16	0.18	0.420	0.4	0.4	0.0	0.0	0.16	0.15	0.0
10:45am	1,060	41	6.0	<2,000	0.0	0.0	0.16	0.16	0.421	0.4	0.41	0.0	0.0	0.14	0.125	0.0
11:00am	1,050	42	6.0	<2,000	0.0	0.0	0.16	0.16	0.395	0.35	0.4	0.0	0.0	0.13	0.115	0.0
11:15am	1,060	41	6.0	<2,000	0.0	0.0	0.16	0.16	0.373	0.3	0.38	0.0	0.0	0.1	0.085	0.0
11:30am	1,050	41	6.0	<2,000	0.0	0.0	0.15	0.16	0.400	0.35	0.39	0.0	0.0	0.12	0.105	0.0
11:45am	1,058	41	6.0	<2,000	0.0	0.0	0.16	0.16	0.372	0.35	0.37	0.0	0.0	0.1	0.085	0.0
12:00pm	1,043	41	6.0	<2,000	0.0	0.0	0.16	0.16	0.390	0.35	0.38	0.0	0.0	0.1	0.0875	0.0
1:00pm	1,153	40	5.8	<2,000	0.0	0.0	0.14	0.14	0.350	0.3	0.35	0.0	0.0	0.05	0.0425	0.0
Increased Air Flow From Well Head Via Valve at ICE Unit																
1:15pm	1,163	49	7.5	3,200	0.0	0.0	0.16	0.17	0.439	0.41	0.42	0.0	0.0	0.06	0.05	0.0
1:30pm	1,210	50	7.5	2,600	0.0	0.0	0.17	0.17	0.454	0.41	0.45	0.0	0.0	0.07	0.06	0.0
1:45pm	1,190	50	7.4	5,300	0.0	0.0	0.17	0.16	0.440	0.4	0.43	0.0	0.0	0.06	0.05	0.0
2:00pm	1,202	50	7.3	2,500	0.0	0.0	0.15	0.15	0.420	0.4	0.4	0.0	0.0	0.02	0.01	0.0
2:30pm	1,198	50	7.4	4,000	0.0	0.0	0.16	0.16	0.428	0.4	0.41	0.0	0.0	0.02	0.02	0.0
3:00pm	1,183	50	7.4	3,000	0.0	0.0	0.19	0.17	0.464	0.4	0.45	0.0	0.0	0.08	0.065	0.0
4:00pm	1,191	50	7.5	4,700	0.0	0.0	0.19	0.19	0.464	0.41	0.46	0.0	0.0	0.08	0.07	0.0

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

TABLE 1
SVE PILOT TEST FIELD DATA - PUBLIC WORKS FACILITY
ROXANA, ILLINOIS
March 16, 2011

ICE Unit Data					VMP-10				VMP-29				VMP-30			
Time	SVE Test Well: SVE-2				5-5.5 feet	10-10.5 feet	20-20.5 feet	30-30.5 feet	11 feet	19 feet	28 feet	41 feet	10.5 feet	18 feet	27.5 feet	41 feet
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
5:00pm	1,191	49	7.6	3,000	0.0	0.0	0.2	0.21	0.497	0.43	0.47	0.0	0.0	0.12	0.11	0.0
6:00pm	1,200	49	7.8	2,200	0.0	0.0	0.2	0.22	0.493	0.41	0.47	0.0	0.0	0.22	0.19	0.0
7:00pm	1,198	49	8.1	3,600	0.0	0.0	0.22	0.26	0.586	0.47	0.52	0.0	0.0	0.1	0.09	0.0

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

TABLE 1
SVE PILOT TEST FIELD DATA - PUBLIC WORKS FACILITY
ROXANA, ILLINOIS
March 17, 2011

ICE Unit Data					VMP-10				VMP-29				VMP-30			
Time	SVE Test Well: SVE-2				5-5.5 feet	10-10.5 feet	20-20.5 feet	30-30.5 feet	11 feet	19 feet	28 feet	41 feet	10.5 feet	18 feet	27.5 feet	41 feet
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
8:42am	683	12	1.6	<2,000	0.0	0.0	0.0	0.0	0.01	0.00	0.0	0.0	0.0	0.00	0.01	NR
8:45am	781	23	2.8	<2,000	0.0	0.0	0.02	0.03	0.05	0.00	0.04	0.0	0.0	0.00	0.015	NR
8:50am	876	30	4.0	7,700	0.0	0.0	0.08	0.08	0.135	0.15	0.15	0.0	0.0	0.03	0.01	NR
8:55am	996	39	5.4	6,600	0.0	0.0	0.10	0.11	0.262	0.20	0.26	0.0	0.0	0.06	0.05	NR
9:10am	1,172	49	7.2	<2,000	0.0	0.0	0.19	0.20	0.444	0.40	0.44	0.0	0.0	0.14	0.115	NR
9:25am	1,244	53	7.8	9,800	0.0	0.0	0.19	0.20	0.462	0.40	0.46	0.0	0.0	0.14	0.12	NR
9:40am	1,272	54	8.1	8,900	0.0	0.0	0.19	0.20	0.464	0.50	0.49	0.0	0.0	0.13	0.105	NR
9:55am	1,270	55	8.1	8,500	0.0	0.0	0.20	0.22	0.460	0.50	0.47	0.0	0.0	0.08	0.07	NR
10:10am	1,265	54	8.2	8,700	0.0	0.0	0.20	0.21	0.465	0.50	0.48	0.0	0.0	0.07	0.05	NR
10:25am	1,265	55	8.3	9,400	0.0	0.0	0.20	0.22	0.472	0.50	0.49	0.0	0.0	0.1	0.09	NR
10:40am	1,260	55	8.3	4,000	0.0	0.0	0.20	0.22	0.507	0.50	0.51	0.0	0.0	0.15	0.125	NR
10:55am	1,248	55	8.2	3,000	0.0	0.0	0.21	0.23	0.483	0.50	0.51	0.0	0.0	0.14	0.12	NR
11:10am	1,242	55	8.1	10,300	0.0	0.0	0.20	0.21	0.467	0.45	0.48	0.0	0.0	0.12	0.09	NR
11:25am	1,235	55	8.0	11,300	0.0	0.0	0.18	0.19	0.429	0.40	0.46	0.0	0.0	0.07	0.05	NR
11:40am	1,231	55	8.0	5,500	0.0	0.0	0.16	0.15	0.385	0.30	0.42	0.0	0.0	0.00	0.00	NR
12:40pm	1,210	54	7.5	7,900	0.0	0.0	0.18	0.18	0.420	0.35	0.44	0.0	0.0	0.00	0.00	NR
1:40pm	1,199	53	7.5	13,000	0.0	0.0	0.18	0.10	0.435	0.40	0.46	0.0	0.0	0.05	0.04	NR
2:40pm	1,197	53	7.6	11,800	0.0	0.0	0.16	0.01	0.415	0.40	0.42	0.0	0.0	0.02	0.01	NR
3:40pm	1,127	52	7.1	14,400	0.0	0.0	0.18	0.0	0.423	0.40	0.44	0.0	0.0	0.04	0.03	NR
4:40pm	1,119	52	7.6	7,200	0.0	0.0	0.24	0.02	0.501	0.50	0.52	0.0	0.0	0.2	0.175	NR
5:40pm	1,147	53	7.9	11,800	0.0	0.0	0.25	0.22	0.533	0.50	0.55	0.0	0.0	0.22	0.195	NR
6:40pm	1,150	53	8.0	11,800	0.0	0.0	0.28	0.28	0.581	0.55	0.59	0.0	0.0	0.3	0.25	NR
7:40pm	NM	*72	8.2	NM	0.0	0.0	0.32	0.40	0.665	0.6	0.64	0.0	0.0	0.4	0.2	NR
8:40pm	NM	*68	8.4	NM	0.0	0.0	0.28	0.50	0.624	0.6	0.64	0.0	0.0	0.34	0.2	NR

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

* Calculated from Anemometer Readings at Influent Hose

NM - Not measured

NR - No response from instrumentation

TABLE 1
SVE PILOT TEST FIELD DATA - PUBLIC WORKS FACILITY
ROXANA, ILLINOIS
March 17, 2011

ICE Unit Data					VMP-10				VMP-29				VMP-30			
Time	SVE Test Well: SVE-2				5-5.5 feet	10-10.5 feet	20-20.5 feet	30-30.5 feet	11 feet	19 feet	28 feet	41 feet	10.5 feet	18 feet	27.5 feet	41 feet
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
9:40pm	NM	*70	8.6	NM	NM	NM	0.26	0.54	0.608	0.6	0.6	0.0	0.0	0.3	0.2	NM
10:40pm	NM	*71	8.7	NM	NM	NM	0.26	0.58	0.628	0.6	0.6	0.0	0.0	0.32	0.2	NM
11:40pm	NM	*72	8.8	NM	NM	NM	0.26	0.62	0.601	0.6	0.62	0.0	0.0	0.3	0.2	NM

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

* Calculated from Anemometer Readings at Influent Hose

NM - Not measured

TABLE 1
SVE PILOT TEST FIELD DATA - PUBLIC WORKS FACILITY
ROXANA, ILLINOIS
March 18, 2011

ICE Unit Data					VMP-10				VMP-29				VMP-30			
Time	SVE Test Well: SVE-2				5-5.5 feet	10-10.5 feet	20-20.5 feet	30-30.5 feet	11 feet	19 feet	28 feet	41 feet	10.5 feet	18 feet	27.5 feet	41 feet
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
12:40am	NM	*73	8.8	NM	0.0	0.0	0.25	0.62	0.583	0.6	0.58	0.0	0.0	0.26	0.2	NR
1:40am	NM	*71	9.1	NM	0.0	0.0	0.32	0.48	0.689	0.7	0.70	0.0	0.0	0.38	0.3	NR
2:40am	NM	*69	9.5	NM	0.0	0.0	0.28	0.34	0.722	0.7	0.68	0.0	0.0	0.4	0.3	NR
3:40am	NM	*68	9.7	NM	0.0	0.0	0.28	0.32	0.63	0.6	0.66	0.0	0.0	0.28	0.2	NR
4:40am	NM	*68	9.8	NM	0.0	0.0	0.26	0.30	0.628	0.6	0.64	0.0	0.0	0.28	0.2	NR
5:40am	NM	*70	10.2	NM	0.0	0.0	0.30	0.36	0.712	0.7	0.70	0.0	0.0	0.36	0.3	NR
6:40am	NM	*69	10.3	NM	0.0	0.0	0.28	0.34	0.682	0.6	0.67	0.0	0.0	0.33	0.2	NR
7:40am	1,167	63	10.4	8,100	0.0	0.0	0.26	0.30	0.674	0.6	0.64	0.0	0.0	0.3	0.25	NR
8:40am	1,187	64	10.5	10,700	0.0	0.0	0.25	0.29	0.661	0.6	0.74	0.0	0.0	0.35	0.25	NR
9:40am	1,162	61	10.0	8,500	0.0	0.0	0.31	0.36	0.735	0.6	0.85	0.0	0.0	0.4	0.3	NR
10:40am	1,154	61	10.1	10,000	0.0	0.0	0.32	0.36	0.733	0.7	0.88	0.0	0.0	0.42	0.3	NR
11:40am	1,143	62	10.0	10,300	0.0	0.0	0.22	0.25	0.592	0.7	0.73	0.0	0.0	0.19	0.18	NR
12:40pm	1,120	62	10.8	10,000	0.0	0.0	0.17	0.22	0.684	0.6	0.82	0.0	0.0	0.38	0.4	NR
1:40pm	1,115	62	10.2	9,500	0.0	0.0	0.22	0.26	0.570	0.6	0.70	0.0	0.0	0.105	0.1	NR
2:40pm	1,130	62	10.8	8,100	0.0	0.0	0.28	0.30	0.658	0.7	0.80	0.0	0.0	0.28	0.23	NR
3:40pm	1,124	62	11.0	9,800	0.0	0.0	0.28	0.31	0.681	0.7	0.79	0.0	0.0	0.31	0.2	NR
4:40pm	1,128	62	11.2	9,100	0.0	0.0	0.23	0.27	0.601	0.6	0.75	0.0	0.0	0.22	0.2	NR
5:40pm	1,110	63	10.4	8,200	0.0	0.0	0.27	0.31	0.672	0.7	0.80	0.0	0.0	0.3	0.2	NR
6:40pm	1,106	62	10.5	8,000	0.0	0.0	0.27	0.31	0.652	0.6	0.81	0.0	0.0	0.28	0.2	NR
7:40pm	1,107	62	10.6	7,900	0.0	0.0	0.26	0.31	0.641	0.7	0.80	0.0	0.0	0.27	0.2	NR
8:40pm	1,095	63	10.6	9,300	0.0	0.0	0.25	0.30	0.655	0.7	0.80	0.0	0.0	0.28	0.2	NR
9:40pm	1,088	63	10.7	7,600	0.0	0.0	0.27	0.32	0.684	0.7	0.80	0.0	0.0	0.31	0.2	NR
10:40pm	1,094	63	10.8	7,400	0.0	0.0	0.27	0.32	0.678	0.6	0.80	0.0	0.0	0.31	0.2	NR
11:40pm	1,077	63	10.8	8,600	0.0	0.0	0.26	0.29	0.641	0.6	0.79	0.0	0.0	0.26	0.2	NR

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

* Calculated from Anemometer Readings at Influent Hose

NM - Not measured

NR - No response from instrumentation

TABLE 1
SVE PILOT TEST FIELD DATA - PUBLIC WORKS FACILITY
ROXANA, ILLINOIS
March 19, 2011

ICE Unit Data					VMP-10				VMP-29				VMP-30			
Time	SVE Test Well: SVE-2				5-5.5 feet	10-10.5 feet	20-20.5 feet	30-30.5 feet	11 feet	19 feet	28 feet	41 feet	10.5 feet	18 feet	27.5 feet	41 feet
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
12:40am	1,079	63	10.9	6,300	NR	NR	0.26	0.30	0.67	0.7	0.80	NR	NR	0.29	0.2	NR
1:40am	1,075	63	10.9	7,800	NR	NR	0.26	0.32	0.667	0.7	0.80	NR	NR	0.29	0.2	NR
2:40am	1,077	64	11.0	8,700	NR	NR	0.27	0.33	0.701	0.7	0.81	NR	NR	0.31	0.2	NR
3:40am	1,066	64	10.9	6,900	NR	NR	0.24	0.29	0.648	0.6	0.79	NR	NR	0.26	0.2	NR
4:40am	1,058	64	11.0	8,000	NR	NR	0.26	0.32	0.666	0.6	0.80	NR	NR	0.28	0.2	NR
5:40am	1,050	64	11.2	6,700	NR	NR	0.27	0.31	0.695	0.7	0.80	NR	NR	0.32	0.2	NR
6:40am	1,055	64	11.2	5,800	NR	NR	0.26	0.31	0.672	0.6	0.80	NR	NR	0.29	0.2	NR
7:40am	1,068	65	11.2	7,300	NR	NR	0.30	0.35	0.700	0.7	0.83	NR	NR	0.33	0.2	NR
8:40am	1,070	65	11.1	7,800	NR	NR	0.27	0.32	0.660	0.6	0.79	NR	NR	0.32	0.2	NR
9:40am	1,060	65	11.0	7,900	NR	NR	0.28	0.32	0.670	0.7	0.80	NR	NR	0.28	0.2	NR
10:40am	1,063	65	10.8	6,300	NR	NR	0.27	0.31	0.647	0.7	0.80	NR	NR	0.25	0.2	NR
11:40am	1,055	65	10.6	4,900	NR	NR	0.20	0.23	0.590	0.6	0.74	NR	NR	0.13	0.1	NR
12:40pm	1,058	64	10.4	6,700	NR	NR	0.20	0.22	0.578	0.6	0.72	NR	NR	0.14	0.1	NR
1:40pm	1,045	64	10.4	9,500	NR	NR	0.24	0.25	0.590	0.6	0.75	NR	NR	0.16	0.1	NR
2:40pm	1,041	64	10.4	8,100	NR	NR	0.24	0.27	0.587	0.6	0.70	NR	NR	0.17	0.1	NR
3:40pm	1,037	64	10.4	7,400	NR	NR	0.25	0.29	0.651	0.7	0.81	NR	NR	0.21	0.175	NR
4:40pm	1,042	64	10.5	6,700	NR	NR	0.25	0.30	0.670	0.7	0.79	NR	NR	0.25	0.2	NR
5:40pm	1,036	64	10.7	6,700	NR	NR	0.24	0.28	0.608	0.6	0.77	NR	NR	0.2	0.2	NR
6:40pm	1,038	64	10.8	8,900	NR	NR	0.19	0.23	0.568	0.5	0.72	NR	NR	0.11	0.1	NR
7:40pm	1,030	64	11.0	7,100	NR	NR	0.30	0.36	0.790	0.8	0.89	NR	NR	0.42	0.3	NR
8:40pm	1,034	64	11.0	7,600	NR	NR	0.24	0.28	1.125	0.8	0.80	NR	NR	0.32	0.3	NR
9:40pm	1,026	64	11.1	6,900	NR	NR	0.28	0.31	1.454	0.7	0.80	NR	NR	0.28	0.1	NR
10:40pm	1,035	64	11.0	6,100	NR	NR	0.28	0.14	1.552	0.5	0.62	NR	NR	0.0	0.0	NR
11:40pm	1,025	64	11.3	8,100	NR	NR	0.29	0.39	1.534	0.8	0.88	NR	NR	0.31	0.3	NR

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

NR - No response from instrumentation

TABLE 1
SVE PILOT TEST FIELD DATA - PUBLIC WORKS FACILITY
ROXANA, ILLINOIS
March 20, 2011

ICE Unit Data					VMP-10				VMP-29				VMP-30			
Time	SVE Test Well: SVE-2				5-5.5 feet	10-10.5 feet	20-20.5 feet	30-30.5 feet	11 feet	19 feet	28 feet	41 feet	10.5 feet	18 feet	27.5 feet	41 feet
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
12:40am	1,032	64	11.1	6,700	NR	NR	0.29	0.36	0.994	0.9	0.86	NR	NR	0.3	0.3	NR
1:40am	1,024	64	11.0	6,900	NR	NR	0.26	0.28	0.483	0.6	0.78	NR	NR	0.2	0.18	NR
2:40am	1,028	64	11.1	5,900	NR	NR	0.28	0.36	1.065	0.7	0.84	NR	NR	0.3	0.26	NR
3:40am	1,023	64	11.2	6,400	NR	NR	0.26	0.32	1.161	0.7	0.79	NR	NR	0.2	0.22	NR
4:40am	1,020	64	11.1	4,300	NR	NR	0.26	0.26	0.68	0.7	0.75	NR	NR	0.2	0.16	NR
5:40am	1,016	64	11.1	6,600	NR	NR	0.27	0.34	0.789	0.8	0.84	NR	NR	0.2	0.26	NR
6:40am	1,025	64	11.1	6,600	NR	NR	0.26	0.30	0.733	0.7	0.80	NR	NR	0.2	0.2	NR

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

NR - No response from instrumentation

TABLE 2
SVE PILOT TEST FIELD DATA - WRR
ROXANA, ILLINOIS
March 21, 2011

ICE Unit Data					VMP-26				VMP-27				VMP-28			
Time	SVE Test Well: SVE-1				10 feet	20 feet	30 feet	38 feet	10 feet	20 feet	30 feet	38 feet	10 feet	20 feet	30 feet	37 feet
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
10:20am	590	4	0.1	150,000	0.0	0.0	0.1	0.0	0.01	0.12	0.04	0.1	0.07	0.07	0.07	0.08
10:22am	600	5	0.3	150,000	0.0	0.0	0.1	0.0	0.01	0.14	0.05	0.1	0.07	0.06	0.07	0.08
10:25am	630	6	0.5	150,000	0.0	0.0	0.1	0.0	0.09	0.15	0.06	0.1	0.07	0.07	0.09	0.1
10:30am	633	6	0.4	120,000	0.0	0.0	0.1	0.0	0.1	0.15	0.06	0.1	0.07	0.08	0.1	0.11
10:35am	625	5	0.4	123,000	0.0	0.136	0.1	0.0	0.08	0.14	0.05	0.1	0.07	0.08	0.1	0.1
10:50am	640	5	0.3	130,100	0.0	0.144	0.1	0.0	0.16	0.23	0.14	0.2	0.13	0.13	0.16	0.18
11:05am	613	4	0.2	184,500	0.171	0.218	0.227	0.187	0.18	0.22	0.14	0.3	0.14	0.14	0.18	0.2
11:20am	610	3	0.2	243,000	0.125	0.185	0.184	0.165	0.15	0.2	0.13	0.3	0.1	0.11	0.13	0.15
11:35am	615	3	0.4	239,100	0.05	0.05	0.095	0.098	0.07	0.12	0.05	0.2	0.06	0.05	0.08	0.09
11:50am	608	3	0.3	240,000	0.17	0.036	0.05	0.038	0.04	0.05	0.0	0.04	0.0	0.0	0.02	0.01
12:05pm	616	3	0.2	175,500	0.034	0.072	0.068	0.055	0.04	0.08	0.0	0.03	0.01	0.03	0.04	0.04
12:05pm	614	3	0.2	236,000	0.016	0.066	0.041	0.037	0.04	0.07	0.0	0.02	0.0	0.01	0.03	0.03
12:20pm	611	3	0.1	229,000	0.037	0.011	0.014	0.025	0.0	0.0	0.0	0.05	0.0	0.0	0.0	0.0
12:35pm	616	3	0.1	216,000	0.061	0.046	0.056	0.065	0.0	0.0	0.0	0.08	0.0	0.0	0.0	0.0
1:05pm	614	3	0.0	222,000	0.149	0.16	0.213	0.207	0.0	0.0	0.0	0.21	0.0	0.0	0.0	0.0
1:20pm	618	3	0.1	231,000	0.232	0.251	0.23	0.289	0.29	0.31	0.3	0.33	0.32	0.3	0.33	0.33
2:20pm	610	0	0.3	328,000	0.47	0.513	0.516	0.578	0.57	0.58	0.57	0.62	0.52	0.54	0.6	0.6
3:20pm	605	0	0.0	310,000	0.493	0.547	0.542	0.618	0.6	0.63	0.62	0.67	0.52	0.54	0.61	0.62
4:20pm	610	0	0.0	336,000	0.537	0.6	0.602	0.686	0.65	0.67	0.67	0.73	0.56	0.58	0.65	0.66
5:20pm	612	0	0.0	317,000	0.568	0.644	0.651	0.707	0.7	0.73	0.72	0.78	0.62	0.64	0.71	0.72
6:20pm	630	0	0.1	392,000	0.54	0.608	0.613	0.677	0.66	0.69	0.68	0.74	0.55	0.58	0.66	0.66

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

TABLE 2
SVE PILOT TEST FIELD DATA - WRR
ROXANA, ILLINOIS
March 22, 2011

ICE Unit Data					VMP-26				VMP-27				VMP-28			
Time	SVE Test Well: SVE-1				10 feet	20 feet	30 feet	38 feet	10 feet	20 feet	30 feet	38 feet	10 feet	20 feet	30 feet	37 feet
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
9:05am	611	0	0.1	381,900	0.301	0.409	0.396	0.46	>0.25	0.47	0.4	0.1	>0.25	0.36	0.43	>0.25
9:07am	610	0	0.1	455,000	0.245	0.402	0.396	0.453	>0.25	0.48	0.4	0.1	>0.25	0.38	0.43	>0.25
9:10am	614	0	0.1	400,000	0.255	0.43	0.427	0.496	>0.25	0.47	0.3	0.1	>0.25	0.36	0.42	>0.25
9:15am	616	0	0.0	464,000	0.351	0.551	0.526	0.565	>0.25	0.58	0.5	0.6	>0.25	0.44	0.5	>0.25
9:20am	616	0	0.1	450,000	0.275	0.468	0.457	0.509	>0.25	0.54	0.5	1.3	>0.25	0.5	0.54	>0.25
9:35am	618	0	0.0	410,700	0.34	0.594	0.588	0.644	>0.25	0.64	0.5	1.3	>0.25	0.54	0.6	>0.25
9:50am	637	0	0.2	444,000	0.373	0.65	0.645	0.709	>0.25	0.7	0.6	0.8	>0.25	0.63	0.69	>0.25
10:05am	634	0	0.4	474,000	0.424	0.72	0.719	0.776	>0.25	0.77	0.7	0.8	>0.25	0.68	0.77	>0.25
10:20am	634	0	0.4	445,000	0.454	0.763	0.76	0.83	>0.25	0.81	0.8	0.8	>0.25	0.74	0.82	>0.25
10:35am	637	0	0.4	470,000	0.443	0.783	0.785	0.86	>0.25	0.82	0.8	0.9	>0.25	0.75	0.85	>0.25
10:50am	635	0	0.4	483,000	0.4	0.703	0.69	0.754	>0.25	0.74	0.7	0.9	>0.25	0.7	0.77	>0.25
11:05am	635	0	0.2	469,000	0.322	0.579	0.578	0.655	>0.25	0.67	0.6	0.9	>0.25	0.58	0.68	>0.25
11:20am	635	0	0.2	463,000	0.365	0.668	0.668	0.745	>0.25	0.74	0.7	0.8	>0.25	0.63	0.72	>0.25
11:35am	635	0	0.5	478,000	0.531	0.888	0.89	0.955	>0.25	0.92	0.9	1	>0.25	0.84	0.95	>0.25
11:50am	636	0	0.4	494,000	0.392	0.676	0.68	0.769	>0.25	0.77	0.7	0.9	>0.25	0.68	0.79	>0.25
12:05pm	636	0	0.2	471,000	0.298	0.559	0.567	0.649	>0.25	0.64	0.5	0.8	>0.25	0.56	0.67	>0.25
1:05pm	636	0	0.2		0.295	0.557	0.563	0.646	>0.25	0.87	0.8	0.9	>0.25	0.82	0.95	>0.25

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

TABLE 2
SVE PILOT TEST FIELD DATA - WRR
ROXANA, ILLINOIS
March 22, 2011

ICE Unit Data				
Time	**SVE Test Well: P-56**			
(min.)	**Temp (°F)**	**Airflow (cfm)**	**Pressure (inches of water)**	**Vapor Conc. (ppmv)[1]**
2:55pm	610	0.0	1.32	435,000
2:57pm	644	3.0	8.1	280,000
3:00pm	668	4.0	9.454	216,000
3:05pm	693	6.0	79	134,000
3:10pm	686	5.0	75.4	145,000
3:25pm	688	4.0	75.1	216,000
3:40pm	689	3.0	77.9	251,000
Pilot Test Activities Paused at 3:55 pm for DTW Gauging Attempts				
4:29pm	616	0.0	4.1	470,000
4:31pm	649	2.0	13.8	338,000
4:34pm	684	2.0	24.1	547,000
4:39pm	669	0.0	14.7	462,000
4:44pm	676	0.0	12.9	582,000
4:59pm	675	2.0	15.1	558,000
5:14pm	654	2.0	14.9	559,000
5:29pm	655	0.0	14.3	560,000

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit

TABLE 2
SVE PILOT TEST FIELD DATA - WRR
ROXANA, ILLINOIS
March 23, 2011

ICE Unit Data					P60-12D	P60-12	P60-13
Time	SVE Test Well: P60-11						
(min.)	Temp (°F)	Airflow (cfm)	Pressure (inches of water)	Vapor Conc. (ppmv)[1]	Pressure (inches of water)	Pressure (inches of water)	Pressure (inches of water)
9:37am	570	0	0.9	200,900			
9:39am	580	0	2.5	226,000			
9:42am	584	7	5.1	60,900			
9:47am	707	6	4.8	171,000			
9:52am	699	7	4.6	191,000			
10:07am	700	8	4.5	154,000			
10:22am	695	8	4.6	152,500			
10:37am	690	8	4.5	137,200			
10:52am	690	8	4.5	149,000			
11:07am	690	8	4.4	145,000			
11:22am	690	8	4.2	147,000			
11:37am	685	8	4.1	147,000	0.16	0.01	
1:52am	685	8	4	152,000	0.12		
12:07pm	680	8	3.9	134,000		0.26	
12:22pm	683	8	3.9	170,000	0.09		
12:37pm	685	7	3.7	165,000		0.0	
1:37pm	650	5	3.1	217,000	0.0		0.0
2:37pm	645	5	3.0	224,000	0.0		0.0
3:37pm	640	3	3.5	379,000			

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit PID

TABLE 2
SVE PILOT TEST FIELD DATA - WRR
ROXANA, ILLINOIS
March 24, 2011

ICE Unit Data				
Time	**SVE Test Well: P60-11**			
(min.)	**Temp (°F)**	**Airflow (cfm)**	**Pressure (inches of water)**	**Vapor Conc. (ppmv)[1]**
10:55am	531	0	25.3	116,000
10:57am	533	0	2.1	167,000
11:00am	528	0	12	142,000
11:05am	524	0	12.2	72,000
11:10am	521	0	11.7	65,300
11:25am	517	0	10.5	139,500
11:40am	517	0	9.6	173,000
11:55am	516	0	9	164,000
12:10pm	514	0	8.8	132,000
12:25pm	514	0	8.4	194,000
12:40pm	513	0	15	144,000
12:55pm	511	0	14.8	84,000
1:10pm	508	0	14.4	197,000
1:25pm	509	0	14.3	161,000
1:40pm	510	0	14.0	200,000
1:55pm	507	0	13.5	190,000
2:10pm	508	0	13.1	180,000
2:25pm	508	0	12.9	157,000
2:40pm	505	0	12.5	95,000
2:55pm	505	0	12.4	155,400
3:10pm	506	0	12.7	189,000
3:25pm	500	0	12.3	185,000

Notes:

Indicates Negative Pressure (vacuum)

