



January 9, 2014

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

**Subject: SVE System Construction Completion Report Addendum No. 2
Equilon Enterprises LLC d/b/a Shell Oil Products US
Roxana, Illinois
1191150002 -- Madison County
ILD 080 012 305
Log No. B-43R**

Dear Mr. Nightingale:

URS Corporation (URS), on behalf of Shell Oil Products US (SOPUS), is submitting the enclosed SVE System Construction Completion Report (CCR) Addendum No. 2. This CCR documents the northern extension of the West Fenceline portion of the SVE system.

If you have any questions concerning this report, please contact Kevin Dyer, SOPUS Principal Program Manager at (618) 288-7237 or kevin.dyer@shell.com or me at (314) 743-4108 or bob.billman@urs.com.

Sincerely,
URS Corporation, on behalf of Shell Oil Products US

Robert B. Billman
Senior Project Manager

Nick Eldred
Senior Project Manager

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

Cc: Kevin Dyer, SOPUS
Eric Petersen, Phillips 66
Repository – Roxana Public Library
Gina Search, IEPA-Collinsville
Project File



Illinois Environmental Protection Agency

Bureau of Land • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

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
 Mail Address _____
 City _____
 State _____ Zip Code _____
 Contact Name _____
 Contact Title _____
 Phone _____

3.0 Operator Information

Name Equilon Enterprises LLC d/b/a Shell Oil Products US
 Mail Address 17 Junction Drive, PMB #399
 City Glen Carbon
 State IL Zip Code 62034
 Contact Name Kevin Dyer
 Contact Title Principal Program Manager
 Phone 618-288-7237

4.0 Type of Submission (check applicable item and provide requested information, as applicable)

- RFI Phase I Workplan/Report IEPA Permit Log No. B-43R
 RFI Phase II Workplan/Report Date of Last IEPA Letter on Project July 22, 2013
 CMP Report; Log No. of Last IEPA Letter on Project B-43R-CA-51
 Other (describe): SVE System CCR Addendum No. 2-SVE System Extension Does this submittal include groundwater information: Yes No
 Date of Submittal 1-9-14

5.0 Description of Submittal: (briefly describe what is being submitted and its purpose)

Construction Completion Report Addendum for a Soil Vapor Extraction System Extension constructed within the Wood River Refinery

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

Cover Letter, RCRA Corrective Action Certification, and SVE System Construction Completion Report Addendum

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.

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

Date of Submission: 1-9-14

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 Edger* Date: 12/23/13
 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.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44 (h))

Professional's Signature: *Steven P. Tierney* Date: 12/19/2013

Professional's Name Steven P. Tierney

Address URS Corporation / 345 East Ash Avenue

City Decatur

State IL Zip Code 62704

Phone 217-875-4800

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 _____

Date: _____

Signature of Laboratory Responsible Officer

Mailing Address of Laboratory

Address _____

City _____

State _____ Zip Code _____

Name and Title of Laboratory Responsible Officer

R E P O R T

SVE SYSTEM CONSTRUCTION
COMPLETION REPORT
ADDENDUM NO. 2 – SVE
SYSTEM EXTENSION

Located at:

WRB REFINING LP
WOOD RIVER REFINERY
ROXANA, ILLINOIS

Prepared for
Shell Oil Products US
17 Junction Drive
PMB#39
Glen Carbon, IL 62034

January 2014



URS Corporation
1001 Highland Plaza Drive West, Suite 300
St. Louis, MO 63110
(314) 429-0100
Project # 21562850.18000

TABLE OF CONTENTS

1.0	INTRODUCTION	1-1
1.1	SITE BACKGROUND	1-1
1.2	SOIL VAPOR EXTRACTION.....	1-2
2.0	TECHNICAL SPECIFICATIONS.....	2-1
3.0	DEVIATIONS FROM CONCEPTUAL DESIGN... ..	3-1
4.0	DESCRIPTION OF CONSTRUCTION ACTIVITIES.....	4-1
4.1	SVE WELL INSTALLATION ACTIVITIES.....	4-1
4.1.1	Pre-field Activities and Borehole Clearance.....	4-1
4.1.2	Drilling and Soil Sampling.....	4-1
4.1.3	SVE Well Installation	4-2
4.1.4	Sample Handling, Laboratory Testing and Results.....	4-2
4.1.5	Investigation Derived Waste.....	4-3
4.2	INSTALLATION OF SVE SYSTEM EXTENSION PIPING.....	4-3
5.0	DETAILED AS-BUILT DRAWINGS	5-1
6.0	QUALITY ASSURANCE/QUALITY CONTROL.....	6-1
7.0	CONCLUSIONS	7-1
8.0	REFERENCES	8-1

List of Tables

Table 1	SVE Well Construction
Table 2	SVE Extension: Summary of Analytes Detected

List of Figures

Figure 1	Site Location Map
Figure 2	Soil Vapor Extraction System Overall Plan
Figure 2A	Soil Vapor Extraction System

List of Appendices

Appendix A	Conceptual Design Drawings
Appendix B	Soil Boring Logs and SVE Well Installation Details
Appendix C	Transect Locations and Details
Appendix D	Data Review Sheets and Laboratory Analytical Reports
Appendix E	Contractor QA/QC Documentation and Test Results
Appendix F	As-built Drawing
Appendix G	Construction Photographs

At the request of Shell Oil Products US (SOPUS), URS Corporation (URS) designed and constructed an extension of the Soil Vapor Extraction (SVE) system (System) previously constructed along the west boundary (West Fenceline) of the Wood River Refinery (WRR) North Property, in the Village of Roxana, Illinois (Village) and within the Village Public Works (PW) Yard. The West Fenceline portion of the System was installed between March 2011 and January 2012, as presented in the May 2012 *SVE System Construction Completion Report* (CCR). After an access agreement was executed between SOPUS and the Village on October 5, 2012, the PW Yard portion of the System was installed in October and November 2012, as presented in the February 14, 2013 *SVE System Construction Completion Report Addendum*. This report documents an extension of the West Fenceline portion of the system to the north. The purpose of this Construction Completion Report (CCR) Addendum (Addendum No. 2) is to provide information regarding System layout and construction activities for the SVE System Extension. This addendum was formatted in a consistent manner with the previous CCR addendum.

1.1 SITE BACKGROUND

The WRR is composed of five areas, including the North Property, which contains storage tanks and most of the current and past waste management areas. Located in the Village at 900 South Central Avenue, WRR was operated by Shell Oil Company and subsequent owners until ownership changed to ConocoPhillips (COP) effective June 1, 2000. WRB Refining LLC, formed January 1, 2007, was a 50/50 joint venture between COP and EnCana US Refineries, LLC. On December 31, 2010, WRB Refining LLC was converted into a limited partnership named WRB Refining LP (WRB) with limited partners COP and Cenovus US Refinery Holdings. ConocoPhillips Company announced the separation of their Refining and Marketing business from their Exploration & Production business on July 14, 2011. The separation included an ownership change as well as a name change that became effective May 1, 2012. Phillips 66 (P66) is now the operator of WRR. Equilon Enterprises LLC (d/b/a Shell Oil Products US (SOPUS)) is working with the assistance of P66 on several environmental projects and programs.

Subsurface investigations have been conducted within the area generally bounded by Illinois Route 111 to the west, the West Fenceline to the east, East 1st Street to the north, and Rand Avenue to the south and within the WRR along the West Fenceline (**Figure 1**). This area will be referred to as the “Site.”

The previously constructed SVE System area is located on the North Property, along the West Fenceline, between Second and Eighth Streets in the Village and on the Village Public Works

property south of Eighth Street (**Figure 2**). The construction area for the SVE System Extension is presented on **Figure 2A**.

1.2 SOIL VAPOR EXTRACTION

On behalf of SOPUS, URS designed and installed an SVE System to address vapor detected in the Village. The SVE System final design was submitted to IEPA in the June 2011 *Conceptual/Final Design Report*, which included background information, remedial objectives, and a conceptual approach to meet the remedial objectives. A *Joint Construction and Operating Permit* was issued by IEPA on July 14, 2011 for construction and operation of the SVE System. SOPUS submitted the *SVE System Construction Completion Report* for the West Fenceline portion of the System in May 2012 and the *SVE System Construction Completion Report Addendum* for the PW Yard portion of the SVE System in February 2013. Operation of the West Fenceline and the PW Yard portions of the SVE System commenced on January 31, 2012 and December 3, 2012, respectively. SVE System operation and monitoring activities are documented in quarterly Soil Vapor Sampling and SVE Monitoring Reports.

Based on the results of soil vapor sampling documented in the quarterly reports, in August 2013, SOPUS decided to extend the West Fenceline portion of the system to the north to address soil vapor in and around VMP-47.

As stated above, this CCR Addendum describes the construction activities associated with installation of the SVE System Extension.

Conceptual design drawings used for construction and installation of the SVE System Extension are provided in **Appendix A**.

The SVE System Extension consists of five SVE wells located along the West Fenceline of the WRR North Property (**Figure 2**). The wells were installed on approximately 120-foot spacing based on a design radius of influence (ROI) of 60 feet, which is consistent with the ROI used for design of the West Fenceline portion of the SVE System as documented in the *Conceptual/Final Design Report*. During pre-design investigation activities, which included advancing soil borings for vapor monitoring point (VMP) installation (VMP-57 through VMP-61), the greatest concentrations of soil vapors were observed close to the water table and significant shallow soil impacts were not observed; therefore, the five new SVE wells were screened closer to the water table. Pre-design investigation activities were documented in the *Soil Vapor Sampling and SVE Monitoring Report – 3rd Quarter 2013*, dated October 31, 2013. SVE well construction details are summarized in **Table 1**. Soil boring logs and well installation details for VMP-57 through VMP-61 and SVE-37 through SVE-41 are provided **Appendix B**.

The five SVE System Extension wells (SVE-37, SVE-38, SVE-39, SVE-40, and SVE-41) are an extension of the previously installed “red line” (**Figure 2 and Figure 2A**). The existing “red line” wells are interconnected by 4-inch diameter carbon steel piping. Aboveground piping for SVE-37, which was completed above grade, connects to the aboveground “red line” header between existing wells SVE-5 and SVE-6. Wells SVE-38 through SVE-41, which were completed in below grade vaults, are interconnected by underground piping that connects to the “red line” header above grade near well SVE-5. Three flanged Tee connections were installed on the underground piping to facilitate the potential future connection of additional SVE wells, if needed (Figure 2A).

The SVE System Extension wells are connected via the “red line” to a vapor/liquid separator (VLS) and a rotary lobe positive displacement blower housed within a customized intermodal freight container (conex). Piping from the “red line” SVE wells feeds into the conex, where vapor moves through the VLS, before traveling through the blower and a baffle connected to a Regenerative Thermal Oxidizer (RTO). A second blower, located on the RTO side of the baffle, pushes the vapor into the RTO and adds fresh air to dilute the vapor stream as necessary.

URS contracted Widman Construction, Inc. (Widman) of Godfrey, Illinois to conduct excavation of exploratory trenches in the SVE System Extension area to assess the presence of underground utilities or other underground obstructions that could potentially interfere with construction. Widman conducted hydro-excavation of eight exploratory transect trenches along the West Fenceline between August 21 and September 12, 2013 in the SVE System Extension area. Several underground pipes were observed during trenching. The SVE System Extension well

and underground conveyance piping locations were designed to minimize the potential for encountering these observed underground obstructions during construction. Transect locations and details are provided in **Appendix C**.

Excavated soils were placed in labeled and covered roll-off boxes and managed by URS on behalf of SOPUS. P66 personnel coordinated the transportation and disposal of the solid waste at a properly licensed disposal facility.

There were no deviations from the drawings provided in **Appendix A**.

Construction of the SVE System Extension consisted of the installation of five SVE wells, carbon steel piping, one aboveground stainless steel well enclosure (SVE-37) and four galvanized steel vaults (SVE-38 through SVE-41) along the west fenceline.

URS contracted Roberts Environmental Drilling, Inc. (REDI) of Millstadt, Illinois to install the SVE wells. Gross Mechanical Contractors, Inc. (Gross), of St. Louis, Missouri, was contracted by URS to conduct installation of the piping, aboveground well enclosure, and well vaults. Gross contracted with Widman to perform excavation, backfilling and paving work.

4.1 SVE WELL INSTALLATION ACTIVITIES

SVE System Extension wells SVE-37 through SVE-41 were installed in September 2013. The following subsections provide a brief description of the well installation activities that were performed. SVE well locations are shown on **Figures 2 and 2A**.

4.1.1 Pre-field Activities and Borehole Clearance

Prior to the start of work, the well locations were marked in the field with spray paint. A utility locate was arranged using Illinois' Joint Utility Locating Information for Excavators (JULIE) service. While JULIE provided identification of public utility lines, REDI was contracted to perform private utility locating services using ground penetrating radar (GPR) and electromagnetic (EM) technologies at each location.

Borehole clearance via an air-vacuum system (air-knife) operated by REDI was then used to clear each boring location to a depth of 10 feet with respect to underground utility lines or other obstructions.

Subsurface material observations were made during borehole clearance activities by advancing a hand auger prior to air-knifing to collect grab samples for field-screening and soil classification. An iterative process was used. A soil sample was collected via hand auger, the air knife was used to advance the borehole approximately one foot, and then these steps were repeated to a depth of 10 feet. Observations were noted on the soil boring logs (**Appendix B**).

4.1.2 Drilling and Soil Sampling

All drilling, sampling and well installation activities were performed by REDI. With the exception of SVE-37, drilling and soil sampling was performed with a CME-75 drill rig using 6.25-inch inside diameter (ID) hollow stem augers and split spoon samplers. SVE-37 was completed utilizing a Geoprobe DT-8040 drill rig due to the presence of surface obstructions and limited workspace. For wells SVE-38 through SVE-41, soil sampling was conducted via a split spoon sampler advanced in two-foot increments just below the lead auger. In well SVE-37, soil samples were collected utilizing a 5-foot long acetate liner driven by direct push means, prior to

being over drilled with 6.25-inch ID hollow stem augers. The subsurface stratigraphy was continuously logged by a qualified field scientist in accordance with applicable ASTM standards and the Unified Soil Classification System (USCS). The field scientist noted soil attributes such as color, particle size, consistency, moisture content, structure, plasticity, odor (if obvious), and organic content (if visible). Soil samples were screened in the field using a photoionization detector (PID) and flame ionization detector (FID). Observations were noted on the soil boring logs (**Appendix B**). All soil borings were completed to pre-determined depths ranging from 30-36 feet below ground surface (bgs).

One discrete soil sample was collected for laboratory analysis from the each boring from a depth within the screened interval of each SVE well.

4.1.3 SVE Well Installation

Upon completion of soil sample collection, an SVE well was installed through the augers. The well was constructed using a 4-inch diameter Schedule 40 PVC casing, with a 10-foot section of 0.010-inch slotted PVC well screen. The well screens were set from 25 to 35 feet bgs in wells SVE-37 through SVE-40 and from 20 to 30 feet bgs in well SVE-41, close to the depth to groundwater observed during drilling at each location. The sand pack of each well consisted of silica filter sand placed within the annular space and extended to approximately 2 feet above the top of the well screen. A bentonite seal approximately 2 feet thick was placed above the sand pack. The borehole annulus was then grouted to approximately 4 feet bgs with cement-bentonite grout. SVE well SVE-37 was completed above ground and connected to the existing aboveground SVE system piping. Wells SVE-38 through SVE-41 were completed in below grade vaults and connected to an extension of the existing “red line” SVE header. A summary of well construction details is provided in **Table 1** and well construction diagrams for each well are provided in **Appendix B**.

4.1.4 Sample Handling, Laboratory Testing and Results

Soil samples were collected in laboratory-supplied containers appropriate for the test method and labeled in the field. Pertinent sample information was recorded on the chain of custody (COC) form at the time of sample collection. The COCs can be found with the analytical report in **Appendix D**.

Upon collection and labeling, sample containers were immediately placed inside an iced cooler, packed in such a way as to prevent breakage and maintain an inside temperature at or below 4°C. The samples were then delivered via overnight courier, under the proper COC documentation, to the laboratory for analysis.

A total of 7 soil (5 investigative soil samples, 1 field duplicate soil sample, 1 soil matrix spike and matrix spike duplicate (MS/MSD)), 1 aqueous field equipment blank, and four aqueous VOC trip blank sets were prepared and sent to Accutest Laboratories in Marlborough, Massachusetts. Samples were submitted for the following analysis:

- Method 8260B VOCs
- Method 8011 VOCs
- Method 8270 SVOCs
- Method 8270C SIM – Low Level PAHs
- Method 8015 TPH-GRO

Up to the top 15 tentatively identified compounds (TICs)¹ were also identified with the Method 8260B VOC analysis.

The soil sample collected from SVE-41 and corresponding equipment blank were not analyzed because the sample cooler was delayed in transit and arrived at the laboratory out of temperature range.

A tabular summary of the analytical detections for the soil samples collected during SVE well installation activities is presented in **Table 2. Appendix D** contains URS Data Reviews and the laboratory reports with chain of custody forms for the soil data.

4.1.5 Investigation Derived Waste

Investigation derived waste (IDW), including soil cuttings, personal protective equipment (PPE) and expendable materials, and decontamination and development water were collected and disposed of properly. Expendable materials (e.g., disposable sampling equipment such as gloves) having a low probability of impact were collected in trash bags and disposed of as municipal waste. Soil cuttings from the borings were collected and placed directly in a labeled and covered roll-off and managed by URS on behalf of SOPUS. P66 personnel coordinated the transportation and disposal of the solid IDW at a properly licensed disposal facility. Decontamination water was collected and disposed of at a designated WRR sewer inlet for treatment with other wastewater generated at the WRR.

4.2 INSTALLATION OF SVE SYSTEM EXTENSION PIPING

Construction field activities for installation of the SVE System Extension piping were performed between September 23, 2013 and October 22, 2013. Prior to field construction activities,

¹ TICs reported are those present at levels above 10 percent of associated internal standard responses.

portions of the carbon steel piping were shop-fabricated. Hydro-excavation of a trench for installation of underground piping to wells SVE-38 through SVE-41 commenced on September 27, 2013. Following excavation, 4-inch diameter carbon steel piping with cathodic protection was installed, along with galvanized steel well vaults with pre-cast concrete floors.

The carbon steel piping connecting SVE wells SVE-38 through SVE-41 to the previously existing “red line” near SVE-5 was bedded with approximately three inches of sand below and six inches of sand above the pipe. The remaining portion of the piping excavations and the well vault excavations were backfilled with flowable fill to a depth of approximately 4 inches bgs. A 4-inch layer of asphalt was then placed to match the existing pavement.

Excavated soils were placed in labeled and covered roll-off boxes and managed by URS on behalf of SOPUS. P66 personnel coordinated the transportation and disposal of the solid waste at a properly licensed disposal facility.

Aboveground piping was installed to SVE-37 and tied into the previously existing “red line” between SVE-5 and SVE-6. A stainless steel aboveground well enclosure was installed at SVE-37.

Prior to backfilling, successful non-destructive evaluation (NDE) and hydrostatic testing of field welds was completed between September 30, 2013 and October 7, 2013. On October 11, 2013, all new piping to SVE-38 through SVE-41 was successfully pneumatically tested with nitrogen. No leaks were detected at any of the flanged connections during the test. Quality Assurance/Quality Control (QA/QC) field test results can be found in **Appendix E**. NDE and hydrostatic test results for shop-fabricated pipe are also provided in **Appendix E**.

Gross completed construction activities on October 22, 2013 with the completion of asphalt placement, painting of parking stall stripes, and removal of construction fencing and barriers. URS began commissioning of the SVE System Extension on October 23, 2013, with all SVE System Extension wells online by November 7, 2013.

Plan views of the System are included in **Figures 2** and **2A**. A detailed as-built drawing is included in **Appendix F**.

URS personnel provided oversight during the construction and installation of the SVE System Extension to monitor, document, and assure construction activities and performance met the intent of the design specifications. Oversight activities included layout, documentation of installation, and observation of field construction activities. Additionally, the on-site URS representatives monitored compliance of the contractor with their QA/QC plans.

QA/QC documentation provided by Gross is presented in **Appendix E**.

Daily on-site construction observation was performed by URS field representatives and Gross' on-site QA/QC representatives. The construction and installation activities performed by URS' contractors for the SVE System Extension were in general conformance with the conceptual design drawings.

Photographs of construction activities are included in **Appendix G**.

Illinois Environmental Protection Agency (IEPA). July 14, 2011. *Joint Construction and Operating Permit*

Shell Oil Products US. June 2011. *Conceptual/Final Design Report*. Prepared by URS Corporation.

Shell Oil Products US. May 2012. *SVE System Construction Completion Report*. Prepared by URS Corporation.

Shell Oil Products US. February 2013. *SVE System Construction Completion Report Addendum*. Prepared by URS Corporation.

Shell Oil Products US. October 2013. *Soil Vapor Sampling and SVE Monitoring Report – 3rd Quarter 2013*. Prepared by URS Corporation.

**Table 1
SVE Well Construction**

WELL ID	COMPLETION DATE	COORDINATES		GROUND ELEVATION (feet)	SCREEN INTERVAL (feet bgs)	TOTAL WELL DEPTH	TOTAL BORING DEPTH
		Northing	Easting				
SVE-37	09/13/13	793780.97	2322274.20	≈444	25-35	35	35
SVE-38	09/16/13	793895.21	2322269.10	≈444	25-35	35	36
SVE-39	09/17/13	794002.37	2322267.16	444.5	25-35	35	36
SVE-40	09/18/13	794126.18	2322262.63	≈444	25-35	35	36
SVE-41	09/19/13	794252.11	2322259.16	≈443	20-30	30	30

NOTES:

- 1) Ground elevation is approximate and based on topographic survey completed prior to SVE well installation.
- 2) Screen interval and total well/boring depth recorded at time of drilling.

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	VOCs														
				Benzene (mg/kg)			sec-Butylbenzene (mg/kg)			Cymene (p-Isopropyltoluene) (mg/kg)			Ethylbenzene (mg/kg)			Isopropylbenzene (Cumene) (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013	< 0.08	U		< 0.8	U		< 0.8	U		< 0.32	U		< 0.8	U	
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013	0.0097		J	0.0021	J		0.0013	J		0.0143			0.0035	J	
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013	0.0016		J	< 0.0058	U		< 0.0058	U		0.0053			0.00037	J	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	0.0012			0.00029	J		< 0.0052	U		0.0028			< 0.0052	U	
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013	0.001			< 0.0062	U		< 0.0062	U		0.0026			< 0.0062	U	

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	VOCs														
				Naphthalene (mg/kg)			n-Propylbenzene (mg/kg)			Toluene (mg/kg)			1,2,4-Trimethylbenzene (mg/kg)			1,3,5-Trimethylbenzene (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013	< 0.8	U		< 0.8	U		< 0.8	U		< 0.8	U		< 0.8	U	
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013	0.0043	J		0.0049	J		0.0054	J		0.033	J		0.0155		
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013	0.0015	J		0.00086	J		0.0043	J		0.0031	J	J	0.0014	J	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	< 0.0052	U		0.0003	J		0.0029	J		0.00062	J		0.00079	J	
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013	< 0.0062	U		< 0.0062	U		0.003	J		0.00043	J		< 0.0062	U	

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	VOCs									VOC TICS					
				m,p-Xylenes (mg/kg)			o-Xylenes (mg/kg)			Xylenes (total) (mg/kg)			Benzene, 1-ethyl-2-methyl- (mg/kg)			Benzene, 1-ethyl-3-methyl- (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013	< 0.32	U		< 0.32	U		< 0.32	U							
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013	0.0587		J	0.0278		J	0.0865		J	0.071	JN				
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013	0.0043		J	0.002	J	J	0.0064		J				0.0064	JN	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	0.00085	J		< 0.0021	U		0.00085	J							
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013	0.0007	J		< 0.0025	U		0.0007	J							

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	VOC TICS														
				Butane (mg/kg)			Butane, 2,2-dimethyl- (mg/kg)			Butane, 2,2,3,3-tetramethyl- (mg/kg)			2-Butene, 2-methyl- (mg/kg)			Cyclohexane, methyl- (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013							5.9	JN							
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013	0.37	JN		0.0087	JN					0.028	JN				
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013													0.0094	JN	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	0.067	JN											0.02	JN	
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013															

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

Location	Sample ID	Depth	Sample Date	VOC TICS											
				Cyclohexane, 1-ethyl-2-methyl- (mg/kg)			Cyclohexane, 1-ethyl-4-methyl-, cis (mg/kg)			Cyclopentane, 1-ethyl-2-methyl-, cis (mg/kg)			Cyclopentane, methyl- (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013												
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013										0.081	JN	
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013										0.0077	JN	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	0.0054	JN		0.0072	JN		0.0065	JN				
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013												

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	VOC TICS														
				Cyclopropane, methylmethylene- (mg/kg)			Dimethyl Sulfoxide (mg/kg)			Heptafluorobutyric acid, n-pentyl ester (mg/kg)			Heptane, 2-methyl- (mg/kg)			Hexane (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013				2.1	JN										
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013	0.0056	JN											0.044	JN	
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013										0.0082	JN		0.011	JN	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013													0.0084	JN	
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013							0.0079	JN							

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	VOC TICS														
				Hexane, 2-methyl- (mg/kg)			Hexane, 2,2,3-trimethyl- (mg/kg)			Hexane, 2,2,5,5-tetramethyl- (mg/kg)			Isopentane (Butane, 2-methyl-) (mg/kg)			Octane (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013										3	JN				
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013	0.05	JN								0.19	JN				
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013	0.0071	JN					0.0067	JN		0.026	JN		0.0062	JN	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	0.0075	JN		0.019	JN					0.045	JN				
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013										0.015	JN				

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	VOC TICS														
				Pentane (mg/kg)			Pentane, 2-methyl- (mg/kg)			Pentane, 2,2,4-trimethyl- (mg/kg)			Pentane, 2,3,3-trimethyl- (mg/kg)			Pentane, 2,3,4-trimethyl- (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013	2.7	JN		2.6	JN					3.9	JN		2.7	JN	
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013	0.11	JN					0.066	JN					0.043	JN	
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013	0.017	JN		0.012	JN										
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	0.021	JN		0.027	JN		0.027	JN		0.025	JN		0.018	JN	
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013	0.012	JN													

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	VOC TICS									SVOCs						
				Pentane, 2,4-dimethyl- (mg/kg)			Pentane, 3-ethyl-2-methyl- (mg/kg)			Pentane, 3-methyl- (mg/kg)			Acenaphthene (mg/kg)			Acenaphthylene (mg/kg)			
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013	3	JN						2.6	JN		0.0019	J		0.0013	J	
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013				0.074	JN			0.054	JN		< 0.006	U		< 0.006	U	
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013								0.0068	JN		< 0.006	U		< 0.006	U	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	0.023	JN									< 0.0056	U		< 0.0056	U	
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013											< 0.0057	U		< 0.0057	U	

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	SVOCs														
				Anthracene (mg/kg)			Benzo(a)anthracene (mg/kg)			Benzo(a)pyrene (mg/kg)			Benzo(b)fluoranthene (mg/kg)			Benzo(g,h,i)perylene (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013	0.0019	J		0.0018	J		0.0021	J		0.0034	J		0.0028	J	
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013	< 0.006	U		< 0.006	U		< 0.006	U		< 0.006	U		0.0218		
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013	< 0.006	U		< 0.006	U		< 0.006	U		< 0.006	U		0.0057	J	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	< 0.0056	U		< 0.0056	U		< 0.0056	U		< 0.0056	U		< 0.0056	U	
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013	< 0.0057	U		< 0.0057	U		< 0.0057	U		< 0.0057	U		< 0.0057	U	

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	SVOCs														
				Benzo(k)fluoranthene (mg/kg)			Chrysene (1,2-Benzphenanthracene) (mg/kg)			Dibenzo(a,h)anthracene (mg/kg)			Fluoranthene (mg/kg)			Fluorene (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013	0.0024	J		0.0021	J		0.0018	J		0.0025	J		0.0022	J	
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013	< 0.006	U		< 0.006	U		0.022			0.001	J		< 0.006	U	
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013	< 0.006	U		< 0.006	U		0.0056	J		< 0.006	U		< 0.006	U	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	< 0.0056	U		< 0.0056	U		< 0.0056	U		< 0.0056	U		< 0.0056	U	
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013	< 0.0057	U		< 0.0057	U		< 0.0057	U		< 0.0057	U		< 0.0057	U	

TABLE 2 - SVE EXTENSION: SUMMARY OF ANALYTES DETECTED

SEE LAST PAGE OF TABLE FOR NOTES

Location	Sample ID	Depth	Sample Date	SVOCs												TPH-GRO		
				Indeno(1,2,3-cd)pyrene (mg/kg)			2-Methylnaphthalene (mg/kg)			Phenanthrene (mg/kg)			Pyrene (mg/kg)			TPH-GRO (VOA) (mg/kg)		
				Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals	Result	Lab Quals	URS Quals
SVE-37	SVE37-091313 (33-35')	33 - 35 ft	9/13/2013	0.0025	J		0.0019	J		0.0026	J		0.0027	J		21		
SVE-38	SVE38-091613 (34-36')	34 - 36 ft	9/16/2013	0.0228			0.0049	J		0.0014	J		< 0.006	U		< 13	U	
SVE-38	SVE38-091613 (34-36')-Dup	34 - 36 ft	9/16/2013	0.0063			0.0039	J		< 0.006	U		< 0.006	U		< 13	U	
SVE-39	SVE39-091713(34-36')	34 - 36 ft	9/17/2013	< 0.0056	U		< 0.0056	U		< 0.0056	U		< 0.0056	U		< 12	U	
SVE-40	SVE-40-091813(30-32')	30 - 32 ft	9/18/2013	< 0.0057	U		< 0.0057	U		< 0.0057	U		< 0.0057	U		< 15	U	

Laboratory Qualifiers

< "U" = Not detected at the reporting limit.

J = The analyte was detected below the reporting limit. Result is estimated.