Indicates Positive Pressure

[1] Vapor Concentrations were measured by an internal ICE unit

TABLE 3
ROXANA PILOT TEST STUDY
INTERNAL COMBUSTION ENGINE EMISSION
AIR SAMPLE ANALYTICAL DATA

Sample ID	Sample Date	1,2,4-Trimethylbenzene			1,3,5-Trimethylbenzene			1,3-Butadiene			2,2,4-Trimethylpentane			2-Butanone			2-Propanol			4-Ethyltoluene		
		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
AE#1	3/16/2011	<0.1	U		<0.1	U		0.093			<0.096	U		<0.24	U		<0.2	U		<0.1	U	
AE#2	3/17/2011	<0.042	U	UJ	<0.042	U	UJ	0.077		J	<0.04	U	UJ	<0.1	U	UJ	<0.084	U	UJ	<0.042	U	UJ
AE#3	3/18/2011	<0.099	U		<0.099	U		0.13			<0.094	U		<0.24	U		<0.2	U		<0.099	U	
AE#4	3/19/2011	<0.04	U		<0.04	U		0.21			<0.038	U		<0.097	U		<0.081	U		<0.04	U	
AE#5	3/21/2011	0.025			<0.013	U		<0.006	U		0.38			0.068			<0.026	U		<0.013	U	
AE#6	3/22/2011	<0.042	U		<0.042	U		<0.019	U		0.5			<0.1	U		<0.084	U		<0.042	U	
AE#7	3/23/2011	<0.02	U		<0.02	U		<0.0092	U		1.7			0.1			<0.041	U		<0.02	U	
AE#8	3/24/2011	0.012			<0.0098	U		0.43			0.05			0.13			0.023			0.024		

Sample ID	Sample Date	4-Methyl-2-pentanone			Acetone			Benzene			Bromodichloromethane			Carbon disulfide			Chlorobenzene			Chloroethane		
		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
AE#1	3/16/2011	<0.084	U		0.34			4.2			<0.14	U		<0.26	U		<0.095	U		<0.22	U	
AE#2	3/17/2011	<0.035	U	UJ	0.26		J	0.51		J	<0.057	U	UJ	<0.11	U	UJ	<0.039	U	UJ	<0.09	U	UJ
AE#3	3/18/2011	<0.083	U		0.3			0.23			<0.14	U		<0.25	U		<0.093	U		<0.21	U	
AE#4	3/19/2011	<0.034	U		<0.078	U		0.23			<0.055	U		<0.1	U		<0.038	U		<0.086	U	
AE#5	3/21/2011	<0.011	U		<0.026	U		1.9			<0.018	U		<0.034	U		<0.012	U		<0.028	U	
AE#6	3/22/2011	<0.035	U		<0.081	U		2.7			<0.057	U		<0.1	U		<0.039	U		<0.09	U	
AE#7	3/23/2011	<0.017	U		<0.04	U		2.3			<0.028	U		<0.052	U		<0.019	U		<0.044	U	
AE#8	3/24/2011	0.0094			0.69			1.8			<0.013	U		<0.025	U		<0.0092	U		<0.021	U	

Sample ID	Sample Date	Chloroform			Cyclohexane			Dichlorodifluoromethane			Dichloromethane (Methylene chloride)			Ethanol			Ethylbenzene			Heptane		
		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
AE#1	3/16/2011	<0.1	U		<0.071	U		<0.1	U		<0.072	U		0.23			<0.089	U		<0.084	U	
AE#2	3/17/2011	<0.042	U	UJ	<0.029	U	UJ	<0.042	U	UJ	0.031		J	0.11		J	<0.037	U	UJ	<0.035	U	UJ
AE#3	3/18/2011	<0.099	U		<0.07	U		<0.1	U		<0.07	U		<0.15	U		<0.088	U		<0.083	U	
AE#4	3/19/2011	<0.04	U		<0.028	U		<0.04	U		<0.028	U		0.086			<0.036	U		<0.034	U	
AE#5	3/21/2011	<0.013	U		0.04			<0.013	U		<0.0094	U		0.17			0.072			0.065		
AE#6	3/22/2011	<0.042	U		0.06			<0.042	U		<0.03	U		0.17			<0.037	U		0.043		
AE#7	3/23/2011	<0.02	U		0.07			<0.021	U		<0.014	U		0.14			0.05			<0.017	U	
AE#8	3/24/2011	<0.0097	U		0.022			<0.0098	U		<0.0069	U		0.19			0.12			0.045		

TABLE 3
ROXANA PILOT TEST STUDY
INTERNAL COMBUSTION ENGINE EMISSION
AIR SAMPLE ANALYTICAL DATA

Sample ID	Sample Date	Hexane			Isopropylbenzene (Cumene)			m,p-Xylene			n-Propylbenzene			o-Xylenes			Styrene			Tetrachloroethene		
		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
AE#1	3/16/2011	0.076			0.32			<0.089	U		<0.1	U		<0.089	U		0.094			<0.14	U	
AE#2	3/17/2011	<0.03	U	UJ	0.13		J	<0.037	U	UJ	<0.042	U	UJ	<0.037	U	UJ	0.047		J	0.093		J
AE#3	3/18/2011	<0.071	U		<0.099	U		<0.088	U		<0.099	U		<0.088	U		<0.086	U		<0.14	U	
AE#4	3/19/2011	<0.029	U		<0.04	U		<0.036	U		<0.04	U		<0.036	U		<0.035	U		<0.056	U	
AE#5	3/21/2011	0.54			0.038			0.11			<0.013	U		0.033			0.012			<0.018	U	
AE#6	3/22/2011	0.45			<0.042	U		0.054			<0.042	U		<0.037	U		<0.036	U		<0.058	U	
AE#7	3/23/2011	0.24			<0.02	U		0.069			<0.02	U		0.027			<0.018	U		<0.028	U	
AE#8	3/24/2011	0.1			<0.0098	U		0.15			<0.0098	U		0.045			0.051			<0.013	U	

Sample ID	Sample Date	Tetrahydrofuran			Toluene			Trichlorofluoromethane		
		Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals	Result (mg/m^3)	Lab Quals	URS Quals
AE#1	3/16/2011	<0.061	U		0.25			<0.12	U	
AE#2	3/17/2011	<0.025	U	UJ	0.13		J	<0.048	U	UJ
AE#3	3/18/2011	<0.06	U		0.11			<0.11	U	
AE#4	3/19/2011	<0.024	U		0.052			<0.046	U	
AE#5	3/21/2011	0.0089			0.48			<0.015	U	
AE#6	3/22/2011	<0.025	U		0.37			<0.048	U	
AE#7	3/23/2011	0.014			0.55			<0.023	U	
AE#8	3/24/2011	0.21			0.63			<0.011	U	

TABLE 4
SOIL SAMPLE ANALYSIS RESULTS
ROXANA, IL

Location	Depth	Sample Date	1,2,4-Trimethylbenzene			1,3,5-Trimethylbenzene			4-Chlorotoluene			Acetone			Benzene		
			Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result	Lab Qual	URS Qual
GP-14	**12 - 13 ft**	3/14/2011	< 0.01	U		< 0.01	U		< 0.01	U		0.0643		U	0.0025		
GP-14	**30.5 - 31.5 ft**	3/14/2011	< 0.0063	U		< 0.0063	U		< 0.0063	U		0.0323		U	0.0017		
GP-14	**39 - 40 ft**	3/14/2011	0.12	J		0.0392	J		< 0.7	U		< 0.7	U		0.263		
GP-15	**11 - 12 ft**	3/14/2011	< 0.28	U		< 0.28	U		< 0.28	U		< 0.28	U		< 0.028	U	
GP-15	**19 - 20 ft**	3/14/2011	3.17	J		1.76	J		< 13	U		< 13	U		< 1.3	U	
GP-15	**27 - 28 ft**	3/14/2011	1.4	J		0.401	J		< 3.6	U		< 3.6	U		< 0.36	U	
GP-15	**27 - 28 ft**	3/14/2011	0.861	J		0.271	J		< 1.5	U		< 1.5	U		< 0.15	U	
GP-15	**37 - 38 ft**	3/14/2011	0.527	J		0.207	J		< 2.8	U		< 2.8	U		< 0.28	U	
GP-15	**37 - 38 ft**	3/14/2011	0.156	J		0.0506	J		< 0.46	U		< 0.46	U		< 0.046	U	
GP-16	**11 - 12 ft**	3/17/2011	< 0.63	U		< 0.63	U		< 0.63	U		< 0.63	U		< 0.063	U	
GP-16	**27 - 28 ft**	3/16/2011	< 2	U		0.138	J		< 2	U		< 2	U		< 0.2	U	
GP-16	**34 - 35 ft**	3/16/2011	0.447	J		0.642	J		< 1.3	U		< 1.3	U		< 0.13	U	
GP-16	**39 - 40 ft**	3/16/2011	0.375	J		0.221	J		< 0.73	U		< 0.73	U		< 0.073	U	
GP-17	**12 - 13 ft**	3/15/2011	< 6.1	U		< 6.1	U		< 6.1	U		< 6.1	U		< 0.61	U	
GP-17	**23 - 24 ft**	3/15/2011	< 2.6	U		0.892	J		< 2.6	U		< 2.6	U		< 0.26	U	
GP-17	**39 - 40 ft**	3/15/2011	3.74			0.901	J		< 1.9	U		< 1.9	U		0.695		
GP-18	**12 - 13 ft**	3/16/2011	< 0.0052	U		< 0.0052	U		< 0.0052	U		< 0.0052	U		0.00044	J	
GP-18	**29.5 - 30.5 ft**	3/16/2011	< 2	U		< 2	U		< 2	U		< 2	U		< 0.2	U	
GP-18	**39 - 40 ft**	3/16/2011	0.0496	J		0.0457	J		< 0.64	U		< 0.64	U		2.42		
GP-19	**12 - 13 ft**	3/17/2011	< 0.0065	U		< 0.0065	U		< 0.0065	U		< 0.0065	U		0.0303		
GP-19	**27 - 28 ft**	3/17/2011	< 0.0065	U		< 0.0065	U		< 0.0065	U		0.0183		U	0.0856		
GP-19	**39 - 40 ft**	3/17/2011	< 2.2	U		< 2.2	U		< 2.2	U		< 2.2	U		15.6		
SVE-1	**11 - 12 ft**	3/4/2011	0.0522			0.0088			< 0.0071	U		< 0.0071	U		0.0114		
SVE-1	**27 - 28 ft**	3/4/2011	8.6			1.69			< 0.65	U		< 0.65	U		< 0.065	U	
SVE-1	**53 - 54 ft**	3/4/2011	64.1			16.3			< 3.1	U		< 3.1	U		2.8		
SVE-1	**53 - 54 ft**	3/4/2011	40.6			10.2			< 3	U		< 3	U		1.78		
SVE-2	**11 - 12 ft**	3/2/2011	< 0.0061	U		< 0.0061	U		0.00048	J		0.022		U	0.0016		
SVE-2	**33 - 34 ft**	3/2/2011	< 33	U		< 33	U		< 33	U		< 33	U		553		
SVE-2	**43 - 44 ft**	3/2/2011	< 23	U		< 23	U		< 23	U		< 23	U		1150		
VMP-26	**11 - 12 ft**	3/7/2011	37.8			6.82			< 1.2	U		< 1.2	U		< 0.12	U	
VMP-26	**31 - 32 ft**	3/7/2011	119			30.1			< 5.6	U		< 5.6	U		1.98		

TABLE 4
SOIL SAMPLE ANALYSIS RESULTS
ROXANA, IL

Location	Depth	Sample Date	Bromomethane			Carbon disulfide			Cymene (p-Isopropyltoluene)			Dichloromethane (Methylene chloride)			Ethylbenzene		
			Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual
GP-14	**12 - 13 ft**	3/14/2011	< 0.004	U		< 0.01	U		< 0.01	U		< 0.004	U		0.0078		
GP-14	**30.5 - 31.5 ft**	3/14/2011	< 0.0025	U		< 0.0063	U		< 0.0063	U		< 0.0025	U		0.0068		
GP-14	**39 - 40 ft**	3/14/2011	< 0.28	U		< 0.7	U		< 0.7	U		0.191	J	U	0.254	J	
GP-15	**11 - 12 ft**	3/14/2011	< 0.11	U		< 0.28	U		< 0.28	U		0.102	J	U	< 0.11	U	
GP-15	**19 - 20 ft**	3/14/2011	< 5.2	U		< 13	U		2.72	J		3.97	J	U	< 5.2	U	
GP-15	**27 - 28 ft**	3/14/2011	< 1.5	U		< 3.6	U		0.991	J		1.22	J	U	0.376	J	
GP-15	**27 - 28 ft**	3/14/2011	< 0.6	U		< 1.5	U		0.718	J		< 0.6	U		0.0865	J	
GP-15	**37 - 38 ft**	3/14/2011	< 1.1	U		< 2.8	U		0.211	J		< 1.1	U		0.266	J	
GP-15	**37 - 38 ft**	3/14/2011	< 0.18	U		< 0.46	U		0.0795	J		< 0.18	U		< 0.18	U	
GP-16	**11 - 12 ft**	3/17/2011	< 0.25	U		< 0.63	U		< 0.63	U		0.238	J	U	< 0.25	U	
GP-16	**27 - 28 ft**	3/16/2011	< 0.81	U		< 2	U		< 2	U		< 0.81	U		< 0.81	U	
GP-16	**34 - 35 ft**	3/16/2011	< 0.51	U		< 1.3	U		< 1.3	U		0.496	J	U	0.176	J	
GP-16	**39 - 40 ft**	3/16/2011	< 0.29	U		< 0.73	U		< 0.73	U		0.334		U	0.0565	J	
GP-17	**12 - 13 ft**	3/15/2011	< 2.4	U		< 6.1	U		< 6.1	U		< 2.4	U		< 2.4	U	
GP-17	**23 - 24 ft**	3/15/2011	< 1	U		< 2.6	U		0.581	J		< 1	U		< 1	U	
GP-17	**39 - 40 ft**	3/15/2011	< 0.76	U		< 1.9	U		0.252	J		< 0.76	U		3.53		
GP-18	**12 - 13 ft**	3/16/2011	< 0.0021	U		< 0.0052	U		< 0.0052	U		< 0.0021	U		< 0.0021	U	
GP-18	**29.5 - 30.5 ft**	3/16/2011	< 0.78	U		< 2	U		0.68	J		0.49	J	U	< 0.78	U	
GP-18	**39 - 40 ft**	3/16/2011	< 0.26	U		< 0.64	U		< 0.64	U		0.215	J	U	0.13	J	
GP-19	**12 - 13 ft**	3/17/2011	0.0112			0.0025	J		< 0.0065	U		< 0.0026	U		0.0008	J	
GP-19	**27 - 28 ft**	3/17/2011	< 0.0026	U		< 0.0065	U		< 0.0065	U		< 0.0026	U		0.0031		
GP-19	**39 - 40 ft**	3/17/2011	< 0.89	U		< 2.2	U		< 2.2	U		0.796	J	U	< 0.89	U	
SVE-1	**11 - 12 ft**	3/4/2011	< 0.0029	U		0.002	J		< 0.0071	U		< 0.0029	U		0.0186		
SVE-1	**27 - 28 ft**	3/4/2011	< 0.26	U		< 0.65	U		0.227	J		0.295	B	U	1.48		
SVE-1	**53 - 54 ft**	3/4/2011	< 1.2	U		< 3.1	U		0.994	J		1.25	B	U	54.5		J/J
SVE-1	**53 - 54 ft**	3/4/2011	< 1.2	U		< 3	U		0.644	J		1.26	B		31.5		
SVE-2	**11 - 12 ft**	3/2/2011	< 0.0024	U		< 0.0061	U		< 0.0061	U		< 0.0024	U		0.0033		
SVE-2	**33 - 34 ft**	3/2/2011	< 13	U		< 33	U		< 33	U		< 13	U		< 13	U	
SVE-2	**43 - 44 ft**	3/2/2011	< 9.2	U		< 23	U		< 23	U		< 9.2	U		< 9.2	U	
VMP-26	**11 - 12 ft**	3/7/2011	< 0.47	U		< 1.2	U		0.727	J		0.552	B	U	3.71		
VMP-26	**31 - 32 ft**	3/7/2011	< 2.2	U		< 5.6	U		1.38	J		2.55	B	U	61.3		

TABLE 4
SOIL SAMPLE ANALYSIS RESULTS
ROXANA, IL

Location	Depth	Sample Date	Isopropylbenzene (Cumene)			m,p-Xylene			Methyl tert-Butyl Ether (MTBE)			n-Butylbenzene			n-Propylbenzene		
			Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual
GP-14	**12 - 13 ft**	3/14/2011	< 0.01	U		0.0016	J		< 0.004	U		< 0.01	U		< 0.01	U	
GP-14	**30.5 - 31.5 ft**	3/14/2011	< 0.0063	U		0.0013	J		< 0.0025	U		< 0.0063	U		< 0.0063	U	
GP-14	**39 - 40 ft**	3/14/2011	< 0.7	U		0.55			< 0.28	U		< 0.7	U		< 0.7	U	
GP-15	**11 - 12 ft**	3/14/2011	< 0.28	U		< 0.11	U		< 0.11	U		< 0.28	U		< 0.28	U	
GP-15	**19 - 20 ft**	3/14/2011	8.54	J	J	< 5.2	U		< 5.2	U		10.4	J		8.94	J	
GP-15	**27 - 28 ft**	3/14/2011	0.617	J	J	0.771	J		< 1.5	U		< 3.6	U		0.631	J	
GP-15	**27 - 28 ft**	3/14/2011	0.277	J		0.226	J		< 0.6	U		< 1.5	U		0.328	J	
GP-15	**37 - 38 ft**	3/14/2011	0.15	J	J	0.248	J		< 1.1	U		1.02	J		0.168	J	
GP-15	**37 - 38 ft**	3/14/2011	< 0.46	U		< 0.18	U		< 0.18	U		< 0.46	U		0.0302	J	
GP-16	**11 - 12 ft**	3/17/2011	< 0.63	U		< 0.25	U		< 0.25	U		< 0.63	U		< 0.63	U	
GP-16	**27 - 28 ft**	3/16/2011	1	J	J	< 0.81	U		< 0.81	U		2.17			3.11		
GP-16	**34 - 35 ft**	3/16/2011	0.507	J	J	0.0938	J		< 0.51	U		0.517	J		1.47		
GP-16	**39 - 40 ft**	3/16/2011	0.0854	J	J	0.0851	J		< 0.29	U		< 0.73	U		0.27	J	
GP-17	**12 - 13 ft**	3/15/2011	3.16	J	J	< 2.4	U		< 2.4	U		3.51	J		2.94	J	
GP-17	**23 - 24 ft**	3/15/2011	4		J	0.58	J		< 1	U		3.01			4.05		
GP-17	**39 - 40 ft**	3/15/2011	0.586	J	J	4.73			< 0.76	U		0.648	J		0.756	J	
GP-18	**12 - 13 ft**	3/16/2011	< 0.0052	U		< 0.0021	U		< 0.0021	U		< 0.0052	U		< 0.0052	U	
GP-18	**29.5 - 30.5 ft**	3/16/2011	< 2	U		< 0.78	U		< 0.78	U		2.1			< 2	U	
GP-18	**39 - 40 ft**	3/16/2011	0.0801	J	J	< 0.26	U		< 0.26	U		0.274	J		0.16	J	
GP-19	**12 - 13 ft**	3/17/2011	< 0.0065	U		0.0017	J		< 0.0026	U		< 0.0065	U		0.00087	J	
GP-19	**27 - 28 ft**	3/17/2011	0.0016	J		0.00088	J		< 0.0026	U		0.012			0.0017	J	
GP-19	**39 - 40 ft**	3/17/2011	0.206	J	J	< 0.89	U		< 0.89	U		0.807	J		0.145	J	
SVE-1	**11 - 12 ft**	3/4/2011	0.0068	J		0.0297			< 0.0029	U		0.0206			0.0165		
SVE-1	**27 - 28 ft**	3/4/2011	0.532	J		3.2			< 0.26	U		< 0.65	U		1.77		
SVE-1	**53 - 54 ft**	3/4/2011	5.55			126		J/J	< 1.2	U		< 3.1	U		13.7		
SVE-1	**53 - 54 ft**	3/4/2011	3.03			74.1			< 1.2	U		< 3	U		8.79		
SVE-2	**11 - 12 ft**	3/2/2011	< 0.0061	U		< 0.0024	U		< 0.0024	U		< 0.0061	U		< 0.0061	U	
SVE-2	**33 - 34 ft**	3/2/2011	< 33	U		< 13	U		< 13	U		< 33	U		< 33	U	
SVE-2	**43 - 44 ft**	3/2/2011	< 23	U		< 9.2	U		< 9.2	U		< 23	U		< 23	U	
VMP-26	**11 - 12 ft**	3/7/2011	2.05			9.88			< 0.47	U		< 1.2	U		5.63		
VMP-26	**31 - 32 ft**	3/7/2011	8.27			166			< 2.2	U		< 5.6	U		24.3		

TABLE 4
SOIL SAMPLE ANALYSIS RESULTS
ROXANA, IL

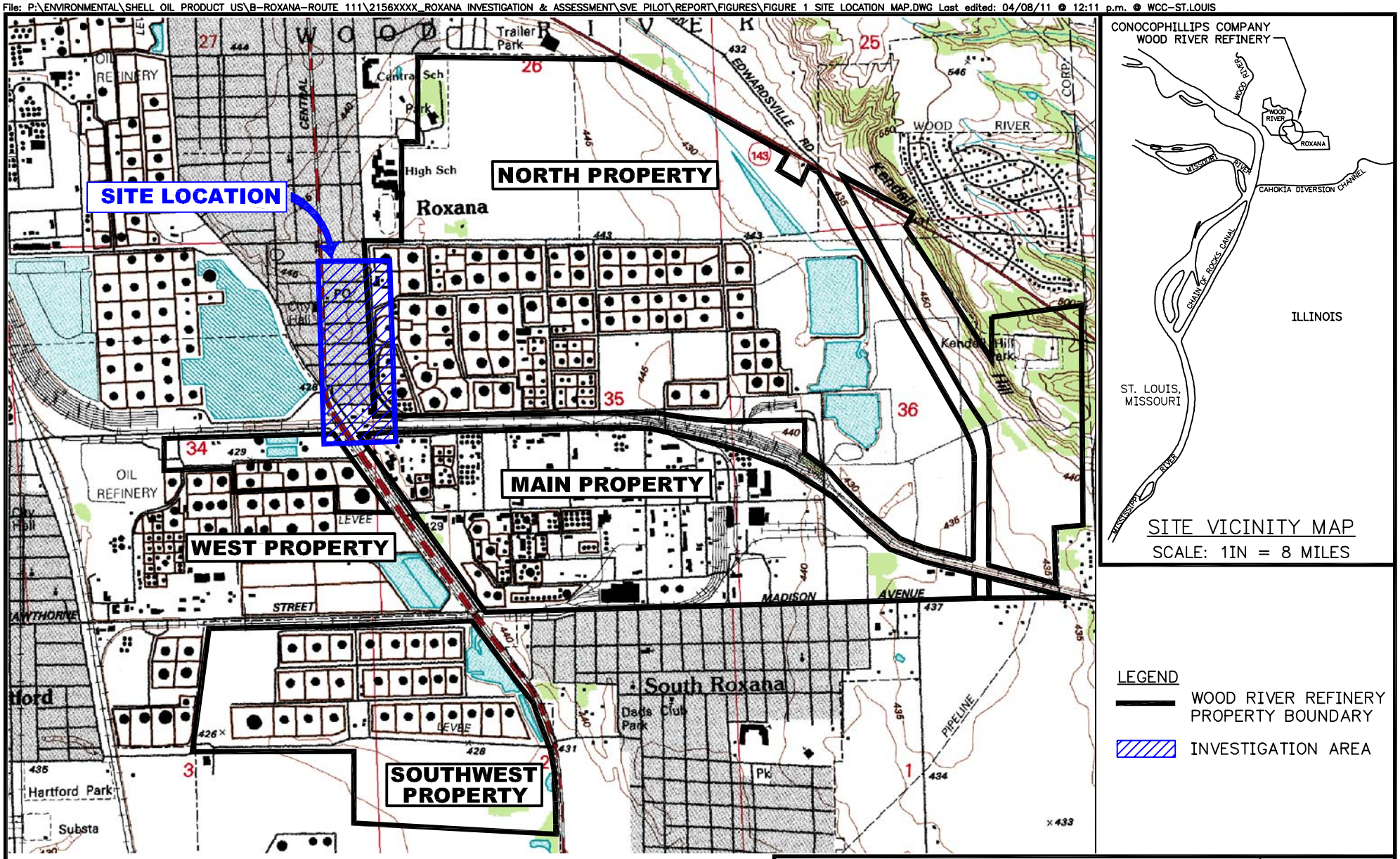
Location	Depth	Sample Date	o-Xylenes			sec-Butylbenzene			tert-Butylbenzene			Toluene			TPH (>C28-C40)		
			Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual
GP-14	12 - 13 ft	3/14/2011	< 0.004	U		< 0.01	U		< 0.01	U		0.0076	J		< 18	U	
GP-14	30.5 - 31.5 ft	3/14/2011	< 0.0025	U		< 0.0063	U		< 0.0063	U		0.0065			< 18	U	
GP-14	39 - 40 ft	3/14/2011	0.201	J		< 0.7	U		< 0.7	U		0.0704	J		20.7	J	
GP-15	11 - 12 ft	3/14/2011	< 0.11	U		< 0.28	U		< 0.28	U		< 0.28	U		16.5	J	
GP-15	19 - 20 ft	3/14/2011	< 5.2	U		6.52	J		< 13	U		< 13	U		< 93	U	
GP-15	27 - 28 ft	3/14/2011	0.209	J		0.639	J		< 3.6	U		< 3.6	U		< 86	U	
GP-15	27 - 28 ft	3/14/2011	0.0788	J		0.424	J		< 1.5	U		< 1.5	U		< 93	U	
GP-15	37 - 38 ft	3/14/2011	< 1.1	U		< 2.8	U		< 2.8	U		< 2.8	U		< 17	U	
GP-15	37 - 38 ft	3/14/2011	< 0.18	U		0.0454	J		< 0.46	U		< 0.46	U		< 82	U	
GP-16	11 - 12 ft	3/17/2011	< 0.25	U		< 0.63	U		< 0.63	U		< 0.63	U		34.6		
GP-16	27 - 28 ft	3/16/2011	< 0.81	U		0.48	J		< 2	U		< 2	U		23.2		
GP-16	34 - 35 ft	3/16/2011	< 0.51	U		0.124	J		< 1.3	U		< 1.3	U		13.8	J	
GP-16	39 - 40 ft	3/16/2011	< 0.29	U		< 0.73	U		< 0.73	U		< 0.73	U		< 17	U	
GP-17	12 - 13 ft	3/15/2011	< 2.4	U		1.96	J		< 6.1	U		< 6.1	U		2300		
GP-17	23 - 24 ft	3/15/2011	< 1	U		2.97			< 2.6	U		< 2.6	U		654		
GP-17	39 - 40 ft	3/15/2011	0.698	J		0.207	J		< 1.9	U		< 1.9	U		36.6		
GP-18	12 - 13 ft	3/16/2011	< 0.0021	U		< 0.0052	U		< 0.0052	U		< 0.0052	U		< 20	U	
GP-18	29.5 - 30.5 ft	3/16/2011	< 0.78	U		0.899	J		< 2	U		< 2	U		86.8	J	
GP-18	39 - 40 ft	3/16/2011	< 0.26	U		0.0976	J		0.0368	J		< 0.64	U		< 18	U	
GP-19	12 - 13 ft	3/17/2011	< 0.0026	U		0.0018	J		< 0.0065	U		0.0036	J		< 19	U	
GP-19	27 - 28 ft	3/17/2011	< 0.0026	U		0.0025	J		0.0018	J		0.0029	J		< 17	U	
GP-19	39 - 40 ft	3/17/2011	< 0.89	U		0.377	J		0.339	J		< 2.2	U		< 17	U	
SVE-1	11 - 12 ft	3/4/2011	0.0016	J		0.0033	J		< 0.0071	U		0.008			< 19	U	
SVE-1	27 - 28 ft	3/4/2011	0.287			0.351	J		< 0.65	U		< 0.65	U		< 17	U	
SVE-1	53 - 54 ft	3/4/2011	50.7			1.58	J		0.321	J		16.3		J/J	< 18	U	
SVE-1	53 - 54 ft	3/4/2011	30.5			0.992	J		0.152	J		9.37			< 18	U	
SVE-2	11 - 12 ft	3/2/2011	< 0.0024	U		< 0.0061	U		< 0.0061	U		0.0044	J		< 17	U	
SVE-2	33 - 34 ft	3/2/2011	< 13	U		< 33	U		< 33	U		< 33	U		68.4		
SVE-2	43 - 44 ft	3/2/2011	< 9.2	U		< 23	U		< 23	U		< 23	U		27.4		
VMP-26	11 - 12 ft	3/7/2011	< 0.47	U		1.25			< 1.2	U		< 1.2	U		< 18	U	
VMP-26	31 - 32 ft	3/7/2011	54.7			2.47	J		< 5.6	U		6.78			< 19	U	

TABLE 4
SOIL SAMPLE ANALYSIS RESULTS
ROXANA, IL

Location	Depth	Sample Date	TPH (C10-C28)			TPH-GRO (VOA)			Xylenes (total)		
			Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual	Result (mg/kg)	Lab Qual	URS Qual
GP-14	**12 - 13 ft**	3/14/2011	< 18	U		< 26	U		0.0016	J	
GP-14	**30.5 - 31.5 ft**	3/14/2011	< 18	U		< 23	U		0.0013	J	
GP-14	**39 - 40 ft**	3/14/2011	< 22	U		20.1			0.751		
GP-15	**11 - 12 ft**	3/14/2011	22.1			< 7.1	U		< 0.11	U	
GP-15	**19 - 20 ft**	3/14/2011	4830			2520			< 5.2	U	
GP-15	**27 - 28 ft**	3/14/2011	5400			728			0.98	J	
GP-15	**27 - 28 ft**	3/14/2011	4420			109		J/J	0.305	J	
GP-15	**37 - 38 ft**	3/14/2011	755		J/J	341		J/J	0.248	J	
GP-15	**37 - 38 ft**	3/14/2011	1730			22.8			< 0.18	U	
GP-16	**11 - 12 ft**	3/17/2011	60.9			< 13	U		< 0.25	U	
GP-16	**27 - 28 ft**	3/16/2011	76.8			298		J	< 0.81	U	
GP-16	**34 - 35 ft**	3/16/2011	16.7	J		145		J	0.0938	J	
GP-16	**39 - 40 ft**	3/16/2011	< 17	U		36.9		J	0.0851	J	
GP-17	**12 - 13 ft**	3/15/2011	8070			3910			< 2.4	U	
GP-17	**23 - 24 ft**	3/15/2011	2070			914			0.58	J	
GP-17	**39 - 40 ft**	3/15/2011	48.9			296			5.42		
GP-18	**12 - 13 ft**	3/16/2011	< 20	U		< 12	U		< 0.0021	U	
GP-18	**29.5 - 30.5 ft**	3/16/2011	2150			176			< 0.78	U	
GP-18	**39 - 40 ft**	3/16/2011	25.2			40			0.0413	J	
GP-19	**12 - 13 ft**	3/17/2011	< 19	U		< 7.1	U		0.0017	J	
GP-19	**27 - 28 ft**	3/17/2011	< 17	U		< 16	U		0.00088	J	
GP-19	**39 - 40 ft**	3/17/2011	< 17	U		55.6			< 0.89	U	
SVE-1	**11 - 12 ft**	3/4/2011	< 19	U		< 15	U		0.0312		
SVE-1	**27 - 28 ft**	3/4/2011	72.8			150			3.48		
SVE-1	**53 - 54 ft**	3/4/2011	35.5			1690		J/J	177		J/J
SVE-1	**53 - 54 ft**	3/4/2011	55.6			801			105		
SVE-2	**11 - 12 ft**	3/2/2011	< 17	U		< 15	U		< 0.0024	U	
SVE-2	**33 - 34 ft**	3/2/2011	24.6			36.9			< 13	U	
SVE-2	**43 - 44 ft**	3/2/2011	42			1390			< 9.2	U	
VMP-26	**11 - 12 ft**	3/7/2011	312			439			9.88		
VMP-26	**31 - 32 ft**	3/7/2011	492			1410			220		

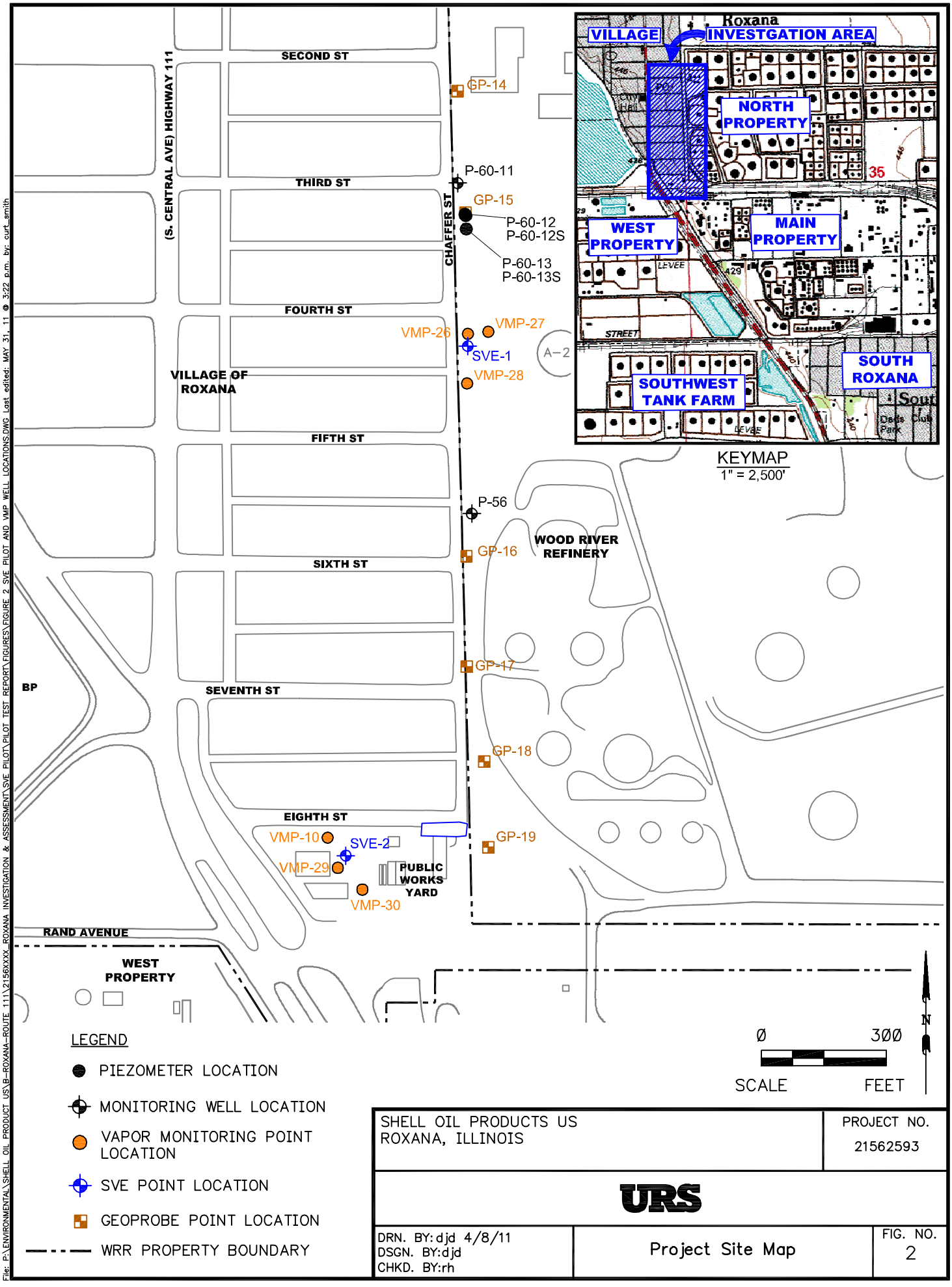
FIGURES

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\2156XXXX_ROXANA INVESTIGATION & ASSESSMENT\SVE PILOT\REPORT\FIGURES\FIGURE 1 SITE LOCATION MAP.DWG Last edited: 04/08/11 @ 12:11 p.m. @ WCC-ST.LOUIS



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

SHELL OIL PRODUCTS US ROXANA, ILLINOIS	PROJECT NO. 21562593
URS	
DRN. BY: djd 4/8/11 DSGN. BY: djd CHKD. BY: rh	Site Location Map FIG. NO. 1


SECOND ST
THIRD ST
FOURTH ST
FIFTH ST
SIXTH ST
SEVENTH ST
EIGHTH ST
(S. CENTRAL AVE) HIGHWAY 111
CHAFFER ST
VILLAGE OF ROXANA
BP
WOOD RIVER REFINERY
PUBLIC WORKS YARD
RAND AVENUE
WEST PROPERTY
GP-14
P-60-11
GP-15
P-60-12
P-60-12S
P-60-13
P-60-13S
VMP-26
VMP-27
SVE-1
VMP-28
A-2
P-56
GP-16
GP-17
GP-18
GP-19
VMP-10
SVE-2
VMP-29
VMP-30
Roxana
VILLAGE
INVESTGATION AREA
NORTH PROPERTY
WEST PROPERTY
MAIN PROPERTY
SOUTHWEST TANK FARM
SOUTH ROXANA
LEVEE
KEYMAP
1" = 2,500'
LEGEND
PIEZOMETER LOCATION
MONITORING WELL LOCATION
VAPOR MONITORING POINT LOCATION
SVE POINT LOCATION
GEOPROBE POINT LOCATION
WRR PROPERTY BOUNDARY
Ø
300
SCALE
FEET
N
SHELL OIL PRODUCTS US
ROXANA, ILLINOIS
PROJECT NO.
21562593
URS
DRN. BY: djd 4/8/11
DSGN. BY: djd
CHKD. BY: rh
Project Site Map
FIG. NO.
2
File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562XXXX_ROXANA INVESTIGATION & ASSESSMENT\SVE PILOT\PILOT TEST REPORT\FIGURES\FIGURE 2 SVE PILOT AND VMP WELL LOCATIONS.DWG Last edited: MAY 31, 11 @ 3:22 p.m. by: curt_smith

THIRD ST

CHAFFER ST

FOURTH ST

WOOD RIVER REFINERY

GP-15

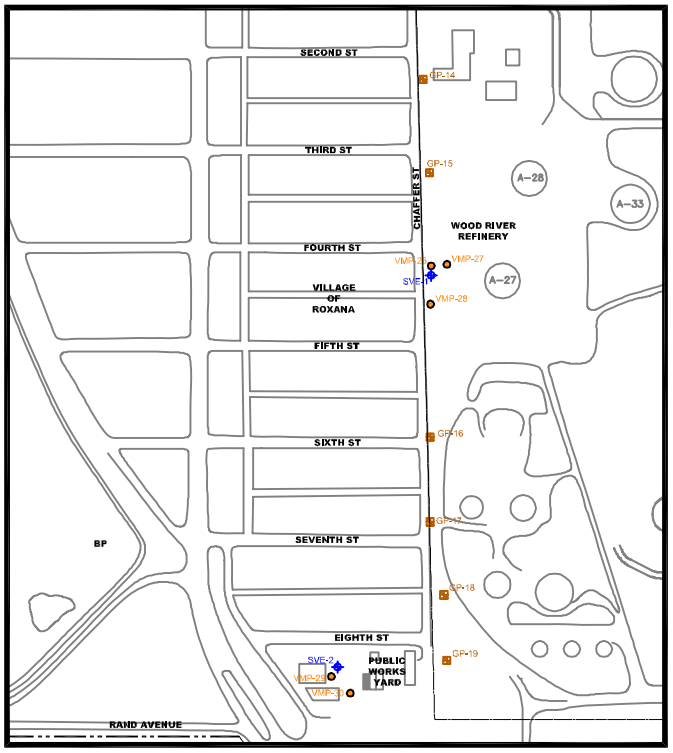
VMP-26

VMP-27

SVE-1

VMP-28

A-27



KEYMAP
1" = 600'

Ø 6Ø
SCALE FEET

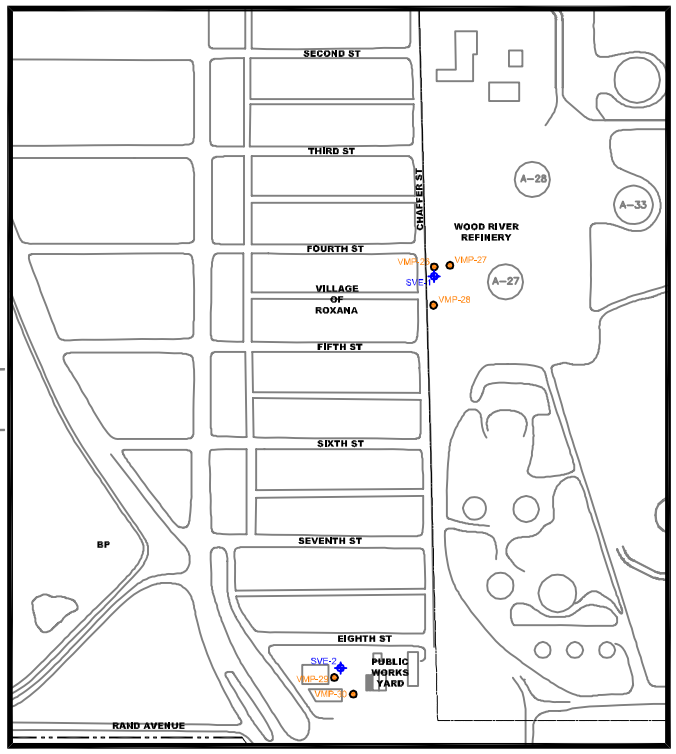
N

LEGEND

- VAPOR MONITORING POINT LOCATION
- SVE POINT LOCATION
- GEOPROBE LOCATION
- WRR PROPERTY BOUNDARY

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562593
URS		
DRN. BY: djd 4/8/11 DSGN. BY: djd CHKD. BY: rh	WRR SVE-1 Extraction Well, Vapor Monitoring Point & Geoprobe Locations	FIG. NO. 3

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562XXXX_ROXANA INVESTIGATION & ASSESSMENT\SVE PILOT\REPORT\FIGURES\FIGURE 3 AND 4 PUBLIC WORKS AND WRR.DWG Last edited: MAY 17, 11 @ 4:14 p.m. by: curt_smith



KEYMAP
1" = 600'

EIGHTH ST

VMP-10

SVE-2

VMP-29

VMP-30

PUBLIC WORKS YARD

Ø 60

SCALE FEET

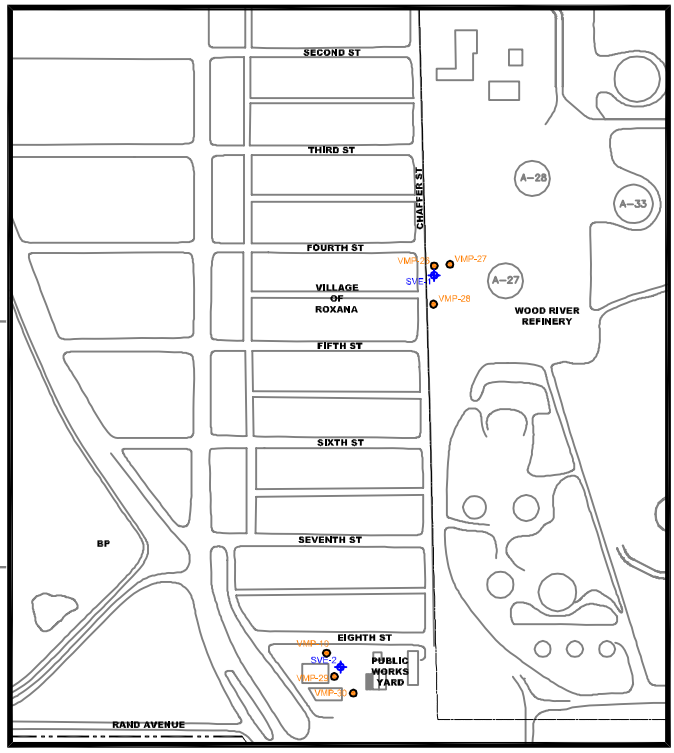
N

LEGEND

- VAPOR MONITORING POINT LOCATION
- SVE POINT LOCATION
- WRR PROPERTY BOUNDARY

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562593
URS		
DRN. BY: djd 4/8/11 DSGN. BY: djd CHKD. BY: rh	Public Works SVE-2 Extraction Well and Vapor Monitoring Point Locations	FIG. NO. 4

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562XXX_ROXANA INVESTIGATION & ASSESSMENT\SVE PILOT\REPORT\FIGURES\FIGURE 3 AND 4 PUBLIC WORKS AND WRR.DWG Last edited: MAY 17, 11 @ 3:42 p.m. by: curt_smith



KEYMAP
1" = 600'

EIGHTH ST

VMP-10

ICE UNIT

3"ø HOSE

SVE-2

PUBLIC WORKS YARD

500 GALLON PROPANE TANK

VMP-29

RADIUS OF INFLUENCE
MONITORING POINT

VMP-30

ø 30

SCALE FEET

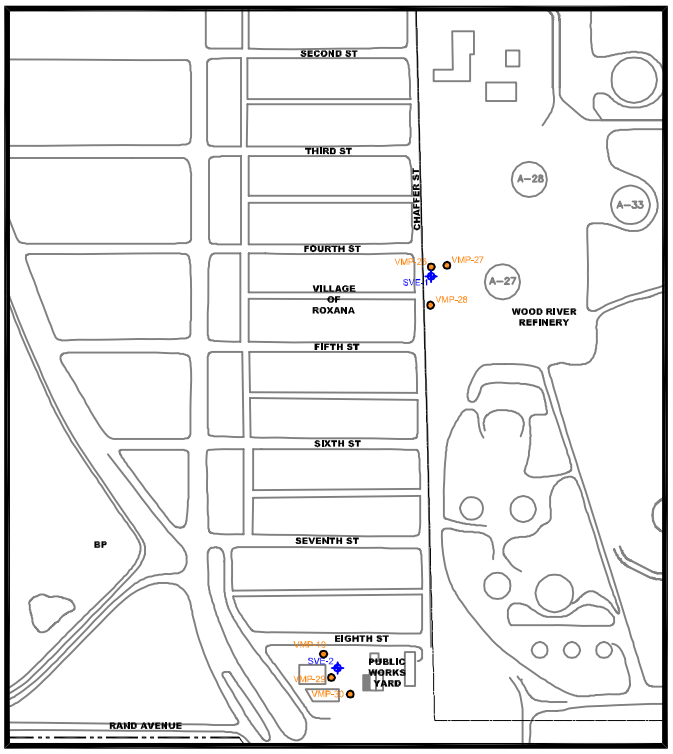
N

LEGEND

- VAPOR MONITORING POINT LOCATION
- SVE POINT LOCATION
- WRR PROPERTY BOUNDARY

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562593
URS		
DRN. BY: djd 4/8/11 DSGN. BY: djd CHKD. BY: rh	Public Works Pilot Test Piping and Instrumentation Diagram	FIG. NO. 5

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562XXXX_ROXANA INVESTIGATION & ASSESSMENT\SVE PILOT\REPORT\FIGURES\FIGURE 5 AND 6 PILOT TEST PIPING.DWG Last edited: MAY 17, 11 @ 3:43 p.m. by: curt_smith



KEYMAP
1" = 600'

VMP-26

VMP-27

CHAFFER ST

3"ø HOSE

ICE UNIT

SVE-1

RADIUS OF INFLUENCE
MONITORING POINT

WOOD RIVER
REFINERY

VMP-28

Ø 3Ø
SCALE FEET

N

LEGEND

- VAPOR MONITORING POINT LOCATION
- SVE POINT LOCATION
- WRR PROPERTY BOUNDARY

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562593
URS		
DRN. BY: djd 4/8/11 DSGN. BY: djd CHKD. BY: rh	WRR Pilot Test Piping and Instrumentation Diagram	FIG. NO. 6

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\B-ROXANA-ROUTE 111\21562XXXX_ROXANA INVESTIGATION & ASSESSMENT\SVE PILOT\REPORT\FIGURES\FIGURE 5 AND 6 PILOT TEST PIPING.DWG Last edited: MAY 17, 11 @ 3:44 p.m. by: curt_smith

APPENDIX A

SVE Well and VMP Boring Logs/Well Construction Diagrams

Boring Logs

LOG OF BORING
GP-14

Completion Date: 3/14/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	USCS	DESCRIPTION	NOTES
				ASPHALT	Asphalt	Air knife completed to 10' bgs to clear utilities
				FILL	Moist, brown, silt, with gravel (FILL)	
			0.0			
			0.0		Moist, dark brown to gray, low plasticity SILT (ML) with clay, trace sand	
			1.4			
			0.0		Clay increases	
5			0.0	ML		
			0.0		Becomes light brown, sandy silt with clay	
			0.0			
			0.4			
			0.9		Becomes with light tan sand, decreasing clay	
10			0.7	CL	Stiff, moist, dark brown, Silty CLAY (CL),	
	24	24	1.5			
			1.0	ML	Medium dense, moist, light brown, SILT (ML)	
			2.6	SP	Medium dense, dry, light brown, fine grained, poorly graded, SAND (SP)	
	48	38			Black banding	
15			2.4			
			1.7			
	48	38				
			1.4			
20						
			2.7		Becomes dense, moist, gray, banding grades out	
	48	39				
			7.8			
			3.2		With banding	

Completion Depth: **40.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING
GP-14

Completion Date: 3/14/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	48	36	2.8				Same: Dense, moist, gray, fine grained SAND (SP), with black banding Becomes medium grained, banding grades out	
			2.6				Becomes very dense, fine grained	
30	48	34	2.2				Becomes dense	
			3.8				With banding	
	48	48	6.0			SP	Becomes gray	
35			7.3				1" thick lense of coarse grained sand	
			9.8					
	48	44	7.2					
40			24				Becomes dark gray	
							Bottom of boring at 40' bgs	
45								

Completion Depth: **40.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic
USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING
GP-15

Completion Date: 3/14/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	USCS	DESCRIPTION	NOTES
				FILL	Gravel (FILL)	Air knife completed to 10' bgs to clear utilities
			0.0		Moist, dark brownish gray, Silty CLAY	
			0.0			
			34.5			
			18.1			
5					Moist, brown, poorly graded SAND (SP), with trace silt	
			7.4	SP		
			13.3		Becomes greenish gray	
			25.3			
			9.6			
			24.9			
10	24	14	21.5	SM	Medium dense, moist, brown, Silty SAND (SM)	
			4.5		Medium dense, moist, gray, fine grained, poorly graded, SAND (SP)	
					5" black banding	
	48	38				
15			5.7			
			10.2			
	48	30		SP		
			678			
20					Becomes dense	
			395			
	48	34				
			428			
					Becomes loose	

Completion Depth: **40.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING
GP-15

Completion Date: 3/14/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	48	32	620				Same: Loose, moist, gray, fine grained, poorly graded, SAND (SP)	
			844					
			810					
30	48	32	758					
			915			SP		
	48	32						
35			910					
			945					
	48	34						
			140					
40							Bottom of boring at 40' bgs	
45								

Completion Depth: **40.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected

Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING
GP-16

Completion Date: 3/17/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	USCS	DESCRIPTION	NOTES
				FILL	Gravel (FILL)	Air knife completed to 10' bgs to clear utilities
			424	CL	Moist, dark brown to black, low plastic, CLAY (CL), with silt, trace sand	
			772		Medium dense, moist, brown, fine grained, poorly graded SAND (SP)	
			311			
			505		Trace silt	
5			180			
			326			
			265			
			367			
			347			
10	24	20	220		Becomes wet	
			107			
	48	36				
15			54			
			450		4" thick clay seam	
	48	36			Becomes silty	
			947		Silt grades out	
20			1037			
	48	35	947			
			927			
			927	SP		

Completion Depth: **44.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: 40 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING
GP-16

Completion Date: 3/17/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	48	36	254 930				Same: Medium dense, moist, brown, fine grained SAND (SP), with black staining	
30	48	36	140 250					
35	48	36	82 1730			SP		
	48	35	645 110					
40	48	34	45 160				▽ Becomes very dense, medium grained	
45							Bottom of boring at 44' bgs	

Completion Depth: **44.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: 40 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic
USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING
GP-17

Completion Date: 3/15/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
						FILL	Gravel (FILL)	Air knife completed to 10' bgs to clear utilities
			57.9				Becomes wet, brown, with silt	
			800					
5			185			FILL	Grayish-black silty clay, with fine sand	
			391					
			229				Medium dense, wet, grayish brown, fine grained, poorly graded SAND (SP)	
			271					
			191			SP		
10							Becomes brown	
	24	22	225					
						SM	Wet, brown, Silty SAND (SM)	
			380				Medium dense, moist, brown fine grained, poorly graded, SAND (SP)	
	48	36						
15			687					
							Becomes dense	
			716					
	48	32				SP		
			1293					
20								
			1196					
	48	33						
			1274					
						CL	Stiff, wet, light brown, Silty CLAY (CL)	

Completion Depth: **40.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.

- ▽ Water level at time of drilling
- ▼ Water level after drilling
- ATD - At time of drilling
- Splitspoon Sampler
- Hollow Stem Auger- Soil samples not collected
- Geoprobe
- Air Knife/Hand Auger Sampler
- Air Rotary
- Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING
GP-17

Completion Date: 3/15/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	48	35	16.5			CL	Same: Stiff, wet, light brown, Silty CLAY (CL)	
			32				Medium dense, moist, light brown, fine grained, poorly graded SAND (SP) 1" Silt seam 1" Clay seam	
30	48	36	5.9					
			5.7					
	48	36	3.5			SP		
35			4.0					
	48	36	8.3				Becomes very dense, gray, with black banding	
			79					
40							Bottom of boring at 40' bgs	
45								

Completion Depth: **40.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic
USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING
GP-18

Completion Date: 3/16/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	USCS	DESCRIPTION	NOTES
				FILL	Gravel (FILL)	Air knife completed to 10' bgs to clear utilities
			19.3	CL	Moist, dark brown, medium plastic, CLAY (CL) with silt, trace sand	
			10.9			
			14.0			
			15.0			
5			4.4	SP	Moist, light brown, fine grained, poorly graded SAND (SP), with silty clay Becomes silty	
			10.2			
			6.4			
			2.5		With light brown mottles	
			1.1			
10	48	1	8.5	CL	Soft, wet, brown, Silty CLAY (CL)	
			21	SP	Medium dense, moist, brown, fine grained, poorly graded SAND (SP)	
	48	18				
15			26			
			18		Becomes gray	
	48	35			Trace black banding	
			10			
20					Becomes brown	
			11.0			
	48	30				
			14.0			

Completion Depth: **44.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: 40 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic
USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING
GP-18

Completion Date: 3/16/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	48	32	18.2 25			SP	Same: Medium dense, moist, brown, fine grained, poorly graded SAND (SP)	
30	48	46	1450 46			SP CL	Becomes gray Soft, moist, gray, medium, plastic, CLAY (CL), with banding	
35	48	36	21 72			SP	Medium dense, moist, light brown, fine grained, poorly graded SAND (SP)	
40	48	39	42 96			SP	Black banding ▽	
	48	38	1450 3650			SP	Becomes very dense, wet, black Becomes medium grained	
45							Bottom of boring at 44' bgs	

Completion Depth: **44.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: 40 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING
GP-19

Completion Date: 3/17/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	USCS	DESCRIPTION	NOTES
				ASPHALT	Asphalt	Air knife completed to 10' bgs to clear utilities
				FILL	Gravel (FILL)	
			8.2	SM	Moist, dark brown to gray SAND (SM)	
5			18.6			
			28.9			
			6.2		Becomes wet	
			10.9		Becomes greenish/gray	
			20.4		With light brown mottling	
10	24	1	5.3	SP	Medium dense, wet, brown, fine grained, poorly graded SAND (SP), with silt	
			14.5		Becomes light brown, silt grades out	
	48	36				
15			10.5			
			5.6			
	48	35				
			4.0			
20			7.3			
	48	37				
			9.0			

Completion Depth: **44.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: 40 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic
USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/23/11

LOG OF BORING
GP-19

Completion Date: 3/17/11
Casing Elevation: Not_Installed
Ground Elevation: N/A

Coordinates
Northing: N/A
Easting: N/A

Depth In feet	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	48	34	15 33				Same: Medium dense, wet, brown, fine grained, poorly graded Silty SAND (SP)	
30	48	33	14 34					
35	48	34	4.2 4.6			SP		
	48	34	3.2 6.4					
40	48	36	1475 1650				▽ Becomes very dense, medium grained Black staining	
45							Bottom of boring at 44' bgs	

Completion Depth: **44.0 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Drilling method: **Direct Push**
Logged by: **N. Satam**

Water Depth: 40 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger Sampler
Air Rotary
Roto-Sonic
USC based on field visual observations

URS

URS (ENVIRON) LOG 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/23/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
SVE-1

Completion Date: 3/4/11
Casing Elevation: 443.54
Ground Elevation: 443.29

Coordinates
Northing:793210.40
Easting:2322305.00

Depth In feet	Construction	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	SVE-1						FILL	Gravel and Asphalt (FILL)	Air knife completed to 10' bgs to clear utilities
							SM	Loose, moist, brown with gray, Silty SAND (SM)	
5							SP	Loose, moist, grayish brown, fine grained, poorly graded, SAND (SP), with silt	
10							SC	Medium dense, moist, dark gray, fine grained, Clayey SAND (SC)	
				103.1					
				25.2			SP	Medium dense, moist to dry, gray, fine grained, poorly graded, SAND (SP)	
15		120	120	28.8					
				11.5					
				49.2					
20				289.9					
				368.7					

Completion Depth: **55.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type: _____
Drilled by: _____
Logged by: **M. Miller**

Water Depth: 41 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling

Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected

Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG+1 WELL 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
SVE-1

Completion Date: 3/4/11
Casing Elevation: 443.54
Ground Elevation: 443.29

Coordinates
Northing:793210.40
Easting:2322305.00

Depth In feet	Construction	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	SVE-1								
		120	120	622.5				Same: Medium dense, wet to dry, gray, fine grained, poorly graded SAND (SP)	
				865.2					
				681.1					
30								Becomes brown	
				450.3					
		60	60	508.0					
				370.2					
35								Becomes moist, medium grained	
				496.6			SP		
								Becomes moist to wet	
				737.9					
40		120	120						
				767.4					▽
								Becomes wet	
				785.3					
				789.9					
45									
				838.5					
				801.2					

Completion Depth: **55.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type: _____
Drilled by: _____
Logged by: **M. Miller**

Water Depth: 41 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling

Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected

Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG+1 WELL 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
SVE-1

Completion Date: 3/4/11
Casing Elevation: 443.54
Ground Elevation: 443.29

Coordinates
Northing:793210.40
Easting:2322305.00

Depth In feet	Construction	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	SVE-1	120	120	856.4 820.0 775.3			SP	SAME: Medium dense, wet, brown, medium grained, poorly graded, SAND (SP).	
55								Bottom of boring at 55.0' bgs	
60									
65									
70									

Completion Depth: **55.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type: _____
Drilled by: _____
Logged by: **M. Miller**

Water Depth: 41 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling

Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected

Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG+1 WELL 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
SVE-2

Completion Date: 3/2/11
Casing Elevation: 436.38
Ground Elevation: 436.21

Coordinates
Northing:791987.40
Easting:2322012.00

Depth In feet	Construction	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	SVE-2						TOPSOIL	Topsoil	Air knife completed to 10' bgs to clear utilities
							FILL	Silty clay, trace roots (FILL)	
							SM	Loose, moist, brown, Silty SAND (SM)	
5								Loose, moist, brown, fine grained, poorly graded, SAND (SP), with silt	
10				0.8				Becomes dense, moist to dry, light brown, fine to medium grained, silt grades out	
				1.8					
15		120	120	2.4			SP		
				2.5					
				2.8					
20				3.8					
				3.6					

Completion Depth: **45.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type: _____
Drilled by: _____
Logged by: **M. Miller**

Water Depth: 30.5 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling

Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected

Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG+1 WELL 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
SVE-2

Completion Date: 3/2/11
Casing Elevation: 436.38
Ground Elevation: 436.21

Coordinates
Northing:791987.40
Easting:2322012.00

Depth In feet	Construction	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	SVE-2								
		120	120	2.8				SAME: Dense, moist to dry, light brown, fine to medium grained, poorly graded, SAND (SP)	
				3.2					
				4.1					
30									▽
				536.9				Becomes wet	
		60	60					Becomes gray brown, trace silt	
				528.4					
				147.01				Becomes brown, silt grades out	
35							SP	Becomes wet, medium grained	
				1500+					
40		120	60						
				1500+					
				1500+					
45								Bottom of Boring at 45.0' bgs	

Completion Depth: **45.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type: _____
Drilled by: _____
Logged by: **M. Miller**

Water Depth: 30.5 ft., After ATD hrs.
Water Depth: _____ ft., After _____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling

Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected

Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG+1 WELL 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
VMP-26

Completion Date: 3/7/11
Casing Elevation:
Ground Elevation: 443.34

Coordinates
Northing:793239.80
Easting:2322305.00

Depth In feet	Construction: VMP-26-38	Construction: VMP-26-30	Construction: VMP-26-20	Construction: VMP-26-10	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
										FILL	Gravel and Asphalt (FILL)	Air knife completed to 10' bgs to clear utilities
										CL	Medium stiff, moist, dark gray, Silty CLAY (CL)	
5										SM	Loose, moist, dark gray, Silty SAND (SM)	
										SP	Loose, moist, dark gray, fine grained, poorly graded SAND (SP), with silt	
10							1458				Becomes dense, gray	
							833.5					
15					120	120	1344					
							1297					
							995.6					
20											Becomes moist to dry	
							1160					
							1246					

Completion Depth: **40.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type:
Drilled by:
Logged by: **M. Miller**

Water Depth: ____ ft., After ____ hrs.
Water Depth: ____ ft., After ____ hrs.
▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic
USC based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL
VMP-26

Completion Date: 3/7/11
Casing Elevation:
Ground Elevation: 443.34

Coordinates
Northing:793239.80
Easting:2322305.00

Depth In feet	Construction: VMP-26-38	Construction: VMP-26-30	Construction: VMP-26-20	Construction: VMP-26-10	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30					120	120	1049			SP	SAME: Dense, moist to dry, gray, fine grained, poorly graded, SAND (SP)	
							1422					
							1268					
							1620					
							1018			SM	Dense, moist to wet, dark gray, fine grained, Silty SAND (SM)	
35					120	120	1165			SP	Dense, moist to dry, brown, fine to medium grained, poorly graded, SAND (SP)	
							771.5					
							236.8					
40											Bottom of Boring at 40.0' bgs	
45												

Completion Depth: **40.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type:
Drilled by:
Logged by: **M. Miller**

URS

Water Depth: ____ ft., After ____ hrs.
Water Depth: ____ ft., After ____ hrs.