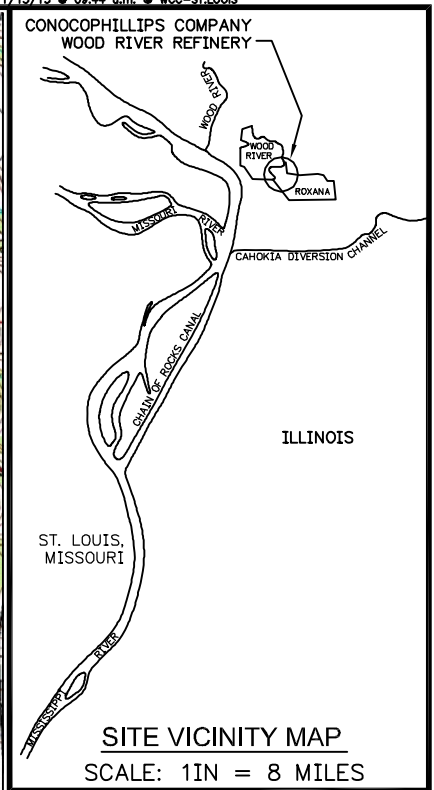
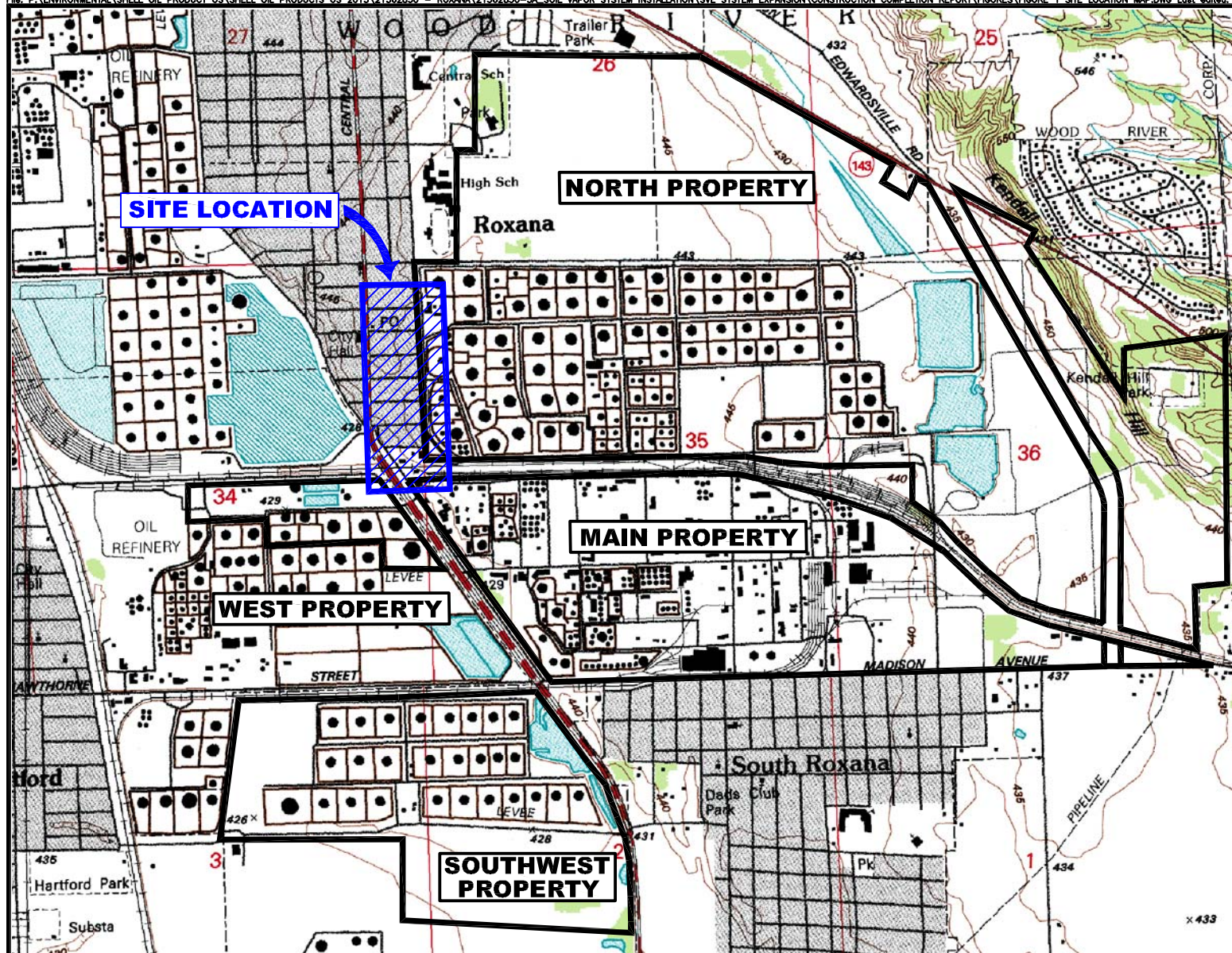
JN = Estimated value for tentatively identified compound (TICs). (library search)



Note: Library searches for TICs are used to look for the presence of non-target analytes.

TICs reported are those present at levels above ten percent of associated internal standard responses.

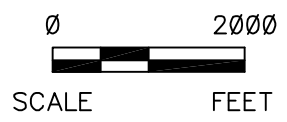
URS Qualifiers

J = The result is estimated.



- LEGEND**
-  WOOD RIVER REFINERY PROPERTY BOUNDARY
 -  INVESTIGATION AREA

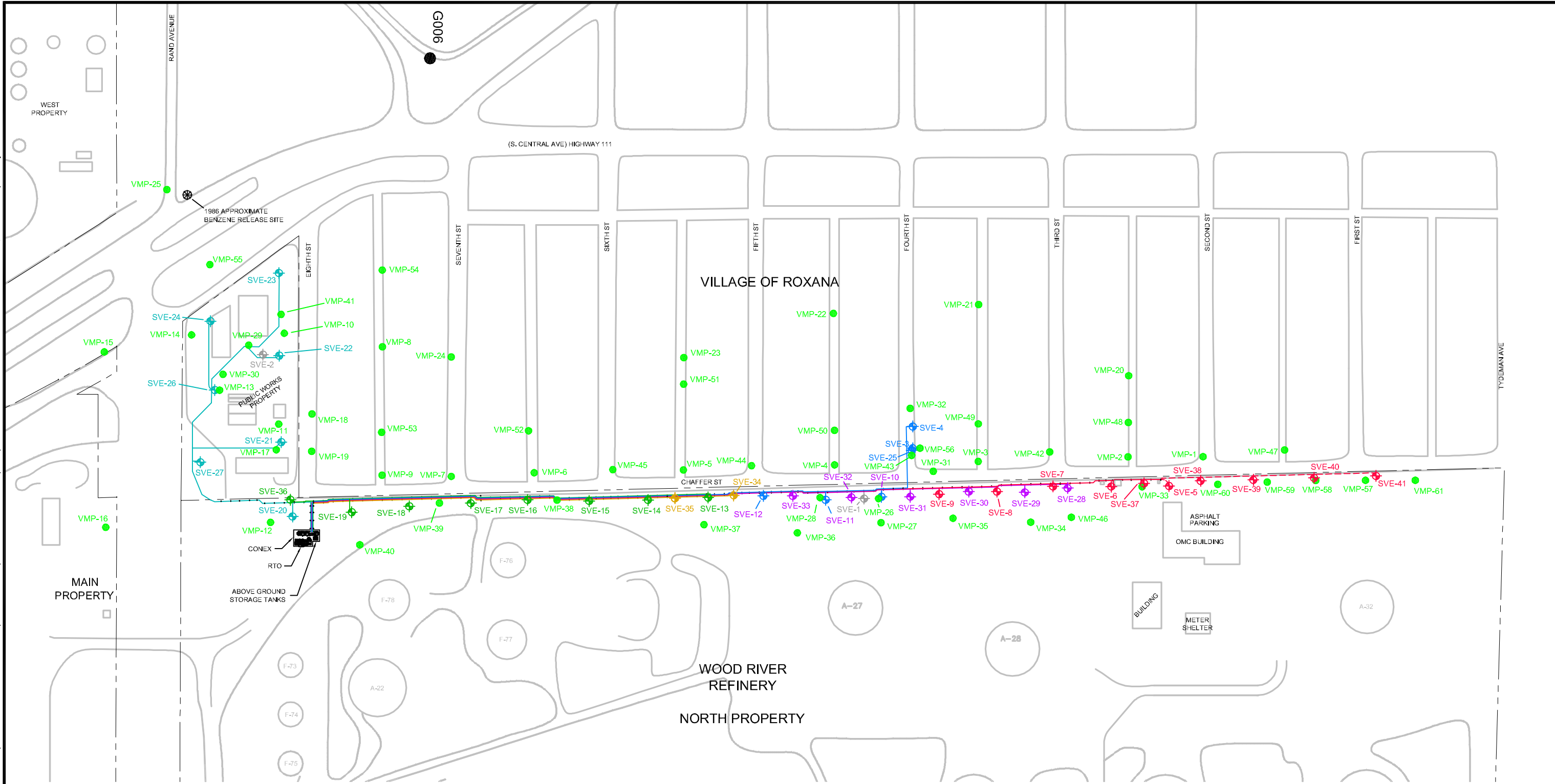
CONTOUR INTERVAL = 5 FT



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

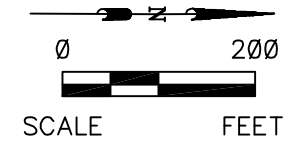
SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY: djd November 2013 DSGN. BY: djd CHKD. BY: st	Site Location Map	FIG. NO. 1

FILE: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\SHELL OIL PRODUCTS US 2013\21562850 - ROXANA\21562850-SOIL VAPOR SYSTEM INSTALLATION\SVE SYSTEM EXPANSION CONSTRUCTION COMPLETION REPORT\FIGURES\FIGURE 2 SOIL VAPOR EXTRACTION SYSTEM OVERALL PLAN.DWG Last edited: NOV. 19. 13 11:11 am by: dardL_dogule



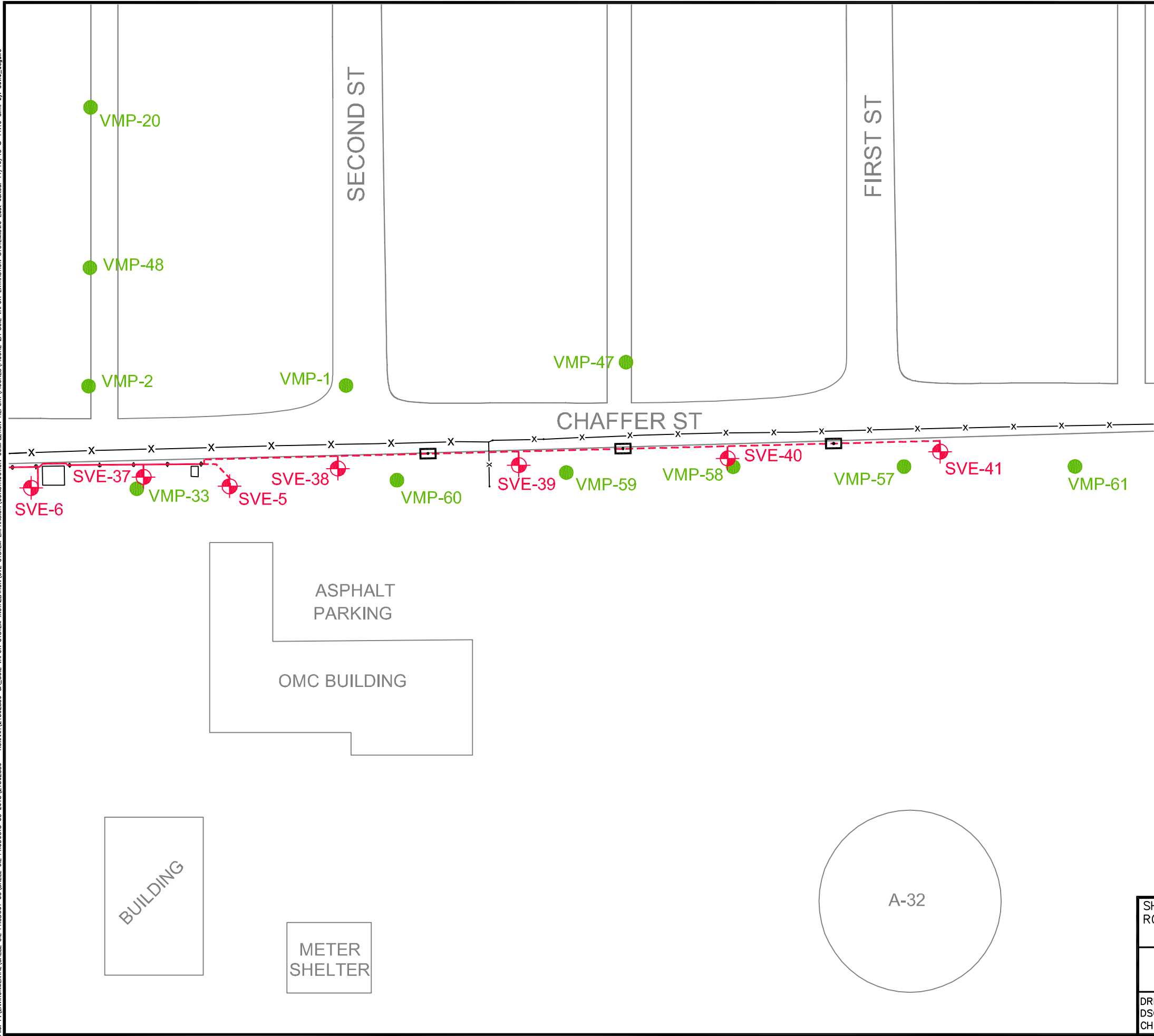
LEG NO.	SVE WELLS	COLOR	WELL SYMBOL
1	SVE-5 THROUGH SVE-9 & SVE-37 THROUGH SVE-41	RED	
2	SVE-3, SVE-4, SVE-25 & SVE-10 THROUGH SVE-12	BLUE	
3	SVE-13 THROUGH SVE-19 & SVE-36	GREEN	
4	SVE-20 THROUGH SVE-27	TEAL	
5	SVE-28 THROUGH SVE-33	PURPLE	
6	SVE-34 THROUGH SVE-35	BROWN	

LEGEND:
 SVE EXTRACTION WELL (SEE TABLE FOR COLOR LEGEND)
 VAPOR MONITORING POINT (VMP)
 PROPERTY BOUNDARY
 UNDERGROUND PIPING



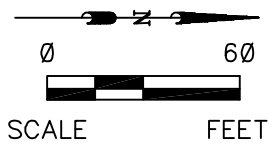
SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY: djd November 2013 DSGN. BY: djd CHKD. BY: st	Soil Vapor Extraction System Overall Plan	FIG. NO. 2

Fig: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\SHELL OIL PRODUCTS US 2013\21562850 - ROXANA\21562850-5A_SOIL VAPOR SYSTEM INSTALLATION\SVE SYSTEM EXPANSION\CONSTRUCTION COMPLETION REPORT\FIGURES\FIGURE 2A_SOIL VAPOR EXTRACTION SYSTEM.DWG Last edited: 11/19/13 @ 11:10 a.m. by: david_dequire



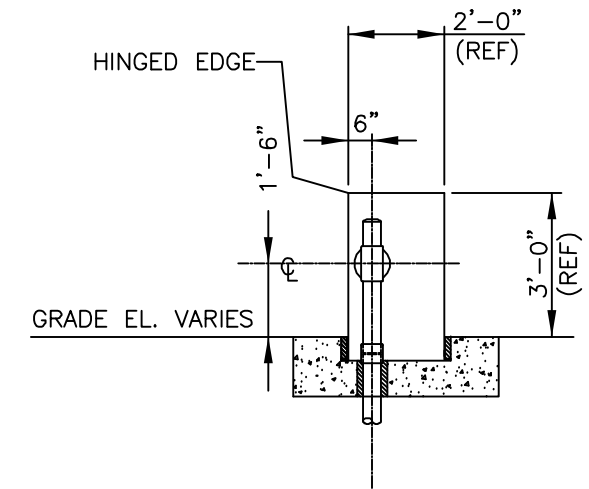
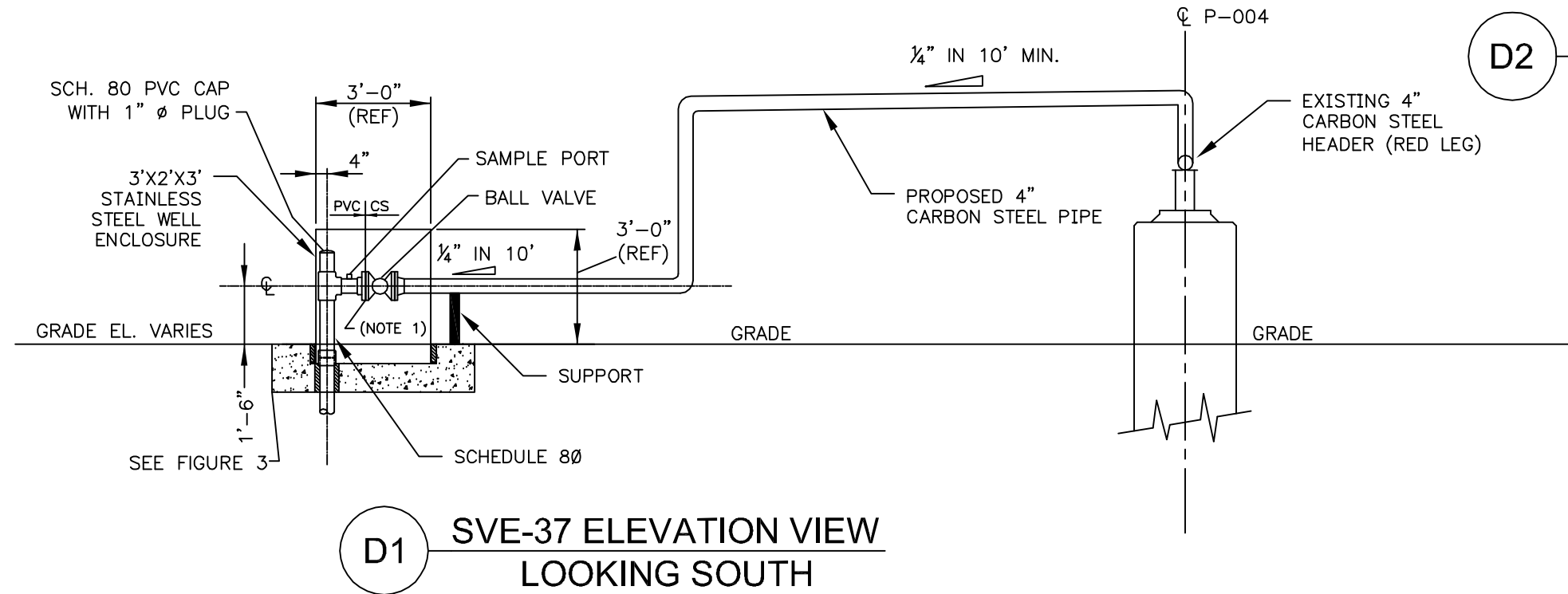
LEG NO.	SVE WELLS	COLOR	WELL SYMBOL
1	SVE-5 THROUGH SVE-9 & SVE-37 THROUGH SVE-41	RED	
2	SVE-3, SVE-4, SVE-25 & SVE-10 THROUGH SVE-12	BLUE	
3	SVE-13 THROUGH SVE-19 & SVE-36	GREEN	
4	SVE-20 THROUGH SVE-27	TEAL	
5	SVE-28 THROUGH SVE-33	PURPLE	
6	SVE-34 THROUGH SVE-35	BROWN	

- LEGEND:**
- TEE FOR POTENTIAL FUTURE SVE WELL CONNECTION
 - UNDERGROUND PIPING
 - SVE EXTRACTION WELL (SEE TABLE FOR COLOR LEGEND)
 - VAPOR MONITORING POINT (VMP) LOCATION
 - PROPERTY BOUNDARY/FENCE LINE



SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY:djd November 2013 DSGN. BY:djd CHKD. BY:st	Soil Vapor Extraction System	FIG. NO. 2A

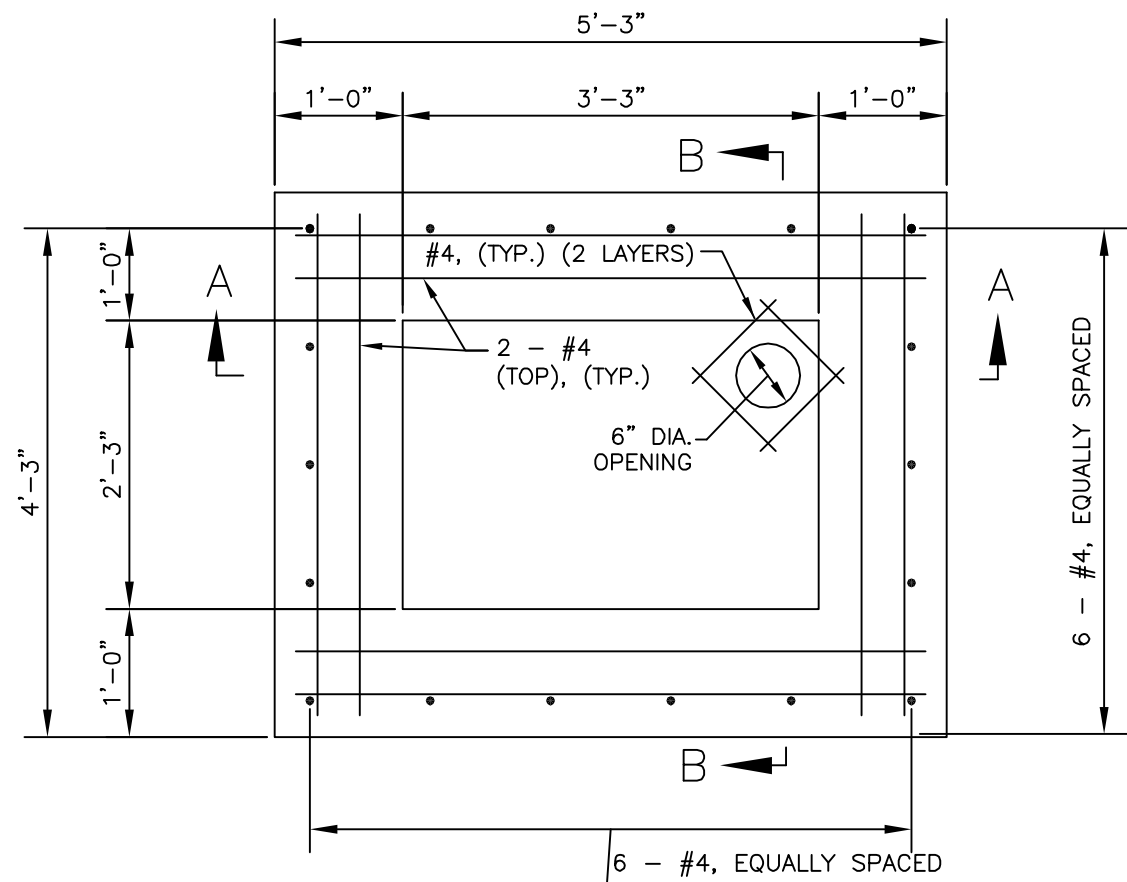
FILE: ENVIRONMENTAL/SHELL OIL PRODUCT US/SHELL OIL PRODUCTS US 2013/21562850 - ROMANA/21562850-SOIL VAPOUR SYSTEM INSTALLATION/SITE SYSTEM EXPANSION/DRAFT PLAN FOR VAPOR IN VILLAGES/FIGURES/FIGURE 2 SVE-37 CONNECTION WELL HEAD DETAILS/DWG LINT: SEP. 25. 13 @ 4:25 p.m. BY: david.dejeu



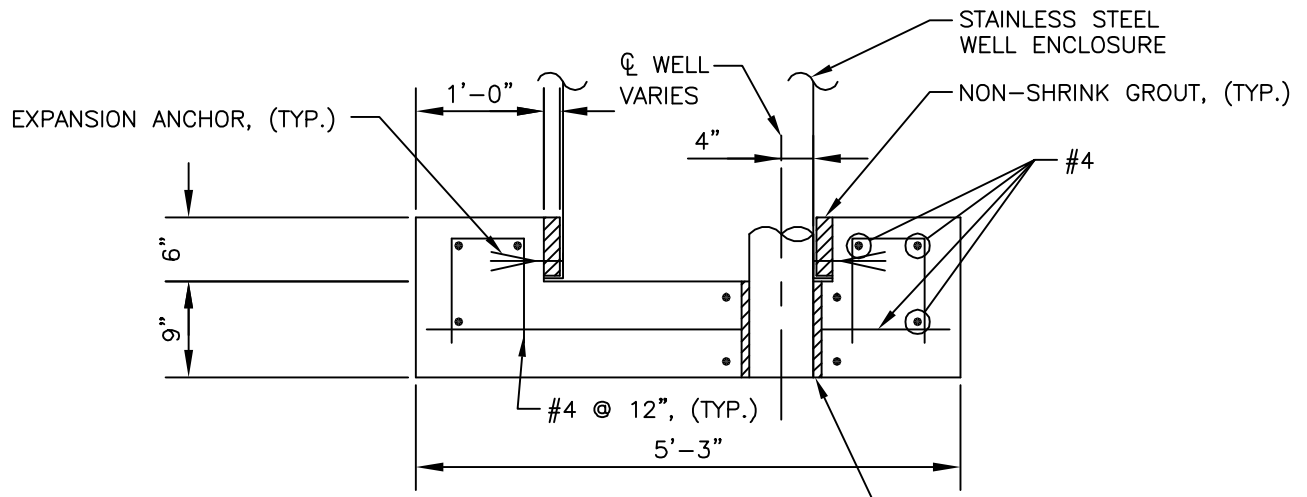
NOT TO SCALE

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY: djd 9/20/13 DSGN. BY: st CHKD. BY: sd	SVE-37 Wellhead Details	FIG. NO. 2

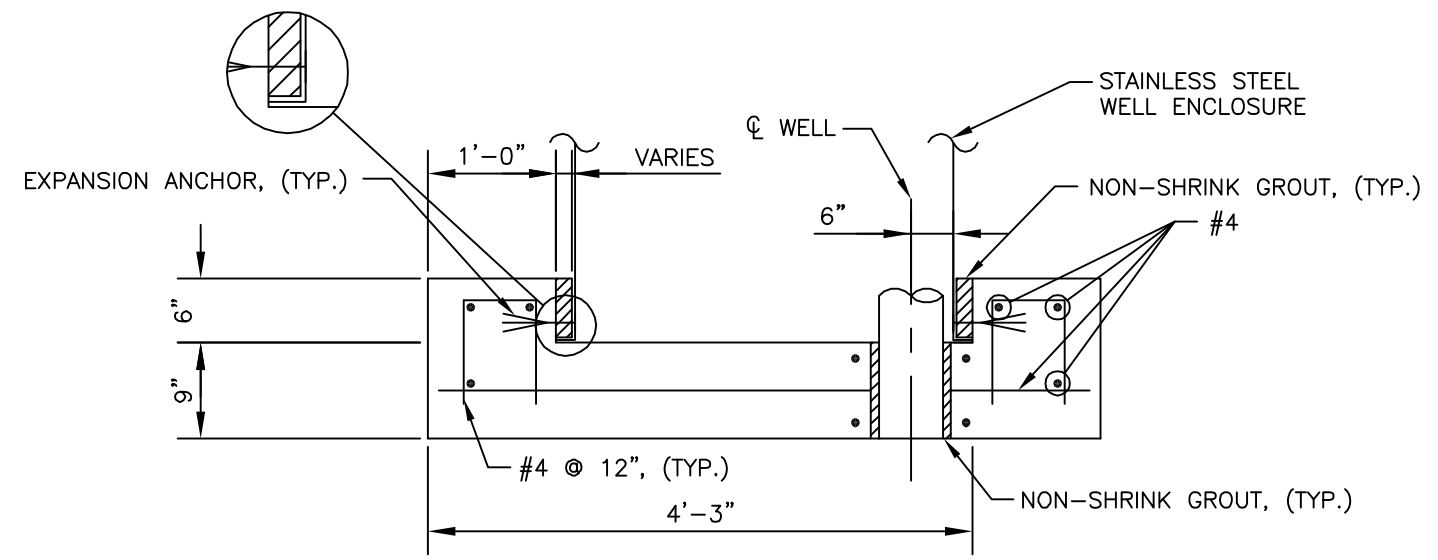
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PLAN



SECTION A-A



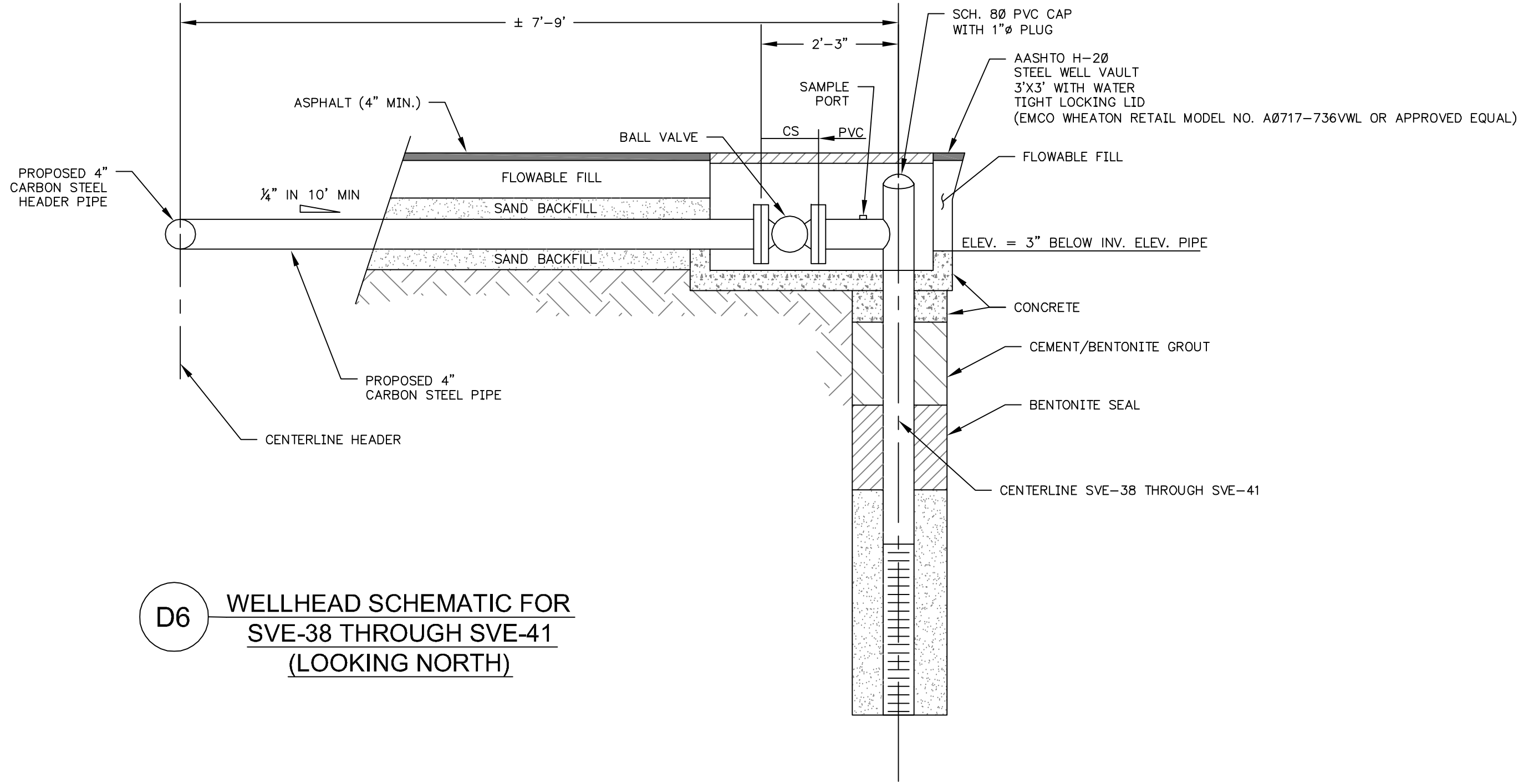
SECTION B-B

- NOTES:
1. PROVIDE EXPANSION ANCHOR CONNECTIONS OF ENCLOSURE TO CONCRETE. INSTALL TWO ANCHORS MINIMUM PER EACH SIDE OF ENCLOSURE, EQUALLY SPACED. ANCHORS SHALL BE 1/4"Ø STAINLESS STEEL OR HOT-DIPPED GALVANIZED, HILTI KWIK BOLT 3, 2" MIN. EMBED OR SIMPSON STRONG-TIE WEDGE-ALL, 2 1/4" MIN. EMBED. SUBMIT ALTERNATE ANCHORAGE TO ENGINEER FOR APPROVAL.
 2. PROVIDE ADDITIONAL REINFORCING AROUND PIPE OPENING AS SHOWN.
 3. WORK THIS FIGURE WITH FIGURE 2