- ▽ Water level at time of drilling
- ▼ Water level after drilling
- ATD - At time of drilling
- Splitspoon Sampler
- Hollow Stem Auger- Soil samples not collected
- Geoprobe
- Air Knife/Hand Auger Sampler
- Air Rotary
- Roto-Sonic

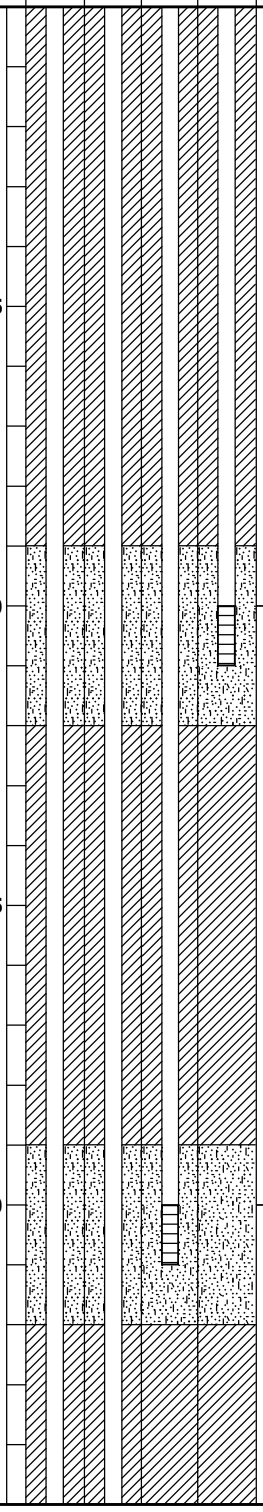
USC based on field visual observations

URS (ENVIRON) LOG+4 WELLS 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
VMP-27

Completion Date: 3/7/11
Casing Elevation:
Ground Elevation: 443.58

Coordinates
Northing:793244.90
Easting:2322354.00



USCS	DESCRIPTION	NOTES
FILL	Gravel (FILL)	Air knife completed to 10' bgs to clear utilities
CL	Medium stiff, moist, dark brown, Sandy CLAY (CL), with gravel	
SM	Loose, moist, gray, Silty SAND (SM), trace clay	
SP	Medium dense, moist, dark gray, fine grained, poorly graded, SAND (SP), with silt Becomes dense, moist to dry, gray brown, silt grades out	

Completion Depth: **40.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type:
Drilled by:
Logged by: **M. Miller**

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic
USC based on field visual observations

URS

URS (ENVIRON) LOG+4 WELLS 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
VMP-27

Completion Date: 3/7/11
Casing Elevation:
Ground Elevation: 443.58

Coordinates
Northing:793244.90
Easting:2322354.00

Depth In feet	Construction: VMP-27-38	Construction: VMP-27-30	Construction: VMP-27-20	Construction: VMP-27-10	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30					120	120	202.4			SP	SAME: Dense, moist to dry, gray brown, fine grained, poorly graded, SAND (SP)	
							181.3					
							198.0					
							94.5					
							96.7			SM	Dense, moist to wet, dark gray, fine grained Silty SAND (SM)	
35					120	120	204.3			SP	Dense, moist to dry, brown, fine to medium grained, poorly graded, SAND (SP)	
							187.6					
							390.4				Becomes moist	
40											Bottom of boring at 40' bgs	
45												

Completion Depth: **40.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type: _____
Drilled by: _____
Logged by: **M. Miller**

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.

- ▽ Water level at time of drilling
- ▼ Water level after drilling
- ATD - At time of drilling
- Splitspoon Sampler
- Hollow Stem Auger- Soil samples not collected
- Geoprobe
- Air Knife/Hand Auger Sampler
- Air Rotary
- Roto-Sonic

USC based on field visual observations

URS (ENVIRON) LOG+4 WELLS 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
VMP-28

Completion Date: 3/8/11
Casing Elevation:
Ground Elevation: 443.80

Coordinates
Northing:793120.70
Easting:2322303.00

Depth In feet	Construction: VMP-28-37	Construction: VMP-28-30	Construction: VMP-28-20	Construction: VMP-28-10	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
										FILL	Gravel and Asphalt (FILL)	Air knife completed to 10' bgs to clear utilities
										CL	Medium stiff, moist, dark gray to black, Sandy CLAY (CL)	
5										SM	Loose, moist, dark gray, Silty SAND (SM), with clay Trace clay	
										SP	Loose, moist to dry, dark gray to black, fine grained, porly graded, SAND (SP), with silt	
10							527.8				Becomes medium dense, dry, black	
							867.5					
											Becomes dense, gray	
15					120	120	847.1					
							994.3					
							932.5					
20										ML	Stiff, moist, gray, Sandy SILT (ML)	
							542.2					
							166.7			SP	Dense, dry, brown, fine grained, poorly graded, SAND (SP)	

Completion Depth: **40.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type:
Drilled by:
Logged by: **M. Miller**

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic
USC based on field visual observations

URS (ENVIRON) LOG+4 WELLS 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
VMP-28

Completion Date: 3/8/11
Casing Elevation:
Ground Elevation: 443.80

Coordinates
Northing:793120.70
Easting:2322303.00

Depth In feet	Construction: VMP-28-37	Construction: VMP-28-30	Construction: VMP-28-20	Construction: VMP-28-10	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
					120	120	224.9				Same: Dense, dry, brown, fine grained, poorly graded, SAND (SP)	
							304.6			SP		
							181.1				Becomes moist, trace silt	
30												
										SM	Dense, moist, gray, fine grained, Silty SAND (SM), with black banding	
							832.6				Dense, dry, brown, fine to medium grained, poorly graded, SAND (SP)	
							568.7					
35					120	120	195.2			SP		
							270.0					
							241.3				Becomes moist	
40											Bottom of Boring at 40.0' bgs	
45												

Completion Depth: **40.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type:
Drilled by:
Logged by: **M. Miller**

URS

Water Depth: ____ ft., After ____ hrs.
Water Depth: ____ ft., After ____ hrs.

- ▽ Water level at time of drilling
- ▼ Water level after drilling
- ATD - At time of drilling
- Splitspoon Sampler
- Hollow Stem Auger- Soil samples not collected
- Geoprobe
- Air Knife/Hand Auger Sampler
- Air Rotary
- Roto-Sonic

USC based on field visual observations

URS (ENVIRON) LOG+4 WELLS 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
VMP-29

Completion Date: 2/28/11
Casing Elevation:
Ground Elevation: 434.66

Coordinates
Northing:791958.30
Easting:2321993.00

Depth In feet	Construction: VMP-29-40	Construction: VMP-29-26	Construction: VMP-29-18	Construction: VMP-29-10	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
										ASPHALT	Asphalt with Gravel	Air knife completed to 10' bgs to clear utilities
										FILL	Loose, Silty Sand with Clay (FILL)	
5											Loose, moist, light brown, fine grained, poorly graded, SAND (SP), with Silt	
10											Trace silt	
							11.6				Becomes medium dense, fine to medium grained, silt grades out	
							20.0					
										SP		
15					120	114	15.4					
							19.9					
							13.6					
20											Becomes dense	
							34.3					
							25.8					

Completion Depth: **42.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type:
Drilled by:
Logged by: **M. Miller**

Water Depth: 29.5 ft., After ATD hrs.
Water Depth: ____ ft., After ____ hrs.

- ▽ Water level at time of drilling
- ▼ Water level after drilling
- ATD - At time of drilling
- Splitspoon Sampler
- Hollow Stem Auger- Soil samples not collected
- Geoprobe
- Air Knife/Hand Auger Sampler
- Air Rotary
- Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG+4 WELLS 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
VMP-29

Completion Date: 2/28/11
Casing Elevation:
Ground Elevation: 434.66

Coordinates
Northing:791958.30
Easting:2321993.00

Depth In feet	Construction: VMP-29-40	Construction: VMP-29-26	Construction: VMP-29-18	Construction: VMP-29-10	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
					120	120	28.7				SAME: Dense, moist, light brown, fine to medium grained, poorly graded, SAND (SP)	
							16.0				Becomes moist to wet	
							16.9				▽ Becomes wet, gray, fine grained	
30					60	60	86.7				Becomes brown, fine to medium grained	
							133.03					
							547.1			SP		
35							10548				Becomes gray, medium grained, trace coarse sand	
					84	84	15000+					
40							10098					
											Bottom of Boring at 42.0' bgs	
45												

Completion Depth: **42.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type:
Drilled by:
Logged by: **M. Miller**

Water Depth: 29.5 ft., After ATD hrs.
Water Depth: ____ ft., After ____ hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-Soil samples not collected
Geoprobe
Air Knife/Hand Auger Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG+4 WELLS 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
VMP-30

Completion Date: 3/11/11
Casing Elevation:
Ground Elevation: 435.54

Coordinates
Northing:791906.10
Easting:2322052.00

Depth In feet	Construction: VMP-30-40	Construction: VMP-30-26	Construction: VMP-30-18	Construction: VMP-30-10	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
										ASPHALT	Asphalt	Air knife completed to 10' bgs to clear utilities
										FILL	Loose sand with silt, asphalt and gravel, (FILL)	
5												
											Loose, moist, brown, fine grained, poorly graded, SAND (SP), with silt	
10											Becomes medium dense, fine to medium grained, silt grades out	
							2.1					
15					120	84	1.8			SP		
							9.8					
							7.4					
20												
							12.7				Becomes gray	

Completion Depth: **42.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type:
Drilled by:
Logged by: **M. Miller**

Water Depth: 28.5 ft., After ATD hrs.
Water Depth: ft., After hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger
Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG+4 WELLS 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

LOG OF BORING AND WELL CONSTRUCTION DETAIL
VMP-30

Completion Date: 3/11/11
Casing Elevation:
Ground Elevation: 435.54

Coordinates
Northing:791906.10
Easting:2322052.00

Depth In feet	Construction: VMP-30-40	Construction: VMP-30-26	Construction: VMP-30-18	Construction: VMP-30-10	Inches Driven	Inches Recovered	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30					120	72	27.8				SAME: Medium dense, moist, gray, fine to medium grained, poorly graded, SAND (SP)	
							41.0				Becomes dense, moist to wet, fine grained, trace silt ▽ Becomes wet	
					60	60	1066			SP	Becomes gray brown, fine to medium grained	
35							1812					
					84	72	252.1					
40							374.8				Becomes medium grained	
							10527					
45											Bottom of Boring at 42.0' bgs	

Completion Depth: **42.00 Ft bgs**
Project No.: **21562593.00014**
Project Name: **Roxana SVE Pilot Test**
Drilling Contractor: **Boart Longyear**
Drilling method: **Roto Sonic** Rig Type:
Drilled by:
Logged by: **M. Miller**

Water Depth: 28.5 ft., After ATD hrs.
Water Depth: ft., After hrs.

▽ Water level at time of drilling
▼ Water level after drilling
ATD - At time of drilling
Splitspoon Sampler
Hollow Stem Auger-
Soil samples not collected
Geoprobe
Air Knife/Hand Auger Sampler
Air Rotary
Roto-Sonic

USC based on field visual observations

URS

URS (ENVIRON) LOG+4 WELLS 21562593.00014 ROXANA SVE.GPJ URSSTLEV.GDT 5/18/11

APPENDIX A

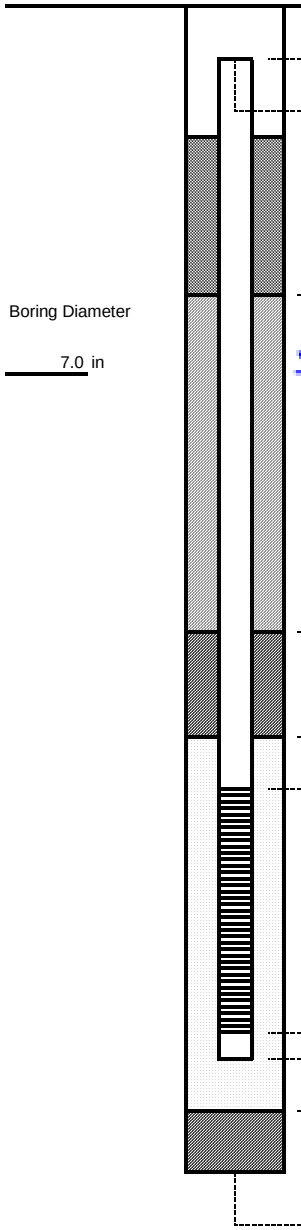
SVE Well and VMP Boring Logs/Well Construction Diagrams

Well Construction Diagrams

SVE Well Installation Details
Flush Mount Monitoring Well Construction Diagram

URS Corporation

Project:	Roxana SVE Pilot Test			Well ID:	SVE-1
Project Location:	Roxana, Illinois	Date Started:	3/4/2011		
Well Location:	Roxana, Illinois	Date Completed:	3/4/2011	Boring ID:	NA
Drilling Contractor:	Boart Longyear	Time Seal Set:	1505	Northing:	793210.421
Driller:		Type of Rig:		Easting:	2322305.418
Consulting Firm:	URS Corporation	Drilling Method:	Roto Sonic	Elevation Datum:	443.54
Geologist:	M. Miller	Completion Zone:	Main Stratum		



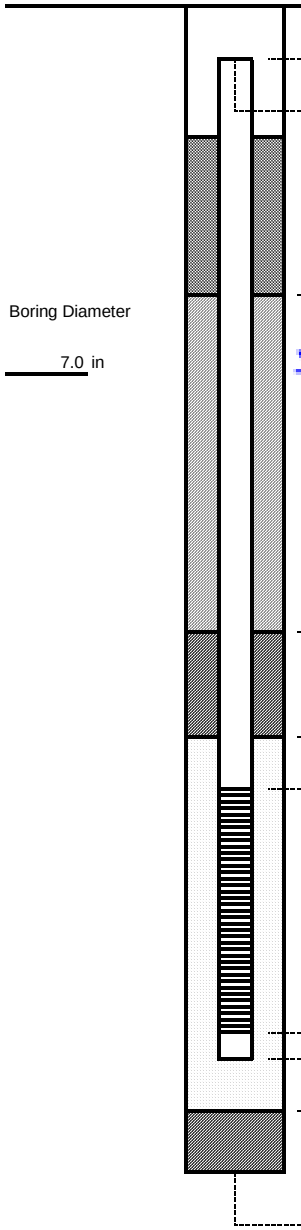
	Depths (ft bgs)	Elevations (ft)
Ground Elevation:		443.54
Depth of Riser Below Ground:	0.25 ft bgs	
Top of Riser Pipe:	0.25	443.29
ID/Type of Surface Casing:	12" Flush Mount	
Type of Surface Seal:	Concrete	
Bottom of Surface Seal:	8.0	435.54
Groundwater (after completion):	40.66	402.88
Type of Riser Pipe:	Sch. 40 PVC	
Riser Diameter:	4.0 in	
Riser Length:	11.75 ft	
Type of Backfill:	Bentonite/Cement Grout	
Top of Seal:	8.0	435.54
Type of Seal:	Bentonite Chips	
Top of Filter Pack	10.0	433.54
Top of Screen	12.0	431.54
Type of Filter Pack:	#10 Red Flint Filter Sand	
Type of Screen:	Sch. 40 PVC	
Screen Diameter	4.0 in	
Screen Slot Size:	0.010 in	
Screen Length:	42.8 ft	
Bottom of Screen:	54.83	388.71
Bottom of Blank Casing:	55.0	388.54
Backfill/Seal Below Well:	55.0	388.54
Type of Backfill/Seal Below Well:	NA	
Bottom of Boring:	55.0	388.54

DIAGRAM IS NOT TO SCALE

SVE Well Installation Details
Flush Mount Monitoring Well Construction Diagram

URS Corporation

Project:	Roxana SVE Pilot Test			Well ID:	SVE-2
Project Location:	Roxana, Illinois	Date Started:	3/2/2011		
Well Location:	Roxana, Illinois	Date Completed:	3/2/2011	Boring ID:	NA
Drilling Contractor:	Boart Longyear	Time Seal Set:	1220	Northing:	791987.449
Driller:		Type of Rig:		Easting:	2322012.145
Consulting Firm:	URS Corporation	Drilling Method:	Roto Sonic	Elevation Datum:	436.38
Geologist:	M. Miller	Completion Zone:	Main Stratum		



Boring Diameter

7.0 in

	Depths (ft bgs)	Elevations (ft)
Ground Elevation:		436.38
Depth of Riser Below Ground:	0.17	
Top of Riser Pipe:	0.17	436.21
ID/Type of Surface Casing:	12" Flush Mount	
Type of Surface Seal:	Concrete	
Bottom of Surface Seal:	8.0	428.38
Groundwater (after completion):	30.50	402.88
Type of Riser Pipe:	Sch. 40 PVC	
Riser Diameter:	4.0 in	
Riser Length:	11.84 ft	
Type of Backfill:	Bentonite/Cement Grout	
Top of Seal:	8.0	428.38
Type of Seal:	Bentonite Chips	
Top of Filter Pack	10.0	426.38
Top of Screen	12.0	424.38
Type of Filter Pack:	#10 Red Flint Filter Sand	
Type of Screen:	Sch. 40 PVC	
Screen Diameter	4.0 in	
Screen Slot Size:	0.010 in	
Screen Length:	32.8 ft	
Bottom of Screen:	44.83	391.55
Bottom of Blank Casing:	45.0	391.38
Backfill/Seal Below Well:	45.0	391.38
Type of Backfill/Seal Below Well:	NA	
Bottom of Boring:	45.0	391.38

DIAGRAM IS NOT TO SCALE

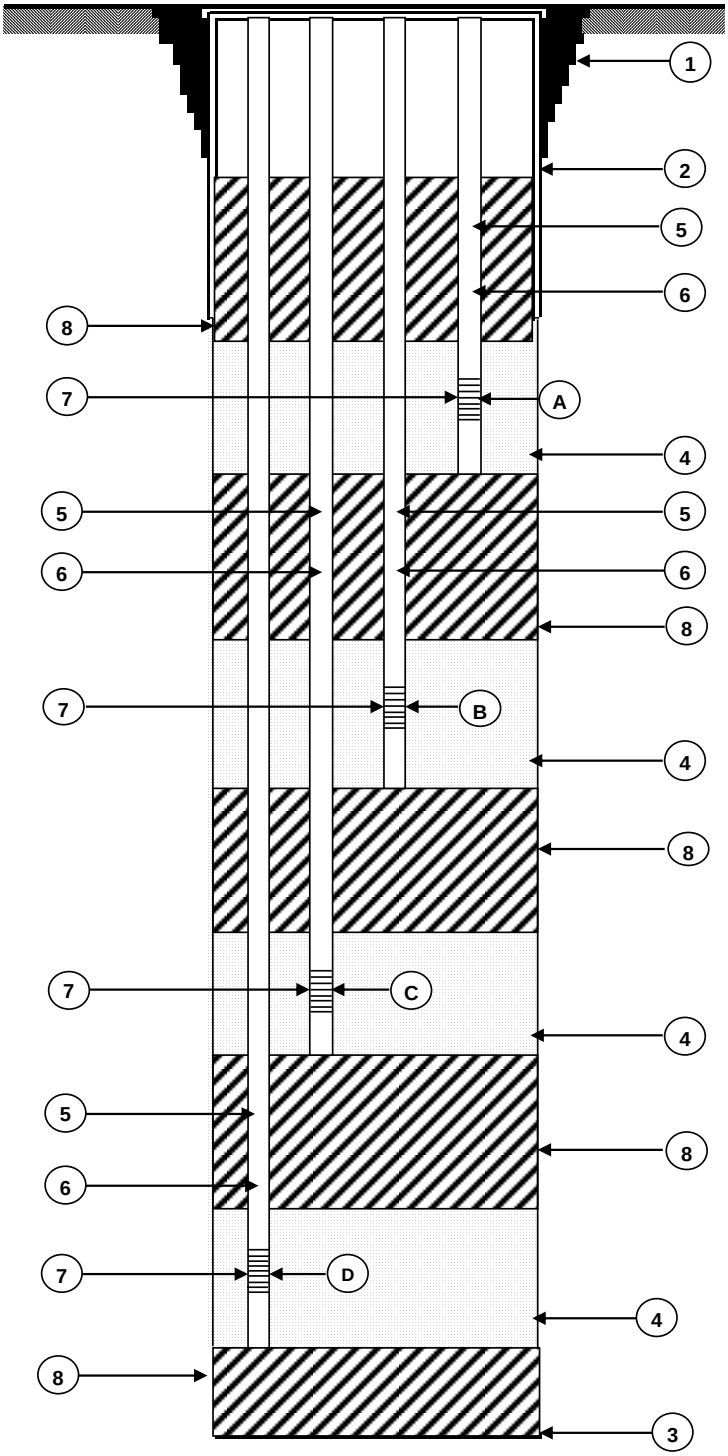
VAPOR MONITORING POINT CONSTRUCTION DIAGRAM

GROUND SURFACE ELEVATION (FEET) **443.34** JOB NUMBER **21562593**

TOP OF INNER WELL CASING ELEVATION **NA** BORING NUMBER **VMP-26**

DATUM **1988 USGS** INSTALLATION DATE **3/7/2011**

LOCATION **Roxana, Illinois**



VAPOR MONITORING PORT INSTALLATION DETAILS

SCREEN	DEPTH TO BOTTOM OF SAND (FEET*)	DEPTH TO TOP OF SAND (FEET*)	DEPTH TO BOTTOM OF SCREEN (FEET*)	DEPTH TO TOP OF SCREEN (FEET*)	LENGTH OF SCREEN (FEET)	DIAMETER OF SCREEN (INCHES)	SLOT SIZE (INCHES)
A	12.0	9.0	11.0	10.0	1.0	0.5	0.010
B	22.0	19.0	21.0	20.0	1.0	0.5	0.010
C	32.0	29.0	31.0	30.0	1.0	0.5	0.010
D	40.0	37.0	39.0	38.0	1.0	0.5	0.010

1 CONCRETE CAP? [YES] NO (CIRCLE ONE)

2 BOREHOLE DIAMETER 6 INCHES

3 TOTAL DEPTH OF BOREHOLE 40.0 FEET*

4 TYPE OF PACK AROUND SCREEN #10 Red Flint Filter Sand

5 RISER MATERIAL Sch. 40 PVC

6 RISER DIAMETER 0.5 INCHES

7 SCREEN MATERIAL Sch. 40 PVC

8 TYPE OF SEAL Bentonite Chips

* (DEPTH FROM GROUND SURFACE)

NOTE: DRAWING NOT TO SCALE

URS Corporation

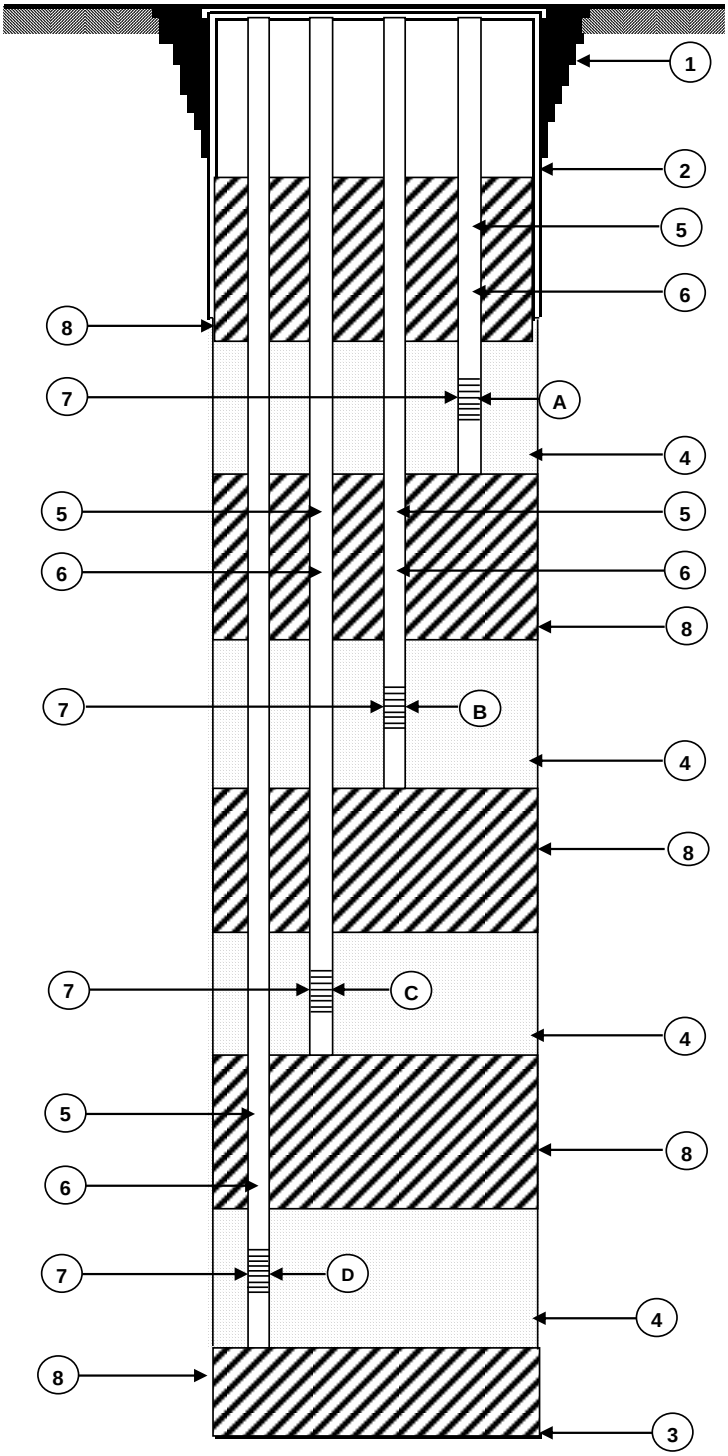
VAPOR MONITORING POINT CONSTRUCTION DIAGRAM

GROUND SURFACE ELEVATION (FEET) **443.58** JOB NUMBER **21562593**

TOP OF INNER WELL CASING ELEVATION **NA** BORING NUMBER **VMP-27**

DATUM **1988 USGS** INSTALLATION DATE **3/7/2011**

LOCATION **Roxana, Illinois**



VAPOR MONITORING PORT INSTALLATION DETAILS

SCREEN	DEPTH TO BOTTOM OF SAND (FEET*)	DEPTH TO TOP OF SAND (FEET*)	DEPTH TO BOTTOM OF SCREEN (FEET*)	DEPTH TO TOP OF SCREEN (FEET*)	LENGTH OF SCREEN (FEET)	DIAMETER OF SCREEN (INCHES)	SLOT SIZE (INCHES)
A	12.0	9.0	11.0	10.0	1.0	0.5	0.010
B	22.0	19.0	21.0	20.0	1.0	0.5	0.010
C	32.0	29.0	31.0	30.0	1.0	0.5	0.010
D	40.0	37.0	39.0	38.0	1.0	0.5	0.010

1 CONCRETE CAP? [YES] NO (CIRCLE ONE)

2 BOREHOLE DIAMETER 6 INCHES

3 TOTAL DEPTH OF BOREHOLE 40.0 FEET*

4 TYPE OF PACK AROUND SCREEN #10 Red Flint Filter Sand

5 RISER MATERIAL Sch. 40 PVC

6 RISER DIAMETER 0.5 INCHES

7 SCREEN MATERIAL Sch. 40 PVC

8 TYPE OF SEAL Bentonite Chips

* (DEPTH FROM GROUND SURFACE)

NOTE: DRAWING NOT TO SCALE

URS Corporation

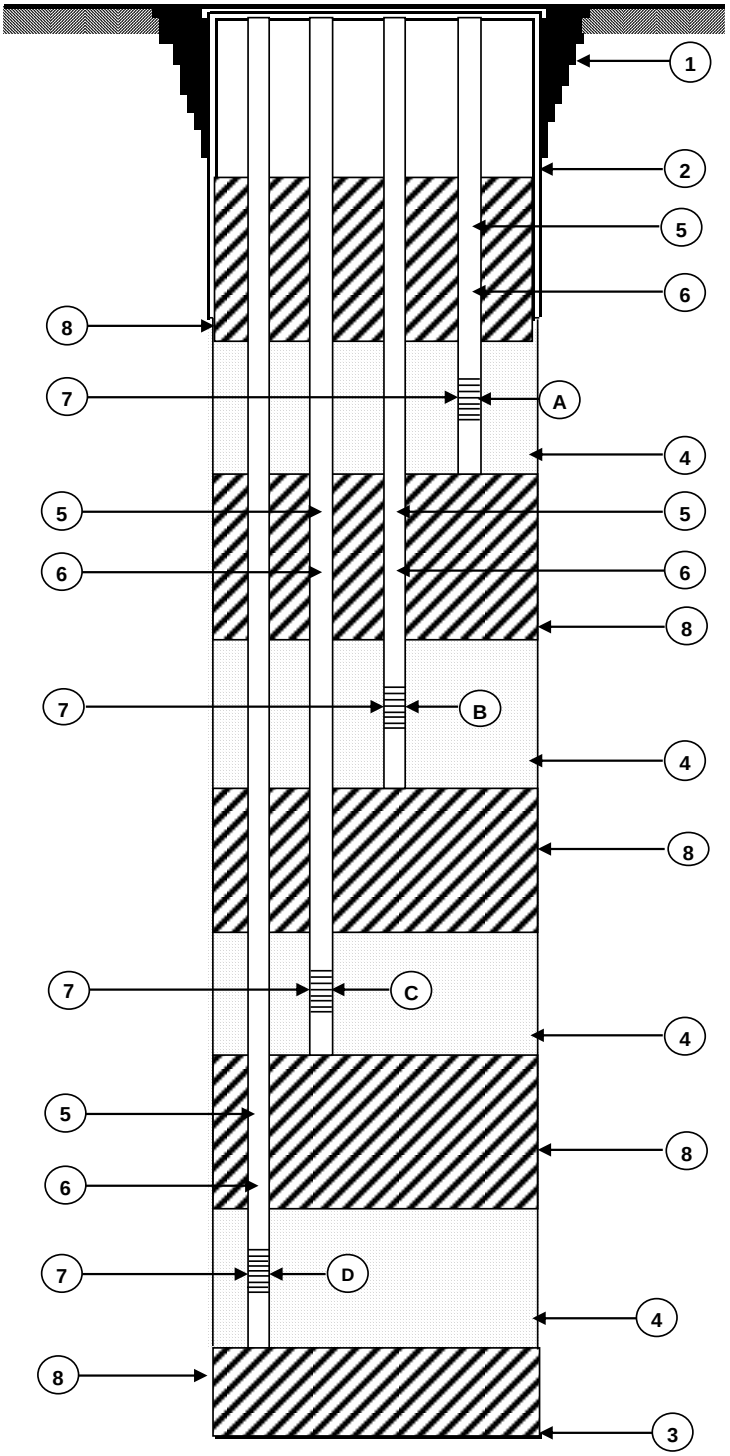
VAPOR MONITORING POINT CONSTRUCTION DIAGRAM

GROUND SURFACE ELEVATION (FEET) **443.80** JOB NUMBER **21562593**

TOP OF INNER WELL CASING ELEVATION **NA** BORING NUMBER **VMP-28**

DATUM **1988 USGS** INSTALLATION DATE **3/8/2011**

LOCATION **Roxana, Illinois**



VAPOR MONITORING PORT INSTALLATION DETAILS

SCREEN	DEPTH TO BOTTOM OF SAND (FEET*)	DEPTH TO TOP OF SAND (FEET*)	DEPTH TO BOTTOM OF SCREEN (FEET*)	DEPTH TO TOP OF SCREEN (FEET*)	LENGTH OF SCREEN (FEET)	DIAMETER OF SCREEN (INCHES)	SLOT SIZE (INCHES)
A	12.0	9.0	11.0	10.0	1.0	0.5	0.010
B	22.0	19.0	21.0	20.0	1.0	0.5	0.010
C	32.0	29.0	31.0	30.0	1.0	0.5	0.010
D	40.0	36.0	38.0	37.0	1.0	0.5	0.010

1 CONCRETE CAP? [YES] NO (CIRCLE ONE)

2 BOREHOLE DIAMETER 6 INCHES

3 TOTAL DEPTH OF BOREHOLE 40.0 FEET*

4 TYPE OF PACK AROUND SCREEN #10 Red Flint Filter Sand

5 RISER MATERIAL Sch. 40 PVC

6 RISER DIAMETER 0.5 INCHES

7 SCREEN MATERIAL Sch. 40 PVC

8 TYPE OF SEAL Bentonite Chips

* (DEPTH FROM GROUND SURFACE)

NOTE: DRAWING NOT TO SCALE

URS Corporation

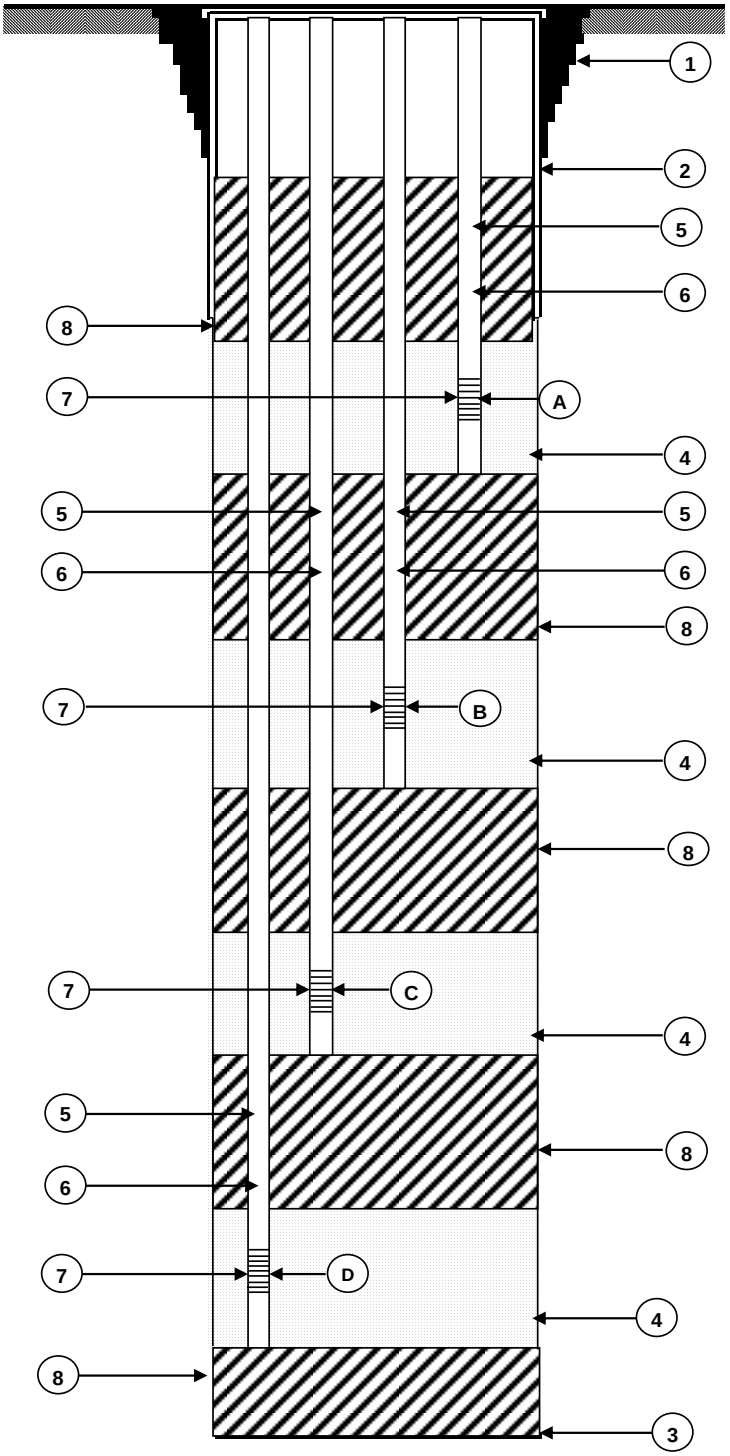
VAPOR MONITORING POINT CONSTRUCTION DIAGRAM

GROUND SURFACE ELEVATION (FEET) **434.66** JOB NUMBER **21562593**

TOP OF INNER WELL CASING ELEVATION **NA** BORING NUMBER **VMP-29**

DATUM **1988 USGS** INSTALLATION DATE **3/1/2011**

LOCATION **Roxana, Illinois**



VAPOR MONITORING PORT INSTALLATION DETAILS

SCREEN	DEPTH TO BOTTOM OF SAND (FEET*)	DEPTH TO TOP OF SAND (FEET*)	DEPTH TO BOTTOM OF SCREEN (FEET*)	DEPTH TO TOP OF SCREEN (FEET*)	LENGTH OF SCREEN (FEET)	DIAMETER OF SCREEN (INCHES)	SLOT SIZE (INCHES)
A	12.0	9.0	11.0	10.0	1.0	0.5	0.010
B	20.0	17.0	19.0	18.0	1.0	0.5	0.010
C	28.0	25.0	27.0	26.0	1.0	0.5	0.010
D	42.0	39.0	41.0	40.0	1.0	0.5	0.010

1 CONCRETE CAP? [YES] NO (CIRCLE ONE)

2 BOREHOLE DIAMETER 6 INCHES

3 TOTAL DEPTH OF BOREHOLE 42.0 FEET*

4 TYPE OF PACK AROUND SCREEN #10 Red Flint Filter Sand

5 RISER MATERIAL Sch. 40 PVC

6 RISER DIAMETER 0.5 INCHES

7 SCREEN MATERIAL Sch. 40 PVC

8 TYPE OF SEAL Bentonite Chips

* (DEPTH FROM GROUND SURFACE)

NOTE: DRAWING NOT TO SCALE

URS Corporation

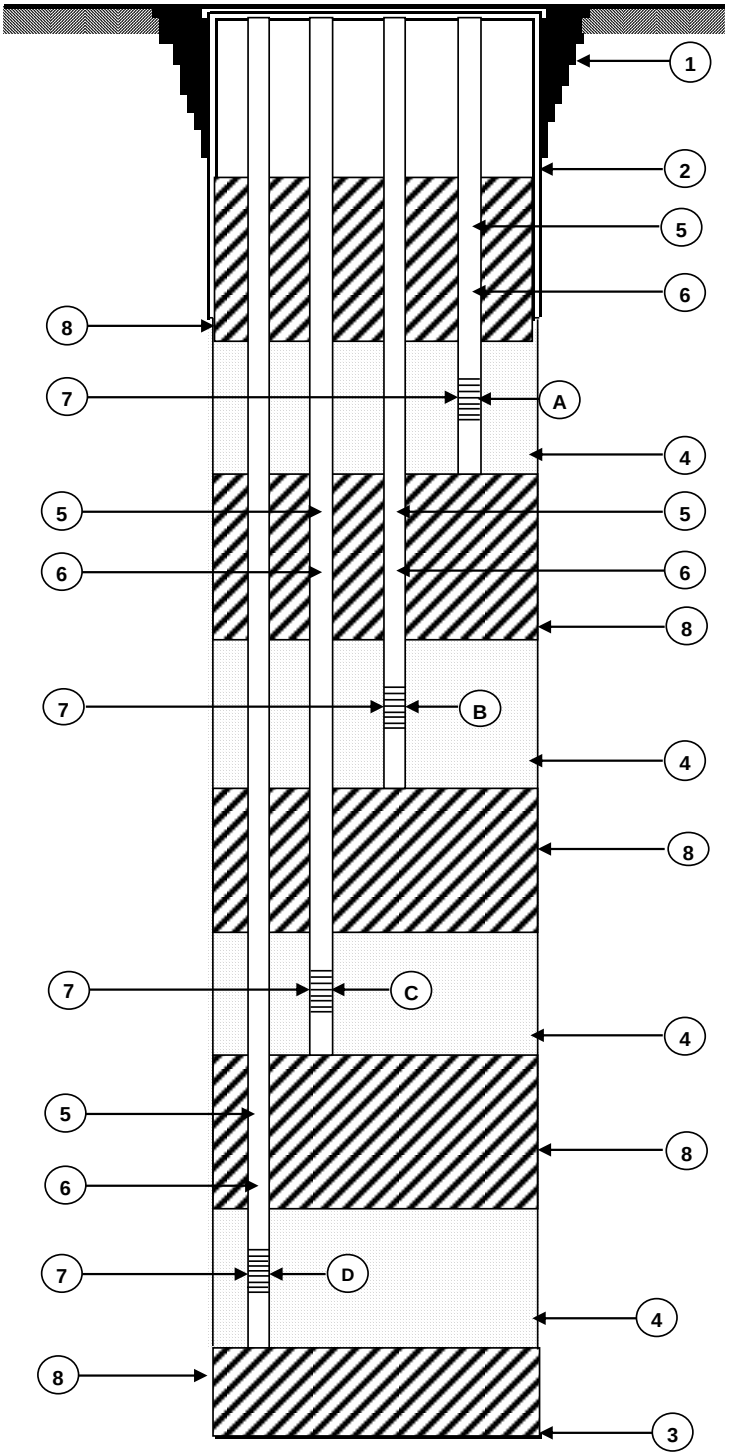
VAPOR MONITORING POINT CONSTRUCTION DIAGRAM

GROUND SURFACE ELEVATION (FEET) **435.54** JOB NUMBER **21562593**

TOP OF INNER WELL CASING ELEVATION **NA** BORING NUMBER **VMP-30**

DATUM **1988 USGS** INSTALLATION DATE **3/1/2011**

LOCATION **Roxana, Illinois**



VAPOR MONITORING PORT INSTALLATION DETAILS

SCREEN	DEPTH TO BOTTOM OF SAND (FEET*)	DEPTH TO TOP OF SAND (FEET*)	DEPTH TO BOTTOM OF SCREEN (FEET*)	DEPTH TO TOP OF SCREEN (FEET*)	LENGTH OF SCREEN (FEET)	DIAMETER OF SCREEN (INCHES)	SLOT SIZE (INCHES)
A	12.0	9.0	11.0	10.0	1.0	0.5	0.010
B	20.0	17.0	19.0	18.0	1.0	0.5	0.010
C	28.0	25.0	27.0	26.0	1.0	0.5	0.010
D	42.0	39.0	41.0	40.0	1.0	0.5	0.010

1 CONCRETE CAP? [YES] NO (CIRCLE ONE)

2 BOREHOLE DIAMETER 6 INCHES

3 TOTAL DEPTH OF BOREHOLE 42.0 FEET*

4 TYPE OF PACK AROUND SCREEN #10 Red Flint Filter Sand

5 RISER MATERIAL Sch. 40 PVC

6 RISER DIAMETER 0.5 INCHES

7 SCREEN MATERIAL Sch. 40 PVC

8 TYPE OF SEAL Bentonite Chips

* (DEPTH FROM GROUND SURFACE)

NOTE: DRAWING NOT TO SCALE

URS Corporation

APPENDIX B Photographs of Pilot Test Field Activities

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Shell Oil Products US	Roxana, IL	21562593

Photo No.	Date:
1	3/24/11

Description:

ICE Unit – Illustrating control panel and muffler system for additional noise reduction due to close proximity to residential areas.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Shell Oil Products US	Roxana, IL	21562593

Photo No.	Date:
2	3/24/11

Description:

ICE Unit – Illustrating residual water knock out tank.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Shell Oil Products US	Roxana, IL	21562593

Photo No.	Date:
3	3/24/11

Description:

Extraction well apparatus – illustrating vacuum hose attachment and vacuum/pressure gauge attached to well head port.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Shell Oil Products US	Roxana, IL	21562593

Photo No.	Date:
4	3/24/11

Description:

ICE Unit – Illustrating portable propane tanks for supplemental fuel and vacuum hose connected to extraction well.

APPENDIX C

Copy of Laboratory Analytical Reports

Roxana SVE Pilot Data Review

Laboratory SDG: 1103438

Data Reviewer: Elizabeth Kunkel

Peer Reviewer: Tony Sedlacek

Date Reviewed: 4/1/2011

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008

Sample Identification	Sample Identification
AE #1	AE #2
AE #3	

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated that all samples were diluted due to high levels of non-target anlaytes. Sample AE #2 was leaking during sample analysis and had to be re-pressurized; professional judgment was used to qualify results from this sample. This issue is addressed further in the appropriate section below.

The cooler receipt form did not indicate any problems.

3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

No

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

Yes

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples collected as part of this SDG?

MS/MSD samples are not applicable for vapor samples, due to the inability to spike the samples.

8.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

9.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

No

10.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Not applicable; analytes were detected in samples that were diluted.

11.0 Additional Qualifications

Were additional qualifications applied?

Yes, professional judgment was used to qualify sample AE #2 due to leakage during sample analysis and the subsequent need to re-pressurize the stainless steel canister.

Sample ID	Parameter	Analyte	Qualification	Comment
AE #2	TO-15	TO-15 detects/non-detects	**J/UJ**	Professional Judgment

Air Toxics LTD.
Laboratory Services Since 1989

3/29/2011
Mr. Steve Shroff
URS Corporation
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana SVE Pilot
Project #: 21562593.00014
Workorder #: 1103438

Dear Mr. Steve Shroff

The following report includes the data for the above referenced project for sample(s) received on 3/19/2011 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Jacquelyn Luta at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Jacquelyn Luta

Project Manager

Air Toxics LTD.
Laboratory Services Since 1989

WORK ORDER #: 1103438

Work Order Summary

CLIENT:	Mr. Steve Shroff URS Corporation 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin URS Corporation P.O. BOX 203970 Austin, TX 78720-1088
PHONE:	314-429-0100	**P.O. #**	
FAX:		**PROJECT #**	21562593.00014 Roxana SVE Pilot
DATE RECEIVED:	03/19/2011	**CONTACT:**	Jacquelyn Luta
DATE COMPLETED:	03/29/2011		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AE #1	Modified TO-15	0.6 "Hg	15 psi
02A	AE #2	Modified TO-15	1.6 "Hg	15 psi
03A	AE #3	Modified TO-15	0.0 "Hg	15 psi
04A	Lab Blank	Modified TO-15	NA	NA
04B	Lab Blank	Modified TO-15	NA	NA
05A	CCV	Modified TO-15	NA	NA
05B	CCV	Modified TO-15	NA	NA
06A	LCS	Modified TO-15	NA	NA
06AA	LCSD	Modified TO-15	NA	NA
06B	LCS	Modified TO-15	NA	NA
06BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Linda D. Frumarn DATE: 03/29/11

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763,
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/09, Expiration date: 06/30/11
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

Air Toxics LTD.
Laboratory Services Since 1989

LABORATORY NARRATIVE
EPA Method TO-15
URS Corporation
Workorder# 1103438

Three 1 Liter Summa Canister samples were received on March 19, 2011. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on all of the samples due to the presence of high level non-target species.

The Summa canister for sample AE #2 was leaking during analysis and had to be re-pressurized. The client was notified and the analysis proceeded. Reported analyte concentrations are considered to be estimated.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV and/or LCS.

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Air Toxics LTD.
Laboratory Services Since 1989

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: AE #1

Lab ID#: 1103438-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	21	42	46	93
Ethanol	82	120	160	230
Acetone	82	140	200	340
Hexane	21	22	73	76
Benzene	21	1300	66	4200
Toluene	21	67	78	250
Styrene	21	22	88	94
Cumene	21	65	100	320

Client Sample ID: AE #2

Lab ID#: 1103438-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	8.6	35	19	77
Ethanol	34	57	64	110
Acetone	34	110	81	260
Methylene Chloride	8.6	9.0	30	31
Benzene	8.6	160	27	510
Toluene	8.6	35	32	130
Tetrachloroethene	8.6	14	58	93
Styrene	8.6	11	36	47
Cumene	8.6	27	42	130

Client Sample ID: AE #3

Lab ID#: 1103438-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	20	61	45	130
Acetone	81	120	190	300
Benzene	20	73	64	230
Toluene	20	29	76	110

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Laboratory Services Since 1989

Client Sample ID: AE #1

Lab ID#: 1103438-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**6032130**	**Date of Collection:**	**3/16/11 4:45:00 PM**
Dil. Factor:	**41.2**	**Date of Analysis:**	**3/22/11 04:49 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	21	Not Detected	100	Not Detected
Freon 114	21	Not Detected	140	Not Detected
Chloromethane	82	Not Detected	170	Not Detected
Vinyl Chloride	21	Not Detected	53	Not Detected
1,3-Butadiene	21	42	46	93
Bromomethane	21	Not Detected	80	Not Detected
Chloroethane	82	Not Detected	220	Not Detected
Freon 11	21	Not Detected	120	Not Detected
Ethanol	82	120	160	230
Freon 113	21	Not Detected	160	Not Detected
1,1-Dichloroethene	21	Not Detected	82	Not Detected
Acetone	82	140	200	340
2-Propanol	82	Not Detected	200	Not Detected
Carbon Disulfide	82	Not Detected	260	Not Detected
3-Chloropropene	82	Not Detected	260	Not Detected
Methylene Chloride	21	Not Detected	72	Not Detected
Methyl tert-butyl ether	21	Not Detected	74	Not Detected
trans-1,2-Dichloroethene	21	Not Detected	82	Not Detected
Hexane	21	22	73	76
1,1-Dichloroethane	21	Not Detected	83	Not Detected
2-Butanone (Methyl Ethyl Ketone)	82	Not Detected	240	Not Detected
cis-1,2-Dichloroethene	21	Not Detected	82	Not Detected
Tetrahydrofuran	21	Not Detected	61	Not Detected
Chloroform	21	Not Detected	100	Not Detected
1,1,1-Trichloroethane	21	Not Detected	110	Not Detected
Cyclohexane	21	Not Detected	71	Not Detected
Carbon Tetrachloride	21	Not Detected	130	Not Detected
2,2,4-Trimethylpentane	21	Not Detected	96	Not Detected
Benzene	21	1300	66	4200
1,2-Dichloroethane	21	Not Detected	83	Not Detected
Heptane	21	Not Detected	84	Not Detected
Trichloroethene	21	Not Detected	110	Not Detected
1,2-Dichloropropane	21	Not Detected	95	Not Detected
1,4-Dioxane	82	Not Detected	300	Not Detected
Bromodichloromethane	21	Not Detected	140	Not Detected
cis-1,3-Dichloropropene	21	Not Detected	93	Not Detected
4-Methyl-2-pentanone	21	Not Detected	84	Not Detected
Toluene	21	67	78	250
trans-1,3-Dichloropropene	21	Not Detected	93	Not Detected
1,1,2-Trichloroethane	21	Not Detected	110	Not Detected
Tetrachloroethene	21	Not Detected	140	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE #1

Lab ID#: 1103438-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**6032130**	**Date of Collection: 3/16/11 4:45:00 PM**	
Dil. Factor:	**41.2**	**Date of Analysis: 3/22/11 04:49 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	82	Not Detected	340	Not Detected
Dibromochloromethane	21	Not Detected	180	Not Detected
1,2-Dibromoethane (EDB)	21	Not Detected	160	Not Detected
Chlorobenzene	21	Not Detected	95	Not Detected
Ethyl Benzene	21	Not Detected	89	Not Detected
m,p-Xylene	21	Not Detected	89	Not Detected
o-Xylene	21	Not Detected	89	Not Detected
Styrene	21	22	88	94
Bromoform	21	Not Detected	210	Not Detected
Cumene	21	65	100	320
1,1,2,2-Tetrachloroethane	21	Not Detected	140	Not Detected
Propylbenzene	21	Not Detected	100	Not Detected
4-Ethyltoluene	21	Not Detected	100	Not Detected
1,3,5-Trimethylbenzene	21	Not Detected	100	Not Detected
1,2,4-Trimethylbenzene	21	Not Detected	100	Not Detected
1,3-Dichlorobenzene	21	Not Detected	120	Not Detected
1,4-Dichlorobenzene	21	Not Detected	120	Not Detected
alpha-Chlorotoluene	21	Not Detected	110	Not Detected
1,2-Dichlorobenzene	21	Not Detected	120	Not Detected
1,2,4-Trichlorobenzene	82	Not Detected	610	Not Detected
Hexachlorobutadiene	82	Not Detected	880	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130
1,2-Dichloroethane-d4	112	70-130
4-Bromofluorobenzene	92	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE #2

Lab ID#: 1103438-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032317**	**Date of Collection: 3/17/11 4:45:00 PM**	
Dil. Factor:	**17.1**	**Date of Analysis: 3/23/11 04:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	8.6	Not Detected	42	Not Detected
Freon 114	8.6	Not Detected	60	Not Detected
Chloromethane	34	Not Detected	71	Not Detected
Vinyl Chloride	8.6	Not Detected	22	Not Detected
1,3-Butadiene	8.6	35	19	77
Bromomethane	8.6	Not Detected	33	Not Detected
Chloroethane	34	Not Detected	90	Not Detected
Freon 11	8.6	Not Detected	48	Not Detected
Ethanol	34	57	64	110
Freon 113	8.6	Not Detected	66	Not Detected
1,1-Dichloroethene	8.6	Not Detected	34	Not Detected
Acetone	34	110	81	260
2-Propanol	34	Not Detected	84	Not Detected
Carbon Disulfide	34	Not Detected	110	Not Detected
3-Chloropropene	34	Not Detected	110	Not Detected
Methylene Chloride	8.6	9.0	30	31
Methyl tert-butyl ether	8.6	Not Detected	31	Not Detected
trans-1,2-Dichloroethene	8.6	Not Detected	34	Not Detected
Hexane	8.6	Not Detected	30	Not Detected
1,1-Dichloroethane	8.6	Not Detected	35	Not Detected
2-Butanone (Methyl Ethyl Ketone)	34	Not Detected	100	Not Detected
cis-1,2-Dichloroethene	8.6	Not Detected	34	Not Detected
Tetrahydrofuran	8.6	Not Detected	25	Not Detected
Chloroform	8.6	Not Detected	42	Not Detected
1,1,1-Trichloroethane	8.6	Not Detected	47	Not Detected
Cyclohexane	8.6	Not Detected	29	Not Detected
Carbon Tetrachloride	8.6	Not Detected	54	Not Detected
2,2,4-Trimethylpentane	8.6	Not Detected	40	Not Detected
Benzene	8.6	160	27	510
1,2-Dichloroethane	8.6	Not Detected	35	Not Detected
Heptane	8.6	Not Detected	35	Not Detected
Trichloroethene	8.6	Not Detected	46	Not Detected
1,2-Dichloropropane	8.6	Not Detected	40	Not Detected
1,4-Dioxane	34	Not Detected	120	Not Detected
Bromodichloromethane	8.6	Not Detected	57	Not Detected
cis-1,3-Dichloropropene	8.6	Not Detected	39	Not Detected
4-Methyl-2-pentanone	8.6	Not Detected	35	Not Detected
Toluene	8.6	35	32	130
trans-1,3-Dichloropropene	8.6	Not Detected	39	Not Detected
1,1,2-Trichloroethane	8.6	Not Detected	47	Not Detected
Tetrachloroethene	8.6	14	58	93