D3 CONCRETE PAD FOR SVE-37 STAINLESS STEEL WELL ENCLOSURE (ABOVE GRADE)

NOT TO SCALE

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY:djd 9/20/13 DSGN. BY:st CHKD. BY:sd	SVE-37 Well Enclosure Pad Details (Above Grade)	FIG. NO. 3



D6 WELLHEAD SCHEMATIC FOR
SVE-38 THROUGH SVE-41
(LOOKING NORTH)

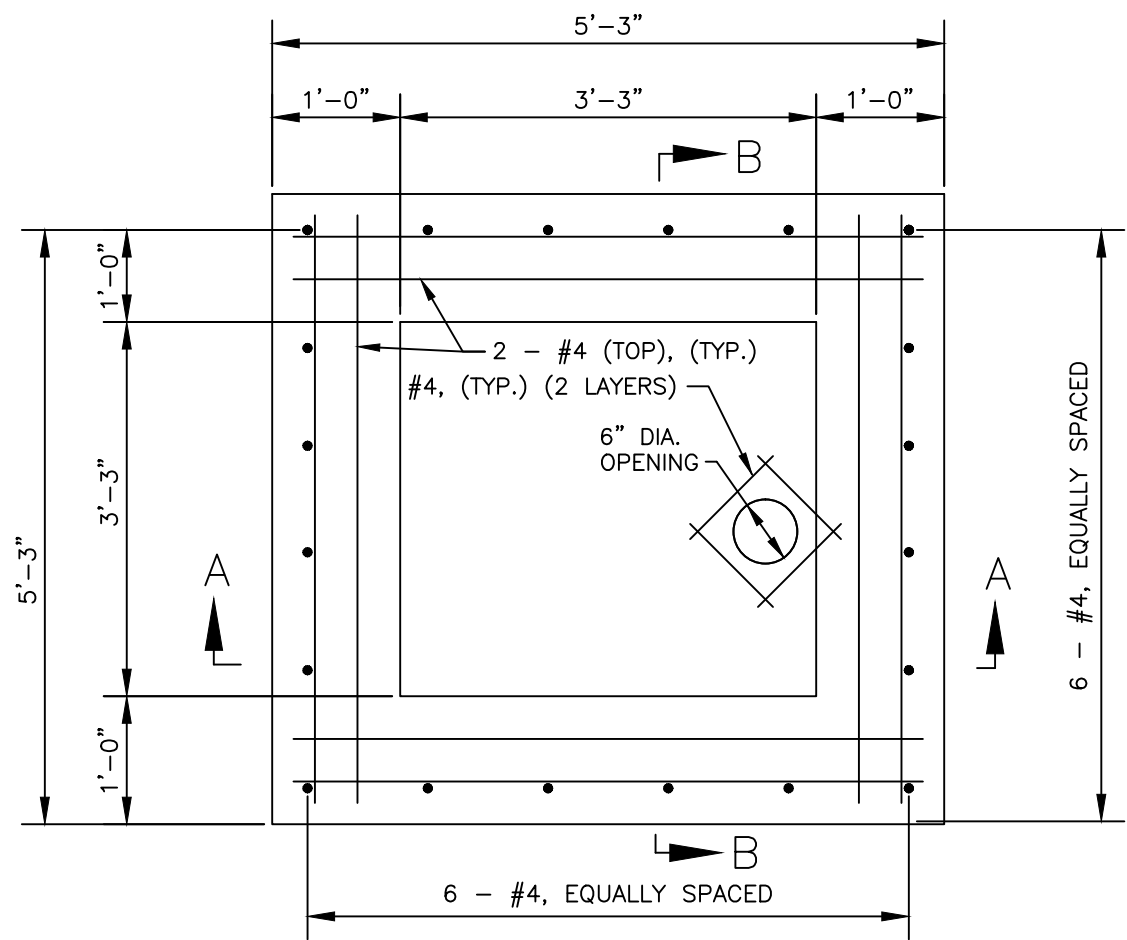
- NOTE:
1. SEE FIGURE 6 FOR WELL VAULT INSTALLATION DETAIL.
 2. CONTRACTOR TO PROVIDE PRICING FOR BOTH CARBON STEEL AND SCH. 80 PVC BALL VALVES.

NOT TO SCALE

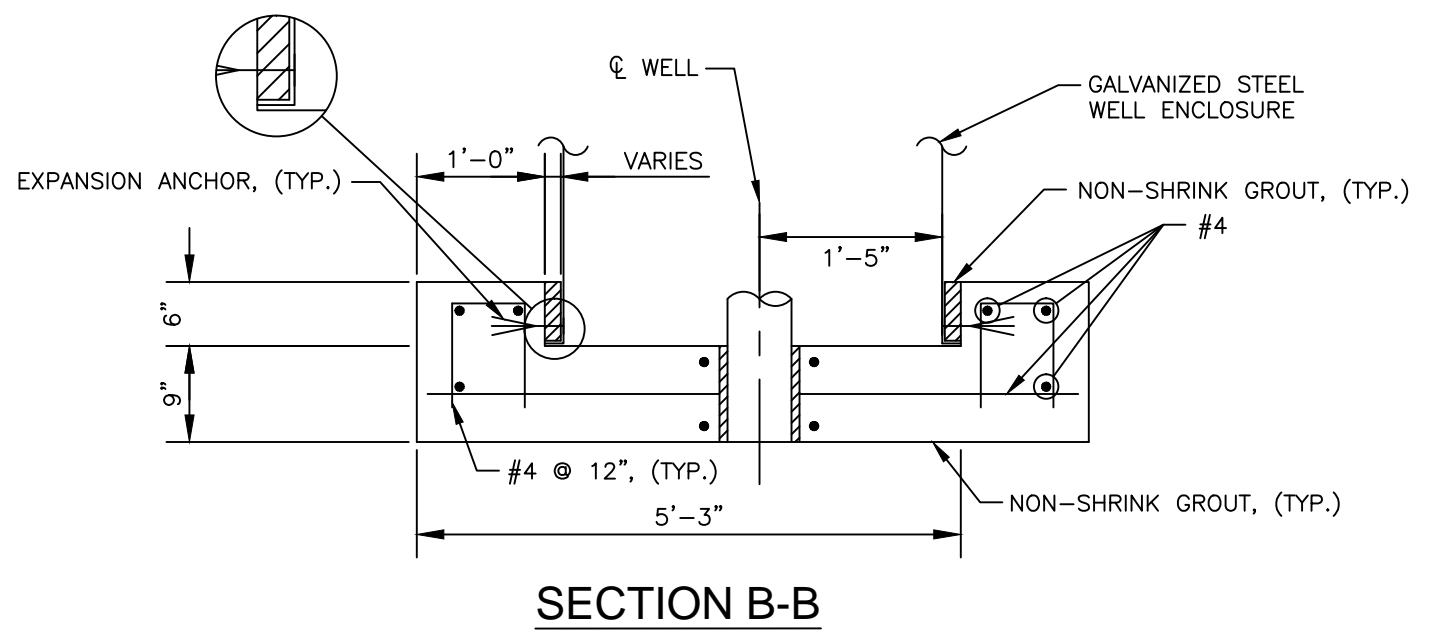
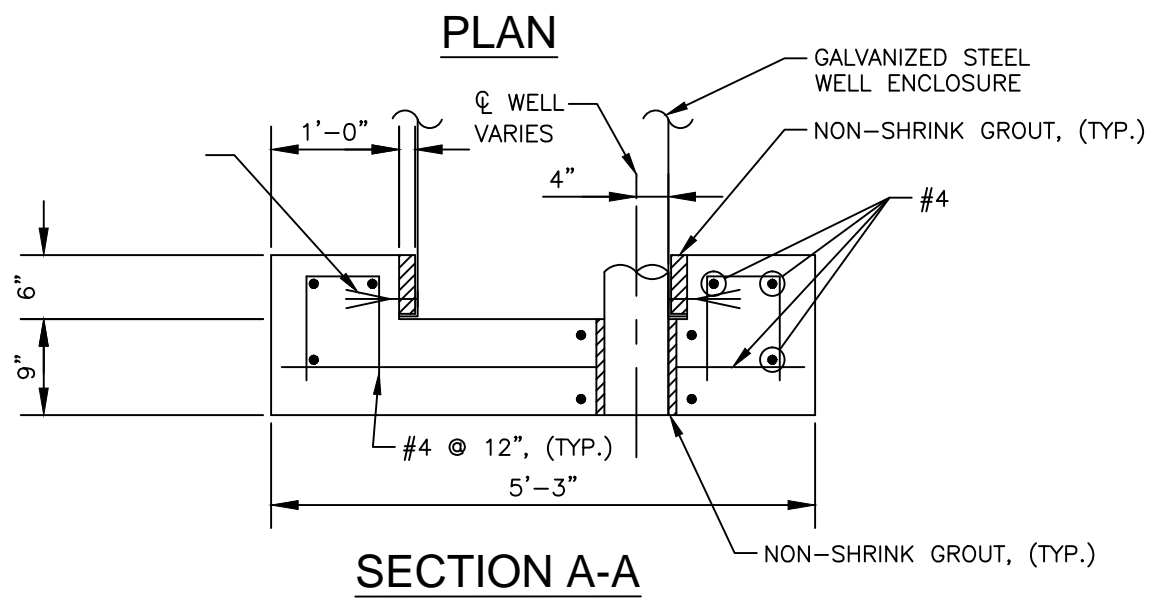
	SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
	URS		
DRN. BY:djd 9/20/13 DSGN. BY:st CHKD. BY:sd	SVE-38 Through SVE-41 WellHead Details		FIG. NO. 5

FILE: E:\ENVIRONMENTAL\SHELL OIL PRODUCT US\SHELL OIL PRODUCTS US 2013\21562850 - ROMANA\21562850 - SOIL VAPOUR SYSTEM INSTALLATION SITE SYSTEM EXPANSION\DRAWING PLAN FOR VAPOR IN VILLAGES\FIGURES\FIGURE 5 SVE-38 THROUGH SVE-41 WELL HEAD DETAILS.DWG Last edited: SEP. 20. 13 @ 2:35 p.m. BY: senek_daguna

FILE: P:\UNWRO-1\SHELL-2\15628-1\2\FAC-1\SYSTEMS-1\UNWTP-1\FIGURES\FIGURE 6 SVE-38 THROUGH SVE-41 WELL ENCLOSURE PAD DETAILS (BELOW GRADE) LUT. REVISED: SEP. 20. 13 @ 3:40 P.M. BY: dmsd_dgshu



- NOTES:
1. PROVIDE EXPANSION ANCHOR CONNECTIONS OF ENCLOSURE TO CONCRETE. INSTALL TWO ANCHORS MINIMUM PER EACH SIDE OF ENCLOSURE, EQUALLY SPACED. ANCHORS SHALL BE 1/4"Ø STAINLESS STEEL OR HOT-DIPPED GALVANIZED, HILTI KWIK BOLT 3, 2" MIN. EMBED OR SIMPSON STRONG-TIE WEDGE-ALL, 2 1/4" MIN. EMBED. SUBMIT ALTERNATE ANCHORAGE TO ENGINEER FOR APPROVAL.
 2. PROVIDE ADDITIONAL REINFORCING AROUND PIPE OPENING AS SHOWN.
 3. WORK THIS FIGURE WITH FIGURE 5.



D7 CONCRETE PADS FOR GALVANIZED STEEL WELL ENCLOSURES (BELOW GRADE)

NOT TO SCALE

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY: djd 9/20/13 DSGN. BY: st CHKD. BY: sd	SVE-38 through SVE-41 Well Enclosure Pad Details (Below Grade)	FIG. NO. 6

SVE Well Installation Details
Stick Up Monitoring Well Construction Diagram



Project:	SVE System Expansion			Well ID:	SVE-37
Project Location:	Roxana, Illinois	Date Started:	9/11/2013		
Well Location:	Along west fenceline of WRR in parking lot north of OMC Building	Date Completed:	9/13/2013	Boring ID:	SVE-37
Drilling Contractor:	Roberts Environmental Drilling, Inc.	Time Seal Set:	1410	Northing:	793780.97
Driller:	P. Seymour	Type of Rig:	Geo Probe 8040 DT	Easting:	2322274.20
Consulting Firm:	URS Corporation	Drilling Method:	HSA (6.25" ID)	Elevation Datum:	NGVD
Geologist:	E. Arthur	Completion Zone:	Equilon Enterprises LLC d/b/a Shell Oil Products US		

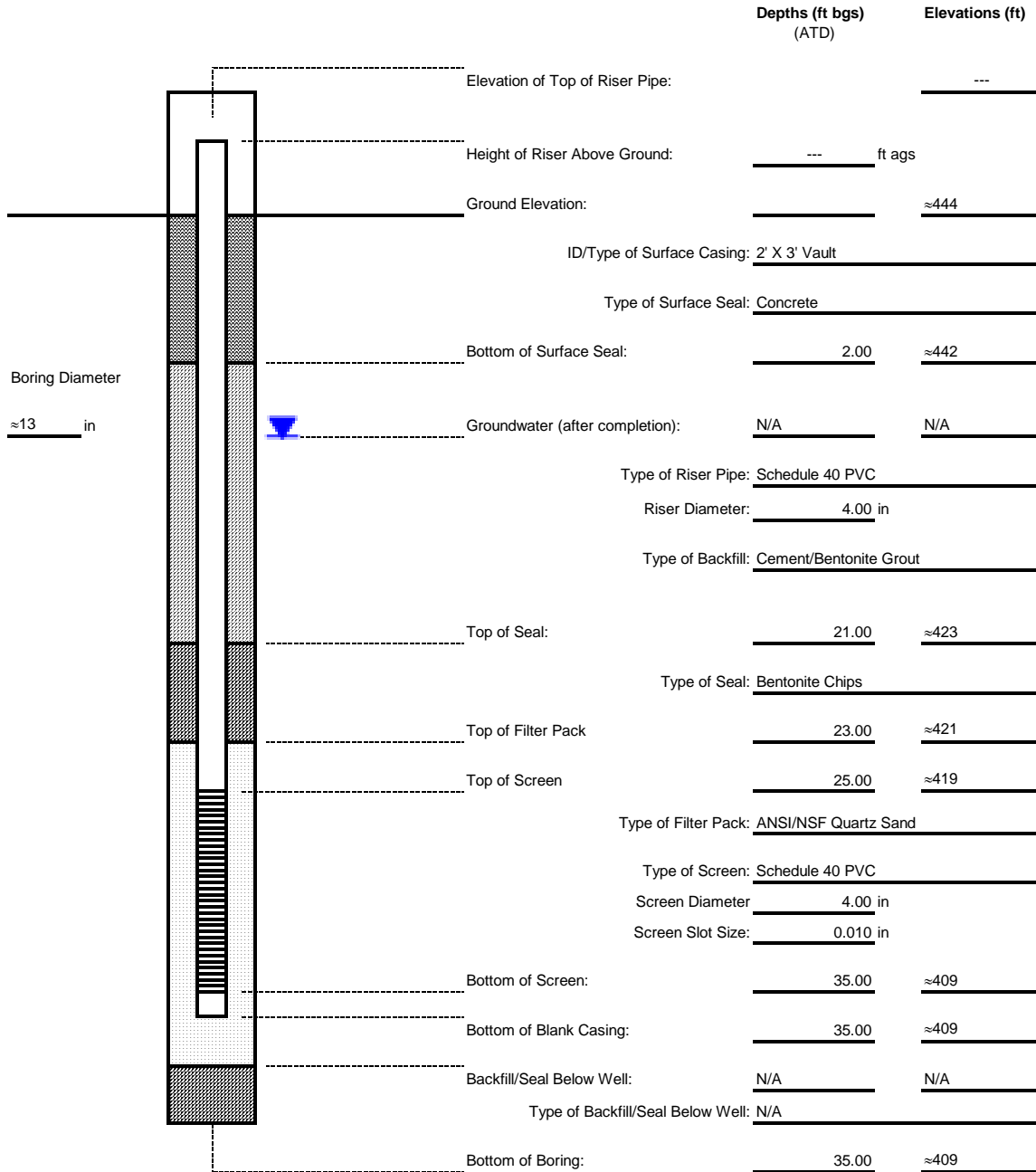


DIAGRAM IS NOT TO SCALE
ATD = At time of drilling

SVE Well Installation Details
 Flush Mount Monitoring Well Construction Diagram



Project:	SVE System Expansion			Well ID:	SVE-38
Project Location:	Roxana, Illinois	Date Started:	9/11/2013		
Well Location:	Along west fenceline of WRR in parking lot north of OMC Building	Date Completed:	9/16/2013	Boring ID:	SVE-38
Drilling Contractor:	Roberts Environmental Drilling, Inc.	Time Seal Set:	1400	Northing:	793895.21
Driller:	P. Seymour	Type of Rig:	CME 75	Easting:	2322269.10
Consulting Firm:	URS Corporation	Drilling Method:	HSA (6.25" ID)	Elevation Datum:	NGVD
Geologist:	E. Arthur	Owner:	Equilon Enterprises LLC d/b/a Shell Oil Products US		

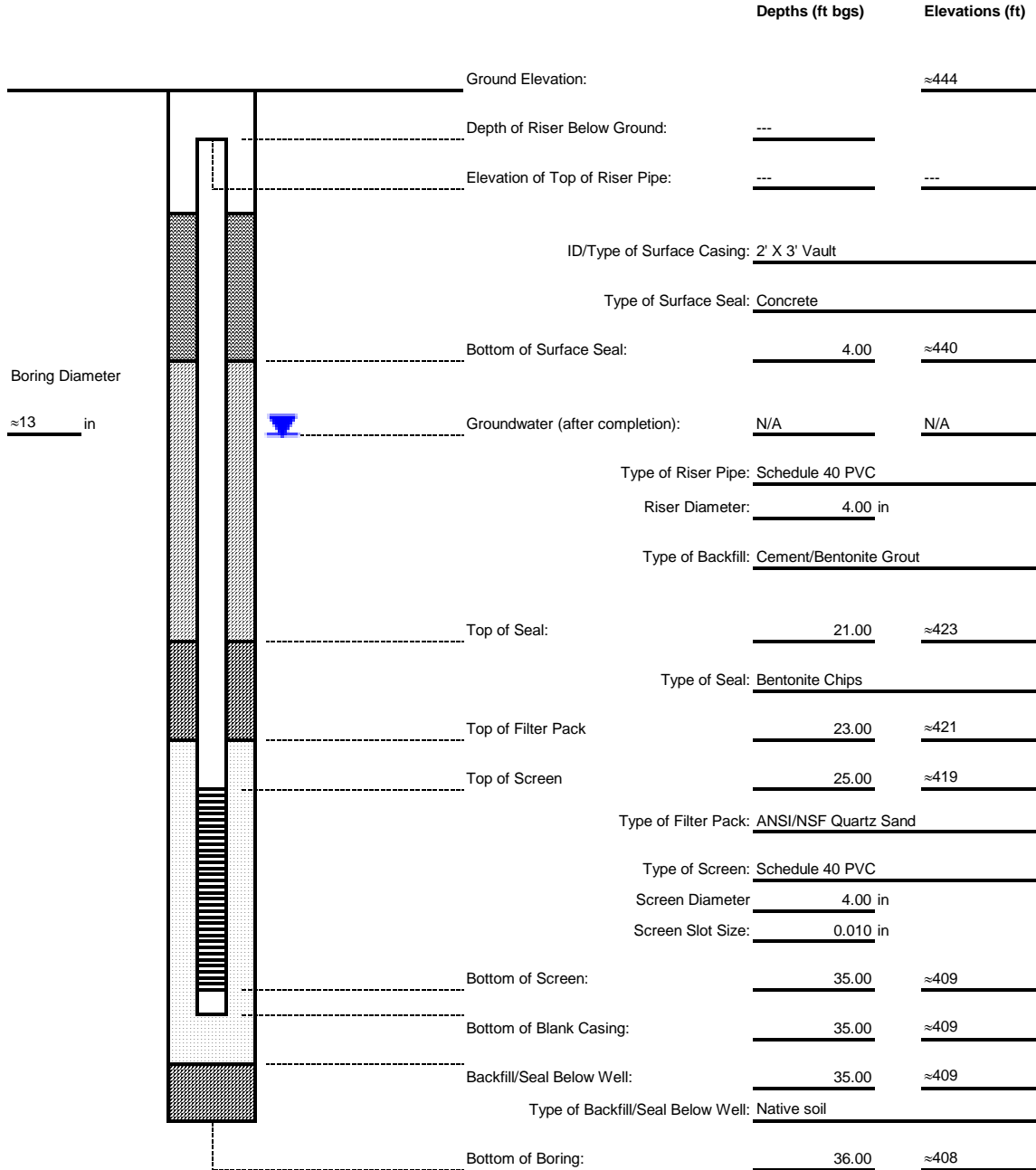


DIAGRAM IS NOT TO SCALE

SVE Well Installation Details
Flush Mount Monitoring Well Construction Diagram



Project:	SVE System Expansion			Well ID:	SVE-39
Project Location:	Roxana, Illinois	Date Started:	9/11/2013		
Well Location:	Along west fenceline of WRR in parking lot north of OMC Building	Date Completed:	9/17/2013	Boring ID:	SVE-39
Drilling Contractor:	Roberts Environmental Drilling, Inc.	Time Seal Set:	1430 (9/16/13)	Northing:	794002.37
Driller:	P. Seymour	Type of Rig:	CME 75	Easting:	2322267.16
Consulting Firm:	URS Corporation	Drilling Method:	HSA (6.25" ID)	Elevation Datum:	NGVD
Geologist:	E. Arthur	Owner:	Equilon Enterprises LLC d/b/a Shell Oil Products US		

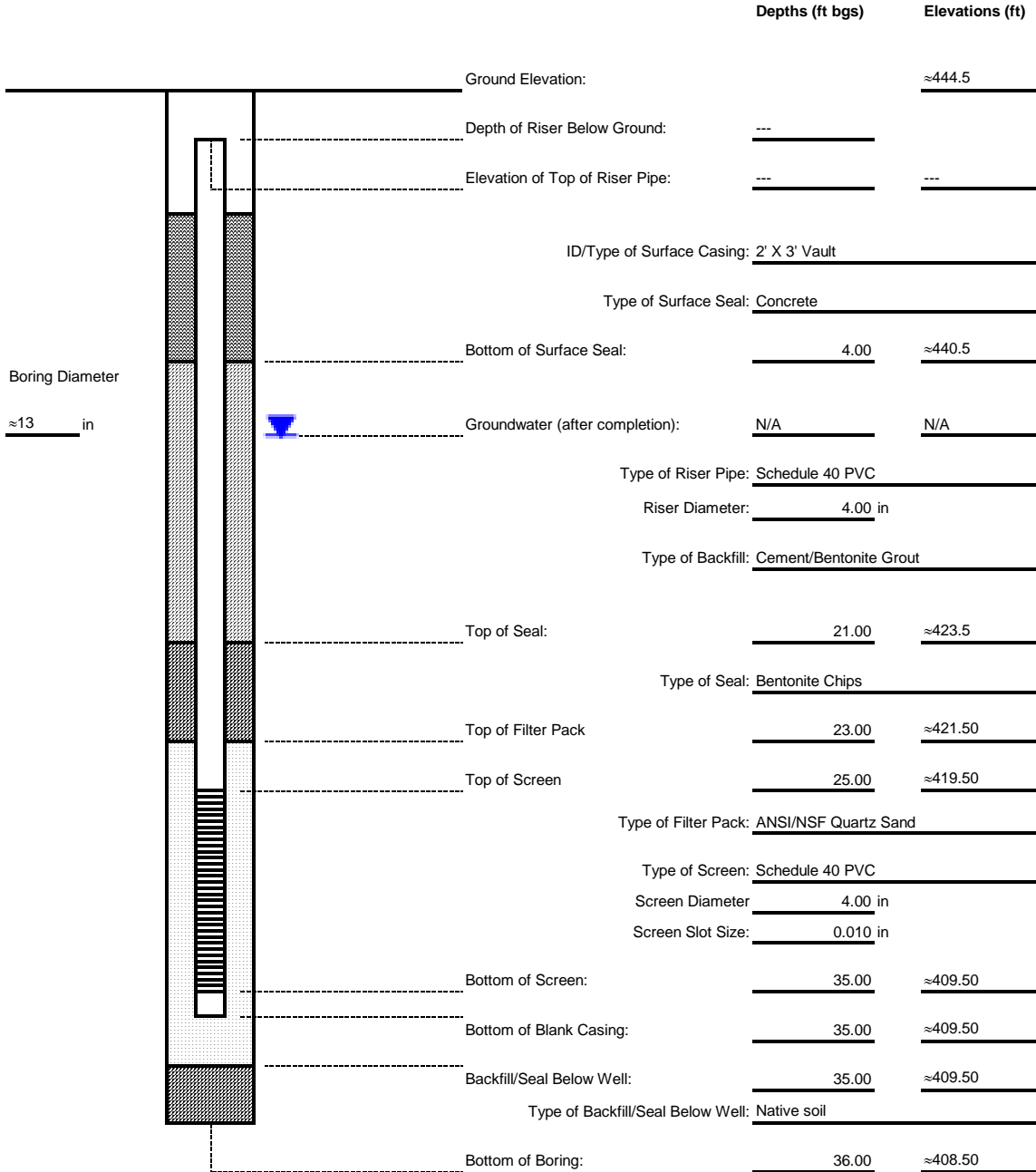


DIAGRAM IS NOT TO SCALE

SVE Well Installation Details
Flush Mount Monitoring Well Construction Diagram



Project:	SVE System Expansion			Well ID:	SVE-40
Project Location:	Roxana, Illinois	Date Started:	9/12/2013		
Well Location:	Along west fenceline of WRR in parking lot north of OMC Building	Date Completed:	9/18/2013	Boring ID:	SVE-40
Drilling Contractor:	Roberts Environmental Drilling, Inc.	Time Seal Set:	1315	Northing:	794126.18
Driller:	P. Seymour	Type of Rig:	CME 75	Easting:	2322262.63
Consulting Firm:	URS Corporation	Drilling Method:	HSA (6.25" ID)	Elevation Datum:	NGVD
Geologist:	E. Arthur	Owner:	Equilon Enterprises LLC d/b/a Shell Oil Products US		

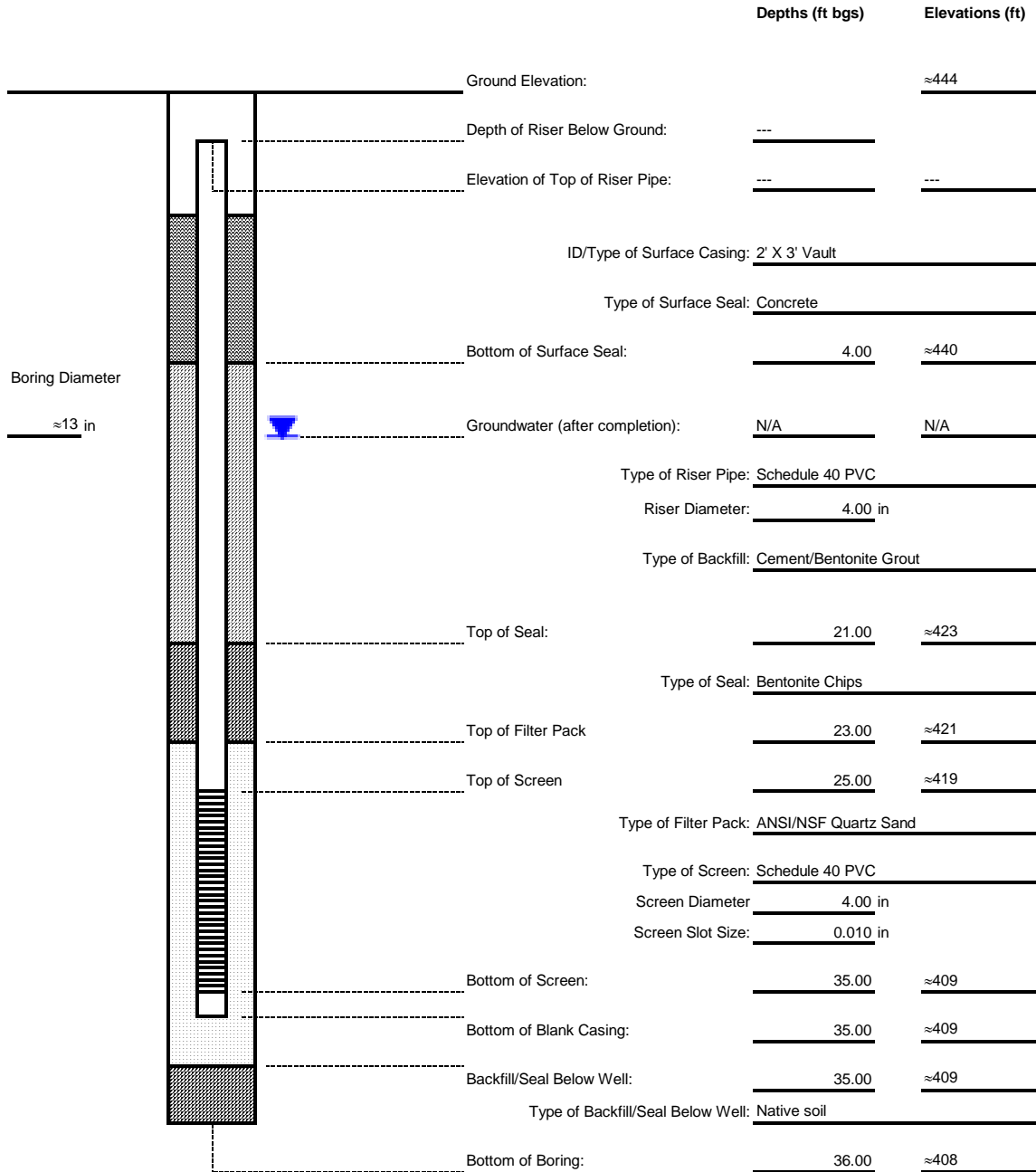


DIAGRAM IS NOT TO SCALE

SVE Well Installation Details
Flush Mount Monitoring Well Construction Diagram



Project:	SVE System Expansion			Well ID:	SVE-41
Project Location:	Roxana, Illinois	Date Started:	9/12/2013		
Well Location:	Along west fenceline of WRR in parking lot north of OMC Building	Date Completed:	9/19/2013	Boring ID:	SVE-41
Drilling Contractor:	Roberts Environmental Drilling, Inc.	Time Seal Set:	1100	Northing:	794252.11
Driller:	P. Seymour	Type of Rig:	CME 75	Easting:	2322259.16
Consulting Firm:	URS Corporation	Drilling Method:	HSA (6.25" ID)	Elevation Datum:	NGVD
Geologist:	E. Arthur	Owner:	Equilon Enterprises LLC d/b/a Shell Oil Products US		

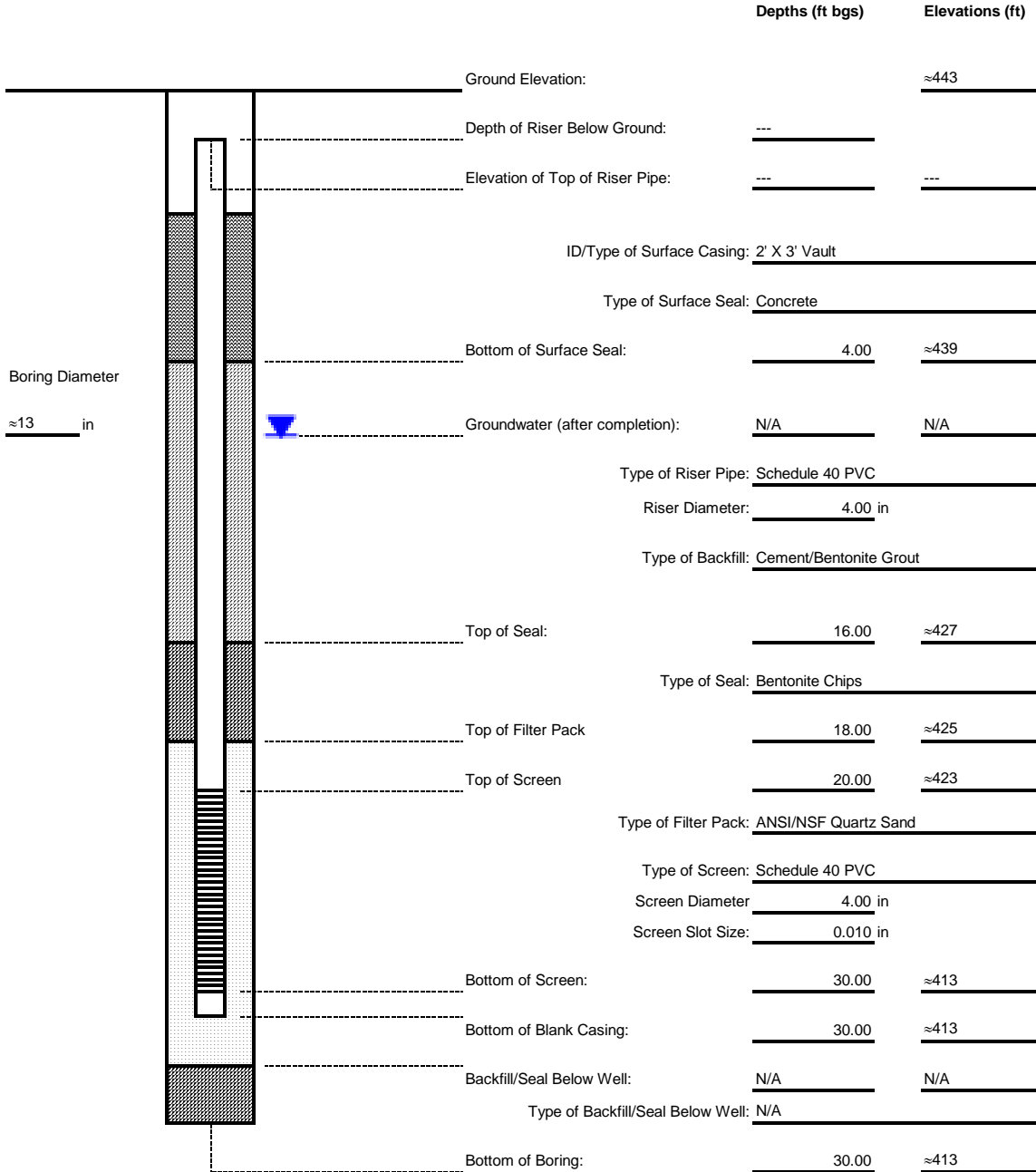


DIAGRAM IS NOT TO SCALE

LOG OF BORING AND WELL CONSTRUCTION DETAIL SVE-37

Start Date: 9/13/13
 Completion Date: 9/13/13
 Casing Elevation: Not Installed
 Ground Elevation: ~444

Coordinates
 Northing: 793780.97
 Easting: 2322274.20

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
							FILL	Asphalt and Gravel (FILL)	
5				0.0			ML	Loose, dry, brown, fine grained Sandy SILT (ML)	
				0.0					
				0.0				Loose, dry, brown, fine grained SAND (SP), with silt	
10				1.3					
				2.2					
15				2.1			SP		
				2.1					
20				2.1					
				1.8				Becomes medium grained, without silt	
				3.0					

URS (ENVIRON) LOG + 1 WELL Y:\GINT\PROJECTS\21562850.18001 (ROXANA SVES 2013).GPJ Y:\GINT\ENVIRONMENTAL\URS\STLEY.GLB 1/2/14

Boring Depth: 35.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Extension
 Drilling Contractor: Roberts Environmental Drilling Co.
 Drilling method: Probe & HSA Rig Type: DT 8040
 Drilled by: P. Seymore
 Logged by: E. Arthur

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



LOG OF BORING AND WELL CONSTRUCTION DETAIL SVE-37

Start Date: 9/13/13
 Completion Date: 9/13/13
 Casing Elevation: Not Installed
 Ground Elevation: ~444

Coordinates
 Northing: 793780.97
 Easting: 2322274.20

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30				1.8	▲		SP	Same: Loose, dry, brown, medium grained SAND (SP), without silt	
				1.7	▲				
				2.6	▲				
				84.5	▲		ML	Loose, wet, gray, very fine SILT (ML)	
35					▲		SP	Loose, wet, gray, coarse grained SAND (SP)	
					▲		ML	Stiff, wet, gray, very fine Clayey SILT (ML)	
					▲			Bottom of boring at 35' bgs	
40					▲				
45					▲				

URS (ENVIRON) LOG + 1 WELL Y:\GINT\ENVIRONMENTAL\URSTLEV.GLB 1/2/14

Boring Depth: 35.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Extension
 Drilling Contractor: Roberts Environmental Drilling Co.
 Drilling method: Probe & HSA Rig Type: DT 8040
 Drilled by: P. Seymore
 Logged by: E. Arthur



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
 Sonic

USC based on field visual observations

LOG OF BORING AND WELL CONSTRUCTION DETAIL SVE-38

Start Date: 9/16/13
Completion Date: 9/16/13
Casing Elevation: Not Installed
Ground Elevation: ~444

Coordinates
Northing: 793895.21
Easting: 2322269.10

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
						[Cross-hatch symbol]	FILL	Asphalt and Gravel (FILL)	
5				0.6		[Vertical lines symbol]	ML	Loose, wet, brown, very fine grained Clayey SILT (ML)	
				1.4		[Vertical lines symbol]	ML		
				1.5		[Vertical lines symbol]	ML		
				1.4		[Diagonal lines symbol]	SC	Loose, wet, brown, fine grained Clayey SAND (SC)	
10		24	20	0.0		[Vertical lines symbol]	ML	Loose, dry, brown, very fine grained SILT (ML), with clay	
						[Dotted symbol]	SP	Loose, dry, brown, fine grained SAND (SP)	
						[Dotted symbol]	SP	Grades to medium grained	
15		24	19	0.2		[Dotted symbol]	SP		
						[Dotted symbol]	SP		
						[Dotted symbol]	SP	With fine grained sand	
20		24	21	6.4		[Diagonal lines symbol]	CL	Becomes medium grained Medium stiff, moist, gray, low plastic CLAY (CL)	
						[Vertical lines symbol]	ML	Loose, dry, gray, very fine grained Sandy SILT (ML), with fine grained sand	
		24	21	5.9		[Vertical lines symbol]	ML		

URS (ENVIRON) LOG + 1 WELL Y:\GINT\ENVIRONMENTAL\URSSTLEV GLB 1/2/14 GPJ Y:\GINT\ENVIRONMENTAL\URSSTLEV GLB 1/2/14

Boring Depth: 36.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Extension
 Drilling Contractor: Roberts Environmental Drilling Co.
 Drilling method: Probe & HSA Rig Type: DT 8040
 Drilled by: P. Seymore
 Logged by: E. Arthur

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
- Sonic



USC based on field visual observations

LOG OF BORING AND WELL CONSTRUCTION DETAIL SVE-38

Start Date: 9/16/13
Completion Date: 9/16/13
Casing Elevation: Not Installed
Ground Elevation: ~444

Coordinates
Northing: 793895.21
Easting: 2322269.10

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30	[Well Construction Diagram]	24	18	7.2		|	ML	Same: Loose, dry, gray, fine grained Sandy SILT (ML)	
		24	20	10.74		|		Becomes moist	
		24	22	11.8		|		Becomes wet	
		24	20	5.1		|		Becomes clayey	
		24	16	16.0		|			
35	[Well Construction Diagram]	24	22	47.8		[SP Symbol]	SP	Loose, dry, gray, medium coarse grained SAND (SP)	Auger stopped at 35'
		24	22	47.8		|	ML	Loose, moist, gray, very fine Sandy SILT (ML) Bottom of boring at 36' bgs		Splitspoon driven to 36'
40									
45									

URS (ENVIRON) LOG + 1 WELL Y:\GINT\ENVIRONMENTAL\URSTSTLEV.GLB 1/2/14

Boring Depth: 36.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Extension
 Drilling Contractor: Roberts Environmental Drilling Co.
 Drilling method: Probe & HSA Rig Type: DT 8040
 Drilled by: P. Seymore
 Logged by: E. Arthur

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
- Sonic



USC based on field visual observations

LOG OF BORING AND WELL CONSTRUCTION DETAIL SVE-39

Start Date: 9/17/13
 Completion Date: 9/17/13
 Casing Elevation: Not Installed
 Ground Elevation: ~444.5

Coordinates
 Northing: 794002.37
 Easting: 2322267.16

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
						[Cross-hatch symbol]	FILL	Asphalt and Gravel (FILL)	
				0.2		[Vertical lines symbol]	ML	Loose, wet, brown, very fine, Clayey SILT (ML)	
5				4.1		[Dotted symbol]	SM	Loose, dry, gray, fine Silty SAND (SM)	
				7.8		[Dotted symbol]	SM		
				8.6		[Dotted symbol]	SP	Loose, dry, brown, fine SAND (SP)	
10		24	18	0.5		[Vertical lines symbol]	ML	Loose, dry, gray, very fine SILT (ML)	
		24	22	1.6		[Dotted symbol]	SP	Loose, dry, brown, fine grained SAND (SP) Becomes gray	
15		24	22	2.0		[Dotted symbol]	SP	Becomes moist	
		24	20	5.2		[Dotted symbol]	SP		
		24	21	5.1		[Dotted symbol]	SP	Becomes, gray, medium grained	
20		24	19	10.7		[Vertical lines symbol]	ML	Loose, moist, gray very fine SILT (ML), with medium grained sand	
		24	20	7.0		[Dotted symbol]	SP	Loose, moist, brown, medium coarse grained SAND (SP)	

URS (ENVIRON) LOG + 1 WELL Y:\GINT\ENVIRONMENTAL\URS\STLEV_GLB_1/2/14

Boring Depth: 36.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Extension
 Drilling Contractor: Roberts Environmental Drilling Co.
 Drilling method: Probe & HSA Rig Type: DT 8040
 Drilled by: P. Seymore
 Logged by: E. Arthur

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
- Sonic



USC based on field visual observations

LOG OF BORING AND WELL CONSTRUCTION DETAIL SVE-39

Start Date: 9/17/13
 Completion Date: 9/17/13
 Casing Elevation: Not Installed
 Ground Elevation: ~444.5

Coordinates
 Northing: 794002.37
 Easting: 2322267.16

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30		24	19	15.7			SP	Same: Loose, moist, brown, medium coarse grained SAND (SP)	
		24	15	15.5			CL	Soft, moist, gray, low plastic CLAY (CL)	
35							ML	Loose, moist, gray, very fine SILT (ML)	
		24	16	6.4			SP	Loose, moist, grayish brown, medium coarse grained SAND (SP)	
							ML	Loose, moist, gray, very fine SILT (ML)	
		24	15	24.3			SP	Loose, moist, brown, medium coarse SAND (SP)	
40		24	18	9.4			SP		Augers stopped at 35' Split spoons driven to 36'
		24	20	17.2			ML	Loose, moist, gray, very fine SILT (ML)	
							SP	Loose, moist, brown, medium coarse grained SAND (SP)	
45								Bottom of boring at 36' bgs	

URS (ENVIRON) LOG + 1 WELL Y:\GINT\ENVIRONMENTAL\URSTLEV.GLB 1/2/14

Boring Depth: 36.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Extension
 Drilling Contractor: Roberts Environmental Drilling Co.
 Drilling method: Probe & HSA Rig Type: DT 8040
 Drilled by: P. Seymore
 Logged by: E. Arthur

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

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



USC based on field visual observations

LOG OF BORING AND WELL CONSTRUCTION DETAIL SVE-40

Start Date: 9/18/13
 Completion Date: 9/18/13
 Casing Elevation: Not Installed
 Ground Elevation: ~444

Coordinates
 Northing: 794126.18
 Easting: 2322262.63

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
						X	FILL	Asphalt and Gravel (FILL)	
				0.4		| | | |	ML	Loose, moist, brown, very fine Sandy SILT (ML)	
5				3.7		. . . .	SM	Loose, moist, brown, fine Silty SAND (SM)	
				2.9		. . . .	SP	Loose, moist, gray, fine grained SAND (SP)	
10		24	6	0.8		. . . .		Becomes brownish gray, dry	
		24	22	3.2		. . . .		Becomes light brown	
15		24	22	2.1		. . . .		Becomes medium grained	
		24	20	7.0		. . . .		Becomes gray	
20		24	19	4.8		. . . .		Becomes moist, gray	
		24	20	5.4		. . . .	Becomes moist, gray		
		24	22	6.9		. . . .	Grades to medium grained		

URS (ENVIRON) LOG + 1 WELL Y:\GINT\ENVIRONMENTAL\URS\STLEY GLB 1/2/14

Boring Depth: 35.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Extension
 Drilling Contractor: Roberts Environmental Drilling Co.
 Drilling method: Probe & HSA Rig Type: DT 8040
 Drilled by: P. Seymore
 Logged by: E. Arthur

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
 Sonic
 USC based on field
 visual observations



LOG OF BORING AND WELL CONSTRUCTION DETAIL SVE-40

Start Date: 9/18/13
Completion Date: 9/18/13
Casing Elevation: Not Installed
Ground Elevation: ~444

Coordinates
Northing: 794126.18
Easting: 2322262.63

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30		24	22	4.9	■	●		Loose, moist, light brown, medium grained SAND (SP)	
		24	22	3.5		●	SP	Grades to light brown	
		24	22	3.5		●		Grades to coarse grained	
		24	22	10.1		■	ML	Loose, moist, gray, very fine SILT (ML)	
		24	23	9.7		■		Loose, moist, brown, coarse grained SAND (SP)	
		24	22	7.8		■			
35								Augers stopped at 35'	
40								Bottom of boring at 36' bgs	
45								Split spoon driven to 36'	

URS (ENVIRON) LOG + 1 WELL Y:\GINT\ENVIRONMENTAL\URSTLEV.GLB 1/2/14

Boring Depth: 35.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Extension
 Drilling Contractor: Roberts Environmental Drilling Co.
 Drilling method: Probe & HSA Rig Type: DT 8040
 Drilled by: P. Seymore
 Logged by: E. Arthur

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
- Sonic



USC based on field visual observations

LOG OF BORING AND WELL CONSTRUCTION DETAIL SVE-41

Start Date: 9/19/13
Completion Date: 9/19/13
Casing Elevation: Not Installed
Ground Elevation: ~443

Coordinates
Northing: 794252.11
Easting: 2322259.16

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
						X	FILL	Asphalt and Gravel (FILL)	
				2.7		.	SP	Loose, moist, dark brown, fine grained Silty SAND (SP)	
5				1.4		|	ML	Loose, moist, brown, very fine SILT (ML) with gravel	
				2.3		.	SP	Loose, moist, brown, fine grained SAND (SP)	
				1.0		.	SP	Loose, moist, brown, fine grained SAND (SP)	
10		24	22	0.0		|	ML	Loose, very moist, brown, Clayey SILT (ML)	
		24	21	1.5		.	SP	Loose, moist, brown, fine to medium grained SAND (SP)	
15		24	22	0.9		|	SM	Loose, moist, gray, fine grained, Silty SAND (SM)	
		24	22	1.8		|	SM	Loose, moist, gray, fine grained SAND (SP)	
20		24	21	1.9		.	SP	Loose, moist, gray, fine grained SAND (SP)	
		24	21	1.1		.	SP	Becomes dry, light brown, medium to coarse grained	
		24	23	0.7		.	SP	Becomes fine grained	

URS (ENVIRON) LOG + 1 WELL Y:\GINT\ENVIRONMENTAL\URSSTILEY.GLB 1/2/14

Boring Depth: 35.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Extension
 Drilling Contractor: Roberts Environmental Drilling Co.
 Drilling method: Probe & HSA Rig Type: DT 8040
 Drilled by: P. Seymore
 Logged by: E. Arthur

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
- Sonic



USC based on field visual observations

LOG OF BORING AND WELL CONSTRUCTION DETAIL SVE-41

Start Date: 9/19/13
 Completion Date: 9/19/13
 Casing Elevation: Not Installed
 Ground Elevation: ~443

Coordinates
 Northing: 794252.11
 Easting: 2322259.16

DESCRIPTION

NOTES

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30		24	22	1.6			SP	Loose, dry, light brown, fine grained SAND (SP)	
		24	22	0.9			ML	Loose, wet, gray, very fine SILT (ML)	
		24	21	0.4			SP	Loose, wet, gray, medium grained SAND (SP)	
30								Bottom of boring at 30' bgs	
35									
40									
45									

URS (ENVIRON) LOG + 1 WELL Y:\GINT\PROJECTS\21562850.18001 (ROXANA SVES 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSS\LEV.GLB 1/2/14

Boring Depth: 35.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Extension
 Drilling Contractor: Roberts Environmental Drilling Co.
 Drilling method: Probe & HSA Rig Type: DT 8040
 Drilled by: P. Seymore
 Logged by: E. Arthur

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

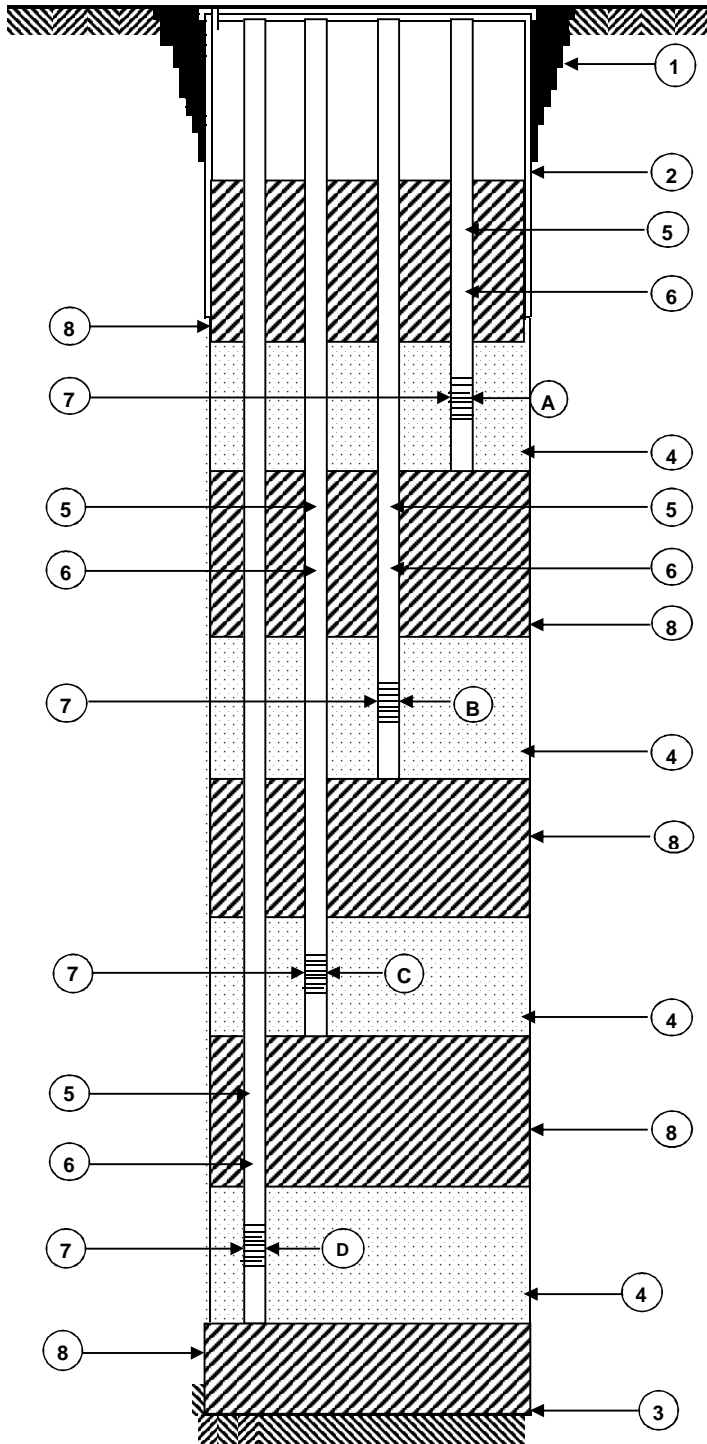
- Water level at time of drilling
- Water level after drilling
- ATD - At time of drilling
- Splitspoon Sampler
- Hollow Stem Auger- Soil samples not collected
- Geoprobe
- Air Knife/Hand Auger Sampler
- Air Rotary
- Sonic



USC based on field visual observations

VAPOR MONITORING POINT CONSTRUCTION DIAGRAM

GROUND SURFACE ELEVATION (FEET) 442.36 JOB NUMBER 21562850
 TOP OF INNER WELL CASING ELEVATION NA BORING NUMBER VMP-57
 DATUM 1988 USGS INSTALLATION DATE 8/20/2013
 LOCATION Roxana, Illinois



VAPOR MONITORING PORT INSTALLATION

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)	PORE DIAMETER (INCHES)
A	6.0	4.5	5.5	5.0	0.5	0.375	0.0057
B	11.0	9.5	10.5	10.0	0.5	0.375	0.0057
C	21.0	19.5	20.5	20.0	0.5	0.375	0.0057
D	31.0	29.5	30.5	30.0	0.5	0.375	0.0057

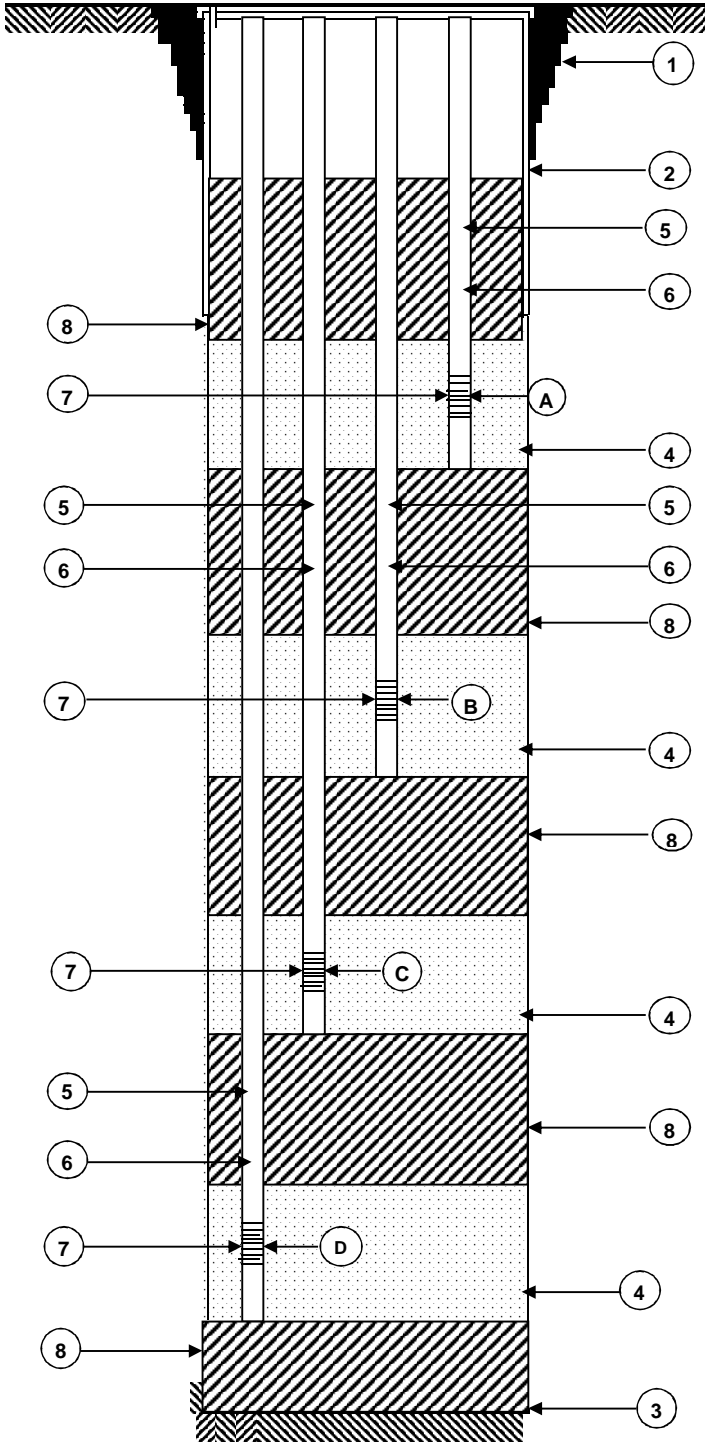
- 1 CONCRETE CAP? YES NO (CIRCLE ONE)
- 2 BOREHOLE DIAMETER 6-1/4" INCHES
- 3 TOTAL DEPTH OF BOREHOLE 53 FEET*
- 4 TYPE OF PACK AROUND SCREEN ANSI/NSF Quartz Sand
- 5 RISER MATERIAL Stainless Steel
- 6 RISER DIAMETER 0.125 INCHES
- 7 SCREEN MATERIAL Stainless Steel
- 8 TYPE OF SEAL Bentonite

* (DEPTH FROM GROUND SURFACE)

NOTE: DRAWING NOT TO SCALE

VAPOR MONITORING POINT CONSTRUCTION DIAGRAM

GROUND SURFACE ELEVATION (FEET) 443.96 JOB NUMBER 21562850
 TOP OF INNER WELL CASING ELEVATION NA BORING NUMBER VMP-58
 DATUM 1988 USGS INSTALLATION DATE 8/21/2013
 LOCATION Roxana, Illinois



VAPOR MONITORING PORT INSTALLATION

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)	PORE DIAMETER (INCHES)
A	6.0	4.5	5.5	5.0	0.5	0.375	0.0057
B	11.0	9.5	10.5	10.0	0.5	0.375	0.0057
C	21.0	19.5	20.5	20.0	0.5	0.375	0.0057
D	34.5	33.0	34.0	33.5	0.5	0.375	0.0057

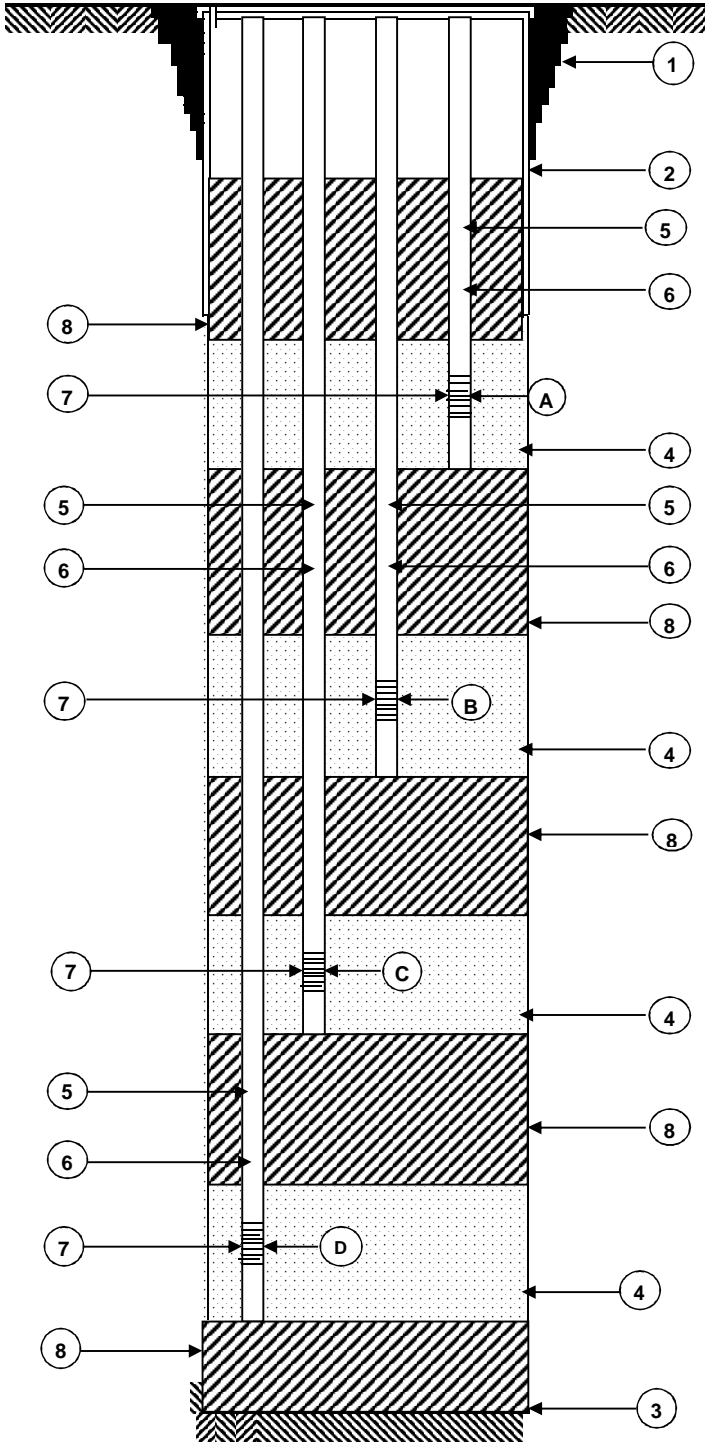
- 1 CONCRETE CAP? YES NO (CIRCLE ONE)
- 2 BOREHOLE DIAMETER 6-1/4" INCHES
- 3 TOTAL DEPTH OF BOREHOLE 48 FEET*
- 4 TYPE OF PACK AROUND SCREEN ANSI/NSF Quartz Sand
- 5 RISER MATERIAL Stainless Steel
- 6 RISER DIAMETER 0.125 INCHES
- 7 SCREEN MATERIAL Stainless Steel
- 8 TYPE OF SEAL Bentonite