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE #2

Lab ID#: 1103438-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032317**	**Date of Collection: 3/17/11 4:45:00 PM**	
Dil. Factor:	**17.1**	**Date of Analysis: 3/23/11 04:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	34	Not Detected	140	Not Detected
Dibromochloromethane	8.6	Not Detected	73	Not Detected
1,2-Dibromoethane (EDB)	8.6	Not Detected	66	Not Detected
Chlorobenzene	8.6	Not Detected	39	Not Detected
Ethyl Benzene	8.6	Not Detected	37	Not Detected
m,p-Xylene	8.6	Not Detected	37	Not Detected
o-Xylene	8.6	Not Detected	37	Not Detected
Styrene	8.6	11	36	47
Bromoform	8.6	Not Detected	88	Not Detected
Cumene	8.6	27	42	130
1,1,2,2-Tetrachloroethane	8.6	Not Detected	59	Not Detected
Propylbenzene	8.6	Not Detected	42	Not Detected
4-Ethyltoluene	8.6	Not Detected	42	Not Detected
1,3,5-Trimethylbenzene	8.6	Not Detected	42	Not Detected
1,2,4-Trimethylbenzene	8.6	Not Detected	42	Not Detected
1,3-Dichlorobenzene	8.6	Not Detected	51	Not Detected
1,4-Dichlorobenzene	8.6	Not Detected	51	Not Detected
alpha-Chlorotoluene	8.6	Not Detected	44	Not Detected
1,2-Dichlorobenzene	8.6	Not Detected	51	Not Detected
1,2,4-Trichlorobenzene	34	Not Detected	250	Not Detected
Hexachlorobutadiene	34	Not Detected	360	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	106	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE #3

Lab ID#: 1103438-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032318**	**Date of Collection: 3/18/11 4:45:00 PM**	
Dil. Factor:	**40.4**	**Date of Analysis: 3/23/11 05:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	20	Not Detected	100	Not Detected
Freon 114	20	Not Detected	140	Not Detected
Chloromethane	81	Not Detected	170	Not Detected
Vinyl Chloride	20	Not Detected	52	Not Detected
1,3-Butadiene	20	61	45	130
Bromomethane	20	Not Detected	78	Not Detected
Chloroethane	81	Not Detected	210	Not Detected
Freon 11	20	Not Detected	110	Not Detected
Ethanol	81	Not Detected	150	Not Detected
Freon 113	20	Not Detected	150	Not Detected
1,1-Dichloroethene	20	Not Detected	80	Not Detected
Acetone	81	120	190	300
2-Propanol	81	Not Detected	200	Not Detected
Carbon Disulfide	81	Not Detected	250	Not Detected
3-Chloropropene	81	Not Detected	250	Not Detected
Methylene Chloride	20	Not Detected	70	Not Detected
Methyl tert-butyl ether	20	Not Detected	73	Not Detected
trans-1,2-Dichloroethene	20	Not Detected	80	Not Detected
Hexane	20	Not Detected	71	Not Detected
1,1-Dichloroethane	20	Not Detected	82	Not Detected
2-Butanone (Methyl Ethyl Ketone)	81	Not Detected	240	Not Detected
cis-1,2-Dichloroethene	20	Not Detected	80	Not Detected
Tetrahydrofuran	20	Not Detected	60	Not Detected
Chloroform	20	Not Detected	99	Not Detected
1,1,1-Trichloroethane	20	Not Detected	110	Not Detected
Cyclohexane	20	Not Detected	70	Not Detected
Carbon Tetrachloride	20	Not Detected	130	Not Detected
2,2,4-Trimethylpentane	20	Not Detected	94	Not Detected
Benzene	20	73	64	230
1,2-Dichloroethane	20	Not Detected	82	Not Detected
Heptane	20	Not Detected	83	Not Detected
Trichloroethene	20	Not Detected	110	Not Detected
1,2-Dichloropropane	20	Not Detected	93	Not Detected
1,4-Dioxane	81	Not Detected	290	Not Detected
Bromodichloromethane	20	Not Detected	140	Not Detected
cis-1,3-Dichloropropene	20	Not Detected	92	Not Detected
4-Methyl-2-pentanone	20	Not Detected	83	Not Detected
Toluene	20	29	76	110
trans-1,3-Dichloropropene	20	Not Detected	92	Not Detected
1,1,2-Trichloroethane	20	Not Detected	110	Not Detected
Tetrachloroethene	20	Not Detected	140	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE #3

Lab ID#: 1103438-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032318**	**Date of Collection: 3/18/11 4:45:00 PM**	
Dil. Factor:	**40.4**	**Date of Analysis: 3/23/11 05:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	81	Not Detected	330	Not Detected
Dibromochloromethane	20	Not Detected	170	Not Detected
1,2-Dibromoethane (EDB)	20	Not Detected	160	Not Detected
Chlorobenzene	20	Not Detected	93	Not Detected
Ethyl Benzene	20	Not Detected	88	Not Detected
m,p-Xylene	20	Not Detected	88	Not Detected
o-Xylene	20	Not Detected	88	Not Detected
Styrene	20	Not Detected	86	Not Detected
Bromoform	20	Not Detected	210	Not Detected
Cumene	20	Not Detected	99	Not Detected
1,1,2,2-Tetrachloroethane	20	Not Detected	140	Not Detected
Propylbenzene	20	Not Detected	99	Not Detected
4-Ethyltoluene	20	Not Detected	99	Not Detected
1,3,5-Trimethylbenzene	20	Not Detected	99	Not Detected
1,2,4-Trimethylbenzene	20	Not Detected	99	Not Detected
1,3-Dichlorobenzene	20	Not Detected	120	Not Detected
1,4-Dichlorobenzene	20	Not Detected	120	Not Detected
alpha-Chlorotoluene	20	Not Detected	100	Not Detected
1,2-Dichlorobenzene	20	Not Detected	120	Not Detected
1,2,4-Trichlorobenzene	81	Not Detected	600	Not Detected
Hexachlorobutadiene	81	Not Detected	860	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	104	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 1103438-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**6032110**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/21/11 09:32 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 1103438-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**6032110**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/21/11 09:32 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	119	70-130
4-Bromofluorobenzene	88	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 1103438-04B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032311**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/23/11 12:56 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 1103438-04B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032311**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/23/11 12:56 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	102	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 1103438-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**6032102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/21/11 05:35 PM**	

Compound	%Recovery
Freon 12	125
Freon 114	113
Chloromethane	110
Vinyl Chloride	101
1,3-Butadiene	96
Bromomethane	96
Chloroethane	101
Freon 11	129
Ethanol	98
Freon 113	110
1,1-Dichloroethene	105
Acetone	101
2-Propanol	116
Carbon Disulfide	103
3-Chloropropene	106
Methylene Chloride	106
Methyl tert-butyl ether	112
trans-1,2-Dichloroethene	100
Hexane	99
1,1-Dichloroethane	109
2-Butanone (Methyl Ethyl Ketone)	108
cis-1,2-Dichloroethene	109
Tetrahydrofuran	101
Chloroform	117
1,1,1-Trichloroethane	120
Cyclohexane	105
Carbon Tetrachloride	123
2,2,4-Trimethylpentane	106
Benzene	111
1,2-Dichloroethane	130
Heptane	110
Trichloroethene	112
1,2-Dichloropropane	111
1,4-Dioxane	113
Bromodichloromethane	122
cis-1,3-Dichloropropene	119
4-Methyl-2-pentanone	120
Toluene	118
trans-1,3-Dichloropropene	108
1,1,2-Trichloroethane	115
Tetrachloroethene	108

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 1103438-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**6032102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/21/11 05:35 PM**	

Compound	%Recovery
2-Hexanone	122
Dibromochloromethane	118
1,2-Dibromoethane (EDB)	115
Chlorobenzene	114
Ethyl Benzene	114
m,p-Xylene	114
o-Xylene	113
Styrene	118
Bromoform	119
Cumene	113
1,1,2,2-Tetrachloroethane	120
Propylbenzene	116
4-Ethyltoluene	125
1,3,5-Trimethylbenzene	104
1,2,4-Trimethylbenzene	106
1,3-Dichlorobenzene	109
1,4-Dichlorobenzene	104
alpha-Chlorotoluene	120
1,2-Dichlorobenzene	104
1,2,4-Trichlorobenzene	100
Hexachlorobutadiene	98

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	108	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	99	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 1103438-05B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032305**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/23/11 09:52 AM**	

Compound	%Recovery
Freon 12	105
Freon 114	103
Chloromethane	101
Vinyl Chloride	98
1,3-Butadiene	89
Bromomethane	96
Chloroethane	106
Freon 11	105
Ethanol	96
Freon 113	107
1,1-Dichloroethene	98
Acetone	102
2-Propanol	106
Carbon Disulfide	99
3-Chloropropene	100
Methylene Chloride	103
Methyl tert-butyl ether	101
trans-1,2-Dichloroethene	101
Hexane	101
1,1-Dichloroethane	102
2-Butanone (Methyl Ethyl Ketone)	101
cis-1,2-Dichloroethene	98
Tetrahydrofuran	103
Chloroform	102
1,1,1-Trichloroethane	104
Cyclohexane	96
Carbon Tetrachloride	107
2,2,4-Trimethylpentane	103
Benzene	100
1,2-Dichloroethane	109
Heptane	103
Trichloroethene	109
1,2-Dichloropropane	105
1,4-Dioxane	104
Bromodichloromethane	107
cis-1,3-Dichloropropene	107
4-Methyl-2-pentanone	102
Toluene	100
trans-1,3-Dichloropropene	104
1,1,2-Trichloroethane	98
Tetrachloroethene	104

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 1103438-05B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032305**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/23/11 09:52 AM**	

Compound	%Recovery
2-Hexanone	98
Dibromochloromethane	105
1,2-Dibromoethane (EDB)	99
Chlorobenzene	100
Ethyl Benzene	97
m,p-Xylene	94
o-Xylene	95
Styrene	100
Bromoform	111
Cumene	97
1,1,2,2-Tetrachloroethane	95
Propylbenzene	95
4-Ethyltoluene	98
1,3,5-Trimethylbenzene	95
1,2,4-Trimethylbenzene	94
1,3-Dichlorobenzene	100
1,4-Dichlorobenzene	102
alpha-Chlorotoluene	98
1,2-Dichlorobenzene	101
1,2,4-Trichlorobenzene	110
Hexachlorobutadiene	114

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	104	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 1103438-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**6032103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/21/11 06:11 PM**	

Compound	%Recovery
Freon 12	122
Freon 114	108
Chloromethane	116
Vinyl Chloride	99
1,3-Butadiene	97
Bromomethane	89
Chloroethane	98
Freon 11	127
Ethanol	93
Freon 113	108
1,1-Dichloroethene	105
Acetone	94
2-Propanol	112
Carbon Disulfide	122
3-Chloropropene	113
Methylene Chloride	106
Methyl tert-butyl ether	111
trans-1,2-Dichloroethene	113
Hexane	96
1,1-Dichloroethane	109
2-Butanone (Methyl Ethyl Ketone)	106
cis-1,2-Dichloroethene	104
Tetrahydrofuran	92
Chloroform	113
1,1,1-Trichloroethane	118
Cyclohexane	102
Carbon Tetrachloride	120
2,2,4-Trimethylpentane	100
Benzene	112
1,2-Dichloroethane	128
Heptane	107
Trichloroethene	110
1,2-Dichloropropane	110
1,4-Dioxane	108
Bromodichloromethane	120
cis-1,3-Dichloropropene	112
4-Methyl-2-pentanone	114
Toluene	113
trans-1,3-Dichloropropene	110
1,1,2-Trichloroethane	112
Tetrachloroethene	104

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 1103438-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**6032103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/21/11 06:11 PM**	

Compound	%Recovery
2-Hexanone	110
Dibromochloromethane	113
1,2-Dibromoethane (EDB)	113
Chlorobenzene	110
Ethyl Benzene	110
m,p-Xylene	111
o-Xylene	110
Styrene	115
Bromoform	111
Cumene	110
1,1,2,2-Tetrachloroethane	118
Propylbenzene	113
4-Ethyltoluene	114
1,3,5-Trimethylbenzene	100
1,2,4-Trimethylbenzene	102
1,3-Dichlorobenzene	104
1,4-Dichlorobenzene	99
alpha-Chlorotoluene	114
1,2-Dichlorobenzene	99
1,2,4-Trichlorobenzene	85
Hexachlorobutadiene	89

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	97	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCSD

Lab ID#: 1103438-06AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**6032104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/21/11 06:37 PM**	

Compound	%Recovery
Freon 12	122
Freon 114	108
Chloromethane	108
Vinyl Chloride	104
1,3-Butadiene	94
Bromomethane	87
Chloroethane	102
Freon 11	125
Ethanol	94
Freon 113	107
1,1-Dichloroethene	106
Acetone	98
2-Propanol	111
Carbon Disulfide	121
3-Chloropropene	124
Methylene Chloride	106
Methyl tert-butyl ether	110
trans-1,2-Dichloroethene	107
Hexane	93
1,1-Dichloroethane	107
2-Butanone (Methyl Ethyl Ketone)	104
cis-1,2-Dichloroethene	101
Tetrahydrofuran	92
Chloroform	114
1,1,1-Trichloroethane	117
Cyclohexane	100
Carbon Tetrachloride	119
2,2,4-Trimethylpentane	99
Benzene	109
1,2-Dichloroethane	122
Heptane	109
Trichloroethene	108
1,2-Dichloropropane	109
1,4-Dioxane	106
Bromodichloromethane	120
cis-1,3-Dichloropropene	112
4-Methyl-2-pentanone	112
Toluene	114
trans-1,3-Dichloropropene	112
1,1,2-Trichloroethane	112
Tetrachloroethene	107

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCSD

Lab ID#: 1103438-06AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**6032104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/21/11 06:37 PM**	

Compound	%Recovery
2-Hexanone	113
Dibromochloromethane	113
1,2-Dibromoethane (EDB)	112
Chlorobenzene	112
Ethyl Benzene	110
m,p-Xylene	110
o-Xylene	112
Styrene	117
Bromoform	114
Cumene	110
1,1,2,2-Tetrachloroethane	118
Propylbenzene	115
4-Ethyltoluene	106
1,3,5-Trimethylbenzene	110
1,2,4-Trimethylbenzene	102
1,3-Dichlorobenzene	106
1,4-Dichlorobenzene	101
alpha-Chlorotoluene	115
1,2-Dichlorobenzene	101
1,2,4-Trichlorobenzene	91
Hexachlorobutadiene	92

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	96	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 1103438-06B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032306**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/23/11 10:23 AM**	

Compound	%Recovery
Freon 12	104
Freon 114	101
Chloromethane	110
Vinyl Chloride	100
1,3-Butadiene	87
Bromomethane	96
Chloroethane	104
Freon 11	107
Ethanol	96
Freon 113	108
1,1-Dichloroethene	106
Acetone	97
2-Propanol	105
Carbon Disulfide	120
3-Chloropropene	112
Methylene Chloride	101
Methyl tert-butyl ether	101
trans-1,2-Dichloroethene	110
Hexane	100
1,1-Dichloroethane	100
2-Butanone (Methyl Ethyl Ketone)	100
cis-1,2-Dichloroethene	97
Tetrahydrofuran	99
Chloroform	102
1,1,1-Trichloroethane	105
Cyclohexane	97
Carbon Tetrachloride	107
2,2,4-Trimethylpentane	102
Benzene	103
1,2-Dichloroethane	110
Heptane	103
Trichloroethene	111
1,2-Dichloropropane	104
1,4-Dioxane	102
Bromodichloromethane	107
cis-1,3-Dichloropropene	107
4-Methyl-2-pentanone	102
Toluene	102
trans-1,3-Dichloropropene	105
1,1,2-Trichloroethane	100
Tetrachloroethene	106

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 1103438-06B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032306**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/23/11 10:23 AM**	

Compound	%Recovery
2-Hexanone	98
Dibromochloromethane	106
1,2-Dibromoethane (EDB)	104
Chlorobenzene	102
Ethyl Benzene	100
m,p-Xylene	100
o-Xylene	100
Styrene	102
Bromoform	110
Cumene	101
1,1,2,2-Tetrachloroethane	100
Propylbenzene	100
4-Ethyltoluene	99
1,3,5-Trimethylbenzene	98
1,2,4-Trimethylbenzene	95
1,3-Dichlorobenzene	105
1,4-Dichlorobenzene	104
alpha-Chlorotoluene	98
1,2-Dichlorobenzene	106
1,2,4-Trichlorobenzene	112
Hexachlorobutadiene	118

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	104	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCSD

Lab ID#: 1103438-06BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032307**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/23/11 10:41 AM**	

Compound	%Recovery
Freon 12	104
Freon 114	100
Chloromethane	107
Vinyl Chloride	98
1,3-Butadiene	88
Bromomethane	93
Chloroethane	100
Freon 11	105
Ethanol	100
Freon 113	105
1,1-Dichloroethene	100
Acetone	93
2-Propanol	103
Carbon Disulfide	117
3-Chloropropene	106
Methylene Chloride	100
Methyl tert-butyl ether	101
trans-1,2-Dichloroethene	112
Hexane	99
1,1-Dichloroethane	101
2-Butanone (Methyl Ethyl Ketone)	96
cis-1,2-Dichloroethene	95
Tetrahydrofuran	96
Chloroform	101
1,1,1-Trichloroethane	103
Cyclohexane	95
Carbon Tetrachloride	107
2,2,4-Trimethylpentane	101
Benzene	100
1,2-Dichloroethane	108
Heptane	100
Trichloroethene	108
1,2-Dichloropropane	103
1,4-Dioxane	98
Bromodichloromethane	105
cis-1,3-Dichloropropene	104
4-Methyl-2-pentanone	101
Toluene	99
trans-1,3-Dichloropropene	102
1,1,2-Trichloroethane	99
Tetrachloroethene	103

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCSD

Lab ID#: 1103438-06BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032307**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/23/11 10:41 AM**	

Compound	%Recovery
2-Hexanone	97
Dibromochloromethane	103
1,2-Dibromoethane (EDB)	102
Chlorobenzene	101
Ethyl Benzene	98
m,p-Xylene	98
o-Xylene	97
Styrene	100
Bromoform	108
Cumene	100
1,1,2,2-Tetrachloroethane	98
Propylbenzene	98
4-Ethyltoluene	96
1,3,5-Trimethylbenzene	96
1,2,4-Trimethylbenzene	94
1,3-Dichlorobenzene	102
1,4-Dichlorobenzene	103
alpha-Chlorotoluene	96
1,2-Dichlorobenzene	105
1,2,4-Trichlorobenzene	108
Hexachlorobutadiene	113

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	106	70-130

1103438

Shell Oil Products Chain Of Custody Record

URS

Air Toxics LTD.
Project Name: Roxana SVE Pilot
Project # 21562593.00014
Lab Vendor #

Please Check Appropriate Box:
☑ ENV. SERVICES ☐ MOTIVA RETAIL ☐ SHELL RETAIL
☐ MOTIVA SD&CM ☐ CONSULTANT ☐ LUBES
☐ SHELL PIPELINE ☐ OTHER

Print Bill To Contact Name: Steve Shroff
PO #
INCIDENT # (ENV SERVICES): 9 7 2 1 6 6 4 0
SAP #: 3 4 0 0 6 1
☐ CHECK IF NO INCIDENT # APPLIES
DATE: 03/18/11
PAGE: 1 of 1

SAMPLING COMPANY: URS CORPORATION
LOG CODE:
ADDRESS: 1001 HIGHLANDS PLAZA DRIVE WEST - SUITE 300; ST. LOUIS, MO 63110
Laboratory Address: Air Toxics, LTD 180 Blue Ravine Road, Suite B, Folsom, CA 95630-4719
TELEPHONE: 314-429-0100
FAX: 314-429-0462
Bill To Contact E-MAIL: Steven_Shroff@URSCorp.com

SITE ADDRESS: Street and City: 900 SOUTH CENTRAL AVE -- ROXANA
State: IL
GLOBAL ID NO.:
EDF DELIVERABLE TO (Name, Company, Office Location): Elizabeth Kunkel, URS, St. Louis
PHONE NO.: 314-743-4179
E-MAIL: Elizabeth_Kunkel@URSCorp.com
CONSULTANT PROJECT NAME#: Roxana SVE Pilot
SAMPLER NAME(S) (Print): RICH HART

TURNAROUND TIME (CALENDAR DAYS):
☑ STANDARD (14 DAY) ☐ 5 DAYS ☐ 3 DAYS ☐ 2 DAYS ☐ 24 HOURS ☐ RESULTS NEEDED ON WEEKEND

☐ LA - RWQCB REPORT FORMAT ☑ UST AGENCY:

DELIVERABLES: ☐ LEVEL 1 ☑ LEVEL 2 ☐ LEVEL 3 ☑ LEVEL 4 ☐ OTHER (SPECIFY)

☑ SHELL CONTRACT RATE APPLIES
☐ STATE REIMBURSEMENT RATE APPLIES
☐ EDD NOT NEEDED
☑ RECEIPT VERIFICATION REQUESTED

REQUESTED ANALYSIS

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	Canister Number	Conister Pressure/Vacuum Initial	Final	Receipt	Final (psi)	TO-15
01A	AE #1	3/16/11	1645	3019	-29	0			X
02A	AE #2	3/17/11	1645	2676	-29	-1			X
03A	AE #3	3/18/11	1645	2545	-29	0			X

Turn Around Time:
☑ Normal
☐ Rush
Specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

ADDITIONAL NOTES:
- 14 day hold time
- Report results between MDL and RL
- Level IV ECVP

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
	FEDEX	3/18/11	1800
		3/19/11	0930

05/2/06 Revision

Fedex
CUSTODY SEAL INTACT
Y N NA

Roxana SVE Pilot Data Review

Laboratory SDG: 1104017

Data Reviewer: Elizabeth Kunkel

Peer Reviewer: Tony Sedlacek

Date Reviewed: 5/18/2011

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008

Sample Identification
Influent PT/PW

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated that sample Influent PT/PW was diluted due to high levels of target analytes. Although not indicated in the laboratory case narrative, TO-15 LCS/LCSD and CCV recoveries were outside evaluation criteria for chloromethane. These issues are addressed further in the appropriate sections below.

The cooler receipt form did not indicate any problems.

3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks?

No

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

No

LCS/LCSD ID	Parameter	Analyte	LCS/LCSD Recovery	RPD	LCS/LCSD/ RPD Criteria
1104017-04A/AA	TO-15	Chloromethane	**169/148**	13	70-130/25

Analytical data which were reported as non-detect and associated with LCS/LCSD recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. Chloromethane was non-detect in samples associated with LCS/LCSD recoveries above evaluation criteria; therefore, no qualification of data was required.

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples collected as part of this SDG?

MS/MSD samples are not applicable for vapor samples, due to the inability to spike the samples.

8.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

9.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

No

10.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Not applicable; analytes were detected in samples that were diluted.

11.0 Additional Qualifications

Were additional qualifications applied?

No, however, the CCV recovery for chloromethane was above evaluation criteria.

CCV ID	Parameter	Analyte	CCV Recovery	CCV Criteria
1104017-03A	TO-15	Chloromethane	**156**	70-130

Analytical data which were reported as non-detect and associated with CCV recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. Chloromethane was non-detect in samples associated with CCV recoveries above evaluation criteria; therefore, no qualification of data was required.

Air Toxics LTD.
Laboratory Services Since 1989

4/5/2011
Mr. Steve Shroff
URS Corporation
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana SVE Pilot
Project #: 21562593.00014
Workorder #: 1104017

Dear Mr. Steve Shroff

The following report includes the data for the above referenced project for sample(s) received on 4/1/2011 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Jacquelyn Luta at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Jacquelyn Luta

Project Manager

Air Toxics LTD.
Laboratory Services Since 1989

WORK ORDER #: 1104017

Work Order Summary

CLIENT:	Mr. Steve Shroff URS Corporation 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin URS Corporation P.O. BOX 203970 Austin, TX 78720-1088
PHONE:	314-429-0100	**P.O. #**	
FAX:		**PROJECT #**	21562593.00014 Roxana SVE Pilot
DATE RECEIVED:	04/01/2011	**CONTACT:**	Jacquelyn Luta
DATE COMPLETED:	04/05/2011		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	Influent PT/PW	Modified TO-15	0.4 "Hg	15 psi
02A	Lab Blank	Modified TO-15	NA	NA
03A	CCV	Modified TO-15	NA	NA
04A	LCS	Modified TO-15	NA	NA
04AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Linda D. Frumarn DATE: 04/05/11

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763,
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/09, Expiration date: 06/30/11
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
URS Corporation
Workorder# 1104017

One 1 Liter Summa Canister sample was received on April 01, 2011. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

All Quality Control Limit exceedences and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

Dilution was performed on sample Influent PT/PW due to the presence of high level target species.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV and/or LCS.

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Air Toxics LTD.
Laboratory Services Since 1989

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: Influent PT/PW

Lab ID#: 1104017-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	41	140	97	340
Hexane	10	25	36	89
Cyclohexane	10	31	35	110
2,2,4-Trimethylpentane	10	330	48	1500
Benzene	10	3700	33	12000

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Influent PT/PW

Lab ID#: 1104017-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3040409**	**Date of Collection:**	**3/19/11 11:40:00 AM**
Dil. Factor:	**20.5**	**Date of Analysis:**	**4/4/11 02:06 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	10	Not Detected	51	Not Detected
Freon 114	10	Not Detected	72	Not Detected
Chloromethane	41	Not Detected	85	Not Detected
Vinyl Chloride	10	Not Detected	26	Not Detected
1,3-Butadiene	10	Not Detected	23	Not Detected
Bromomethane	10	Not Detected	40	Not Detected
Chloroethane	41	Not Detected	110	Not Detected
Freon 11	10	Not Detected	58	Not Detected
Ethanol	41	Not Detected	77	Not Detected
Freon 113	10	Not Detected	78	Not Detected
1,1-Dichloroethene	10	Not Detected	41	Not Detected
Acetone	41	140	97	340
2-Propanol	41	Not Detected	100	Not Detected
Carbon Disulfide	41	Not Detected	130	Not Detected
3-Chloropropene	41	Not Detected	130	Not Detected
Methylene Chloride	10	Not Detected	36	Not Detected
Methyl tert-butyl ether	10	Not Detected	37	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	41	Not Detected
Hexane	10	25	36	89
1,1-Dichloroethane	10	Not Detected	41	Not Detected
2-Butanone (Methyl Ethyl Ketone)	41	Not Detected	120	Not Detected
cis-1,2-Dichloroethene	10	Not Detected	41	Not Detected
Tetrahydrofuran	10	Not Detected	30	Not Detected
Chloroform	10	Not Detected	50	Not Detected
1,1,1-Trichloroethane	10	Not Detected	56	Not Detected
Cyclohexane	10	31	35	110
Carbon Tetrachloride	10	Not Detected	64	Not Detected
2,2,4-Trimethylpentane	10	330	48	1500
Benzene	10	3700	33	12000
1,2-Dichloroethane	10	Not Detected	41	Not Detected
Heptane	10	Not Detected	42	Not Detected
Trichloroethene	10	Not Detected	55	Not Detected
1,2-Dichloropropane	10	Not Detected	47	Not Detected
1,4-Dioxane	41	Not Detected	150	Not Detected
Bromodichloromethane	10	Not Detected	69	Not Detected
cis-1,3-Dichloropropene	10	Not Detected	46	Not Detected
4-Methyl-2-pentanone	10	Not Detected	42	Not Detected
Toluene	10	Not Detected	39	Not Detected
trans-1,3-Dichloropropene	10	Not Detected	46	Not Detected
1,1,2-Trichloroethane	10	Not Detected	56	Not Detected
Tetrachloroethene	10	Not Detected	70	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Influent PT/PW

Lab ID#: 1104017-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3040409**	**Date of Collection:**	**3/19/11 11:40:00 AM**
Dil. Factor:	**20.5**	**Date of Analysis:**	**4/4/11 02:06 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	41	Not Detected	170	Not Detected
Dibromochloromethane	10	Not Detected	87	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected	79	Not Detected
Chlorobenzene	10	Not Detected	47	Not Detected
Ethyl Benzene	10	Not Detected	44	Not Detected
m,p-Xylene	10	Not Detected	44	Not Detected
o-Xylene	10	Not Detected	44	Not Detected
Styrene	10	Not Detected	44	Not Detected
Bromoform	10	Not Detected	100	Not Detected
Cumene	10	Not Detected	50	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected	70	Not Detected
Propylbenzene	10	Not Detected	50	Not Detected
4-Ethyltoluene	10	Not Detected	50	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected	50	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected	50	Not Detected
1,3-Dichlorobenzene	10	Not Detected	62	Not Detected
1,4-Dichlorobenzene	10	Not Detected	62	Not Detected
alpha-Chlorotoluene	10	Not Detected	53	Not Detected
1,2-Dichlorobenzene	10	Not Detected	62	Not Detected
1,2,4-Trichlorobenzene	41	Not Detected	300	Not Detected
Hexachlorobutadiene	41	Not Detected	440	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	112	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 1104017-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3040407**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/4/11 11:14 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 1104017-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3040407**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/4/11 11:14 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	113	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 1104017-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3040402**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/4/11 08:59 AM**	

Compound	%Recovery
Freon 12	92
Freon 114	95
Chloromethane	156 Q
Vinyl Chloride	111
1,3-Butadiene	86
Bromomethane	89
Chloroethane	91
Freon 11	88
Ethanol	91
Freon 113	90
1,1-Dichloroethene	89
Acetone	89
2-Propanol	87
Carbon Disulfide	91
3-Chloropropene	87
Methylene Chloride	92
Methyl tert-butyl ether	80
trans-1,2-Dichloroethene	87
Hexane	88
1,1-Dichloroethane	87
2-Butanone (Methyl Ethyl Ketone)	87
cis-1,2-Dichloroethene	90
Tetrahydrofuran	91
Chloroform	90
1,1,1-Trichloroethane	84
Cyclohexane	87
Carbon Tetrachloride	91
2,2,4-Trimethylpentane	87
Benzene	92
1,2-Dichloroethane	91
Heptane	88
Trichloroethene	90
1,2-Dichloropropane	84
1,4-Dioxane	89
Bromodichloromethane	91
cis-1,3-Dichloropropene	91
4-Methyl-2-pentanone	82
Toluene	90
trans-1,3-Dichloropropene	93
1,1,2-Trichloroethane	92
Tetrachloroethene	101