* (DEPTH FROM GROUND SURFACE)

NOTE: DRAWING NOT TO SCALE

VAPOR MONITORING POINT CONSTRUCTION DIAGRAM

GROUND SURFACE ELEVATION (FEET) 444.60 JOB NUMBER 21562850
 TOP OF INNER WELL CASING ELEVATION NA BORING NUMBER VMP-59
 DATUM 1988 USGS INSTALLATION DATE 8/27/2013
 LOCATION Roxana, Illinois



VAPOR MONITORING PORT INSTALLATION

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)	PORE DIAMETER (INCHES)
A	6.0	4.5	5.5	5.0	0.5	0.375	0.0057
B	11.0	9.5	10.5	10.0	0.5	0.375	0.0057
C	21.0	19.5	20.5	20.0	0.5	0.375	0.0057
D	31.0	29.5	30.5	30.0	0.5	0.375	0.0057

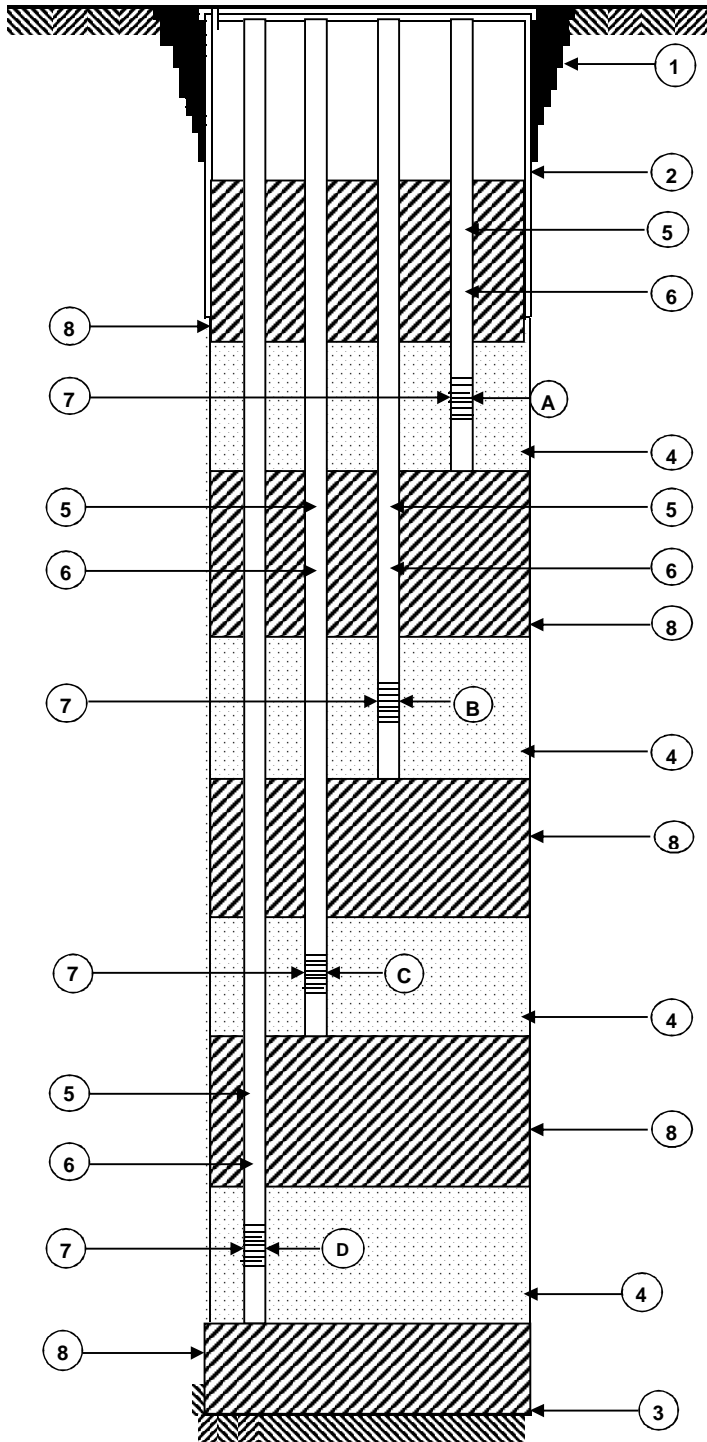
- 1 CONCRETE CAP? YES NO (CIRCLE ONE)
- 2 BOREHOLE DIAMETER 6-1/4" INCHES
- 3 TOTAL DEPTH OF BOREHOLE 48 FEET*
- 4 TYPE OF PACK AROUND SCREEN ANSI/NSF Quartz Sand
- 5 RISER MATERIAL Stainless Steel
- 6 RISER DIAMETER 0.125 INCHES
- 7 SCREEN MATERIAL Stainless Steel
- 8 TYPE OF SEAL Bentonite

* (DEPTH FROM GROUND SURFACE)

NOTE: DRAWING NOT TO SCALE

VAPOR MONITORING POINT CONSTRUCTION DIAGRAM

GROUND SURFACE ELEVATION (FEET) ±442.5 JOB NUMBER 21562850
 TOP OF INNER WELL CASING ELEVATION NA BORING NUMBER VMP-61
 DATUM 1988 USGS INSTALLATION DATE 8/26/2013
 LOCATION Roxana, Illinois



VAPOR MONITORING PORT INSTALLATION

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)	PORE DIAMETER (INCHES)
A	6.0	4.5	5.5	5.0	0.5	0.375	0.0057
B	11.0	9.5	10.5	10.0	0.5	0.375	0.0057
C	21.0	19.5	20.5	20.0	0.5	0.375	0.0057
D	31.0	29.5	30.5	30.0	0.5	0.375	0.0057

- 1 CONCRETE CAP? YES NO (CIRCLE ONE)
- 2 BOREHOLE DIAMETER 6-1/4" INCHES
- 3 TOTAL DEPTH OF BOREHOLE 48 FEET*
- 4 TYPE OF PACK AROUND SCREEN ANSI/NSF Quartz Sand
- 5 RISER MATERIAL Stainless Steel
- 6 RISER DIAMETER 0.125 INCHES
- 7 SCREEN MATERIAL Stainless Steel
- 8 TYPE OF SEAL Bentonite

* (DEPTH FROM GROUND SURFACE)

NOTE: DRAWING NOT TO SCALE

LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-57

Start Date: 8/20/13
 Completion Date: 8/20/13
 Casing Elevation: Not Installed
 Ground Elevation: 442.36

Coordinates
 Northing: 794230.71
 Easting: 2322267.83

Depth In feet	Well Construction				Inches Driven	Inches Recovered	PID/FID (ppm)	Graphic	Sampler Symbol	USCS	DESCRIPTION	NOTES
0 - 1										FILL	Asphalt surface and gravel (FILL)	
1 - 5.7							2.1			ML-CL	Dry, loose, black, very fine Clayey SILT to SILTY CLAY (CL) Becoming brown	
5.7 - 6.4							0.7			ML	Loose, moist, brown, fine clayey, Sandy SILT (ML), with gray mottling	
6.4 - 9.7							0.1			SM	Loose, moist, brown, fine grained, Silty SAND (SM)	
9.7 - 10.0							0.3				With clay	
10.0 - 14.1					36	24	1.4			SP	Loose, moist, gray, fine to medium grained SAND (SP)	
14.1 - 16.0					60	60	2.9			ML-CL	Stiff, moist, gray, very fine Clayey SILT to Silty CLAY (ML-CL)	
16.0 - 19.4							4.0				Loose, moist, gray, fine to medium grained SAND (SP)	
19.4 - 20.0					60	60	0.6			SP		
20.0 - 23.0							3.0					
23.0 - 25.9							2.9				Becomes brown	

Completion Depth: 53.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Expansion Investigation
 Drilling Contractor: Roberts Environmental Inc.
 Drilling method: Geoprobe/Direct Push Rig Type: DT8040
 Drilled by: S. Seymore
 Logged by: E. Arthur

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



URS (ENVIRONMENTAL) LOG + 4 WELLS Y:\GINT\PROJECTS\21562850.18001 (ROXANA VMP5 EXTENSION 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSS\TLEV.GLB 1/8/14

LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-57

Start Date: 8/20/13
 Completion Date: 8/20/13
 Casing Elevation: Not Installed
 Ground Elevation: 442.36

Coordinates
 Northing: 794230.71
 Easting: 2322267.83

Depth In feet	Well Construction			Inches Driven	Inches Recovered	PID/FID (ppm)	Graphic	Sampler Symbol	USCS	DESCRIPTION	NOTES
30	[Hatched]	[Hatched]	[Hatched]	60	60		[Black Diamond]	[Dotted]	SP	Loose, moist, brown, medium SAND (SP)	
						16.8		[Vertical Lines]	SM	Medium stiff, moist, fine grained Silty SAND (SM)	
35	[Hatched]	[Hatched]	[Hatched]	60	60	0.9	[Black Diamond]	[Dotted]	SP	Loose, wet, gray, medium grained SAND (SP)	
						8.0		[Hatched]	CL	Becomes brown Stiff, wet, gray, low plastic CLAY (CL)	
40	[Dotted]	[Dotted]	[Dotted]	60	60	6.5	[Black Diamond]	[Dotted]	SP	Loose, wet, gray, medium SAND (SP)	
						3.7					
45	[Dotted]	[Dotted]	[Dotted]	60	60	18.4	[Black Diamond]	[Dotted]	SP		
						8.4					
	[Dotted]	[Dotted]	[Dotted]	60	60	4.8	[Black Diamond]	[Dotted]	SP		
						35.9		[Vertical Lines]	ML	Stiff, wet, gray, very fine, Clayey SILT (ML)	
						77.6		[Hatched]	CL	Becomes very wet, soft	

Completion Depth: 53.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Expansion Investigation
 Drilling Contractor: Roberts Environmental Inc.
 Drilling method: Geoprobe/Direct Push Rig Type: DT8040
 Drilled by: S. Seymore
 Logged by: E. Arthur

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
 Sonic

USC based on field visual observations



URS (ENVIRON) LOG + 4 WELLS Y:\GINT\PROJECTS\21562850.18001 (ROXANA VMP5 EXTENSION 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSS\TLEV.GLB 1/8/14

LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-57

Start Date: 8/20/13
 Completion Date: 8/20/13
 Casing Elevation: Not Installed
 Ground Elevation: 442.36

Coordinates
 Northing: 794230.71
 Easting: 2322267.83

Depth In feet	Well Construction				Inches Driven	Inches Recovered	PID/FID (ppm)	Graphic	Sampler Symbol	USCS	LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-57	
	DESCRIPTION		NOTES									
55					60	60	1.0			SP	Loose, wet, gray, medium to coarse grained SAND (SP)	
60											Bottom of boring at 53' bgs	
65												
70												

URS (ENVIRON) LOG + 4 WELLS Y:\GINT\PROJECTS\21562850.18001 (ROXANA VMPS EXTENSION 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSS\TLEV.GLB 1/8/14

Completion Depth: 53.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Expansion Investigation
 Drilling Contractor: Roberts Environmental Inc.
 Drilling method: Geoprobe/Direct Push Rig Type: DT8040
 Drilled by: S. Seymore
 Logged by: E. Arthur

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
 Sonic
 USC based on field visual observations



LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-58

Start Date: 8/21/13
 Completion Date: 8/21/13
 Casing Elevation: Not Installed
 Ground Elevation: 443.96

Coordinates
 Northing: 794129.40
 Easting: 2322267.92

Depth In feet	Well Construction				Inches Driven	Inches Recovered	PID/FID (ppm)	Graphic	Sampler Symbol	USCS	DESCRIPTION	NOTES
										FILL	Asphalt surface and gravel (FILL)	
5							3.9			ML	Loose, dry, black, very fine SILT (ML)	
							9.1					
							4.4				Loose, dry, gray, fine grained SAND (SP)	
							5.8					
10					36	18	8.6			SP		
							20.4					
					60	60	10.9				Becomes light brown, fine to medium grained	
							10					
20					60	60	20.9			SM	Loose to medium stiff, dry, fine grained Silty SAND (SM)	
							25.6					

Completion Depth: 48.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Expansion Investigation
 Drilling Contractor: Roberts Environmental Inc.
 Drilling method: Geoprobe/Direct Push Rig Type: DT8040
 Drilled by: S. Seymore
 Logged by: E. Arthur

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
 Sonic

USC based on field visual observations



URS (ENVIRON) LOG + 4 WELLS Y:\GINT\PROJECTS\21562850.18001 (ROXANA VMP5 EXTENSION 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSS\TLEV.GLB 1/8/14

LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-58

Start Date: 8/21/13
 Completion Date: 8/21/13
 Casing Elevation: Not Installed
 Ground Elevation: 443.96

Coordinates
 Northing: 794129.40
 Easting: 2322267.92

Depth In feet	Well Construction			Inches Driven	Inches Recovered	PID/FID (ppm)	Graphic	Sampler Symbol	USCS	DESCRIPTION	NOTES
30	[Hatched]	[Hatched]	[Hatched]	60	60	44.4	[Diamond]	[Dotted]	SM	Loose to medium stiff, dry, fine Silty SAND (SM)	
				60	60	21.4			SP	Loose, dry, fine to medium grained SAND (SP), with gray mottling	
35	[Hatched]	[Hatched]	[Hatched]	60	60	33	[Diamond]	[Dotted]	ML-CL	Stiff, dry, gray, very fine, Clayey SILT to Silty CLAY (ML-CL)	
				60	60	26.9				Loose, dry, brown, medium grained SAND (SP)	
40	[Dotted]	[Dotted]	[Dotted]	60	60	32.6	[Diamond]	[Dotted]	SP	Becomes moist	
				60	60	45.2				Becomes moist to wet, brownish gray	
45	[Dotted]	[Dotted]	[Dotted]	60	60	109	[Diamond]	[Dotted]			
				60	60	50.4					
						78			ML	Stiff, wet, gray, very fine SILT (ML)	
										Bottom of boring at 48' bgs	

URS (ENVIRON) LOG + 4 WELLS Y:\GINT\PROJECTS\21562850.18001 (ROXANA VMP5 EXTENSION 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSS\TLEV.GLB 1/8/14

Completion Depth: 48.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Expansion Investigation
 Drilling Contractor: Roberts Environmental Inc.
 Drilling method: Geoprobe/Direct Push Rig Type: DT8040
 Drilled by: S. Seymore
 Logged by: E. Arthur

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
 Sonic

USC based on field visual observations



LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-59

Start Date: 8/27/13
 Completion Date: 8/27/13
 Casing Elevation: Not Installed
 Ground Elevation: 444.60

Coordinates
 Northing: 794030.57
 Easting: 2322271.39

Depth In feet	Well Construction				Inches Driven	Inches Recovered	PID/FID (ppm)	Graphic	Sampler Symbol	USCS	DESCRIPTION	NOTES
											Asphalt surface and gravel (FILL)	
							26			FILL		
5							1.6			ML	Loose, moist, gray, very fine SILT (ML)	
							11.1			SW	Loose, moist, light gray, fine SAND and SILT (SW)	
							7.2				Grades to fine sand	
10					36	30	5.4			SP	Loose, dry, light brown, fine to medium grained SAND (SP)	
							30.3					
15					60	60	21.4			ML	Loose, dry, gray, very fine SILT (ML)	
							28.8				Loose, dry, brown, medium grained SAND (SP)	
20					60	60	24.7				Becomes fine grained	
							39.9				Becomes fine to medium grained	

Completion Depth: 48.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Expansion Investigation
 Drilling Contractor: Roberts Environmental Inc.
 Drilling method: Geoprobe/Direct Push Rig Type: DT8040
 Drilled by: S. Seymore
 Logged by: E. Arthur

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
 Sonic

USC based on field
visual observations



URS (ENVIRON) LOG + 4 WELLS Y:\GINT\PROJECTS\21562850.18001 (ROXANA VMP5 EXTENSION 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSTLEV.GLB 1/8/14

LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-59

Start Date: 8/27/13
Completion Date: 8/27/13
Casing Elevation: Not Installed
Ground Elevation: 444.60

Coordinates
Northing: 794030.57
Easting: 2322271.39

Depth In feet	Well Construction			Inches Driven	Inches Recovered	PID/FID (ppm)	Graphic	Sampler Symbol	USCS	DESCRIPTION	NOTES
30	[Diagonal Hatching]			60	60	23.9	[Black Diamond]	[Dotted]	SP	Becomes wet	
	[Diagonal Hatching]					35				Becomes moist, brownish gray, medium to coarse grained	
35	[Diagonal Hatching]			60	60	29.3	[Black Diamond]	[Dotted]	SP	Becomes brown	
	[Diagonal Hatching]					17					
40	[Dotted]			60	60	45.3	[Black Diamond]	[Dotted]	SP	Becomes gray	
	[Dotted]					49.9					
45	[Dotted]			60	60	63.7	[Black Diamond]	[Dotted]	SP	Becomes wet, coarse grained	
	[Dotted]					91.4					
	[Dotted]			60	60	128.6	[Black Diamond]	[Dotted]	SP		
	Bottom of boring at 48' bgs										

Completion Depth: 48.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Expansion Investigation
 Drilling Contractor: Roberts Environmental Inc.
 Drilling method: Geoprobe/Direct Push Rig Type: DT8040
 Drilled by: S. Seymore
 Logged by: E. Arthur

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
 Sonic



USC based on field visual observations

URS (ENVIRON) LOG + 4 WELLS Y:\GINT\PROJECTS\21562850.18001 (ROXANA VMP5 EXTENSION 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSS\TLEV.GLB 1/8/14

LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-60

Start Date: 8/22/13
 Completion Date: 8/22/13
 Casing Elevation: Not Installed
 Ground Elevation: 444.25

Coordinates
 Northing: 793930.13
 Easting: 2322275.90

Depth In feet	Well Construction				Inches Driven	Inches Recovered	PID/FID (ppm)	Graphic	Sampler Symbol	USCS	DESCRIPTION	NOTES
										FILL	Asphalt surface and gravel (FILL)	
							0.8			ML	Loose, dry, brown, very fine Clayey SILT (ML), with trace organics	
5							1.4			CL	Medium stiff, dry, low plastic Silty CLAY (CL), grading to very fine silt	
							1.8			ML	Loose, dry, very fine, Clayey SILT (ML)	
							2.3				Loose, dry, gray, fine grained, Silty SAND (SM)	
10					36	24	3.7			SM		
							5.1					
15					60	43	10.1			ML	Stiff, wet, gray, very fine SILT (ML)	
							6.4			SP	Stiff, wet, gray, fine to medium grained SAND (SP)	
20					60	60	25.8			ML	Becomes coarse grained Stiff, wet, gray brown, very fine SILT (ML)	
							35.4			SM	Medium stiff, wet, gray, fine grained, Silty SAND (SM)	

Completion Depth: 48.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Expansion Investigation
 Drilling Contractor: Roberts Environmental Inc.
 Drilling method: Geoprobe/Direct Push Rig Type: DT8040
 Drilled by: S. Seymore
 Logged by: E. Arthur

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



URS (ENVIRON) LOG + 4 WELLS Y:\GINT\PROJECTS\21562850.18001 (ROXANA VMPs EXTENSION 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSS\TLEV.GLB 1/8/14

LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-61

Start Date: 8/26/13
Completion Date: 8/26/13
Casing Elevation: Not Installed
Ground Elevation: ±442.5

Coordinates
Northing: 794332.02
Easting: 2322267.74

Depth In feet	Well Construction				Inches Driven	Inches Recovered	PID/FID (ppm)	Graphic	Sampler Symbol	USCS	DESCRIPTION	NOTES
										FILL	Asphalt surface and gravel (FILL)	
							0.7			ML	Loose, moist, black, very fine SILT (ML) Becomes clayey	
5							6.8					
							1.4			CL	Loose, moist, brown, low plastic, Silty CLAY (CL)	
							0.5			ML	Loose, moist, brown, very fine, Clayey SILT (ML)	
10					36	24	1.2			ML	Becomes dark brown, with clay	
							0.8			SM	Loose, moist, light brown, fine grained, Silty SAND (SM)	
15					60	60				SP	Loose, dry, light brown, medium grained SAND (SP)	
							0.8					
							0.9			ML	Loose, wet, brown, very fine, SILT (ML)	
20					60	60				SP	Loose, moist to wet, brown, medium grained SAND (SP)	
							1.2					
							0.9					

Completion Depth: 48.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Expansion Investigation
 Drilling Contractor: Roberts Environmental Inc.
 Drilling method: Geoprobe/Direct Push Rig Type: DT8040
 Drilled by: S. Seymore
 Logged by: E. Arthur

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
 Sonic

USC based on field visual observations



URS (ENVIRON) LOG + 4 WELLS Y:\GINT\PROJECTS\21562850.18001 (ROXANA VMPs EXTENSION 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSS\TLEV.GLB 1/8/14

LOG OF BORING AND WELL CONSTRUCTION DETAIL VMP-61

Start Date: 8/26/13
Completion Date: 8/26/13
Casing Elevation: Not Installed
Ground Elevation: ±442.5

Coordinates
Northing: 794332.02
Easting: 2322267.74

Depth In feet	Well Construction			Inches Driven	Inches Recovered	PID/FID (ppm)	Graphic	Sampler Symbol	USCS	DESCRIPTION	NOTES
30				60	60	1.2			SP	Same: Loose, moist to wet, brown, medium SAND (SP) Becomes saturated	
						0.6					
35				60	60	1.7			CL	Soft, wet, gray, low plastic CLAY (CL)	
						2.1					
40				60	60	1.4			CL	Loose, wet, gray, very fine SILT (ML)	
						1.7					
45				60	60	2.1			ML	Soft, saturated, gray, low plastic, Silty CLAY (CL)	
						6.1					
48				60	60	4.6			SP	Loose, saturated, gray, very fine, Clayey SILT (ML)	
48									ML	Loose, saturated, medium grained SAND (SP)	
48									ML	Loose, saturated, gray, very fine, SILTY CLAY (ML)	
48									ML	Soft, saturated, gray, low plastic, Silty CLAY	
48									ML	Loose, saturated, gray, very fine, SILTY CLAY	
48										Bottom of boring at 48' bgs	

Completion Depth: 48.0 ft bgs
 Project No.: 21562850.18001
 Project Name: SVE Expansion Investigation
 Drilling Contractor: Roberts Environmental Inc.
 Drilling method: Geoprobe/Direct Push Rig Type: DT8040
 Drilled by: S. Seymore
 Logged by: E. Arthur

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
 Sonic

USC based on field visual observations



URS (ENVIRON) LOG + 4 WELLS Y:\GINT\PROJECTS\21562850.18001 (ROXANA VMPs EXTENSION 2013).GPJ Y:\GINT\ENVIRONMENTAL\URSS\TLEV.GLB 1/8/14

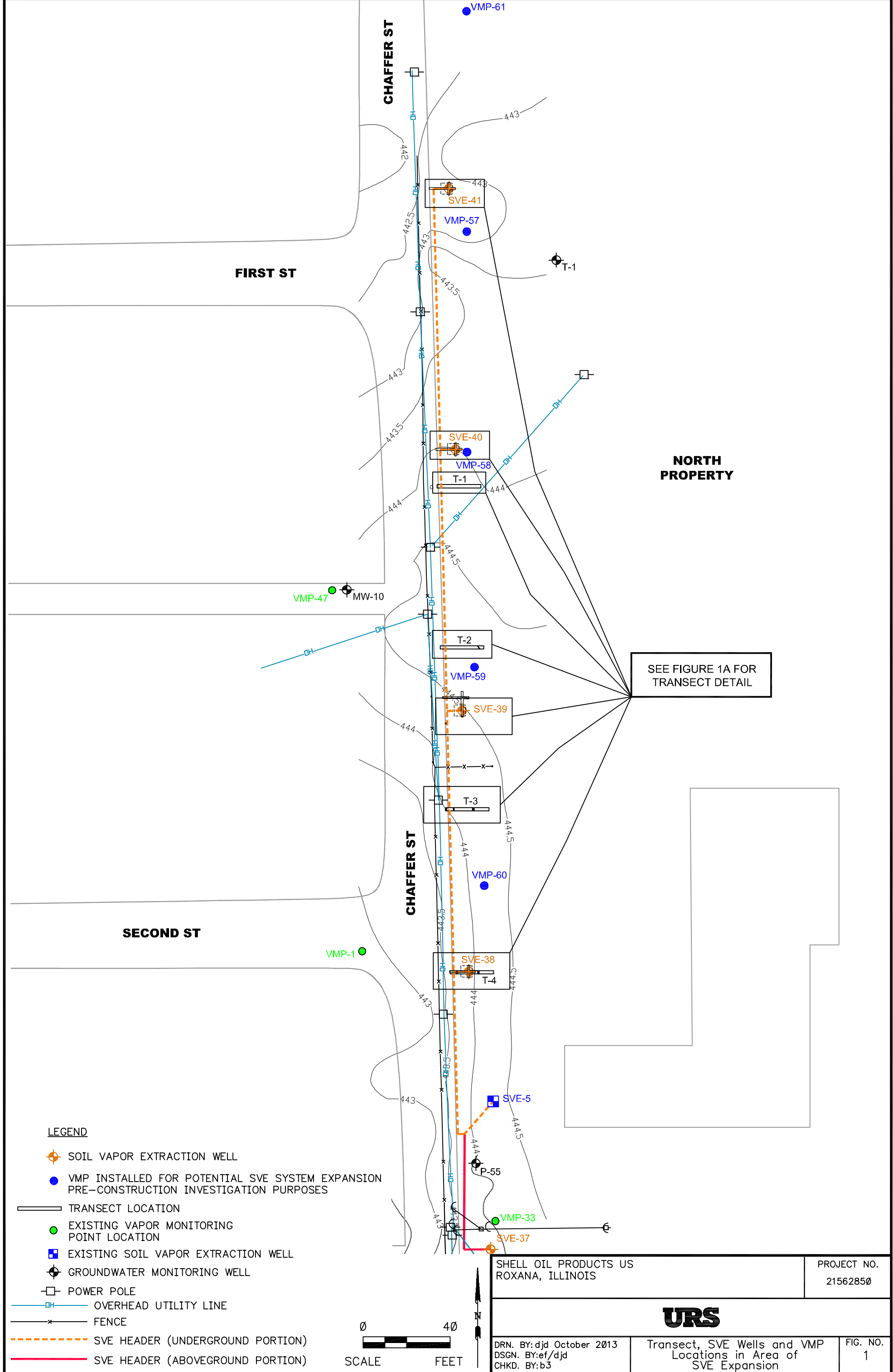
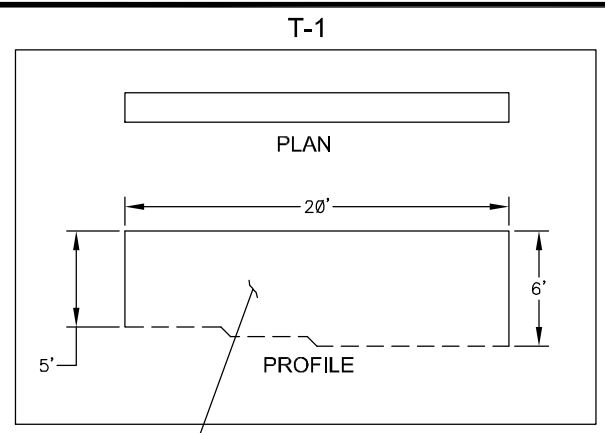
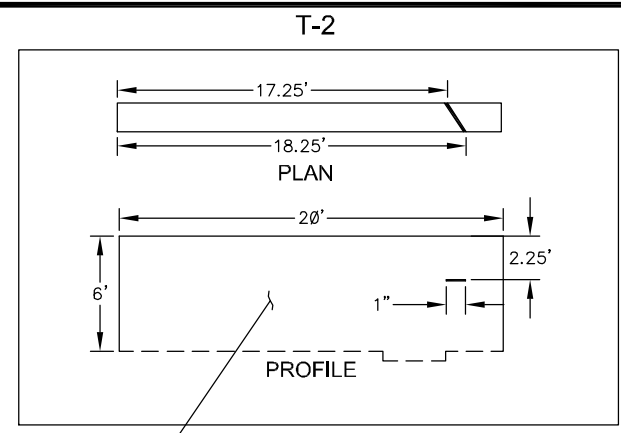


Fig. P:\ENVIRONMENTAL\Shell Oil Products US\Shell Oil Products US 2013\21562850 - ROXANA 21562850-5A_SOIL VAPOR SYSTEM INSTALLATION\SVE SYSTEM EXPANSION\DRAWING PLAN FOR VAPORS IN VILLAGE\FIGURES\TRANSECTS AND WELLS_108131.FIG. 1A_TRANSECT DETAILS.DWG. Last edited: OCT. 18. 13 @ 12:38 p.m. By: david_degure



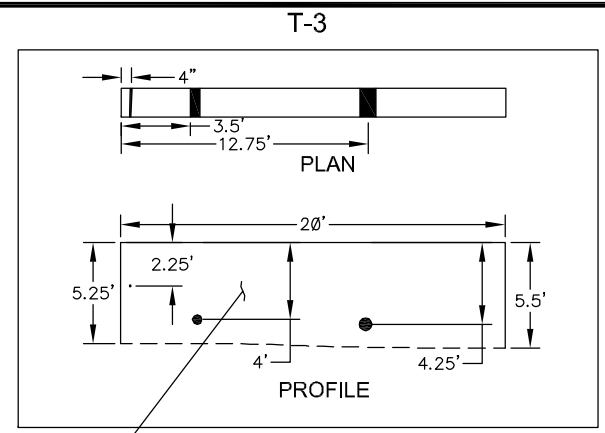
T-1
APPROX. SCALE 1"=10'

NOTE:
NO OBSTRUCTIONS
OBSERVED IN EXCAVATION



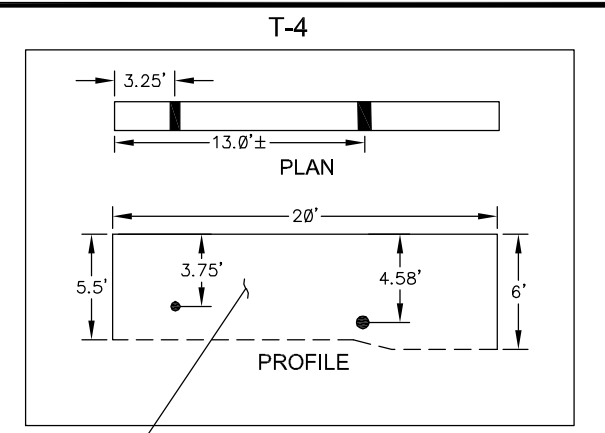
T-2
APPROX. SCALE 1"=10'

NOTES:
± 1.5" DIAMETER PIPE OBSERVED IN THE EASTERN PORTION OF THE TRENCH EXCAVATION. PIPE WAS ± 2.25' BELOW ASPHALT GRADE AND BETWEEN ± 17.25' AND ± 18.25' FROM THE WEST EDGE OF THE EXCAVATION



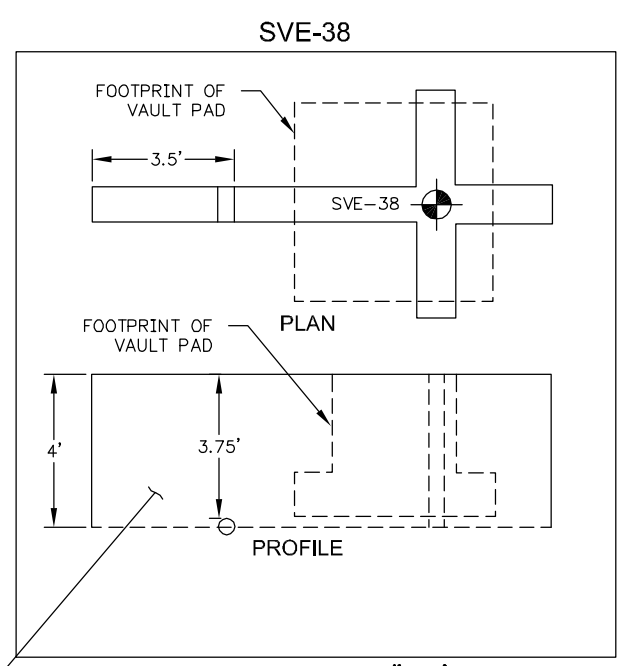
T-3
APPROX. SCALE 1"=10'

NOTES:
± 1" DIAMETER PIPE OBSERVED IN WEST EDGE OF TRENCH. ± 2.25' BELOW GRADE AND ± 4" TO 6" FROM WEST EDGE OF EXCAVATION.
± 6" TO 8" DIAMETER PIPE OBSERVED BETWEEN ± 3.5' TO 4.0' FROM WEST EDGE OF EXCAVATION AT DEPTH OF ± 4' BELOW ASPHALT GRADE.
± 8" DIAMETER YELLOW PIPE OBSERVED AT ± 12.75' FROM WEST EDGE OF EXCAVATION AT A DEPTH OF ± 4.25' BELOW ASPHALT GRADE.



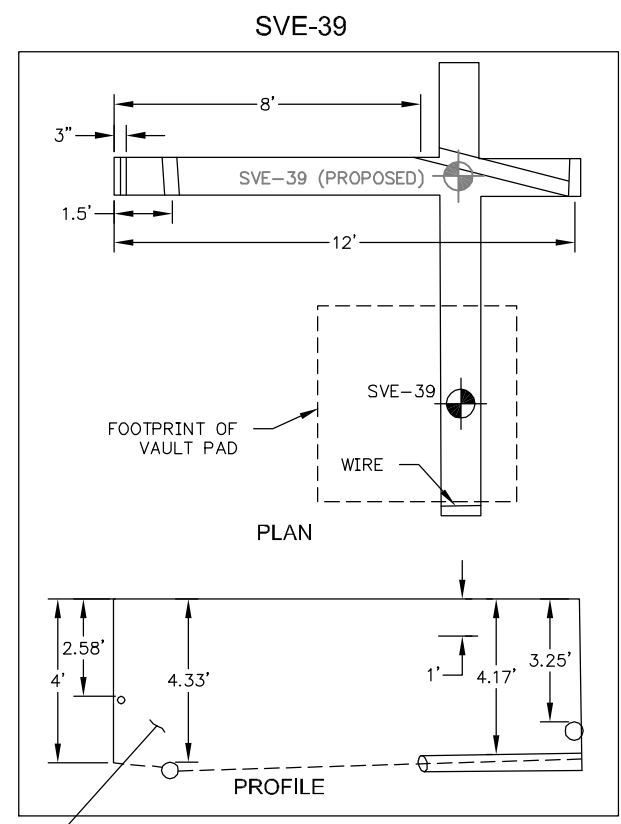
T-4
APPROX. SCALE 1"=10'

NOTES:
± 6" TO 8" DIAMETER PIPE OBSERVED BETWEEN ± 3' AND ± 3.5' FROM WEST EDGE OF EXCAVATION AT A DEPTH OF ± 3.75' BELOW ASPHALT GRADE.
± 8" DIAMETER YELLOW PIPE OBSERVED AT ± 12.5' TO 13.33' FROM WEST EDGE OF EXCAVATION AT A DEPTH OF ± 4.58' BELOW ASPHALT GRADE.



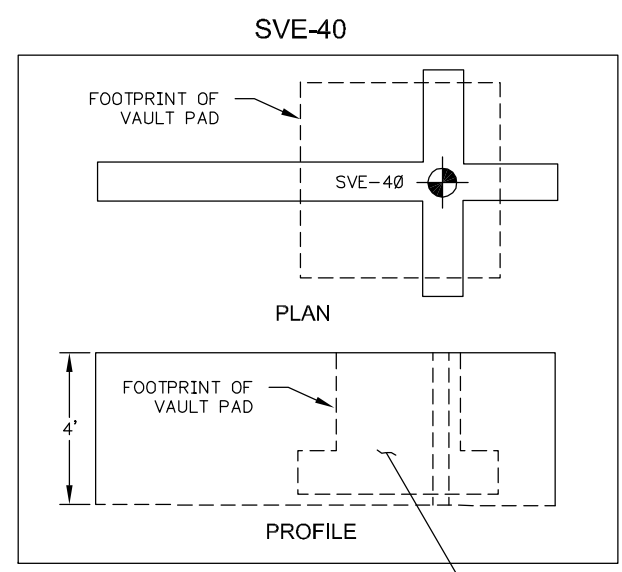
SVE-38
APPROX. SCALE 1"=5'

NOTE:
6" TO 8" DIA. BLACK PIPE OBSERVED APPROXIMATELY 3.5' FROM WEST EDGE OF EXCAVATION AT A DEPTH OF 3.75' BELOW ASPHALT GRADE.



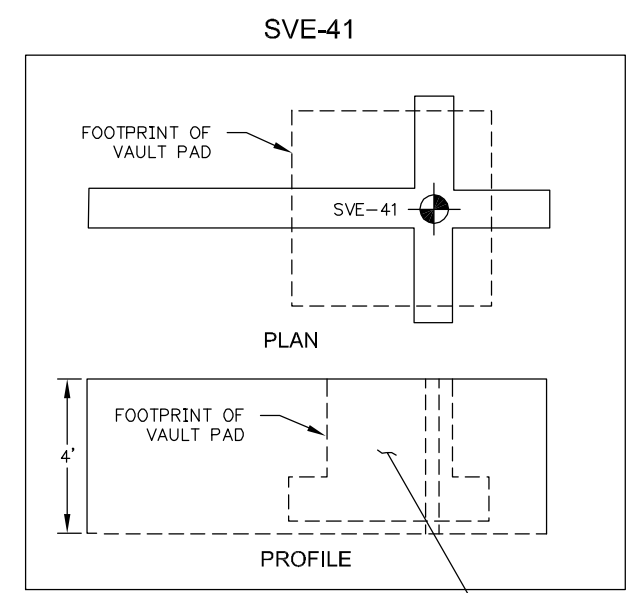
SVE-39
APPROX. SCALE 1"=5'

NOTES:
1.5" DIA. PIPE OBSERVED 3" FROM WEST EDGE OF EXCAVATION AT A DEPTH OF APPROXIMATELY 31" BELOW ASPHALT GRADE.
± 6" DIA. BLACK PIPE OBSERVED 1.5' FROM WEST EDGE OF EXCAVATION AT A DEPTH OF APPROXIMATELY 4.33' BELOW ASPHALT GRADE.
± 8" DIA. YELLOW PIPE OBSERVED 12' FROM WEST EDGE OF EXCAVATION AT A DEPTH OF APPROXIMATELY 3.25' BELOW ASPHALT GRADE.
8" TO 10" CLAY TILE PIPE CROSSING EXCAVATION BETWEEN 8' AND 12' FROM WEST EDGE OF EXCAVATION AT A DEPTH OF APPROXIMATELY 4.2' BELOW ASPHALT GRADE.
SVE-39 RELOCATED 6' SOUTH OF ORIGINAL LOCATION DUE TO PIPE DISCOVERED.
WIRE LOCATED 2.75' SOUTH OF PROPOSED SVE-39 BORE HOLE LOCATION AT A DEPTH OF 1' BELOW ASPHALT GRADE.



SVE-40
APPROX. SCALE 1"=5'

NOTE:
NO OBSTRUCTIONS
OBSERVED IN
EXCAVATION



SVE-41
APPROX. SCALE 1"=5'

NOTE:
NO OBSTRUCTIONS
OBSERVED IN
EXCAVATION

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY: djd August 2013 DSGN. BY: ef/djd CHKD. BY: b3	Transect Details	FIG. NO. 1A

Roxana SVE Extension 2013 Data Review

Laboratory SDG: MC24449

Data Reviewer: Melissa Mansker

Peer Reviewer: Elizabeth Kunkel

Date Reviewed: 10/14/2013

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

Sample Identification	Sample Identification
TB-091613-ST	TB-091613-HCL
SVE-38-091613 (34-36')	SVE-38-091613 (34-36')-Dup

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 VOC and SVOC LCS recoveries and VOC RPDs were outside evaluation criteria. The difference in results for several analytes in the field duplicate pair SVE-38-091613 (34-36')/SVE-38-091613 (34-36')-Dup was greater than five times (5X) the reporting level; therefore, results were qualified as estimated. These issues are addressed further in the appropriate sections below.

The cooler receipt form indicated samples were received by the laboratory at 1.8°C which is outside temperature criteria 4°C ± 2°C. All samples were received in good condition; no qualification of data was required.

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?

No

LCS/ LCSD ID	Parameter	Analyte	LCS/ LCSD Recovery	RPD	LCS/LCSD /RPD Criteria
MSM2067-BS	VOCs	Acrolein	52	NA	70-130
MSM2067-BS	VOCs	1,2,3-Trichlorobenzene	132	NA	70-130

LCS/ LCSD ID	Parameter	Analyte	LCS/ LCSD Recovery	RPD	LCS/LCSD /RPD Criteria
MSM2067-BS	VOCs	1,2,4-Trichlorobenzene	143	NA	70-130
MSV901- BS/BSD	VOCs	Acetone	73/95	26	70-130
OP34955-BS	SVOCs	Hexachlorocyclopentadiene	35	NA	40-140

Analytical data that required qualification based on LCS data are included in the table below. Analytical data reported as non-detect and associated with LCS recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. LCS/LCSD MSV901-BS/BSD was associated with the trip blank; trip blanks are quality control samples and do not require qualification.

Sample ID	Parameter	Analyte	Qualification
SVE-38-091613 (34-36')	VOCs	Acrolein	UJ
SVE-38-091613 (34-36')-Dup	VOCs	Acrolein	UJ
SVE-38-091613 (34-36')	SVOCs	Hexachlorocyclopentadiene	UJ
SVE-38-091613 (34-36')-Dup	SVOCs	Hexachlorocyclopentadiene	UJ

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

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

No

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

Yes

Field ID	Field Duplicate ID
SVE-38-091613 (34-36')	SVE-38-091613 (34-36')-Dup

Were field duplicates within evaluation criteria?

No

Field ID	Field Duplicate ID	Parameter	Analyte	RPD	Qualification
SVE-38-091613 (34-36')	SVE-38-091613 (34-36')-Dup	VOCs	Benzene	> 5X RL	J/J
SVE-38-091613 (34-36')	SVE-38-091613 (34-36')-Dup	VOCs	1,2,4- Trimethylbenzene	>5X RL	J/J
SVE-38-091613 (34-36')	SVE-38-091613 (34-36')-Dup	VOCs	m,p-Xylene	>5X RL	J/J
SVE-38-091613 (34-36')	SVE-38-091613 (34-36')-Dup	VOCs	o-Xylene	>5X RL	J/J
SVE-38-091613 (34-36')	SVE-38-091613 (34-36')-Dup	VOCs	Xylene (total)	>5X RL	J/J

11.0 Sample Dilutions

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

Not applicable; samples analyzed did not require dilution.

12.0 Additional Qualifications

Were additional qualifications applied?

No



10/09/13



Technical Report for

Shell Oil

URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

21562850.18000

Accutest Job Number: MC24449

Sampling Date: 09/16/13

Report to:

URS Corporation

Melissa.mansker@urs.com

ATTN: Melissa Mansker

Total number of pages in report: 94



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Reviewed on
10/14/13
[Signature]
Reza Fand
Lab Director

Client Service contact: Matthew Morrell 508-481-6200

Certifications: MA (M-MA136, SW846 NELAC) CT (PH-0109) NH (250210) RI (00071) ME (MA00136) FL (E87579) NY (11791) NJ (MA926) PA (6801121) ND (R-188) CO MN (11546AA) NC (653) IL (002337) WI (399080220) ISO 17025:2005 (L2235)

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Test results relate only to samples analyzed.

Table of Contents

Sections:



-1-

Section 1: Sample Summary	3
Section 2: Case Narrative/Conformance Summary	4
Section 3: Summary of Hits	7
Section 4: Sample Results	9
4.1: MC24449-1: TB-091613-ST	10
4.2: MC24449-2: TB-091613-HCL	11
4.3: MC24449-3: SVE38-091613 (34-36')	14
4.4: MC24449-4: SVE38-091613 (34-36')DUP	22
Section 5: Misc. Forms	30
5.1: Chain of Custody	31
5.2: Sample Tracking Chronicle	33
5.3: Internal Chain of Custody	34
Section 6: GC/MS Volatiles - QC Data Summaries	36
6.1: Method Blank Summary	37
6.2: Blank Spike Summary	43
6.3: Blank Spike/Blank Spike Duplicate Summary	46
6.4: Matrix Spike/Matrix Spike Duplicate Summary	49
6.5: Internal Standard Area Summaries	55
6.6: Surrogate Recovery Summaries	57
Section 7: GC/MS Semi-volatiles - QC Data Summaries	59
7.1: Method Blank Summary	60
7.2: Blank Spike Summary	63
7.3: Matrix Spike/Matrix Spike Duplicate Summary	66
7.4: Internal Standard Area Summaries	69
7.5: Surrogate Recovery Summaries	74
Section 8: GC Volatiles - QC Data Summaries	76
8.1: Method Blank Summary	77
8.2: Blank Spike Summary	80
8.3: Matrix Spike/Matrix Spike Duplicate Summary	83
8.4: Surrogate Recovery Summaries	86
8.5: GC Surrogate Retention Time Summaries	89
Section 9: General Chemistry - QC Data Summaries	93
9.1: Percent Solids Raw Data Summary	94



Sample Summary

Shell Oil

Job No: MC24449

URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
 Project No: 21562850.18000

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
MC24449-1	09/16/13	00:00 EA	09/17/13	AQ	Trip Blank Water	TB-091613-ST ✓
MC24449-2	09/16/13	00:00 EA	09/17/13	AQ	Trip Blank Water	TB-091613-HCL ✓
MC24449-3	09/16/13	13:00 EA	09/17/13	SO	Soil	SVE38-091613 (34-36') ✓
MC24449-4	09/16/13	13:00 EA	09/17/13	SO	Soil	SVE38-091613 (34-36')DUP ✓

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Shell Oil Job No MC24449
 Site: URSMOSTL: Roxana SVE System Extension, 900 South Central Av Report Date 10/1/2013 5:46:26 PM

2 Sample(s) and 2 Trip Blank(s) were collected on 09/16/2013 and were received at Accutest on 09/17/2013 properly preserved, at 1.8 Deg. C and intact. These Samples received an Accutest job number of MC24449. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix	AQ	Batch ID:	MSV901
--------	----	-----------	--------

- ☛ All samples were analyzed within the recommended method holding time.
- ☛ Sample(s) MC24531-IMS, MC24531-1MSD were used as the QC samples indicated.
- ☛ All method blanks for this batch meet method specific criteria.
- ☛ MS/MSD Recovery(s) for 2-Chloroethyl vinyl ether, 2-Hexanone, Acetone are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- ☛ RPD of MSV901-BSD for Acetone: Outside control limits. Individual spike recoveries within acceptance limits.

Matrix	SO	Batch ID:	MSM2067
--------	----	-----------	---------

- ☛ All samples were analyzed within the recommended method holding time.
- ☛ Sample(s) MC24680-13MS, MC24680-13MSD were used as the QC samples indicated.
- ☛ All method blanks for this batch meet method specific criteria.
- ☛ Blank Spike Recovery(s) for 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, Acrolein are outside control limits. Blank Spike meets program technical requirements.
- ☛ Matrix Spike Recovery(s) for 1,1,1,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, 1,1-Dichloropropene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 1,4-Dioxane, 2-Butanone (MEK), 2-Chloroethyl vinyl ether, 2-Hexanone, Acetone, Acrolein, Acrylonitrile, Benzene, Bromobenzene, Bromodichloromethane, Bromoform, Carbon tetrachloride, Chlorobenzene, cis-1,3-Dichloropropene; Dibromochloromethane, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, m,p-Xylene, Methylene chloride, n-Butylbenzene, n-Propylbenzene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Isopropyltoluene, sec-Butylbenzene, Styrene, tert-Butylbenzene, Tetrachloroethene, Toluene, trans-1,3-Dichloropropene, Trichloroethene, Xylene (total) are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- ☛ Matrix Spike Duplicate Recovery(s) for 1,1,1,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloropropene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,4-Dioxane, 2-Butanone (MEK), 2-Chloroethyl vinyl ether, 2-Hexanone, Acrolein, Acrylonitrile, Benzene, Bromobenzene, Bromodichloromethane, Bromoform, Carbon tetrachloride, Chlorobenzene, cis-1,3-Dichloropropene, Dibromochloromethane, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, m,p-Xylene, Methylene chloride, n-Butylbenzene, n-Propylbenzene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Isopropyltoluene, sec-Butylbenzene, Styrene, tert-Butylbenzene, Tetrachloroethene, Toluene, trans-1,3-Dichloropropene, Trichloroethene, Xylene (total) are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.

Extractables by GCMS By Method SW846 8270C

Matrix SO	Batch ID: OP34955
------------------	--------------------------

- ☒ All samples were extracted within the recommended method holding time.
- ☒ All samples were analyzed within the recommended method holding time.
- ☒ Sample(s) MC24409-24MS, MC24409-24MSD were used as the QC samples indicated.
- ☒ All method blanks for this batch meet method specific criteria.
- ☒ Blank Spike Recovery(s) for Hexachlorocyclopentadiene are outside control limits. Blank Spike meets program technical requirements.
- ☒ Matrix Spike Recovery(s) for 2,4-Dinitrophenol, Benzoic acid, Hexachlorocyclopentadiene, Pyridine are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- ☒ Matrix Spike Duplicate Recovery(s) for Benzoic acid, Hexachlorocyclopentadiene are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- ☒ RPD(s) for MSD for 2,4-Dinitrophenol are outside control limits for sample OP34955-MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.

Extractables by GCMS By Method SW846 8270C BY SIM

Matrix SO	Batch ID: OP34956
------------------	--------------------------

- ☒ All samples were extracted within the recommended method holding time.
- ☒ All samples were analyzed within the recommended method holding time.
- ☒ Sample(s) MC24444-3MS, MC24444-3MSD were used as the QC samples indicated.
- ☒ All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8011

Matrix AQ	Batch ID: OP35014
------------------	--------------------------

- ☒ All samples were analyzed within the recommended method holding time.
- ☒ All method blanks for this batch meet method specific criteria.
- ☒ MC24800-3MS, MC24800-3MSD are were used as the QC samples indicated.

Matrix SO	Batch ID: OP34909
------------------	--------------------------

- ☒ All samples were extracted within the recommended method holding time.
- ☒ All samples were analyzed within the recommended method holding time.
- ☒ Sample(s) MC24403-3MS, MC24403-3MSD were used as the QC samples indicated.
- ☒ All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8015

Matrix SO	Batch ID: GBH1839
------------------	--------------------------

- ☒ All samples were analyzed within the recommended method holding time.
- ☒ Sample(s) MC24409-13MS, MC24409-13MSD were used as the QC samples indicated.
- ☒ All method blanks for this batch meet method specific criteria.
- ☒ MS/MSD Recovery(s) for TPH-GRO (VOA) are outside control limits. Outside control limits due to high level in sample relative to spike amount.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix SO	Batch ID: GN44346
------------------	--------------------------

- ☒ Sample(s) MC24428-8DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(MC24449).

2

Tuesday, October 01, 2013

Page 3 of 3

Summary of Hits

Job Number: MC24449
 Account: Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
 Collected: 09/16/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

MC24449-1 TB-091613-ST

No hits reported in this sample.

MC24449-2 TB-091613-HCL

No hits reported in this sample.

MC24449-3 SVE38-091613 (34-36')

Benzene	0.0097 J	0.00060	0.00030	mg/kg	SW846 8260B
sec-Butylbenzene	0.0021 J	0.0060	0.00019	mg/kg	SW846 8260B
Ethylbenzene	0.0143	0.0024	0.00021	mg/kg	SW846 8260B
Isopropylbenzene	0.0035 J	0.0060	0.00033	mg/kg	SW846 8260B
p-Isopropyltoluene	0.0013 J	0.0060	0.00019	mg/kg	SW846 8260B
Naphthalene	0.0043 J	0.0060	0.00094	mg/kg	SW846 8260B
n-Propylbenzene	0.0049 J	0.0060	0.00029	mg/kg	SW846 8260B
Toluene	0.0054 J	0.0060	0.00029	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	0.0330 J	0.0060	0.00025	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	0.0155	0.0060	0.00015	mg/kg	SW846 8260B
m,p-Xylene	0.0587 J	0.0024	0.00034	mg/kg	SW846 8260B
o-Xylene	0.0278 J	0.0024	0.00024	mg/kg	SW846 8260B
Xylene (total)	0.0865 J	0.0024	0.00024	mg/kg	SW846 8260B
Total TIC, Volatile	1.1953 J			mg/kg	
Benzo(g,h,i)perylene	0.0218	0.0060	0.0024	mg/kg	SW846 8270C BY SIM
Dibenzo(a,h)anthracene	0.0220	0.0060	0.0017	mg/kg	SW846 8270C BY SIM
Fluoranthene	0.0010 J	0.0060	0.00096	mg/kg	SW846 8270C BY SIM
Indeno(1,2,3-cd)pyrene	0.0228	0.0060	0.0015	mg/kg	SW846 8270C BY SIM
2-Methylnaphthalene	0.0049 J	0.0060	0.0013	mg/kg	SW846 8270C BY SIM
Phenanthrene	0.0014 J	0.0060	0.0012	mg/kg	SW846 8270C BY SIM

MC24449-4 SVE38-091613 (34-36')DUP

Benzene	0.0016 J	0.00058	0.00029	mg/kg	SW846 8260B
Ethylbenzene	0.0053	0.0023	0.00021	mg/kg	SW846 8260B
Isopropylbenzene	0.00037 J	0.0058	0.00033	mg/kg	SW846 8260B
Naphthalene	0.0015 J	0.0058	0.00092	mg/kg	SW846 8260B
n-Propylbenzene	0.00086 J	0.0058	0.00028	mg/kg	SW846 8260B
Toluene	0.0043 J	0.0058	0.00028	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	0.0031 J J	0.0058	0.00024	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	0.0014 J	0.0058	0.00015	mg/kg	SW846 8260B
m,p-Xylene	0.0043 J	0.0023	0.00033	mg/kg	SW846 8260B
o-Xylene	0.0020 J J	0.0023	0.00024	mg/kg	SW846 8260B
Xylene (total)	0.0064 J	0.0023	0.00024	mg/kg	SW846 8260B
Total TIC, Volatile	0.1245 J			mg/kg	

Summary of Hits

Job Number: MC24449
Account: Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
Collected: 09/16/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
		0.0057 J	0.0060	0.0023	mg/kg	SW846 8270C BY SIM
		0.0056 J	0.0060	0.0017	mg/kg	SW846 8270C BY SIM
		0.0063	0.0060	0.0015	mg/kg	SW846 8270C BY SIM
		0.0039 J	0.0060	0.0013	mg/kg	SW846 8270C BY SIM

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: TB-091613-ST	Date Sampled: 09/16/13
Lab Sample ID: MC24449-1	Date Received: 09/17/13
Matrix: AQ - Trip Blank Water	Percent Solids: n/a
Method: SW846 8011 SW846 8011	
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB51216.D	1	09/28/13	CZ	09/27/13	OP35014	GBB3020
Run #2							

Run #	Initial Volume	Final Volume
Run #1	35.9 ml	2.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.0044	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.0094	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	100%		36-173%
460-00-4	Bromofluorobenzene (S)	96%		36-173%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID:	TB-091613-HCL	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-2	Date Received:	09/17/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B	Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V23535.D	1	09/26/13	AMY	n/a	n/a	MSV901
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.8	ug/l	
107-02-8	Acrolein	ND	25	6.3	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.5	ug/l	
71-43-2	Benzene	ND	0.50	0.45	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	5.0	0.64	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.33	ug/l	
75-25-2	Bromoform	ND	1.0	0.42	ug/l	
74-83-9	Bromomethane	ND	2.0	1.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	1.6	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.54	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.58	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.87	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.59	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.62	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.48	ug/l	
75-00-3	Chloroethane	ND	2.0	0.84	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	1.4	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.55	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.33	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.35	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.30	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.2	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.37	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.35	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.67	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB-091613-HCL	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-2	Date Received:	09/17/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.45	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.97	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.3	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.63	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.22	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.29	ug/l	
123-91-1	1,4-Dioxane	ND	25	16	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.38	ug/l	
87-68-3	Hexachlorobutadiené	ND	5.0	1.3	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.3	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.64	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.55	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.43	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.3	ug/l	
74-95-3	Methylene bromide	ND	5.0	0.43	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.41	ug/l	
91-20-3	Naphthalene	ND	5.0	0.79	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.59	ug/l	
100-42-5	Styrene	ND	5.0	0.49	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.46	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.42	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.61	ug/l	
108-88-3	Toluene	ND	1.0	0.46	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.76	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.45	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.94	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.49	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.45	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.61	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.70	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	1.1	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.61	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.41	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.41	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB-091613-HCL	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-2	Date Received:	09/17/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.2
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		70-130%
2037-26-5	Toluene-D8	103%		70-130%
460-00-4	4-Bromofluorobenzene	107%		70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-3	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.4
Method:	SW846 8260B	Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M59677.D	1	09/27/13	KD	n/a	n/a	MSM2067
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.07 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.012	0.0047	mg/kg	
107-02-8	Acrolein	ND	0.030	0.0045	mg/kg	WJ
107-13-1	Acrylonitrile	ND	0.030	0.0016	mg/kg	
71-43-2	Benzene	0.0097	0.00060	0.00030	mg/kg	J
108-86-1	Bromobenzene	ND	0.0060	0.00033	mg/kg	
74-97-5	Bromochloromethane	ND	0.0060	0.00070	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0024	0.00043	mg/kg	
75-25-2	Bromoform	ND	0.0024	0.00035	mg/kg	
74-83-9	Bromomethane	ND	0.0024	0.0012	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0060	0.0037	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0060	0.00021	mg/kg	
135-98-8	sec-Butylbenzene	0.0021	0.0060	0.00019	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.0060	0.00043	mg/kg	
75-15-0	Carbon disulfide	ND	0.0060	0.00018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0024	0.0014	mg/kg	
108-90-7	Chlorobenzene	ND	0.0024	0.00032	mg/kg	
75-00-3	Chloroethane	ND	0.0060	0.00072	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0060	0.0057	mg/kg	
67-66-3	Chloroform	ND	0.0024	0.00035	mg/kg	
74-87-3	Chloromethane	ND	0.0060	0.0015	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0060	0.00049	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0060	0.00053	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0024	0.00051	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0024	0.00025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0024	0.00027	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0024	0.00024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0024	0.0013	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0024	0.00040	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0024	0.00065	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0024	0.00062	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0024	0.00061	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0024	0.00053	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-3	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.3
4

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0024	0.00050	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0060	0.00053	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0060	0.00079	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0060	0.00028	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0024	0.00035	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0024	0.00035	mg/kg	
123-91-1	1,4-Dioxane	ND	0.030	0.025	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0060	0.0040	mg/kg	
100-41-4	Ethylbenzene	0.0143	0.0024	0.00021	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0060	0.00068	mg/kg	
591-78-6	2-Hexanone	ND	0.0060	0.0029	mg/kg	
98-82-8	Isopropylbenzene	0.0035	0.0060	0.00033	mg/kg	J
99-87-6	p-Isopropyltoluene	0.0013	0.0060	0.00019	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.0024	0.00047	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0060	0.0022	mg/kg	
74-95-3	Methylene bromide	ND	0.0060	0.00042	mg/kg	
75-09-2	Methylene chloride	ND	0.0024	0.0018	mg/kg	
91-20-3	Naphthalene	0.0043	0.0060	0.00094	mg/kg	J
103-65-1	n-Propylbenzene	0.0049	0.0060	0.00029	mg/kg	J
100-42-5	Styrene	ND	0.0060	0.00025	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0060	0.00046	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0024	0.00035	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0024	0.00053	mg/kg	
108-88-3	Toluene	0.0054	0.0060	0.00029	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0060	0.00052	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0060	0.00043	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0024	0.00022	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0024	0.00042	mg/kg	
79-01-6	Trichloroethene	ND	0.0024	0.00057	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0024	0.0013	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0060	0.00046	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.0330	0.0060	0.00025	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.0155	0.0060	0.00015	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0060	0.0015	mg/kg	
75-01-4	Vinyl chloride	ND	0.0024	0.00068	mg/kg	
	m,p-Xylene	0.0587	0.0024	0.00034	mg/kg	
95-47-6	o-Xylene	0.0278	0.0024	0.00024	mg/kg	
1330-20-7	Xylene (total)	0.0865	0.0024	0.00024	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-3	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.3
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	75%		70-130%
2037-26-5	Toluene-D8	83%		70-130%
460-00-4	4-Bromofluorobenzene	90%		70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
106-97-8	Butane	5.09	.37	mg/kg	JN
78-78-4	Butane, 2-methyl-	6.07	.19	mg/kg	JN
109-66-0	Pentane	6.49	.11	mg/kg	JN
513-35-9	2-Butene, 2-methyl-	6.91	.028	mg/kg	JN
75-83-2	Butane, 2,2-dimethyl-	7.21	.0087	mg/kg	JN
18631-84-0	Cyclopropane, methylmethylene-	7.67	.0056	mg/kg	JN
96-14-0	Pentane, 3-methyl-	8.15	.054	mg/kg	JN
110-54-3	Hexane	8.46	.044	mg/kg	JN
96-37-7	Cyclopentane, methyl-	9.17	.081	mg/kg	JN
591-76-4	Hexane, 2-methyl-	9.87	.05	mg/kg	JN
540-84-1	Pentane, 2,2,4-trimethyl-	10.42	.066	mg/kg	JN
565-75-3	Pentane, 2,3,4-trimethyl-	11.63	.043	mg/kg	JN
609-26-7	Pentane, 3-ethyl-2-methyl-	11.78	.074	mg/kg	JN
611-14-3	Benzene, 1-ethyl-2-methyl-	15.23	.071	mg/kg	JN
	Total TIC, Volatile		1.1953	mg/kg	J