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 1104017-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3040402**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/4/11 08:59 AM**	

Compound	%Recovery
2-Hexanone	90
Dibromochloromethane	96
1,2-Dibromoethane (EDB)	95
Chlorobenzene	95
Ethyl Benzene	96
m,p-Xylene	91
o-Xylene	89
Styrene	93
Bromoform	101
Cumene	96
1,1,2,2-Tetrachloroethane	91
Propylbenzene	94
4-Ethyltoluene	94
1,3,5-Trimethylbenzene	98
1,2,4-Trimethylbenzene	95
1,3-Dichlorobenzene	97
1,4-Dichlorobenzene	102
alpha-Chlorotoluene	88
1,2-Dichlorobenzene	97
1,2,4-Trichlorobenzene	102
Hexachlorobutadiene	102

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	90	70-130
4-Bromofluorobenzene	118	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 1104017-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3040404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/4/11 09:54 AM**	

Compound	%Recovery
Freon 12	99
Freon 114	103
Chloromethane	169 Q
Vinyl Chloride	103
1,3-Butadiene	91
Bromomethane	92
Chloroethane	94
Freon 11	95
Ethanol	91
Freon 113	98
1,1-Dichloroethene	101
Acetone	94
2-Propanol	95
Carbon Disulfide	118
3-Chloropropene	108
Methylene Chloride	97
Methyl tert-butyl ether	90
trans-1,2-Dichloroethene	103
Hexane	95
1,1-Dichloroethane	90
2-Butanone (Methyl Ethyl Ketone)	93
cis-1,2-Dichloroethene	94
Tetrahydrofuran	92
Chloroform	97
1,1,1-Trichloroethane	93
Cyclohexane	96
Carbon Tetrachloride	101
2,2,4-Trimethylpentane	95
Benzene	92
1,2-Dichloroethane	89
Heptane	90
Trichloroethene	91
1,2-Dichloropropane	86
1,4-Dioxane	90
Bromodichloromethane	91
cis-1,3-Dichloropropene	90
4-Methyl-2-pentanone	82
Toluene	92
trans-1,3-Dichloropropene	88
1,1,2-Trichloroethane	92
Tetrachloroethene	100

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 1104017-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3040404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/4/11 09:54 AM**	

Compound	%Recovery
2-Hexanone	84
Dibromochloromethane	90
1,2-Dibromoethane (EDB)	92
Chlorobenzene	93
Ethyl Benzene	92
m,p-Xylene	93
o-Xylene	92
Styrene	94
Bromoform	97
Cumene	98
1,1,2,2-Tetrachloroethane	93
Propylbenzene	96
4-Ethyltoluene	92
1,3,5-Trimethylbenzene	99
1,2,4-Trimethylbenzene	96
1,3-Dichlorobenzene	100
1,4-Dichlorobenzene	103
alpha-Chlorotoluene	89
1,2-Dichlorobenzene	103
1,2,4-Trichlorobenzene	102
Hexachlorobutadiene	100

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	113	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCSD

Lab ID#: 1104017-04AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3040405**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/4/11 10:14 AM**	

Compound	%Recovery
Freon 12	94
Freon 114	99
Chloromethane	148 Q
Vinyl Chloride	104
1,3-Butadiene	88
Bromomethane	91
Chloroethane	85
Freon 11	90
Ethanol	90
Freon 113	94
1,1-Dichloroethene	99
Acetone	91
2-Propanol	91
Carbon Disulfide	113
3-Chloropropene	106
Methylene Chloride	92
Methyl tert-butyl ether	85
trans-1,2-Dichloroethene	101
Hexane	90
1,1-Dichloroethane	88
2-Butanone (Methyl Ethyl Ketone)	88
cis-1,2-Dichloroethene	91
Tetrahydrofuran	90
Chloroform	92
1,1,1-Trichloroethane	87
Cyclohexane	90
Carbon Tetrachloride	95
2,2,4-Trimethylpentane	86
Benzene	93
1,2-Dichloroethane	90
Heptane	90
Trichloroethene	91
1,2-Dichloropropane	86
1,4-Dioxane	85
Bromodichloromethane	90
cis-1,3-Dichloropropene	90
4-Methyl-2-pentanone	81
Toluene	91
trans-1,3-Dichloropropene	91
1,1,2-Trichloroethane	90
Tetrachloroethene	100

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCSD

Lab ID#: 1104017-04AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3040405**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/4/11 10:14 AM**	

Compound	%Recovery
2-Hexanone	86
Dibromochloromethane	91
1,2-Dibromoethane (EDB)	94
Chlorobenzene	94
Ethyl Benzene	92
m,p-Xylene	92
o-Xylene	89
Styrene	94
Bromoform	98
Cumene	97
1,1,2,2-Tetrachloroethane	93
Propylbenzene	94
4-Ethyltoluene	89
1,3,5-Trimethylbenzene	94
1,2,4-Trimethylbenzene	94
1,3-Dichlorobenzene	96
1,4-Dichlorobenzene	99
alpha-Chlorotoluene	84
1,2-Dichlorobenzene	98
1,2,4-Trichlorobenzene	96
Hexachlorobutadiene	99

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	91	70-130
4-Bromofluorobenzene	112	70-130

1104017

Shell Oil Products Chain Of Custody Record

URS

Air Toxics LTD.
Project Name: Roxana SVE Pilot
Project # 21562593.00014
Lab Vendor #

Please Check Appropriate Box:
ENV. SERVICES | MOTIVA RETAIL | SHELL RETAIL
MOTIVA SD&CM | CONSULTANT | LUBES
SHELL PIPELINE | OTHER

Print Bill To Contact Name: Steve Shroff
PO #

INCIDENT # (ENV SERVICES): 9 7 2 1 6 6 4 0
SAP #: 3 4 0 0 6 1
CHECK IF NO INCIDENT # APPLIES
DATE: 3/31011
PAGE: 1 of 1

SAMPLING COMPANY: URS CORPORATION
LOG CODE:
SITE ADDRESS: Street and City: 900 SOUTH CENTRAL AVE -- ROXANA
State: IL
GLOBAL ID NO.:
ADDRESS: 1001 HIGHLANDS PLAZA DRIVE WEST - SUITE 300; ST. LOUIS, MO 63110
EDF DELIVERABLE TO (Name, Company, Office Location): Elizabeth Kunkel, URS, St. Louis
PHONE NO.: 314-743-4179
E-MAIL: Elizabeth_Kunkel@URSCorp.com
CONSULTANT PROJECT NAME/#: Roxana Dissolved Phase
Laboratory Address: Air Toxics, LTD 180 Blue Ravine Road, Suite B, Folsom, CA 95630-4719
SAMPLER NAME(S) (Print):
TELEPHONE: 314-429-0100
FAX: 314-429-0462
Bill To Contact E-MAIL: Steven_Shroff@URSCorp.com

TURNAROUND TIME (CALENDAR DAYS): STANDARD (14 DAY) | 5 DAYS | 3 DAYS | 2 DAYS | 24 HOURS | RESULTS NEEDED ON WEEKEND
UA - RWQCB REPORT FORMAT | UST AGENCY:
DELIVERABLES: LEVEL 1 | LEVEL 2 | LEVEL 3 | LEVEL 4 | OTHER (SPECIFY)

SHELL CONTRACT RATE APPLIES
STATE REIMBURSEMENT RATE APPLIES
EDD NOT NEEDED
RECEIPT VERIFICATION REQUESTED

REQUESTED ANALYSIS

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	Canister Number	Conister Pressure/Vacuum Initial	Final	Receipt	Final (psi)	Modified TO-15
DIA	Influent PT/PW	3/19/11	1140	2687	-29	0			X

Turn Around Time:
Normal
Rush
2 Day
Specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

ADDITIONAL NOTES:
- 14 day hold time
- Report results between MDL and RL
- Level IV ECVP
- Results needed by 5pm (CDT) 04/05/11

Relinquished by: (Signature)	Received by: (Signature) FEDEX	Date: 3/31/11	Time: 1200
Relinquished by: (Signature)	Received by: (Signature) K. McKiernan ATL 4/1/11 9:00	Date: 4/1/11	Time: 9:00
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

05/2/06 Revision

FedEx
CUSTODY SEAL INTACT? Y / N / NA

Roxana SVE Pilot Data Review

Laboratory SDG: 1103537

Data Reviewer: Elizabeth Kunkel

Peer Reviewer: Tony Sedlacek

Date Reviewed: 4/13/2011

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008

Sample Identification	Sample Identification
AE #4	AE #5
AE #6	AE #7

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated that samples AE #4, AE #6, and AE #7 were diluted due to high levels of non-target analytes. Sample AE #5 was diluted due to high levels of target analytes. Although not indicated in the laboratory case narrative, TO-15 LCS/LCSD and CCV recoveries were outside evaluation criteria for chloromethane. These issues are addressed further in the appropriate sections below.

The cooler receipt form did not indicate any problems.

3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blank?

No

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

No

LCS/LCSD ID	Parameter	Analyte	LCS/LCSD Recovery	RPD	LCS/LCSD/ RPD Criteria
1103537-07A/AA	TO-15	Chloromethane	**132/131**	1	70-130/25

Analytical data which were reported as non-detect and associated with LCS recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. Chloromethane was non-detect in samples associated with LCS/LCSD recoveries above evaluation criteria; therefore, no qualification of data was required.

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples collected as part of this SDG?

MS/MSD samples are not applicable for vapor samples, due to the inability to spike the samples.

8.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

9.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

No

10.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Not applicable; analytes were detected in samples that were diluted.

11.0 Additional Qualifications

Were additional qualifications applied?

No, however, the CCV recovery for chloromethane was above evaluation criteria.

CCV ID	Parameter	Analyte	CCV Recovery	CCV Criteria
1103537-06A	TO-15	Chloromethane	**131**	70-130

Analytical data which were reported as non-detect and associated with CCV recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. Chloromethane was non-detect in samples associated with CCV recoveries above evaluation criteria; therefore, no qualification of data was required.

Air Toxics LTD.
Laboratory Services Since 1989

3/31/2011
Mr. Steve Shroff
URS Corporation
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana SVE Pilot
Project #:
Workorder #: 1103537

Dear Mr. Steve Shroff

The following report includes the data for the above referenced project for sample(s) received on 3/24/2011 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Jacquelyn Luta at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Jacquelyn Luta

Project Manager

Air Toxics LTD.
Laboratory Services Since 1989

WORK ORDER #: 1103537

Work Order Summary

CLIENT:	Mr. Steve Shroff URS Corporation 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin URS Corporation P.O. BOX 203970 Austin, TX 78720-1088
PHONE:	314-429-0100	**P.O. #**	
FAX:		**PROJECT #**	Roxana SVE Pilot
DATE RECEIVED:	03/24/2011	**CONTACT:**	Jacquelyn Luta
DATE COMPLETED:	03/31/2011		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AE#4	Modified TO-15	0.5 "Hg	15 psi
02A	AE#5	Modified TO-15	2.0 "Hg	15 psi
03A	AE#6	Modified TO-15	1.5 "Hg	15 psi
04A	AE#7	Modified TO-15	1.0 "Hg	15 psi
05A	Lab Blank	Modified TO-15	NA	NA
06A	CCV	Modified TO-15	NA	NA
07A	LCS	Modified TO-15	NA	NA
07AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Linda D. Frumarn DATE: 03/31/11

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763,
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/09, Expiration date: 06/30/11
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
URS Corporation
Workorder# 1103537

Four 1 Liter Summa Canister samples were received on March 24, 2011. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

All Quality Control Limit exceedences and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

Dilution was performed on samples AE#4, AE#6 and AE#7 due to the presence of high level non-target species.

Dilution was performed on sample AE#5 due to the presence of high level target species.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit.
UJ- Non-detected compound associated with low bias in the CCV and/or LCS.
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

Air Toxics LTD.
Laboratory Services Since 1989

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: AE#4

Lab ID#: 1103537-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	8.2	97	18	210
Ethanol	33	45	62	86
Benzene	8.2	73	26	230
Toluene	8.2	14	31	52

Client Sample ID: AE#5

Lab ID#: 1103537-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	11	90	20	170
Hexane	2.7	150	9.5	540
2-Butanone (Methyl Ethyl Ketone)	11	23	32	68
Tetrahydrofuran	2.7	3.0	8.0	8.9
Cyclohexane	2.7	12	9.3	40
2,2,4-Trimethylpentane	2.7	82	13	380
Benzene	2.7	600	8.6	1900
Heptane	2.7	16	11	65
Toluene	2.7	130	10	480
Ethyl Benzene	2.7	16	12	72
m,p-Xylene	2.7	26	12	110
o-Xylene	2.7	7.6	12	33
Styrene	2.7	2.7	12	12
Cumene	2.7	7.7	13	38
1,2,4-Trimethylbenzene	2.7	5.2	13	25

Client Sample ID: AE#6

Lab ID#: 1103537-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	34	93	64	170
Hexane	8.5	130	30	450

Air Toxics LTD.
Laboratory Services Since 1989

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: AE#6

Lab ID#: 1103537-03A

Cyclohexane	8.5	18	29	60
2,2,4-Trimethylpentane	8.5	110	40	500
Benzene	8.5	860	27	2700
Heptane	8.5	10	35	43
Toluene	8.5	98	32	370
m,p-Xylene	8.5	12	37	54

Client Sample ID: AE#7

Lab ID#: 1103537-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	17	77	32	140
Hexane	4.2	67	15	240
2-Butanone (Methyl Ethyl Ketone)	17	35	49	100
Tetrahydrofuran	4.2	4.8	12	14
Cyclohexane	4.2	20	14	70
2,2,4-Trimethylpentane	4.2	360	20	1700
Benzene	4.2	720	13	2300
Toluene	4.2	150	16	550
Ethyl Benzene	4.2	11	18	50
m,p-Xylene	4.2	16	18	69
o-Xylene	4.2	6.2	18	27

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE#4

Lab ID#: 1103537-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033014**	**Date of Collection:**	**3/19/11 4:45:00 PM**
Dil. Factor:	**16.4**	**Date of Analysis:**	**3/30/11 04:59 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	8.2	Not Detected	40	Not Detected
Freon 114	8.2	Not Detected	57	Not Detected
Chloromethane	33	Not Detected	68	Not Detected
Vinyl Chloride	8.2	Not Detected	21	Not Detected
1,3-Butadiene	8.2	97	18	210
Bromomethane	8.2	Not Detected	32	Not Detected
Chloroethane	33	Not Detected	86	Not Detected
Freon 11	8.2	Not Detected	46	Not Detected
Ethanol	33	45	62	86
Freon 113	8.2	Not Detected	63	Not Detected
1,1-Dichloroethene	8.2	Not Detected	32	Not Detected
Acetone	33	Not Detected	78	Not Detected
2-Propanol	33	Not Detected	81	Not Detected
Carbon Disulfide	33	Not Detected	100	Not Detected
3-Chloropropene	33	Not Detected	100	Not Detected
Methylene Chloride	8.2	Not Detected	28	Not Detected
Methyl tert-butyl ether	8.2	Not Detected	30	Not Detected
trans-1,2-Dichloroethene	8.2	Not Detected	32	Not Detected
Hexane	8.2	Not Detected	29	Not Detected
1,1-Dichloroethane	8.2	Not Detected	33	Not Detected
2-Butanone (Methyl Ethyl Ketone)	33	Not Detected	97	Not Detected
cis-1,2-Dichloroethene	8.2	Not Detected	32	Not Detected
Tetrahydrofuran	8.2	Not Detected	24	Not Detected
Chloroform	8.2	Not Detected	40	Not Detected
1,1,1-Trichloroethane	8.2	Not Detected	45	Not Detected
Cyclohexane	8.2	Not Detected	28	Not Detected
Carbon Tetrachloride	8.2	Not Detected	52	Not Detected
2,2,4-Trimethylpentane	8.2	Not Detected	38	Not Detected
Benzene	8.2	73	26	230
1,2-Dichloroethane	8.2	Not Detected	33	Not Detected
Heptane	8.2	Not Detected	34	Not Detected
Trichloroethene	8.2	Not Detected	44	Not Detected
1,2-Dichloropropane	8.2	Not Detected	38	Not Detected
1,4-Dioxane	33	Not Detected	120	Not Detected
Bromodichloromethane	8.2	Not Detected	55	Not Detected
cis-1,3-Dichloropropene	8.2	Not Detected	37	Not Detected
4-Methyl-2-pentanone	8.2	Not Detected	34	Not Detected
Toluene	8.2	14	31	52
trans-1,3-Dichloropropene	8.2	Not Detected	37	Not Detected
1,1,2-Trichloroethane	8.2	Not Detected	45	Not Detected
Tetrachloroethene	8.2	Not Detected	56	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE#4

Lab ID#: 1103537-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033014**	**Date of Collection:**	**3/19/11 4:45:00 PM**
Dil. Factor:	**16.4**	**Date of Analysis:**	**3/30/11 04:59 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	33	Not Detected	130	Not Detected
Dibromochloromethane	8.2	Not Detected	70	Not Detected
1,2-Dibromoethane (EDB)	8.2	Not Detected	63	Not Detected
Chlorobenzene	8.2	Not Detected	38	Not Detected
Ethyl Benzene	8.2	Not Detected	36	Not Detected
m,p-Xylene	8.2	Not Detected	36	Not Detected
o-Xylene	8.2	Not Detected	36	Not Detected
Styrene	8.2	Not Detected	35	Not Detected
Bromoform	8.2	Not Detected	85	Not Detected
Cumene	8.2	Not Detected	40	Not Detected
1,1,2,2-Tetrachloroethane	8.2	Not Detected	56	Not Detected
Propylbenzene	8.2	Not Detected	40	Not Detected
4-Ethyltoluene	8.2	Not Detected	40	Not Detected
1,3,5-Trimethylbenzene	8.2	Not Detected	40	Not Detected
1,2,4-Trimethylbenzene	8.2	Not Detected	40	Not Detected
1,3-Dichlorobenzene	8.2	Not Detected	49	Not Detected
1,4-Dichlorobenzene	8.2	Not Detected	49	Not Detected
alpha-Chlorotoluene	8.2	Not Detected	42	Not Detected
1,2-Dichlorobenzene	8.2	Not Detected	49	Not Detected
1,2,4-Trichlorobenzene	33	Not Detected	240	Not Detected
Hexachlorobutadiene	33	Not Detected	350	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	111	70-130
4-Bromofluorobenzene	84	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE#5

Lab ID#: 1103537-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033013**	**Date of Collection:**	**3/21/11 5:45:00 PM**
Dil. Factor:	**5.40**	**Date of Analysis:**	**3/30/11 04:16 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2.7	Not Detected	13	Not Detected
Freon 114	2.7	Not Detected	19	Not Detected
Chloromethane	11	Not Detected	22	Not Detected
Vinyl Chloride	2.7	Not Detected	6.9	Not Detected
1,3-Butadiene	2.7	Not Detected	6.0	Not Detected
Bromomethane	2.7	Not Detected	10	Not Detected
Chloroethane	11	Not Detected	28	Not Detected
Freon 11	2.7	Not Detected	15	Not Detected
Ethanol	11	90	20	170
Freon 113	2.7	Not Detected	21	Not Detected
1,1-Dichloroethene	2.7	Not Detected	11	Not Detected
Acetone	11	Not Detected	26	Not Detected
2-Propanol	11	Not Detected	26	Not Detected
Carbon Disulfide	11	Not Detected	34	Not Detected
3-Chloropropene	11	Not Detected	34	Not Detected
Methylene Chloride	2.7	Not Detected	9.4	Not Detected
Methyl tert-butyl ether	2.7	Not Detected	9.7	Not Detected
trans-1,2-Dichloroethene	2.7	Not Detected	11	Not Detected
Hexane	2.7	150	9.5	540
1,1-Dichloroethane	2.7	Not Detected	11	Not Detected
2-Butanone (Methyl Ethyl Ketone)	11	23	32	68
cis-1,2-Dichloroethene	2.7	Not Detected	11	Not Detected
Tetrahydrofuran	2.7	3.0	8.0	8.9
Chloroform	2.7	Not Detected	13	Not Detected
1,1,1-Trichloroethane	2.7	Not Detected	15	Not Detected
Cyclohexane	2.7	12	9.3	40
Carbon Tetrachloride	2.7	Not Detected	17	Not Detected
2,2,4-Trimethylpentane	2.7	82	13	380
Benzene	2.7	600	8.6	1900
1,2-Dichloroethane	2.7	Not Detected	11	Not Detected
Heptane	2.7	16	11	65
Trichloroethene	2.7	Not Detected	14	Not Detected
1,2-Dichloropropane	2.7	Not Detected	12	Not Detected
1,4-Dioxane	11	Not Detected	39	Not Detected
Bromodichloromethane	2.7	Not Detected	18	Not Detected
cis-1,3-Dichloropropene	2.7	Not Detected	12	Not Detected
4-Methyl-2-pentanone	2.7	Not Detected	11	Not Detected
Toluene	2.7	130	10	480
trans-1,3-Dichloropropene	2.7	Not Detected	12	Not Detected
1,1,2-Trichloroethane	2.7	Not Detected	15	Not Detected
Tetrachloroethene	2.7	Not Detected	18	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE#5

Lab ID#: 1103537-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033013**	**Date of Collection:**	**3/21/11 5:45:00 PM**
Dil. Factor:	**5.40**	**Date of Analysis:**	**3/30/11 04:16 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	11	Not Detected	44	Not Detected
Dibromochloromethane	2.7	Not Detected	23	Not Detected
1,2-Dibromoethane (EDB)	2.7	Not Detected	21	Not Detected
Chlorobenzene	2.7	Not Detected	12	Not Detected
Ethyl Benzene	2.7	16	12	72
m,p-Xylene	2.7	26	12	110
o-Xylene	2.7	7.6	12	33
Styrene	2.7	2.7	12	12
Bromoform	2.7	Not Detected	28	Not Detected
Cumene	2.7	7.7	13	38
1,1,2,2-Tetrachloroethane	2.7	Not Detected	18	Not Detected
Propylbenzene	2.7	Not Detected	13	Not Detected
4-Ethyltoluene	2.7	Not Detected	13	Not Detected
1,3,5-Trimethylbenzene	2.7	Not Detected	13	Not Detected
1,2,4-Trimethylbenzene	2.7	5.2	13	25
1,3-Dichlorobenzene	2.7	Not Detected	16	Not Detected
1,4-Dichlorobenzene	2.7	Not Detected	16	Not Detected
alpha-Chlorotoluene	2.7	Not Detected	14	Not Detected
1,2-Dichlorobenzene	2.7	Not Detected	16	Not Detected
1,2,4-Trichlorobenzene	11	Not Detected	80	Not Detected
Hexachlorobutadiene	11	Not Detected	120	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	111	70-130
4-Bromofluorobenzene	88	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE#6

Lab ID#: 1103537-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033015**	**Date of Collection:**	**3/22/11 5:05:00 PM**
Dil. Factor:	**17.0**	**Date of Analysis:**	**3/30/11 05:40 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	8.5	Not Detected	42	Not Detected
Freon 114	8.5	Not Detected	59	Not Detected
Chloromethane	34	Not Detected	70	Not Detected
Vinyl Chloride	8.5	Not Detected	22	Not Detected
1,3-Butadiene	8.5	Not Detected	19	Not Detected
Bromomethane	8.5	Not Detected	33	Not Detected
Chloroethane	34	Not Detected	90	Not Detected
Freon 11	8.5	Not Detected	48	Not Detected
Ethanol	34	93	64	170
Freon 113	8.5	Not Detected	65	Not Detected
1,1-Dichloroethene	8.5	Not Detected	34	Not Detected
Acetone	34	Not Detected	81	Not Detected
2-Propanol	34	Not Detected	84	Not Detected
Carbon Disulfide	34	Not Detected	100	Not Detected
3-Chloropropene	34	Not Detected	110	Not Detected
Methylene Chloride	8.5	Not Detected	30	Not Detected
Methyl tert-butyl ether	8.5	Not Detected	31	Not Detected
trans-1,2-Dichloroethene	8.5	Not Detected	34	Not Detected
Hexane	8.5	130	30	450
1,1-Dichloroethane	8.5	Not Detected	34	Not Detected
2-Butanone (Methyl Ethyl Ketone)	34	Not Detected	100	Not Detected
cis-1,2-Dichloroethene	8.5	Not Detected	34	Not Detected
Tetrahydrofuran	8.5	Not Detected	25	Not Detected
Chloroform	8.5	Not Detected	42	Not Detected
1,1,1-Trichloroethane	8.5	Not Detected	46	Not Detected
Cyclohexane	8.5	18	29	60
Carbon Tetrachloride	8.5	Not Detected	53	Not Detected
2,2,4-Trimethylpentane	8.5	110	40	500
Benzene	8.5	860	27	2700
1,2-Dichloroethane	8.5	Not Detected	34	Not Detected
Heptane	8.5	10	35	43
Trichloroethene	8.5	Not Detected	46	Not Detected
1,2-Dichloropropane	8.5	Not Detected	39	Not Detected
1,4-Dioxane	34	Not Detected	120	Not Detected
Bromodichloromethane	8.5	Not Detected	57	Not Detected
cis-1,3-Dichloropropene	8.5	Not Detected	38	Not Detected
4-Methyl-2-pentanone	8.5	Not Detected	35	Not Detected
Toluene	8.5	98	32	370
trans-1,3-Dichloropropene	8.5	Not Detected	38	Not Detected
1,1,2-Trichloroethane	8.5	Not Detected	46	Not Detected
Tetrachloroethene	8.5	Not Detected	58	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE#6

Lab ID#: 1103537-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033015**	**Date of Collection: 3/22/11 5:05:00 PM**	
Dil. Factor:	**17.0**	**Date of Analysis: 3/30/11 05:40 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	34	Not Detected	140	Not Detected
Dibromochloromethane	8.5	Not Detected	72	Not Detected
1,2-Dibromoethane (EDB)	8.5	Not Detected	65	Not Detected
Chlorobenzene	8.5	Not Detected	39	Not Detected
Ethyl Benzene	8.5	Not Detected	37	Not Detected
m,p-Xylene	8.5	12	37	54
o-Xylene	8.5	Not Detected	37	Not Detected
Styrene	8.5	Not Detected	36	Not Detected
Bromoform	8.5	Not Detected	88	Not Detected
Cumene	8.5	Not Detected	42	Not Detected
1,1,2,2-Tetrachloroethane	8.5	Not Detected	58	Not Detected
Propylbenzene	8.5	Not Detected	42	Not Detected
4-Ethyltoluene	8.5	Not Detected	42	Not Detected
1,3,5-Trimethylbenzene	8.5	Not Detected	42	Not Detected
1,2,4-Trimethylbenzene	8.5	Not Detected	42	Not Detected
1,3-Dichlorobenzene	8.5	Not Detected	51	Not Detected
1,4-Dichlorobenzene	8.5	Not Detected	51	Not Detected
alpha-Chlorotoluene	8.5	Not Detected	44	Not Detected
1,2-Dichlorobenzene	8.5	Not Detected	51	Not Detected
1,2,4-Trichlorobenzene	34	Not Detected	250	Not Detected
Hexachlorobutadiene	34	Not Detected	360	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	112	70-130
4-Bromofluorobenzene	86	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE#7

Lab ID#: 1103537-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033016**	**Date of Collection:**	**3/23/11 4:55:00 PM**
Dil. Factor:	**8.36**	**Date of Analysis:**	**3/30/11 06:24 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	4.2	Not Detected	21	Not Detected
Freon 114	4.2	Not Detected	29	Not Detected
Chloromethane	17	Not Detected	34	Not Detected
Vinyl Chloride	4.2	Not Detected	11	Not Detected
1,3-Butadiene	4.2	Not Detected	9.2	Not Detected
Bromomethane	4.2	Not Detected	16	Not Detected
Chloroethane	17	Not Detected	44	Not Detected
Freon 11	4.2	Not Detected	23	Not Detected
Ethanol	17	77	32	140
Freon 113	4.2	Not Detected	32	Not Detected
1,1-Dichloroethene	4.2	Not Detected	16	Not Detected
Acetone	17	Not Detected	40	Not Detected
2-Propanol	17	Not Detected	41	Not Detected
Carbon Disulfide	17	Not Detected	52	Not Detected
3-Chloropropene	17	Not Detected	52	Not Detected
Methylene Chloride	4.2	Not Detected	14	Not Detected
Methyl tert-butyl ether	4.2	Not Detected	15	Not Detected
trans-1,2-Dichloroethene	4.2	Not Detected	16	Not Detected
Hexane	4.2	67	15	240
1,1-Dichloroethane	4.2	Not Detected	17	Not Detected
2-Butanone (Methyl Ethyl Ketone)	17	35	49	100
cis-1,2-Dichloroethene	4.2	Not Detected	16	Not Detected
Tetrahydrofuran	4.2	4.8	12	14
Chloroform	4.2	Not Detected	20	Not Detected
1,1,1-Trichloroethane	4.2	Not Detected	23	Not Detected
Cyclohexane	4.2	20	14	70
Carbon Tetrachloride	4.2	Not Detected	26	Not Detected
2,2,4-Trimethylpentane	4.2	360	20	1700
Benzene	4.2	720	13	2300
1,2-Dichloroethane	4.2	Not Detected	17	Not Detected
Heptane	4.2	Not Detected	17	Not Detected
Trichloroethene	4.2	Not Detected	22	Not Detected
1,2-Dichloropropane	4.2	Not Detected	19	Not Detected
1,4-Dioxane	17	Not Detected	60	Not Detected
Bromodichloromethane	4.2	Not Detected	28	Not Detected
cis-1,3-Dichloropropene	4.2	Not Detected	19	Not Detected
4-Methyl-2-pentanone	4.2	Not Detected	17	Not Detected
Toluene	4.2	150	16	550
trans-1,3-Dichloropropene	4.2	Not Detected	19	Not Detected
1,1,2-Trichloroethane	4.2	Not Detected	23	Not Detected
Tetrachloroethene	4.2	Not Detected	28	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE#7