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-3	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.4
Method:	SW846 8270C SW846 3546		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R33890.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	0.60	0.075	mg/kg	
95-57-8	2-Chlorophenol	ND	0.30	0.014	mg/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	0.60	0.015	mg/kg	
120-83-2	2,4-Dichlorophenol	ND	0.60	0.017	mg/kg	
105-67-9	2,4-Dimethylphenol	ND	0.60	0.098	mg/kg	
51-28-5	2,4-Dinitrophenol	ND	1.2	0.15	mg/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	0.60	0.075	mg/kg	
95-48-7	2-Methylphenol	ND	0.60	0.024	mg/kg	
	3&4-Methylphenol	ND	0.60	0.029	mg/kg	
88-75-5	2-Nitrophenol	ND	0.60	0.016	mg/kg	
100-02-7	4-Nitrophenol	ND	1.2	0.11	mg/kg	
87-86-5	Pentachlorophenol	ND	0.60	0.042	mg/kg	
108-95-2	Phenol	ND	0.30	0.017	mg/kg	
95-95-4	2,4,5-Trichlorophenol	ND	0.60	0.015	mg/kg	
88-06-2	2,4,6-Trichlorophenol	ND	0.60	0.015	mg/kg	
62-53-3	Aniline	ND	0.60	0.030	mg/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	0.30	0.015	mg/kg	
85-68-7	Butyl benzyl phthalate	ND	0.30	0.012	mg/kg	
100-51-6	Benzyl Alcohol	ND	0.60	0.030	mg/kg	
91-58-7	2-Chloronaphthalene	ND	0.30	0.016	mg/kg	
106-47-8	4-Chloroaniline	ND	0.60	0.015	mg/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	0.30	0.014	mg/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	0.30	0.018	mg/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	0.30	0.022	mg/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	0.30	0.018	mg/kg	
122-66-7	1,2-Diphenylhydrazine	ND	0.30	0.014	mg/kg	
121-14-2	2,4-Dinitrotoluene	ND	0.60	0.040	mg/kg	
606-20-2	2,6-Dinitrotoluene	ND	0.60	0.015	mg/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	0.30	0.030	mg/kg	
132-64-9	Dibenzofuran	ND	0.12	0.017	mg/kg	
84-74-2	Di-n-butyl phthalate	ND	0.30	0.032	mg/kg	
117-84-0	Di-n-octyl phthalate	ND	0.30	0.0094	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-3	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.4
Method:	SW846 8270C SW846 3546		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.3
4

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
84-66-2	Diethyl phthalate	ND	0.30	0.015	mg/kg	
131-11-3	Dimethyl phthalate	ND	0.30	0.017	mg/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	0.30	0.011	mg/kg	
118-74-1	Hexachlorobenzene	ND	0.30	0.019	mg/kg	
77-47-4	Hexachlorocyclopentadiene	ND	0.60	0.15	mg/kg	UJ
67-72-1	Hexachloroethane	ND	0.30	0.015	mg/kg	
78-59-1	Isophorone	ND	0.30	0.014	mg/kg	
88-74-4	2-Nitroaniline	ND	0.60	0.015	mg/kg	
99-09-2	3-Nitroaniline	ND	0.60	0.033	mg/kg	
100-01-6	4-Nitroaniline	ND	0.60	0.015	mg/kg	
98-95-3	Nitrobenzene	ND	0.30	0.016	mg/kg	
62-75-9	n-Nitrosodimethylamine	ND	0.30	0.014	mg/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	0.30	0.017	mg/kg	
86-30-6	N-Nitrosodiphenylamine	ND	0.30	0.018	mg/kg	
110-86-1	Pyridine	ND	0.60	0.030	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	75%		30-130%
4165-62-2	Phenol-d5	72%		30-130%
118-79-6	2,4,6-Tribromophenol	66%		30-130%
4165-60-0	Nitrobenzene-d5	66%		30-130%
321-60-8	2-Fluorobiphenyl	76%		30-130%
1718-51-0	Terphenyl-d14	80%		30-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Semi-Volatile		0	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-3	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.4
Method:	SW846 8270C BY SIM SW846 3546	Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I86191.D	1	09/30/13	WK	09/24/13	OP34956	MSI3208
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.0060	0.00070	mg/kg	
208-96-8	Acenaphthylene	ND	0.0060	0.0011	mg/kg	
120-12-7	Anthracene	ND	0.0060	0.00098	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.0060	0.00075	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.0060	0.00088	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.0060	0.00074	mg/kg	
191-24-2	Benzo(g,h,i)perylene	0.0218	0.0060	0.0024	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.0060	0.0012	mg/kg	
218-01-9	Chrysene	ND	0.0060	0.00093	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	0.0220	0.0060	0.0017	mg/kg	
206-44-0	Fluoranthene	0.0010	0.0060	0.00096	mg/kg	J
86-73-7	Fluorene	ND	0.0060	0.00053	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	0.0228	0.0060	0.0015	mg/kg	
90-12-0	1-Methylnaphthalene	ND	0.012	0.012	mg/kg	
91-57-6	2-Methylnaphthalene	0.0049	0.0060	0.0013	mg/kg	J
85-01-8	Phenanthrene	0.0014	0.0060	0.0012	mg/kg	J
129-00-0	Pyrene	ND	0.0060	0.0021	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	36%		15-110%
4165-62-2	Phenol-d5	35%		15-110%
118-79-6	2,4,6-Tribromophenol	39%		15-110%
4165-60-0	Nitrobenzene-d5	78%		30-130%
321-60-8	2-Fluorobiphenyl	76%		30-130%
1718-51-0	Terphenyl-d14	87%		30-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')	
Lab Sample ID:	MC24449-3	Date Sampled: 09/16/13
Matrix:	SO - Soil	Date Received: 09/17/13
Method:	SW846 8011 SW846 3550B	Percent Solids: 82.4
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK29877.D	1	09/25/13	NK	09/20/13	OP34909	GBK996
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0030	0.00074	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0030	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	135%		61-167%
460-00-4	Bromofluorobenzene (S)	126%		61-167%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')	
Lab Sample ID:	MC24449-3	Date Sampled: 09/16/13
Matrix:	SO - Soil	Date Received: 09/17/13
Method:	SW846 8015	Percent Solids: 82.4
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BH31531.D	1	09/25/13	TB	n/a	n/a	GBH1839
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.24 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	13	2.8	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	78%		61-116%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')DUP	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-4	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.7
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M59678.D	1	09/27/13	KD	n/a	n/a	MSM2067
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.19 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.012	0.0045	mg/kg	
107-02-8	Acrolein	ND	0.029	0.0044	mg/kg	UJ
107-13-1	Acrylonitrile	ND	0.029	0.0016	mg/kg	
71-43-2	Benzene	0.0016	0.00058	0.00029	mg/kg	J
108-86-1	Bromobenzene	ND	0.0058	0.00032	mg/kg	
74-97-5	Bromochloromethane	ND	0.0058	0.00068	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0023	0.00042	mg/kg	
75-25-2	Bromoform	ND	0.0023	0.00034	mg/kg	
74-83-9	Bromomethane	ND	0.0023	0.0011	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0058	0.0036	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0058	0.00020	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0058	0.00018	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0058	0.00041	mg/kg	
75-15-0	Carbon disulfide	ND	0.0058	0.00018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0023	0.0014	mg/kg	
108-90-7	Chlorobenzene	ND	0.0023	0.00031	mg/kg	
75-00-3	Chloroethane	ND	0.0058	0.00070	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0058	0.0055	mg/kg	
67-66-3	Chloroform	ND	0.0023	0.00034	mg/kg	
74-87-3	Chloromethane	ND	0.0058	0.0014	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0058	0.00048	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0058	0.00051	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0023	0.00050	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0023	0.00024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0023	0.00026	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0023	0.00024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0023	0.0013	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0023	0.00039	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0023	0.00063	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0023	0.00061	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0023	0.00059	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0023	0.00052	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')DUP	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-4	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.7
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.4
4

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0023	0.00049	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0058	0.00052	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0058	0.00077	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0058	0.00027	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0023	0.00034	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0023	0.00034	mg/kg	
123-91-1	1,4-Dioxane	ND	0.029	0.024	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0058	0.0039	mg/kg	
100-41-4	Ethylbenzene	0.0053	0.0023	0.00021	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0058	0.00066	mg/kg	
591-78-6	2-Hexanone	ND	0.0058	0.0028	mg/kg	
98-82-8	Isopropylbenzene	0.00037	0.0058	0.00033	mg/kg	J
99-87-6	p-Isopropyltoluene	ND	0.0058	0.00019	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0023	0.00046	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0058	0.0022	mg/kg	
74-95-3	Methylene bromide	ND	0.0058	0.00041	mg/kg	
75-09-2	Methylene chloride	ND	0.0023	0.0018	mg/kg	
91-20-3	Naphthalene	0.0015	0.0058	0.00092	mg/kg	J
103-65-1	n-Propylbenzene	0.00086	0.0058	0.00028	mg/kg	J
100-42-5	Styrene	ND	0.0058	0.00024	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0058	0.00045	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0023	0.00034	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0023	0.00052	mg/kg	
108-88-3	Toluene	0.0043	0.0058	0.00028	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0058	0.00050	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0058	0.00042	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0023	0.00021	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0023	0.00040	mg/kg	
79-01-6	Trichloroethene	ND	0.0023	0.00055	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0023	0.0012	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0058	0.00045	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.0031	0.0058	0.00024	mg/kg	J J
108-67-8	1,3,5-Trimethylbenzene	0.0014	0.0058	0.00015	mg/kg	J
108-05-4	Vinyl Acetate	ND	0.0058	0.0015	mg/kg	
75-01-4	Vinyl chloride	ND	0.0023	0.00066	mg/kg	
	m,p-Xylene	0.0043	0.0023	0.00033	mg/kg	J J
95-47-6	o-Xylene	0.0020	0.0023	0.00024	mg/kg	J J
1330-20-7	Xylene (total)	0.0064	0.0023	0.00024	mg/kg	J J

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')DUP	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-4	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.7
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.4
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	77%		70-130%
2037-26-5	Toluene-D8	81%		70-130%
460-00-4	4-Bromofluorobenzene	86%		70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
78-78-4	Butane, 2-methyl-	6.06	.026	mg/kg	JN
109-66-0	Pentane	6.49	.017	mg/kg	JN
107-83-5	Pentane, 2-methyl-	7.84	.012	mg/kg	JN
96-14-0	Pentane, 3-methyl-	8.14	.0068	mg/kg	JN
110-54-3	Hexane	8.46	.011	mg/kg	JN
96-37-7	Cyclopentane, methyl-	9.17	.0077	mg/kg	JN
591-76-4	Hexane, 2-methyl-	9.87	.0071	mg/kg	JN
1071-81-4	Hexane, 2,2,5,5-tetramethyl-	10.43	.0067	mg/kg	JN
108-87-2	Cyclohexane, methyl-	11.18	.0094	mg/kg	JN
592-27-8	Heptane, 2-methyl-	11.78	.0082	mg/kg	JN
111-65-9	Octane	12.36	.0062	mg/kg	JN
620-14-4	Benzene, 1-ethyl-3-methyl-	15.23	.0064	mg/kg	JN
	Total TIC, Volatile		.1245	mg/kg	J

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')DUP	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-4	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.7
Method:	SW846 8270C SW846 3546		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R33891.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.2 g	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	0.60	0.075	mg/kg	
95-57-8	2-Chlorophenol	ND	0.30	0.014	mg/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	0.60	0.015	mg/kg	
120-83-2	2,4-Dichlorophenol	ND	0.60	0.017	mg/kg	
105-67-9	2,4-Dimethylphenol	ND	0.60	0.098	mg/kg	
51-28-5	2,4-Dinitrophenol	ND	1.2	0.15	mg/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	0.60	0.075	mg/kg	
95-48-7	2-Methylphenol	ND	0.60	0.024	mg/kg	
	3&4-Methylphenol	ND	0.60	0.029	mg/kg	
88-75-5	2-Nitrophenol	ND	0.60	0.016	mg/kg	
100-02-7	4-Nitrophenol	ND	1.2	0.11	mg/kg	
87-86-5	Pentachlorophenol	ND	0.60	0.042	mg/kg	
108-95-2	Phenol	ND	0.30	0.017	mg/kg	
95-95-4	2,4,5-Trichlorophenol	ND	0.60	0.015	mg/kg	
88-06-2	2,4,6-Trichlorophenol	ND	0.60	0.015	mg/kg	
62-53-3	Aniline	ND	0.60	0.030	mg/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	0.30	0.015	mg/kg	
85-68-7	Butyl benzyl phthalate	ND	0.30	0.012	mg/kg	
100-51-6	Benzyl Alcohol	ND	0.60	0.030	mg/kg	
91-58-7	2-Chloronaphthalene	ND	0.30	0.016	mg/kg	
106-47-8	4-Chloroaniline	ND	0.60	0.015	mg/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	0.30	0.014	mg/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	0.30	0.018	mg/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	0.30	0.022	mg/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	0.30	0.018	mg/kg	
122-66-7	1,2-Diphenylhydrazine	ND	0.30	0.013	mg/kg	
121-14-2	2,4-Dinitrotoluene	ND	0.60	0.040	mg/kg	
606-20-2	2,6-Dinitrotoluene	ND	0.60	0.015	mg/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	0.30	0.030	mg/kg	
132-64-9	Dibenzofuran	ND	0.12	0.017	mg/kg	
84-74-2	Di-n-butyl phthalate	ND	0.30	0.032	mg/kg	
117-84-0	Di-n-octyl phthalate	ND	0.30	0.0094	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')DUP	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-4	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.7
Method:	SW846 8270C SW846 3546		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.4
4

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
84-66-2	Diethyl phthalate	ND	0.30	0.015	mg/kg	
131-11-3	Dimethyl phthalate	ND	0.30	0.017	mg/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	0.30	0.011	mg/kg	
118-74-1	Hexachlorobenzene	ND	0.30	0.019	mg/kg	
77-47-4	Hexachlorocyclopentadiene	ND	0.60	0.15	mg/kg	WJ
67-72-1	Hexachloroethane	ND	0.30	0.014	mg/kg	
78-59-1	Isophorone	ND	0.30	0.014	mg/kg	
88-74-4	2-Nitroaniline	ND	0.60	0.015	mg/kg	
99-09-2	3-Nitroaniline	ND	0.60	0.033	mg/kg	
100-01-6	4-Nitroaniline	ND	0.60	0.015	mg/kg	
98-95-3	Nitrobenzene	ND	0.30	0.016	mg/kg	
62-75-9	n-Nitrosodimethylamine	ND	0.30	0.014	mg/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	0.30	0.017	mg/kg	
86-30-6	N-Nitrosodiphenylamine	ND	0.30	0.018	mg/kg	
110-86-1	Pyridine	ND	0.60	0.030	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	71%		30-130%
4165-62-2	Phenol-d5	70%		30-130%
118-79-6	2,4,6-Tribromophenol	72%		30-130%
4165-60-0	Nitrobenzene-d5	60%		30-130%
321-60-8	2-Fluorobiphenyl	73%		30-130%
1718-51-0	Terphenyl-d14	87%		30-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Semi-Volatile		0	mg/kg	

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')DUP	Date Sampled:	09/16/13
Lab Sample ID:	MC24449-4	Date Received:	09/17/13
Matrix:	SO - Soil	Percent Solids:	82.7
Method:	SW846 8270C BY SIM SW846 3546	Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I86192.D	1	09/30/13	WK	09/24/13	OP34956	MSI3208
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.2 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.0060	0.00069	mg/kg	
208-96-8	Acenaphthylene	ND	0.0060	0.0011	mg/kg	
120-12-7	Anthracene	ND	0.0060	0.00097	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.0060	0.00074	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.0060	0.00087	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.0060	0.00073	mg/kg	
191-24-2	Benzo(g,h,i)perylene	0.0057	0.0060	0.0023	mg/kg	J
207-08-9	Benzo(k)fluoranthene	ND	0.0060	0.0011	mg/kg	
218-01-9	Chrysene	ND	0.0060	0.00092	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	0.0056	0.0060	0.0017	mg/kg	J
206-44-0	Fluoranthene	ND	0.0060	0.00095	mg/kg	
86-73-7	Fluorene	ND	0.0060	0.00053	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	0.0063	0.0060	0.0015	mg/kg	
90-12-0	1-Methylnaphthalene	ND	0.012	0.012	mg/kg	
91-57-6	2-Methylnaphthalene	0.0039	0.0060	0.0013	mg/kg	J
85-01-8	Phenanthrene	ND	0.0060	0.0012	mg/kg	
129-00-0	Pyrene	ND	0.0060	0.0021	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	35%		15-110%
4165-62-2	Phenol-d5	34%		15-110%
118-79-6	2,4,6-Tribromophenol	42%		15-110%
4165-60-0	Nitrobenzene-d5	77%		30-130%
321-60-8	2-Fluorobiphenyl	75%		30-130%
1718-51-0	Terphenyl-d14	95%		30-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.4
4

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')DUP		Date Sampled:	09/16/13
Lab Sample ID:	MC24449-4		Date Received:	09/17/13
Matrix:	SO - Soil		Percent Solids:	82.7
Method:	SW846 8011 SW846 3550B		Project:	
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK29878.D	1	09/25/13	NK	09/20/13	OP34909	GBK996
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.5 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0030	0.00073	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0030	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	135%		61-167%
460-00-4	Bromofluorobenzene (S)	121%		61-167%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.4
4

Report of Analysis

Client Sample ID:	SVE38-091613 (34-36')DUP	
Lab Sample ID:	MC24449-4	Date Sampled: 09/16/13
Matrix:	SO - Soil	Date Received: 09/17/13
Method:	SW846 8015	Percent Solids: 82.7
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BH31532.D	1	09/25/13	TB	n/a	n/a	GBH1839
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.27 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	13	2.8	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	79%		61-116%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.4
4

Misc. Forms



Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

LAB (LOCATION)

XENCO
 CALSCEM
 OTHER: **Accutest Labs, 495 Technology Cir. W. Marlborough, MA 01752 (508 481-6200)**
 SPK
 Lab Vendor #



Shell Oil Products Chain Of Custody Record

URS

Please Check Appropriate Box:
 ENV. SERVICES
 MOTIVA RETAIL
 SHELL RETAIL
 MOTIVA SOLCH
 CONSULTANT
 LUBES
 SHELL PIPELINE
 OTHER

Print Bill To Contact Name: **Rob Billman**

INCIDENT # (ENV SERVICES):

9 7 2 1 6 6 4 0
 PO # SAP #

CHECK IF NO INCIDENT # APPLIES

DATE: 8/16/2013

PAGE: 1 of 1

MAILING COMPANY: URS CORPORATION

ADDRESS: 1001 HIGHLANDS PLAZA DRIVE WEST - SUITE 300; ST. LOUIS, MO 63110

PROJECT CONTACT (Name/Title or PO# Report to): Elizabeth Kurikel elizabeth.kurikel@urs.com

TELEPHONE: 314-420-0100 FAX: 314-420-0402

TURNAROUND TIME (CALENDAR DAYS):
 STANDARD (10 DAY) 5 DAYS 3 DAYS 2 DAYS 24 HOURS RESULTS NEEDED ON WEEKEND

BILL ADDRESS: Street and City: 900 South Central Ave; ROXANA, IL

EDP DELIVERABLE TO (Name, Company, Office Location): SVE System Extension 2156 2850-18000

CONSULTANT PROJECT NO.: SVE System Extension 2156 2850-18000

Sample Name(s): Enk Arthur

LAB USE ONLY: MC24449

DELIVERABLES: LEVEL 1 LEVEL 2 LEVEL 3 LEVEL 4 OTHER (SPECIFY) EDD

TEMPERATURE ON RECEIPT °C: Cooler #1: Cooler #2: Cooler #3:

SPECIAL INSTRUCTIONS OR NOTES:
 * Please include "J" values on Reports.
 * Please provide sample receipt upon login.

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

REQUESTED ANALYSIS

FIELD NOTES:

TEMPERATURE ON RECEIPT °C

Container PID Readings or Laboratory Notes

LAB USE ONLY - DATE	Field Sample Identification	SAMPLING		MATRIX	PRESERVATIVE						NO. OF CONT.	VOC 8011 SL	SVOC 8270C SL + TICS	PAH 8270LL	Percent Moisture	VOC 8280B SL + top 15 TICS	TPH-GRO	PID (ppm)	FIELD NOTES
		DATE	TIME		HCL	HNO3	H2SO4	NONE	OTHER										
	TB-091613-ST	8/16/2013		WATER						2	2	X							
	TB-091613-HCL	8/16/2013		WATER	2						2								
	SVE38-091613 (34-36)	8/16/2013	1300	SOLID				3	5	8		X	X	X	X	X	X		47.8
	SVE38-091613 (34-36) DUP	8/16/2013	1300	SOLID				2	5	8		X	X	X	X	X	X		47.8
																			14E, 10A5 163

Requested by (Signature): *[Signature]*

Received by (Signature): **FED EX**

Date: 9/16/13

Time: 1830

Requested by (Signature): **FED EX**

Received by (Signature): *[Signature]*

Date: 9-12-13

Time: 820

Requested by (Signature):

Received by (Signature):

Date:

Time:

1.8°C

5.1
5



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC24449 Client: URS Immediate Client Services Action Required: No
 Date / Time Received: 9/17/2013 Delivery Method: _____ Client Service Action Required at Login: No
 Project: 900 SOUTH CENTRAL No. Coolers: 1 Airbill #'s: _____

Cooler Security Y or N Y or N
 1. Custody Seals Present: 3. COC Present:
 2. Custody Seals Intact: 4. Smpl Dates/Time OK:

Cooler Temperature Y or N
 1. Temp criteria achieved:
 2. Cooler temp verification: Infrared gun
 3. Cooler media: Ice (bag)

Quality Control Preservation Y or N N/A
 1. Trip Blank present / cooler:
 2. Trip Blank listed on COC:
 3. Samples preserved properly:
 4. VOCs headspace free:

Sample Integrity - Documentation Y or N
 1. Sample labels present on bottles:
 2. Container labeling complete:
 3. Sample container label / COC agree:

Sample Integrity - Condition Y or N
 1. Sample recvd within HT:
 2. All containers accounted for:
 3. Condition of sample: Intact

Sample Integrity - Instructions Y or N N/A
 1. Analysis requested is clear:
 2. Bottles received for unspecified tests:
 3. Sufficient volume recvd for analysis:
 4. Compositing instructions clear:
 5. Filtering instructions clear:

Comments

Accutest Laboratories
V:508.481.6200

495 Technology Center West, Bldg One
F: 508.481.7753

Marlborough, MA
www.accutest.com

5.1
5

Internal Sample Tracking Chronicle

Shell Oil

Job No: MC24449

URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
 Project No: 21562850.18000

5.2

5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC24449-1 Collected: 16-SEP-13 00:00 By: EA Received: 17-SEP-13 By: TB-091613-ST						
MC24449-1	SW846 8011	28-SEP-13 00:55	CZ	27-SEP-13	MR	V8011SL
MC24449-2 Collected: 16-SEP-13 00:00 By: EA Received: 17-SEP-13 By: TB-091613-HCL						
MC24449-2	SW846 8260B	26-SEP-13 13:14	AMY			V8260SL +
MC24449-3 Collected: 16-SEP-13 13:00 By: EA Received: 17-SEP-13 By: SVE38-091613 (34-36')						
MC24449-3	SM21 2540 B MOD.	18-SEP-13	HS			%SOL
MC24449-3	SW846 8015	25-SEP-13 03:23	TB			V8015GRO
MC24449-3	SW846 8011	25-SEP-13 17:39	NK	20-SEP-13	NE	V8011SL
MC24449-3	SW846 8260B	27-SEP-13 21:34	KD			V8260SL +
MC24449-3	SW846 8270C BY SIM	30-SEP-13 12:57	WK	24-SEP-13	PA	B8270SIMSL
MC24449-3	SW846 8270C	30-SEP-13 16:22	KR	24-SEP-13	PA	AB8270SL +
MC24449-4 Collected: 16-SEP-13 13:00 By: EA Received: 17-SEP-13 By: SVE38-091613 (34-36')DUP						
MC24449-4	SM21 2540 B MOD.	18-SEP-13	HS			%SOL
MC24449-4	SW846 8015	25-SEP-13 03:58	TB			V8015GRO
MC24449-4	SW846 8011	25-SEP-13 18:03	NK	20-SEP-13	NE	V8011SL
MC24449-4	SW846 8260B	27-SEP-13 22:03	KD			V8260SL +
MC24449-4	SW846 8270C BY SIM	30-SEP-13 13:20	WK	24-SEP-13	PA	B8270SIMSL
MC24449-4	SW846 8270C	30-SEP-13 16:45	KR	24-SEP-13	PA	AB8270SL +

Accutest Internal Chain of Custody

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
 Received: 09/17/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC24449-1.2	VOC Ref #1	Michael Rolo	09/27/13 07:13	Retrieve from Storage
MC24449-1.2	Michael Rolo		09/30/13 07:07	Depleted
MC24449-2.1	VOC Ref #1	Amy Min Yang	09/26/13 11:51	Retrieve from Storage
MC24449-2.1	Amy Min Yang	GCMSV	09/26/13 11:51	Load on Instrument
MC24449-2.1	GCMSV	Amy Min Yang	09/27/13 11:37	Unload from Instrument
MC24449-2.1	Amy Min Yang	VOC Ref #1	09/27/13 11:37	Return to Storage
MC24449-3.1	Walk In Ref #9	Hamid Siamak	09/18/13 08:39	Retrieve from Storage
MC24449-3.1	Hamid Siamak	Walk In Ref #9	09/18/13 11:04	Return to Storage
MC24449-3.3	Walk In Ref #9	Chris Cataldo	09/20/13 15:47	Retrieve from Storage
MC24449-3.3	Chris Cataldo	Walk In Ref #9	09/20/13 23:22	Return to Storage
MC24449-3.3	Walk In Ref #9	Chris Cataldo	09/24/13 07:37	Retrieve from Storage
MC24449-3.3	Chris Cataldo	Walk In Ref #9	09/24/13 15:04	Return to Storage
MC24449-3.4	VOC Ref #10	Krysten Dufort	09/27/13 16:18	Retrieve from Storage
MC24449-3.4	Krysten Dufort	GCMSM	09/27/13 16:18	Load on Instrument
MC24449-3.4	GCMSM	Krysten Dufort	09/30/13 10:03	Unload from Instrument
MC24449-3.4	Krysten Dufort	VOC Ref #10	09/30/13 10:03	Return to Storage
MC24449-3.6	VOC Ref #10	Jaclyn Bergeron	09/19/13 16:39	Retrieve from Storage
MC24449-3.6	Jaclyn Bergeron	VOC Ref #10	09/19/13 16:39	Return to Storage
MC24449-3.7	VOC Ref #10	Todd Bahosh	09/24/13 18:31	Retrieve from Storage
MC24449-3.7	Todd Bahosh	GCBH	09/24/13 18:32	Load on Instrument
MC24449-3.7	GCBH	Todd Bahosh	09/25/13 17:28	Unload from Instrument
MC24449-3.7	Todd Bahosh	VOC Ref #10	09/25/13 17:29	Return to Storage
MC24449-4.1	Walk In Ref #9	Hamid Siamak	09/18/13 08:39	Retrieve from Storage
MC24449-4.1	Hamid Siamak	Walk In Ref #9	09/18/13 11:04	Return to Storage
MC24449-4.3	Walk In Ref #9	Chris Cataldo	09/20/13 15:47	Retrieve from Storage
MC24449-4.3	Chris Cataldo	Walk In Ref #9	09/20/13 23:22	Return to Storage
MC24449-4.3	Walk In Ref #9	Chris Cataldo	09/24/13 07:37	Retrieve from Storage
MC24449-4.3	Chris Cataldo	Walk In Ref #9	09/24/13 15:04	Return to Storage
MC24449-4.4	VOC Ref #10	Krysten Dufort	09/27/13 16:18	Retrieve from Storage
MC24449-4.4	Krysten Dufort	GCMSM	09/27/13 16:18	Load on Instrument
MC24449-4.4	GCMSM	Krysten Dufort	09/30/13 10:03	Unload from Instrument
MC24449-4.4	Krysten Dufort	VOC Ref #10	09/30/13 10:03	Return to Storage
MC24449-4.7	VOC Ref #10	Todd Bahosh	09/24/13 18:31	Retrieve from Storage
MC24449-4.7	Todd Bahosh	GCBH	09/24/13 18:32	Load on Instrument



Accutest Internal Chain of Custody

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
Received: 09/17/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC24449-4.7	GCBH	Todd Bahosh	09/25/13 17:28	Unload from Instrument
MC24449-4.7	Todd Bahosh	VOC Ref #10	09/25/13 17:29	Return to Storage
MC24449-4.8	VOC Ref #10	Jaclyn Bergeron	09/19/13 16:39	Retrieve from Storage
MC24449-4.8	Jaclyn Bergeron	VOC Ref #10	09/19/13 16:39	Return to Storage

5.3



GC/MS Volatiles



QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Surrogate Recovery Summaries

Method Blank Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV901-MB	V23533.D	1	09/26/13	AMY	n/a	n/a	MSV901

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-2

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.8	ug/l	
107-02-8	Acrolein	ND	25	6.3	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.5	ug/l	
71-43-2	Benzene	ND	0.50	0.45	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	5.0	0.64	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.33	ug/l	
75-25-2	Bromoform	ND	1.0	0.42	ug/l	
74-83-9	Bromomethane	ND	2.0	1.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	1.6	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.54	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.58	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.87	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.59	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.62	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.48	ug/l	
75-00-3	Chloroethane	ND	2.0	0.84	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	1.4	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.55	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.33	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.35	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.30	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.2	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.37	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.35	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.67	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.45	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.97	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.3	ug/l	
563-58-6	1,1-Dichloropropane	ND	5.0	0.63	ug/l	

6.1.1

6

Method Blank Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV901-MB	V23533.D	1	09/26/13	AMY	n/a	n/a	MSV901

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-2

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.22	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.29	ug/l	
123-91-1	1,4-Dioxane	ND	25	16	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.38	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.3	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.3	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.64	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.55	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.43	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.3	ug/l	
74-95-3	Methylene bromide	ND	5.0	0.43	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.41	ug/l	
91-20-3	Naphthalene	ND	5.0	0.79	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.59	ug/l	
100-42-5	Styrene	ND	5.0	0.49	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.46	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.42	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.61	ug/l	
108-88-3	Toluene	ND	1.0	0.46	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.76	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.45	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.94	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.49	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.45	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.61	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.70	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	1.1	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.61	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.41	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.41	ug/l	

6.1.1



Method Blank Summary

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV901-MB	V23533.D	1	09/26/13	AMY	n/a	n/a	MSV901

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-2

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	97% 70-130%
2037-26-5	Toluene-D8	103% 70-130%
460-00-4	4-Bromofluorobenzene	104% 70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

6.1.1

6

Method Blank Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2067-MB	M59668.D	1	09/27/13	KD	n/a	n/a	MSM2067

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-3, MC24449-4

6.1.2
6

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.9	ug/kg	
107-02-8	Acrolein	ND	25	3.8	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.25	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.27	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.58	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.36	ug/kg	
75-25-2	Bromoform	ND	2.0	0.29	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.97	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	3.1	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.17	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.16	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.36	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.15	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	1.2	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.27	ug/kg	
75-00-3	Chloroethane	ND	5.0	0.60	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	4.7	ug/kg	
67-66-3	Chloroform	ND	2.0	0.29	ug/kg	
74-87-3	Chloromethane	ND	5.0	1.2	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	0.41	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.44	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.43	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.21	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.22	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.20	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.33	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.54	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.52	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.51	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.45	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.42	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.45	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.66	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.23	ug/kg	