Lab ID#: 1103537-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033016**	**Date of Collection: 3/23/11 4:55:00 PM**	
Dil. Factor:	**8.36**	**Date of Analysis: 3/30/11 06:24 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	17	Not Detected	68	Not Detected
Dibromochloromethane	4.2	Not Detected	36	Not Detected
1,2-Dibromoethane (EDB)	4.2	Not Detected	32	Not Detected
Chlorobenzene	4.2	Not Detected	19	Not Detected
Ethyl Benzene	4.2	11	18	50
m,p-Xylene	4.2	16	18	69
o-Xylene	4.2	6.2	18	27
Styrene	4.2	Not Detected	18	Not Detected
Bromoform	4.2	Not Detected	43	Not Detected
Cumene	4.2	Not Detected	20	Not Detected
1,1,2,2-Tetrachloroethane	4.2	Not Detected	29	Not Detected
Propylbenzene	4.2	Not Detected	20	Not Detected
4-Ethyltoluene	4.2	Not Detected	20	Not Detected
1,3,5-Trimethylbenzene	4.2	Not Detected	20	Not Detected
1,2,4-Trimethylbenzene	4.2	Not Detected	20	Not Detected
1,3-Dichlorobenzene	4.2	Not Detected	25	Not Detected
1,4-Dichlorobenzene	4.2	Not Detected	25	Not Detected
alpha-Chlorotoluene	4.2	Not Detected	22	Not Detected
1,2-Dichlorobenzene	4.2	Not Detected	25	Not Detected
1,2,4-Trichlorobenzene	17	Not Detected	120	Not Detected
Hexachlorobutadiene	17	Not Detected	180	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	90	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 1103537-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033008**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 11:45 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 1103537-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033008**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 11:45 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	112	70-130
4-Bromofluorobenzene	84	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 1103537-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 09:44 AM**	

Compound	%Recovery
Freon 12	119
Freon 114	98
Chloromethane	131 Q
Vinyl Chloride	128
1,3-Butadiene	110
Bromomethane	116
Chloroethane	125
Freon 11	98
Ethanol	130
Freon 113	94
1,1-Dichloroethene	101
Acetone	118
2-Propanol	115
Carbon Disulfide	104
3-Chloropropene	108
Methylene Chloride	104
Methyl tert-butyl ether	80
trans-1,2-Dichloroethene	98
Hexane	118
1,1-Dichloroethane	103
2-Butanone (Methyl Ethyl Ketone)	103
cis-1,2-Dichloroethene	95
Tetrahydrofuran	114
Chloroform	101
1,1,1-Trichloroethane	98
Cyclohexane	100
Carbon Tetrachloride	105
2,2,4-Trimethylpentane	119
Benzene	97
1,2-Dichloroethane	102
Heptane	114
Trichloroethene	96
1,2-Dichloropropane	103
1,4-Dioxane	98
Bromodichloromethane	102
cis-1,3-Dichloropropene	98
4-Methyl-2-pentanone	120
Toluene	98
trans-1,3-Dichloropropene	100
1,1,2-Trichloroethane	98
Tetrachloroethene	96

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 1103537-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 09:44 AM**	

Compound	%Recovery
2-Hexanone	114
Dibromochloromethane	106
1,2-Dibromoethane (EDB)	102
Chlorobenzene	99
Ethyl Benzene	94
m,p-Xylene	89
o-Xylene	93
Styrene	92
Bromoform	105
Cumene	95
1,1,2,2-Tetrachloroethane	106
Propylbenzene	95
4-Ethyltoluene	91
1,3,5-Trimethylbenzene	84
1,2,4-Trimethylbenzene	84
1,3-Dichlorobenzene	86
1,4-Dichlorobenzene	85
alpha-Chlorotoluene	97
1,2-Dichlorobenzene	87
1,2,4-Trichlorobenzene	75
Hexachlorobutadiene	77

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	92	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 1103537-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033006**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 10:21 AM**	

Compound	%Recovery
Freon 12	110
Freon 114	103
Chloromethane	132 Q
Vinyl Chloride	121
1,3-Butadiene	115
Bromomethane	109
Chloroethane	120
Freon 11	102
Ethanol	124
Freon 113	97
1,1-Dichloroethene	112
Acetone	122
2-Propanol	124
Carbon Disulfide	130
3-Chloropropene	123
Methylene Chloride	104
Methyl tert-butyl ether	82
trans-1,2-Dichloroethene	114
Hexane	111
1,1-Dichloroethane	106
2-Butanone (Methyl Ethyl Ketone)	106
cis-1,2-Dichloroethene	102
Tetrahydrofuran	113
Chloroform	106
1,1,1-Trichloroethane	99
Cyclohexane	98
Carbon Tetrachloride	105
2,2,4-Trimethylpentane	112
Benzene	99
1,2-Dichloroethane	109
Heptane	112
Trichloroethene	99
1,2-Dichloropropane	106
1,4-Dioxane	99
Bromodichloromethane	108
cis-1,3-Dichloropropene	101
4-Methyl-2-pentanone	114
Toluene	98
trans-1,3-Dichloropropene	102
1,1,2-Trichloroethane	101
Tetrachloroethene	94

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 1103537-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033006**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 10:21 AM**	

Compound	%Recovery
2-Hexanone	111
Dibromochloromethane	106
1,2-Dibromoethane (EDB)	105
Chlorobenzene	100
Ethyl Benzene	95
m,p-Xylene	95
o-Xylene	96
Styrene	96
Bromoform	104
Cumene	100
1,1,2,2-Tetrachloroethane	107
Propylbenzene	103
4-Ethyltoluene	97
1,3,5-Trimethylbenzene	92
1,2,4-Trimethylbenzene	90
1,3-Dichlorobenzene	93
1,4-Dichlorobenzene	91
alpha-Chlorotoluene	97
1,2-Dichlorobenzene	92
1,2,4-Trichlorobenzene	83
Hexachlorobutadiene	83

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	95	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCSD

Lab ID#: 1103537-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033007**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 10:58 AM**	

Compound	%Recovery
Freon 12	107
Freon 114	102
Chloromethane	131 Q
Vinyl Chloride	119
1,3-Butadiene	113
Bromomethane	107
Chloroethane	119
Freon 11	100
Ethanol	120
Freon 113	94
1,1-Dichloroethene	110
Acetone	120
2-Propanol	122
Carbon Disulfide	129
3-Chloropropene	118
Methylene Chloride	103
Methyl tert-butyl ether	81
trans-1,2-Dichloroethene	111
Hexane	109
1,1-Dichloroethane	104
2-Butanone (Methyl Ethyl Ketone)	104
cis-1,2-Dichloroethene	99
Tetrahydrofuran	111
Chloroform	104
1,1,1-Trichloroethane	97
Cyclohexane	97
Carbon Tetrachloride	102
2,2,4-Trimethylpentane	109
Benzene	98
1,2-Dichloroethane	108
Heptane	112
Trichloroethene	98
1,2-Dichloropropane	106
1,4-Dioxane	100
Bromodichloromethane	108
cis-1,3-Dichloropropene	100
4-Methyl-2-pentanone	113
Toluene	97
trans-1,3-Dichloropropene	102
1,1,2-Trichloroethane	101
Tetrachloroethene	94

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCSD

Lab ID#: 1103537-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**2033007**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 10:58 AM**	

Compound	%Recovery
2-Hexanone	112
Dibromochloromethane	106
1,2-Dibromoethane (EDB)	105
Chlorobenzene	101
Ethyl Benzene	94
m,p-Xylene	92
o-Xylene	96
Styrene	92
Bromoform	104
Cumene	97
1,1,2,2-Tetrachloroethane	108
Propylbenzene	98
4-Ethyltoluene	92
1,3,5-Trimethylbenzene	88
1,2,4-Trimethylbenzene	84
1,3-Dichlorobenzene	90
1,4-Dichlorobenzene	87
alpha-Chlorotoluene	94
1,2-Dichlorobenzene	90
1,2,4-Trichlorobenzene	78
Hexachlorobutadiene	79

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	94	70-130

1103537

Shell Oil Products Chain Of Custody Record

URS

Air Toxics LTD.
Project Name: Roxana SVE Pilot
Project # 21562593.00014
Lab Vendor #

Please Check Appropriate Box:
☑ ENV. SERVICES ☐ MOTIVA RETAIL ☐ SHELL RETAIL
☐ MOTIVA SD&CM ☐ CONSULTANT ☐ LUBES
☐ SHELL PIPELINE ☐ OTHER

Print Bill To Contact Name: Steve Shroff
PO #

INCIDENT # (ENV SERVICES): 9 7 2 1 6 6 4 0
☐ CHECK IF NO INCIDENT # APPLIES
SAP #: 3 4 0 0 6 1
DATE: 03/23/11
PAGE: 1 of 1

SAMPLING COMPANY: URS CORPORATION
LOG CODE:
SITE ADDRESS: Street and City: 900 SOUTH CENTRAL AVE -- ROXANA
State: IL
GLOBAL ID NO.:
ADDRESS: 1001 HIGHLANDS PLAZA DRIVE WEST - SUITE 300; ST. LOUIS, MO 63110
EDF DELIVERABLE TO (Name, Company, Office Location): Elizabeth Kunkel, URS, St. Louis
PHONE NO.: 314-743-4179
E-MAIL: Elizabeth_Kunkel@URSCorp.com
CONSULTANT PROJECT NAME/#: Roxana SVE Pilot
Laboratory Address: Air Toxics, LTD 180 Blue Ravine Road, Suite B, Folsom, CA 95630-4719
SAMPLER NAME(S) (Print): RICH HART
TELEPHONE: 314-429-0100
FAX: 314-429-0462
Bill To Contact E-MAIL: Steven_Shroff@URSCorp.com

TURNAROUND TIME (CALENDAR DAYS):
☑ STANDARD (14 DAY) ☐ 5 DAYS ☐ 3 DAYS ☐ 2 DAYS ☐ 24 HOURS ☐ RESULTS NEEDED ON WEEKEND

☐ LA - RWQCB REPORT FORMAT ☑ UST AGENCY:

DELIVERABLES: ☐ LEVEL 1 ☑ LEVEL 2 ☐ LEVEL 3 ☑ LEVEL 4 ☐ OTHER (SPECIFY)

☑ SHELL CONTRACT RATE APPLIES
☐ STATE REIMBURSEMENT RATE APPLIES
☐ EDD NOT NEEDED
☑ RECEIPT VERIFICATION REQUESTED

REQUESTED ANALYSIS

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	Canister Number	Conister Pressure/Vacuum Initial	Final	Receipt	Final (psi)	TO-15
01A	AE #4	3/19/11	1645	3730	-29	0			X
02A	AE #5	3/21/11	1745	1362	-29	-0.5			X
03A	AE #6	3/22/11	1705	781	-29	-0.5			X
04A	AE #7	3/23/11	1655	5810	-29	0			X

Turn Around Time:
☑ Normal
☐ Rush
Specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

ADDITIONAL NOTES:
- 14 day hold time
- Report results between MDL and RL
- Level IV ECVP

Relinquished by: (Signature)	Received by: (Signature) FEDEX	Date: 3/23/11	Time: 1830
Relinquished by: (Signature)	Received by: (Signature) B. Wuttke AIC 3/24/11 0900	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

05/2/06 Revision

CUSTODY SEAL INTACT? Y N NONE ITEM N/A
Fedex

Roxana SVE Pilot Data Review

Laboratory SDG: 1103591

Data Reviewer: Elizabeth Kunkel

Peer Reviewer: Tony Sedlacek

Date Reviewed: 5/13/2011

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008

Sample Identification
AE #8

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated that sample AE #8 was diluted due to high levels of target analytes. Although not indicated in the laboratory case narrative, TO-15 LCSD and CCV recoveries were outside evaluation criteria for chloromethane. These issues are addressed further in the appropriate sections below.

The cooler receipt form did not indicate any problems.

3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks?

No

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

No

LCS/LCSD ID	Parameter	Analyte	LCS/LCSD Recovery	RPD	LCS/LCSD/ RPD Criteria
1103591-04A/AA	TO-15	Chloromethane	130/**135**	4	70-130/25

Analytical data which were reported as non-detect and associated with the LCSD recovery above evaluation criteria, indicating a possible high bias, did not require qualification. Chloromethane was non-detect in samples associated with LCSD recovery above evaluation criteria; therefore, no qualification of data was required.

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples collected as part of this SDG?

MS/MSD samples are not applicable for vapor samples, due to the inability to spike the samples.

8.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

9.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

No

10.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Not applicable; analytes were detected in samples that were diluted.

11.0 Additional Qualifications

Were additional qualifications applied?

No, however, the CCV recovery listed in the table below was above evaluation criteria.

CCV ID	Parameter	Analyte	CCV Recovery	CCV Criteria
1103537-06A	TO-15	Chloromethane	**143**	70-130

Analytical data which were reported as non-detect and associated with CCV recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. Chloromethane was non-detect in samples associated with CCV recoveries above evaluation criteria; therefore, no qualification of data was required.

Air Toxics LTD.
Laboratory Services Since 1989

4/1/2011
Mr. Steve Shroff
URS Corporation
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana SVE Pilot
Project #: 21562593.00014
Workorder #: 1103591

Dear Mr. Steve Shroff

The following report includes the data for the above referenced project for sample(s) received on 3/26/2011 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Jacquelyn Luta at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Jacquelyn Luta

Project Manager

Air Toxics LTD.
Laboratory Services Since 1989

WORK ORDER #: 1103591

Work Order Summary

CLIENT:	Mr. Steve Shroff URS Corporation 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin URS Corporation P.O. BOX 203970 Austin, TX 78720-1088
PHONE:	314-429-0100	**P.O. #**	
FAX:		**PROJECT #**	21562593.00014 Roxana SVE Pilot
DATE RECEIVED:	03/26/2011	**CONTACT:**	Jacquelyn Luta
DATE COMPLETED:	03/31/2011		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AE#8	Modified TO-15	0.2psi	15 psi
02A	Lab Blank	Modified TO-15	NA	NA
03A	CCV	Modified TO-15	NA	NA
04A	LCS	Modified TO-15	NA	NA
04AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Linda D. Frumarn DATE: 04/01/11

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763,
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/09, Expiration date: 06/30/11
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
URS Corporation
Workorder# 1103591

One 1 Liter Summa Canister sample was received on March 28, 2011. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

A dilution was performed on sample AE#8 due to the presence of high level target species.

All Quality Control Limit exceedences and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit.
UJ- Non-detected compound associated with low bias in the CCV and/or LCS.
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

Air Toxics LTD.
Laboratory Services Since 1989

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: AE#8

Lab ID#: 1103591-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	2.0	190	4.4	430
Ethanol	8.0	100	15	190
Acetone	8.0	290	19	690
2-Propanol	8.0	9.3	20	23
Hexane	2.0	29	7.0	100
2-Butanone (Methyl Ethyl Ketone)	8.0	43	23	130
Tetrahydrofuran	2.0	72	5.9	210
Cyclohexane	2.0	6.4	6.8	22
2,2,4-Trimethylpentane	2.0	11	9.3	50
Benzene	2.0	580	6.4	1800
Heptane	2.0	11	8.2	45
4-Methyl-2-pentanone	2.0	2.3	8.2	9.4
Toluene	2.0	170	7.5	630
Ethyl Benzene	2.0	29	8.6	120
m,p-Xylene	2.0	35	8.6	150
o-Xylene	2.0	10	8.6	45
Styrene	2.0	12	8.5	51
4-Ethyltoluene	2.0	4.9	9.8	24
1,2,4-Trimethylbenzene	2.0	2.4	9.8	12

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE#8

Lab ID#: 1103591-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3033016**	**Date of Collection:**	**3/24/11 3:15:00 PM**
Dil. Factor:	**3.98**	**Date of Analysis:**	**3/30/11 04:17 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2.0	Not Detected	9.8	Not Detected
Freon 114	2.0	Not Detected	14	Not Detected
Chloromethane	8.0	Not Detected	16	Not Detected
Vinyl Chloride	2.0	Not Detected	5.1	Not Detected
1,3-Butadiene	2.0	190	4.4	430
Bromomethane	2.0	Not Detected	7.7	Not Detected
Chloroethane	8.0	Not Detected	21	Not Detected
Freon 11	2.0	Not Detected	11	Not Detected
Ethanol	8.0	100	15	190
Freon 113	2.0	Not Detected	15	Not Detected
1,1-Dichloroethene	2.0	Not Detected	7.9	Not Detected
Acetone	8.0	290	19	690
2-Propanol	8.0	9.3	20	23
Carbon Disulfide	8.0	Not Detected	25	Not Detected
3-Chloropropene	8.0	Not Detected	25	Not Detected
Methylene Chloride	2.0	Not Detected	6.9	Not Detected
Methyl tert-butyl ether	2.0	Not Detected	7.2	Not Detected
trans-1,2-Dichloroethene	2.0	Not Detected	7.9	Not Detected
Hexane	2.0	29	7.0	100
1,1-Dichloroethane	2.0	Not Detected	8.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	8.0	43	23	130
cis-1,2-Dichloroethene	2.0	Not Detected	7.9	Not Detected
Tetrahydrofuran	2.0	72	5.9	210
Chloroform	2.0	Not Detected	9.7	Not Detected
1,1,1-Trichloroethane	2.0	Not Detected	11	Not Detected
Cyclohexane	2.0	6.4	6.8	22
Carbon Tetrachloride	2.0	Not Detected	12	Not Detected
2,2,4-Trimethylpentane	2.0	11	9.3	50
Benzene	2.0	580	6.4	1800
1,2-Dichloroethane	2.0	Not Detected	8.0	Not Detected
Heptane	2.0	11	8.2	45
Trichloroethene	2.0	Not Detected	11	Not Detected
1,2-Dichloropropane	2.0	Not Detected	9.2	Not Detected
1,4-Dioxane	8.0	Not Detected	29	Not Detected
Bromodichloromethane	2.0	Not Detected	13	Not Detected
cis-1,3-Dichloropropene	2.0	Not Detected	9.0	Not Detected
4-Methyl-2-pentanone	2.0	2.3	8.2	9.4
Toluene	2.0	170	7.5	630
trans-1,3-Dichloropropene	2.0	Not Detected	9.0	Not Detected
1,1,2-Trichloroethane	2.0	Not Detected	11	Not Detected
Tetrachloroethene	2.0	Not Detected	13	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: AE#8

Lab ID#: 1103591-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3033016**	**Date of Collection:**	**3/24/11 3:15:00 PM**
Dil. Factor:	**3.98**	**Date of Analysis:**	**3/30/11 04:17 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	8.0	Not Detected	33	Not Detected
Dibromochloromethane	2.0	Not Detected	17	Not Detected
1,2-Dibromoethane (EDB)	2.0	Not Detected	15	Not Detected
Chlorobenzene	2.0	Not Detected	9.2	Not Detected
Ethyl Benzene	2.0	29	8.6	120
m,p-Xylene	2.0	35	8.6	150
o-Xylene	2.0	10	8.6	45
Styrene	2.0	12	8.5	51
Bromoform	2.0	Not Detected	20	Not Detected
Cumene	2.0	Not Detected	9.8	Not Detected
1,1,2,2-Tetrachloroethane	2.0	Not Detected	14	Not Detected
Propylbenzene	2.0	Not Detected	9.8	Not Detected
4-Ethyltoluene	2.0	4.9	9.8	24
1,3,5-Trimethylbenzene	2.0	Not Detected	9.8	Not Detected
1,2,4-Trimethylbenzene	2.0	2.4	9.8	12
1,3-Dichlorobenzene	2.0	Not Detected	12	Not Detected
1,4-Dichlorobenzene	2.0	Not Detected	12	Not Detected
alpha-Chlorotoluene	2.0	Not Detected	10	Not Detected
1,2-Dichlorobenzene	2.0	Not Detected	12	Not Detected
1,2,4-Trichlorobenzene	8.0	Not Detected	59	Not Detected
Hexachlorobutadiene	8.0	Not Detected	85	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	104	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 1103591-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3033013**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 02:08 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: Lab Blank

Lab ID#: 1103591-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3033013**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 02:08 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	104	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 1103591-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3033004**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 09:39 AM**	

Compound	%Recovery
Freon 12	97
Freon 114	98
Chloromethane	143 Q
Vinyl Chloride	111
1,3-Butadiene	98
Bromomethane	97
Chloroethane	105
Freon 11	96
Ethanol	99
Freon 113	92
1,1-Dichloroethene	97
Acetone	99
2-Propanol	94
Carbon Disulfide	98
3-Chloropropene	98
Methylene Chloride	99
Methyl tert-butyl ether	87
trans-1,2-Dichloroethene	95
Hexane	97
1,1-Dichloroethane	97
2-Butanone (Methyl Ethyl Ketone)	95
cis-1,2-Dichloroethene	93
Tetrahydrofuran	98
Chloroform	96
1,1,1-Trichloroethane	88
Cyclohexane	94
Carbon Tetrachloride	96
2,2,4-Trimethylpentane	94
Benzene	96
1,2-Dichloroethane	93
Heptane	94
Trichloroethene	91
1,2-Dichloropropane	90
1,4-Dioxane	92
Bromodichloromethane	93
cis-1,3-Dichloropropene	89
4-Methyl-2-pentanone	87
Toluene	94
trans-1,3-Dichloropropene	96
1,1,2-Trichloroethane	97
Tetrachloroethene	98

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: CCV

Lab ID#: 1103591-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3033004**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 09:39 AM**	

Compound	%Recovery
2-Hexanone	102
Dibromochloromethane	97
1,2-Dibromoethane (EDB)	98
Chlorobenzene	97
Ethyl Benzene	97
m,p-Xylene	95
o-Xylene	93
Styrene	98
Bromoform	93
Cumene	100
1,1,2,2-Tetrachloroethane	93
Propylbenzene	97
4-Ethyltoluene	98
1,3,5-Trimethylbenzene	100
1,2,4-Trimethylbenzene	98
1,3-Dichlorobenzene	93
1,4-Dichlorobenzene	98
alpha-Chlorotoluene	84
1,2-Dichlorobenzene	96
1,2,4-Trichlorobenzene	92
Hexachlorobutadiene	87

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	102	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 1103591-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3033005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 10:15 AM**	

Compound	%Recovery
Freon 12	95
Freon 114	92
Chloromethane	130
Vinyl Chloride	119
1,3-Butadiene	92
Bromomethane	91
Chloroethane	99
Freon 11	89
Ethanol	90
Freon 113	86
1,1-Dichloroethene	97
Acetone	90
2-Propanol	89
Carbon Disulfide	114
3-Chloropropene	105
Methylene Chloride	93
Methyl tert-butyl ether	85
trans-1,2-Dichloroethene	101
Hexane	91
1,1-Dichloroethane	93
2-Butanone (Methyl Ethyl Ketone)	89
cis-1,2-Dichloroethene	89
Tetrahydrofuran	89
Chloroform	92
1,1,1-Trichloroethane	84
Cyclohexane	88
Carbon Tetrachloride	90
2,2,4-Trimethylpentane	87
Benzene	89
1,2-Dichloroethane	86
Heptane	86
Trichloroethene	86
1,2-Dichloropropane	87
1,4-Dioxane	83
Bromodichloromethane	87
cis-1,3-Dichloropropene	85
4-Methyl-2-pentanone	80
Toluene	84
trans-1,3-Dichloropropene	92
1,1,2-Trichloroethane	91
Tetrachloroethene	89

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCS

Lab ID#: 1103591-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3033005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 10:15 AM**	

Compound	%Recovery
2-Hexanone	90
Dibromochloromethane	90
1,2-Dibromoethane (EDB)	92
Chlorobenzene	92
Ethyl Benzene	90
m,p-Xylene	91
o-Xylene	86
Styrene	92
Bromoform	88
Cumene	94
1,1,2,2-Tetrachloroethane	87
Propylbenzene	91
4-Ethyltoluene	86
1,3,5-Trimethylbenzene	93
1,2,4-Trimethylbenzene	89
1,3-Dichlorobenzene	88
1,4-Dichlorobenzene	91
alpha-Chlorotoluene	79
1,2-Dichlorobenzene	88
1,2,4-Trichlorobenzene	83
Hexachlorobutadiene	77

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	100	70-130

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCSD

Lab ID#: 1103591-04AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3033006**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 10:33 AM**	

Compound	%Recovery
Freon 12	102
Freon 114	98
Chloromethane	135 Q
Vinyl Chloride	110
1,3-Butadiene	95
Bromomethane	95
Chloroethane	107
Freon 11	94
Ethanol	95
Freon 113	95
1,1-Dichloroethene	102
Acetone	96
2-Propanol	94
Carbon Disulfide	118
3-Chloropropene	110
Methylene Chloride	96
Methyl tert-butyl ether	90
trans-1,2-Dichloroethene	103
Hexane	96
1,1-Dichloroethane	96
2-Butanone (Methyl Ethyl Ketone)	93
cis-1,2-Dichloroethene	92
Tetrahydrofuran	93
Chloroform	95
1,1,1-Trichloroethane	89
Cyclohexane	94
Carbon Tetrachloride	98
2,2,4-Trimethylpentane	97
Benzene	91
1,2-Dichloroethane	86
Heptane	86
Trichloroethene	88
1,2-Dichloropropane	87
1,4-Dioxane	85
Bromodichloromethane	88
cis-1,3-Dichloropropene	85
4-Methyl-2-pentanone	82
Toluene	88
trans-1,3-Dichloropropene	88
1,1,2-Trichloroethane	91
Tetrachloroethene	89

Air Toxics LTD.
Laboratory Services Since 1989

Client Sample ID: LCSD

Lab ID#: 1103591-04AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3033006**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/30/11 10:33 AM**	

Compound	%Recovery
2-Hexanone	92
Dibromochloromethane	93
1,2-Dibromoethane (EDB)	91
Chlorobenzene	91
Ethyl Benzene	93
m,p-Xylene	92
o-Xylene	90
Styrene	93
Bromoform	85
Cumene	98
1,1,2,2-Tetrachloroethane	91
Propylbenzene	95
4-Ethyltoluene	89
1,3,5-Trimethylbenzene	97
1,2,4-Trimethylbenzene	92
1,3-Dichlorobenzene	91
1,4-Dichlorobenzene	95
alpha-Chlorotoluene	80
1,2-Dichlorobenzene	93
1,2,4-Trichlorobenzene	90
Hexachlorobutadiene	81

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	106	70-130

1103591

Shell Oil Products Chain Of Custody Record

URS

Air Toxics LTD.
Project Name: Roxana SVE Pilot
Project # 21562593.00014
Lab Vendor #

Please Check Appropriate Box:
☑ ENV. SERVICES ☐ MOTIVA RETAIL ☐ SHELL RETAIL
☐ MOTIVA SD&CM ☐ CONSULTANT ☐ LUBES
☐ SHELL PIPELINE ☐ OTHER

Print Bill To Contact Name: Steve Shroff
PO #

INCIDENT # (ENV SERVICES): 9 7 2 1 6 6 4 0
☐ CHECK IF NO INCIDENT # APPLIES
SAP #: 3 4 0 0 6 1
DATE: 03/25/11
PAGE: 1 of 1

SAMPLING COMPANY: URS CORPORATION
LOG CODE:
SITE ADDRESS: Street and City: 900 SOUTH CENTRAL AVE -- ROXANA
State: IL
GLOBAL ID NO.:
ADDRESS: 1001 HIGHLANDS PLAZA DRIVE WEST - SUITE 300; ST. LOUIS, MO 63110
EDF DELIVERABLE TO (Name, Company, Office Location): Elizabeth Kunkel, URS, St. Louis
PHONE NO.: 314-743-4179
E-MAIL: Elizabeth.Kunkel@URSCorp.com
CONSULTANT PROJECT NAME#: Roxana SVE Pilot
Laboratory Address: Air Toxics, LTD 180 Blue Ravine Road, Suite B, Folsom, CA 95630-4719
SAMPLER NAME(S) (Print): RICH HART
TELEPHONE: 314-429-0100
FAX: 314-429-0462
Bill To Contact E-MAIL: Steven.Shroff@URSCorp.com

TURNAROUND TIME (CALENDAR DAYS):
☑ STANDARD (14 DAY) ☐ 5 DAYS ☐ 3 DAYS ☐ 2 DAYS ☐ 24 HOURS ☐ RESULTS NEEDED ON WEEKEND

☐ LA - RWQCB REPORT FORMAT ☑ UST AGENCY:

DELIVERABLES: ☐ LEVEL 1 ☑ LEVEL 2 ☐ LEVEL 3 ☑ LEVEL 4 ☐ OTHER (SPECIFY)

☑ SHELL CONTRACT RATE APPLIES
☐ STATE REIMBURSEMENT RATE APPLIES
☐ EDD NOT NEEDED
☑ RECEIPT VERIFICATION REQUESTED

REQUESTED ANALYSIS

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	Canister Number	Conister Pressure/Vacuum Initial	Final	Receipt	Final (psi)	TO-15
CA	AE #8	3/24/11	1515	3667	-29	0			X

Turn Around Time:
☑ Normal
☐ Rush
Specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

ADDITIONAL NOTES:
- 14 day hold time
- Report results between MDL and RL
- Level IV ECVP

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
	FEDEX	3/25/11	1300
	B. Whittaker ATC	3/26/11	0925

CUSTODY SEAL INTACT? N/A

Fedex

05/2006 Revision