Method Blank Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2067-MB	M59668.D	1	09/27/13	KD	n/a	n/a	MSM2067

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-3, MC24449-4

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.29	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.29	ug/kg	
123-91-1	1,4-Dioxane	ND	25	21	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	3.3	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.18	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.57	ug/kg	
591-78-6	2-Hexanone	ND	5.0	2.4	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.28	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.16	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.40	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.8	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.35	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.5	ug/kg	
91-20-3	Naphthalene	ND	5.0	0.79	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	0.24	ug/kg	
100-42-5	Styrene	ND	5.0	0.21	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.39	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.29	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.44	ug/kg	
108-88-3	Toluene	ND	5.0	0.24	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.43	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.36	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.18	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.35	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.47	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	1.0	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.39	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.13	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.57	ug/kg	
	m,p-Xylene	ND	2.0	0.29	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.20	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.20	ug/kg	

6.1.2

6

Method Blank Summary

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2067-MB	M59668.D	1	09/27/13	KD	n/a	n/a	MSM2067

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-3, MC24449-4

6.1.2

6

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	77%	70-130%
2037-26-5	Toluene-D8	81%	70-130%
460-00-4	4-Bromofluorobenzene	85%	70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/kg	

Blank Spike Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2067-BS	M59665.D	1	09/27/13	KD	n/a	n/a	MSM2067

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-3, MC24449-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	50	54.0	108	70-130
107-02-8	Acrolein	250	130	52* a	70-130
107-13-1	Acrylonitrile	50	54.6	109	70-130
71-43-2	Benzene	50	54.8	110	70-130
108-86-1	Bromobenzene	50	61.2	122	70-130
74-97-5	Bromochloromethane	50	60.6	121	70-130
75-27-4	Bromodichloromethane	50	55.9	112	70-130
75-25-2	Bromoform	50	60.5	121	70-130
74-83-9	Bromomethane	50	57.6	115	70-130
78-93-3	2-Butanone (MEK)	50	54.4	109	70-130
104-51-8	n-Butylbenzene	50	63.7	127	70-130
135-98-8	sec-Butylbenzene	50	57.2	114	70-130
98-06-6	tert-Butylbenzene	50	55.9	112	70-130
75-15-0	Carbon disulfide	50	59.0	118	70-130
56-23-5	Carbon tetrachloride	50	61.0	122	70-130
108-90-7	Chlorobenzene	50	53.2	106	70-130
75-00-3	Chloroethane	50	59.1	118	70-130
110-75-8	2-Chloroethyl vinyl ether	50	41.4	83	10-160
67-66-3	Chloroform	50	59.7	119	70-130
74-87-3	Chloromethane	50	64.8	130	70-130
95-49-8	o-Chlorotoluene	50	56.0	112	70-130
106-43-4	p-Chlorotoluene	50	59.6	119	70-130
124-48-1	Dibromochloromethane	50	55.0	110	70-130
95-50-1	1,2-Dichlorobenzene	50	60.2	120	70-130
541-73-1	1,3-Dichlorobenzene	50	60.7	121	70-130
106-46-7	1,4-Dichlorobenzene	50	64.3	129	70-130
75-71-8	Dichlorodifluoromethane	50	56.5	113	70-130
75-34-3	1,1-Dichloroethane	50	61.3	123	70-130
107-06-2	1,2-Dichloroethane	50	55.2	110	70-130
75-35-4	1,1-Dichloroethene	50	57.4	115	70-130
156-59-2	cis-1,2-Dichloroethene	50	54.1	108	70-130
156-60-5	trans-1,2-Dichloroethene	50	55.9	112	70-130
78-87-5	1,2-Dichloropropane	50	54.1	108	70-130
142-28-9	1,3-Dichloropropane	50	51.8	104	70-130
594-20-7	2,2-Dichloropropane	50	61.1	122	70-130
563-58-6	1,1-Dichloropropene	50	58.0	116	70-130

* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2067-BS	M59665.D	1	09/27/13	KD	n/a	n/a	MSM2067

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-3, MC24449-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	54.2	108	70-130
10061-02-6	trans-1,3-Dichloropropene	50	58.5	117	70-130
123-91-1	1,4-Dioxane	250	294	118	70-130
97-63-2	Ethyl methacrylate	50	52.9	106	76-141
100-41-4	Ethylbenzene	50	55.0	110	70-130
87-68-3	Hexachlorobutadiene	50	64.4	129	70-130
591-78-6	2-Hexanone	50	54.4	109	70-130
98-82-8	Isopropylbenzene	50	56.7	113	70-130
99-87-6	p-Isopropyltoluene	50	63.3	127	70-130
1634-04-4	Methyl Tert Butyl Ether	50	53.6	107	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	58.1	116	70-130
74-95-3	Methylene bromide	50	60.6	121	70-130
75-09-2	Methylene chloride	50	58.4	117	70-130
91-20-3	Naphthalene	50	61.5	123	70-130
103-65-1	n-Propylbenzene	50	57.6	115	70-130
100-42-5	Styrene	50	55.2	110	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	53.7	107	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	58.8	118	70-130
127-18-4	Tetrachloroethene	50	60.3	121	70-130
108-88-3	Toluene	50	57.5	115	70-130
87-61-6	1,2,3-Trichlorobenzene	50	66.1	132* a	70-130
120-82-1	1,2,4-Trichlorobenzene	50	71.3	143* a	70-130
71-55-6	1,1,1-Trichloroethane	50	59.8	120	70-130
79-00-5	1,1,2-Trichloroethane	50	54.4	109	70-130
79-01-6	Trichloroethene	50	54.4	109	70-130
75-69-4	Trichlorofluoromethane	50	57.3	115	70-130
96-18-4	1,2,3-Trichloropropane	50	59.1	118	70-130
95-63-6	1,2,4-Trimethylbenzene	50	59.6	119	70-130
108-67-8	1,3,5-Trimethylbenzene	50	58.1	116	70-130
108-05-4	Vinyl Acetate	50	37.9	76	70-130
75-01-4	Vinyl chloride	50	49.2	98	70-130
	m,p-Xylene	100	109	109	70-130
95-47-6	o-Xylene	50	52.7	105	70-130
1330-20-7	Xylene (total)	150	162	108	70-130

* = Outside of Control Limits.

6.2.1
6

Blank Spike Summary

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2067-BS	M59665.D	1	09/27/13	KD	n/a	n/a	MSM2067

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-3, MC24449-4

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	77%	70-130%
2037-26-5	Toluene-D8	81%	70-130%
460-00-4	4-Bromofluorobenzene	83%	70-130%

(a) Outside control limits. Blank Spike meets program technical requirements.

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV901-BS	V23530.D	1	09/26/13	AMY	n/a	n/a	MSV901
MSV901-BSD	V23531.D	1	09/26/13	AMY	n/a	n/a	MSV901

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	36.5	73	47.6	95	26* a	70-130/25
107-02-8	Acrolein	250	277	111	284	114	2	70-130/25
107-13-1	Acrylonitrile	50	47.1	94	48.0	96	2	70-130/25
71-43-2	Benzene	50	53.3	107	52.0	104	2	70-130/25
108-86-1	Bromobenzene	50	54.6	109	53.5	107	2	70-130/25
74-97-5	Bromochloromethane	50	53.0	106	52.1	104	2	70-130/25
75-27-4	Bromodichloromethane	50	55.2	110	53.5	107	3	70-130/25
75-25-2	Bromoform	50	45.2	90	44.4	89	2	70-130/25
74-83-9	Bromomethane	50	56.8	114	54.6	109	4	70-130/25
78-93-3	2-Butanone (MEK)	50	45.6	91	56.9	114	22	70-130/25
104-51-8	n-Butylbenzene	50	57.8	116	56.2	112	3	70-130/25
135-98-8	sec-Butylbenzene	50	58.2	116	56.3	113	3	70-130/25
98-06-6	tert-Butylbenzene	50	59.1	118	57.0	114	4	70-130/25
75-15-0	Carbon disulfide	50	56.6	113	55.3	111	2	70-130/25
56-23-5	Carbon tetrachloride	50	54.8	110	52.5	105	4	70-130/25
108-90-7	Chlorobenzene	50	44.4	89	43.2	86	3	70-130/25
75-00-3	Chloroethane	50	61.0	122	59.8	120	2	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	35.6	71	36.5	73	2	70-130/25
67-66-3	Chloroform	50	57.2	114	56.0	112	2	70-130/25
74-87-3	Chloromethane	50	60.6	121	58.4	117	4	70-130/25
95-49-8	o-Chlorotoluene	50	57.6	115	55.9	112	3	70-130/25
106-43-4	p-Chlorotoluene	50	57.8	116	56.1	112	3	70-130/25
124-48-1	Dibromochloromethane	50	47.6	95	46.8	94	2	70-130/25
95-50-1	1,2-Dichlorobenzene	50	50.7	101	50.3	101	1	70-130/25
541-73-1	1,3-Dichlorobenzene	50	51.9	104	50.6	101	3	70-130/25
106-46-7	1,4-Dichlorobenzene	50	51.8	104	50.4	101	3	70-130/25
75-71-8	Dichlorodifluoromethane	50	50.2	100	49.5	99	1	70-130/25
75-34-3	1,1-Dichloroethane	50	63.8	128	62.9	126	1	70-130/25
107-06-2	1,2-Dichloroethane	50	49.6	99	48.4	97	2	70-130/25
75-35-4	1,1-Dichloroethene	50	56.6	113	55.2	110	3	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	56.8	114	56.3	113	1	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	55.6	111	54.9	110	1	70-130/25
78-87-5	1,2-Dichloropropane	50	52.1	104	51.6	103	1	70-130/25
142-28-9	1,3-Dichloropropane	50	49.8	100	48.9	98	2	70-130/25
594-20-7	2,2-Dichloropropane	50	58.7	117	56.5	113	4	70-130/25
563-58-6	1,1-Dichloropropene	50	58.4	117	56.6	113	3	70-130/25

* = Outside of Control Limits.

6.3.1
 6

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV901-BS	V23530.D	1	09/26/13	AMY	n/a	n/a	MSV901
MSV901-BSD	V23531.D	1	09/26/13	AMY	n/a	n/a	MSV901

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	50	49.5	99	48.6	97	2	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	51.5	103	50.4	101	2	70-130/25
123-91-1	1,4-Dioxane	250	243	97	241	96	1	70-130/25
97-63-2	Ethyl methacrylate	50	50.6	101	50.1	100	1	77-137/25
100-41-4	Ethylbenzene	50	51.1	102	49.4	99	3	70-130/25
87-68-3	Hexachlorobutadiene	50	60.8	122	61.0	122	0	70-130/25
591-78-6	2-Hexanone	50	38.7	77	50.0	100	25	70-130/25
98-82-8	Isopropylbenzene	50	58.1	116	56.2	112	3	70-130/25
99-87-6	p-Isopropyltoluene	50	58.9	118	57.0	114	3	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	56.6	113	57.6	115	2	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	44.5	89	47.2	94	6	70-130/25
74-95-3	Methylene bromide	50	54.5	109	53.8	108	1	70-130/25
75-09-2	Methylene chloride	50	54.0	108	53.5	107	1	70-130/25
91-20-3	Naphthalene	50	51.6	103	53.2	106	3	70-130/25
103-65-1	n-Propylbenzene	50	57.0	114	54.8	110	4	70-130/25
100-42-5	Styrene	50	49.8	100	48.4	97	3	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	45.7	91	44.9	90	2	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	51.9	104	51.8	104	0	70-130/25
127-18-4	Tetrachloroethene	50	54.3	109	52.5	105	3	70-130/25
108-88-3	Toluene	50	57.6	115	56.0	112	3	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	52.6	105	55.6	111	6	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	54.0	108	54.3	109	1	70-130/25
71-55-6	1,1,1-Trichloroethane	50	56.6	113	54.7	109	3	70-130/25
79-00-5	1,1,2-Trichloroethane	50	50.8	102	50.6	101	0	70-130/25
79-01-6	Trichloroethene	50	50.2	100	49.2	98	2	70-130/25
75-69-4	Trichlorofluoromethane	50	49.5	99	46.4	93	6	70-130/25
96-18-4	1,2,3-Trichloropropane	50	53.2	106	53.2	106	0	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	54.6	109	52.9	106	3	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	54.9	110	53.3	107	3	70-130/25
108-05-4	Vinyl Acetate	50	46.0	92	45.8	92	0	70-130/25
75-01-4	Vinyl chloride	50	46.4	93	44.7	89	4	70-130/25
	m,p-Xylene	100	100	100	96.6	97	3	70-130/25
95-47-6	o-Xylene	50	47.6	95	45.9	92	4	70-130/25
1330-20-7	Xylene (total)	150	148	99	143	95	3	70-130/25

* = Outside of Control Limits.

6.3.1
 6

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV901-BS	V23530.D	1	09/26/13	AMY	n/a	n/a	MSV901
MSV901-BSD	V23531.D	1	09/26/13	AMY	n/a	n/a	MSV901

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-2

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	95%	94%	70-130%
2037-26-5	Toluene-D8	105%	105%	70-130%
460-00-4	4-Bromofluorobenzene	105%	105%	70-130%

(a) Outside control limits. Individual spike recoveries within acceptance limits.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24531-1MS	V23544.D	5	09/26/13	AMY	n/a	n/a	MSV901
MC24531-1MSD	V23545.D	5	09/26/13	AMY	n/a	n/a	MSV901
MC24531-1	V23539.D	1	09/26/13	AMY	n/a	n/a	MSV901

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-2

CAS No.	Compound	MC24531-1 ug/l	Spike Q	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	250	124	50* a	129	52* a	4	70-130/30
107-02-8	Acrolein	ND	1250	1310	105	1310	105	0	70-130/30
107-13-1	Acrylonitrile	ND	250	258	103	258	103	0	70-130/30
71-43-2	Benzene	ND	250	266	106	259	104	3	70-130/30
108-86-1	Bromobenzene	ND	250	271	108	268	107	1	70-130/30
74-97-5	Bromochloromethane	ND	250	266	106	266	106	0	70-130/30
75-27-4	Bromodichloromethane	ND	250	291	116	275	110	6	70-130/30
75-25-2	Bromoform	ND	250	246	98	242	97	2	70-130/30
74-83-9	Bromomethane	ND	250	286	114	279	112	2	70-130/30
78-93-3	2-Butanone (MEK)	ND	250	194	78	187	75	4	70-130/30
104-51-8	n-Butylbenzene	ND	250	283	113	278	111	2	70-130/30
135-98-8	sec-Butylbenzene	ND	250	282	113	278	111	1	70-130/30
98-06-6	tert-Butylbenzene	ND	250	291	116	282	113	3	70-130/30
75-15-0	Carbon disulfide	ND	250	278	111	272	109	2	70-130/30
56-23-5	Carbon tetrachloride	ND	250	299	120	279	112	7	70-130/30
108-90-7	Chlorobenzene	ND	250	217	87	212	85	2	70-130/30
75-00-3	Chloroethane	ND	250	309	124	299	120	3	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	250	ND	0* a	ND	0* a	nc	70-130/30
67-66-3	Chloroform	ND	250	294	118	289	116	2	70-130/30
74-87-3	Chloromethane	ND	250	294	118	293	117	0	70-130/30
95-49-8	o-Chlorotoluene	ND	250	282	113	277	111	2	70-130/30
106-43-4	p-Chlorotoluene	ND	250	284	114	281	112	1	70-130/30
124-48-1	Dibromochloromethane	ND	250	252	101	244	98	3	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	250	250	100	252	101	1	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	250	252	101	252	101	0	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	250	253	101	252	101	0	70-130/30
75-71-8	Dichlorodifluoromethane	ND	250	301	120	271	108	10	70-130/30
75-34-3	1,1-Dichloroethane	ND	250	322	129	314	126	3	70-130/30
107-06-2	1,2-Dichloroethane	ND	250	272	109	259	104	5	70-130/30
75-35-4	1,1-Dichloroethene	ND	250	281	112	276	110	2	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	250	281	112	279	112	1	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	250	274	110	273	109	0	70-130/30
78-87-5	1,2-Dichloropropane	ND	250	263	105	255	102	3	70-130/30
142-28-9	1,3-Dichloropropane	ND	250	255	102	251	100	2	70-130/30
594-20-7	2,2-Dichloropropane	ND	250	294	118	286	114	3	70-130/30
563-58-6	1,1-Dichloropropene	ND	250	301	120	292	117	3	70-130/30

* = Outside of Control Limits.

6.4.1

6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24531-1MS	V23544.D	5	09/26/13	AMY	n/a	n/a	MSV901
MC24531-1MSD	V23545.D	5	09/26/13	AMY	n/a	n/a	MSV901
MC24531-1	V23539.D	1	09/26/13	AMY	n/a	n/a	MSV901

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-2

CAS No.	Compound	MC24531-1 ug/l	Spike Q	ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	250	244	98	239	96	2	70-130/30	
10061-02-6	trans-1,3-Dichloropropene	ND	250	271	108	267	107	1	70-130/30	
123-91-1	1,4-Dioxane	ND	1250	1310	105	1280	102	2	70-130/30	
97-63-2	Ethyl methacrylate	ND	250	275	110	268	107	3	72-139/30	
100-41-4	Ethylbenzene	ND	250	254	102	245	98	4	70-130/30	
87-68-3	Hexachlorobutadiene	ND	250	295	118	300	120	2	70-130/30	
591-78-6	2-Hexanone	ND	250	163	65* a	158	63* a	3	70-130/30	
98-82-8	Isopropylbenzene	ND	250	282	113	278	111	1	70-130/30	
99-87-6	p-Isopropyltoluene	ND	250	287	115	286	114	0	70-130/30	
1634-04-4	Methyl Tert Butyl Ether	ND	250	296	118	299	120	1	70-130/30	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	252	101	251	100	0	70-130/30	
74-95-3	Methylene bromide	ND	250	293	117	284	114	3	70-130/30	
75-09-2	Methylene chloride	ND	250	264	106	264	106	0	70-130/30	
91-20-3	Naphthalene	ND	250	242	97	281	112	15	70-130/30	
103-65-1	n-Propylbenzene	ND	250	276	110	272	109	1	70-130/30	
100-42-5	Styrene	ND	250	246	98	240	96	2	70-130/30	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	232	93	224	90	4	70-130/30	
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	272	109	276	110	1	70-130/30	
127-18-4	Tetrachloroethene	ND	250	271	108	263	105	3	70-130/30	
108-88-3	Toluene	ND	250	287	115	280	112	2	70-130/30	
87-61-6	1,2,3-Trichlorobenzene	ND	250	250	100	282	113	12	70-130/30	
120-82-1	1,2,4-Trichlorobenzene	ND	250	255	102	268	107	5	70-130/30	
71-55-6	1,1,1-Trichloroethane	ND	250	294	118	281	112	5	70-130/30	
79-00-5	1,1,2-Trichloroethane	ND	250	267	107	263	105	2	70-130/30	
79-01-6	Trichloroethene	ND	250	254	102	245	98	4	70-130/30	
75-69-4	Trichlorofluoromethane	ND	250	269	108	254	102	6	70-130/30	
96-18-4	1,2,3-Trichloropropane	ND	250	288	115	289	116	0	70-130/30	
95-63-6	1,2,4-Trimethylbenzene	ND	250	267	107	261	104	2	70-130/30	
108-67-8	1,3,5-Trimethylbenzene	ND	250	268	107	264	106	2	70-130/30	
108-05-4	Vinyl Acetate	ND	250	235	94	236	94	0	70-130/30	
75-01-4	Vinyl chloride	ND	250	229	92	224	90	2	70-130/30	
	m,p-Xylene	ND	500	493	99	476	95	4	70-130/30	
95-47-6	o-Xylene	ND	250	233	93	228	91	2	70-130/30	
1330-20-7	Xylene (total)	ND	750	726	97	704	94	3	70-130/30	

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24531-1MS	V23544.D	5	09/26/13	AMY	n/a	n/a	MSV901
MC24531-1MSD	V23545.D	5	09/26/13	AMY	n/a	n/a	MSV901
MC24531-1	V23539.D	1	09/26/13	AMY	n/a	n/a	MSV901

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-2

CAS No.	Surrogate Recoveries	MS	MSD	MC24531-1	Limits
1868-53-7	Dibromofluoromethane	98%	97%	101%	70-130%
2037-26-5	Toluene-D8	105%	105%	103%	70-130%
460-00-4	4-Bromofluorobenzene	105%	106%	107%	70-130%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

* = Outside of Control Limits.

6.4.1
6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24680-13MS	M59673.D	1	09/27/13	KD	n/a	n/a	MSM2067
MC24680-13MSD	M59674.D	1	09/27/13	KD	n/a	n/a	MSM2067
MC24680-13	M59672.D	1	09/27/13	KD	n/a	n/a	MSM2067

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-3, MC24449-4

CAS No.	Compound	MC24680-13 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	23.5		55.7	260	425* a	262	427* a	1	70-130/30
107-02-8	Acrolein	ND		279	77.4	28* a	74.5	27* a	4	70-130/30
107-13-1	Acrylonitrile	ND		55.7	77.3	139* a	79.1	142* a	2	70-130/30
71-43-2	Benzene	ND		55.7	34.8	62* a	37.2	67* a	7	70-130/30
108-86-1	Bromobenzene	ND		55.7	25.5	46* a	27.7	50* a	8	70-130/30
74-97-5	Bromochloromethane	ND		55.7	53.5	96	54.6	98	2	70-130/30
75-27-4	Bromodichloromethane	ND		55.7	35.3	63* a	37.7	67* a	7	70-130/30
75-25-2	Bromoform	ND		55.7	31.0	56* a	34.0	61* a	9	70-130/30
74-83-9	Bromomethane	ND		55.7	61.7	111	64.5	115	4	70-130/30
78-93-3	2-Butanone (MEK)	ND		55.7	82.7	148* a	79.4	142* a	4	70-130/30
104-51-8	n-Butylbenzene	ND		55.7	14.3	26* a	13.4	24* a	6	70-130/30
135-98-8	sec-Butylbenzene	ND		55.7	13.6	24* a	13.6	24* a	0	70-130/30
98-06-6	tert-Butylbenzene	ND		55.7	13.9	25* a	13.8	25* a	1	70-130/30
75-15-0	Carbon disulfide	2.2		55.7	54.6	94	57.3	99	5	70-130/30
56-23-5	Carbon tetrachloride	ND		55.7	28.8	52* a	32.3	58* a	11	70-130/30
108-90-7	Chlorobenzene	ND		55.7	21.5	39* a	22.8	41* a	6	70-130/30
75-00-3	Chloroethane	ND		55.7	67.9	122	70.5	126	4	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND		55.7	ND	0* a	ND	0* a	nc	10-160/30
67-66-3	Chloroform	ND		55.7	46.5	83	48.8	87	5	70-130/30
74-87-3	Chloromethane	ND		55.7	72.1	129	72.5	130	1	70-130/30
95-49-8	o-Chlorotoluene	ND		55.7	19.2	34* a	19.9	36* a	4	70-130/30
106-43-4	p-Chlorotoluene	ND		55.7	19.4	35* a	21.5	38* a	10	70-130/30
124-48-1	Dibromochloromethane	ND		55.7	34.1	61* a	35.5	64* a	4	70-130/30
95-50-1	1,2-Dichlorobenzene	ND		55.7	17.0	31* a	18.0	32* a	6	70-130/30
541-73-1	1,3-Dichlorobenzene	ND		55.7	17.2	31* a	18.3	33* a	6	70-130/30
106-46-7	1,4-Dichlorobenzene	ND		55.7	19.1	34* a	20.2	36* a	6	70-130/30
75-71-8	Dichlorodifluoromethane	ND		55.7	67.2	121	64.3	115	4	70-130/30
75-34-3	1,1-Dichloroethane	ND		55.7	52.1	94	54.8	98	5	70-130/30
107-06-2	1,2-Dichloroethane	ND		55.7	47.0	84	48.6	87	3	70-130/30
75-35-4	1,1-Dichloroethene	ND		55.7	48.9	88	53.3	95	9	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND		55.7	44.2	79	46.7	84	6	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND		55.7	45.9	82	50.0	89	9	70-130/30
78-87-5	1,2-Dichloropropane	ND		55.7	35.1	63* a	37.2	67* a	6	70-130/30
142-28-9	1,3-Dichloropropane	ND		55.7	38.7	69* a	41.0	73	6	70-130/30
594-20-7	2,2-Dichloropropane	ND		55.7	43.8	79	48.9	88	11	70-130/30
563-58-6	1,1-Dichloropropene	ND		55.7	28.8	52* a	32.2	58* a	11	70-130/30

* = Outside of Control Limits.

6.4.2
6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24680-13MS	M59673.D	1	09/27/13	KD	n/a	n/a	MSM2067
MC24680-13MSD	M59674.D	1	09/27/13	KD	n/a	n/a	MSM2067
MC24680-13	M59672.D	1	09/27/13	KD	n/a	n/a	MSM2067

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-3, MC24449-4

CAS No.	Compound	MC24680-13 Spike ug/kg	Q	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
10061-01-5	cis-1,3-Dichloropropene	ND		55.7	32.7	59* a	34.9	62* a	7	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		55.7	34.8	62* a	37.0	66* a	6	70-130/30
123-91-1	1,4-Dioxane	ND		279	395	142* a	411	147* a	4	70-130/30
97-63-2	Ethyl methacrylate	ND		55.7	40.5	73	42.5	76	5	41-160/30
100-41-4	Ethylbenzene	ND		55.7	18.2	33* a	19.2	34* a	5	70-130/30
87-68-3	Hexachlorobutadiene	ND		55.7	6.1	11* a	5.6	10* a	9	70-130/30
591-78-6	2-Hexanone	ND		55.7	77.0	138* a	79.5	142* a	3	70-130/30
98-82-8	Isopropylbenzene	1.5		55.7	25.2	43* a	25.0	42* a	1	70-130/30
99-87-6	p-Isopropyltoluene	ND		55.7	14.0	25* a	13.5	24* a	4	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		55.7	53.7	96	55.5	99	3	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		55.7	67.6	121	70.8	127	5	70-130/30
74-95-3	Methylene bromide	ND		55.7	47.6	85	49.8	89	5	70-130/30
75-09-2	Methylene chloride	2.4		55.7	96.9	170* a	92.9	162* a	4	70-130/30
91-20-3	Naphthalene	ND		55.7	12.5	22* a	12.6	23* a	1	70-130/30
103-65-1	n-Propylbenzene	0.95		55.7	21.1	36* a	21.0	36* a	0	70-130/30
100-42-5	Styrene	ND		55.7	17.1	31* a	18.4	33* a	7	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		55.7	22.8	41* a	24.3	43* a	6	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		55.7	42.2	76	45.4	81	7	70-130/30
127-18-4	Tetrachloroethene	6.1		55.7	28.3	40* a	30.5	44* a	7	70-130/30
108-88-3	Toluene	0.32		55.7	23.9	42* a	25.3	45* a	6	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		55.7	7.3	13* a	6.6	12* a	10	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		55.7	9.4	17* a	9.3	17* a	1	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		55.7	36.4	65* a	40.4	72	10	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		55.7	37.1	67* a	37.5	67* a	1	70-130/30
79-01-6	Trichloroethene	4.1		55.7	33.6	53* a	35.1	55* a	4	70-130/30
75-69-4	Trichlorofluoromethane	ND		55.7	46.9	84	52.9	95	12	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		55.7	52.0	93	56.4	101	8	70-130/30
95-63-6	1,2,4-Trimethylbenzene	0.86		55.7	21.6	37* a	19.6	34* a	10	70-130/30
108-67-8	1,3,5-Trimethylbenzene	0.35		55.7	18.0	32* a	17.6	31* a	2	70-130/30
108-05-4	Vinyl Acetate	ND		55.7	39.8	71	42.6	76	7	70-130/30
75-01-4	Vinyl chloride	ND		55.7	54.9	99	59.0	106	7	70-130/30
	m,p-Xylene	ND		111	32.9	30* a	35.2	31* a	7	70-130/30
95-47-6	o-Xylene	ND		55.7	16.1	29* a	17.5	31* a	8	70-130/30
1330-20-7	Xylene (total)	ND		167	49.0	29* a	52.7	31* a	7	70-130/30

* = Outside of Control Limits.

6.4.2
 6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24680-13MS	M59673.D	1	09/27/13	KD	n/a	n/a	MSM2067
MC24680-13MSD	M59674.D	1	09/27/13	KD	n/a	n/a	MSM2067
MC24680-13	M59672.D	1	09/27/13	KD	n/a	n/a	MSM2067

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24449-3, MC24449-4

CAS No.	Surrogate Recoveries	MS	MSD	MC24680-13 Limits
1868-53-7	Dibromofluoromethane	87%	84%	80% 70-130%
2037-26-5	Toluene-D8	76%	75%	80% 70-130%
460-00-4	4-Bromofluorobenzene	106%	109%	89% 70-130%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

* = Outside of Control Limits.

Volatile Internal Standard Area Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSM2067-CC2064	Injection Date:	09/27/13
Lab File ID:	M59664.D	Injection Time:	15:12
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	274129	9.35	423430	10.23	177255	13.50	215410	16.07	101887	6.85
Upper Limit ^a	548258	9.85	846860	10.73	354510	14.00	430820	16.57	203774	7.35
Lower Limit ^b	137065	8.85	211715	9.73	88628	13.00	107705	15.57	50944	6.35

Lab Sample ID	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
MSM2067-BS	283561	9.35	437580	10.23	186858	13.50	220033	16.07	106516	6.84
MSM2067-MB	278834	9.35	420536	10.23	163401	13.50	198585	16.07	98748	6.84
ZZZZZZ	269819	9.35	418177	10.23	162981	13.51	195666	16.07	98488	6.84
ZZZZZZ	261335	9.35	401996	10.23	159649	13.50	197072	16.07	186812	6.84
ZZZZZZ	270123	9.36	412904	10.23	161205	13.51	194746	16.07	98425	6.84
MC24680-13	264227	9.35	409440	10.23	157887	13.51	182202	16.07	112972	6.84
MC24680-13MS	230009	9.35	368224	10.23	135830	13.51	116533	16.07	175998	6.84
MC24680-13MSD	244805	9.35	391269	10.23	143573	13.50	120440	16.07	183367	6.84
ZZZZZZ	296436	9.35	456569	10.23	189264	13.50	205191	16.07	114290	6.84
ZZZZZZ	305221	9.35	469166	10.23	185113	13.51	211113	16.07	119808	6.84
MC24449-3	235384	9.35	354697	10.23	141865	13.51	175671	16.07	138870	6.84
MC24449-4	282082	9.35	433262	10.23	172400	13.51	215966	16.07	196097	6.84
ZZZZZZ	298876	9.35	458494	10.23	175714	13.51	212057	16.07	125895	6.84
ZZZZZZ	314975	9.35	474823	10.23	192669	13.51	235034	16.07	115343	6.84
ZZZZZZ	312230	9.36	476084	10.23	188597	13.51	217671	16.07	113218	6.84
ZZZZZZ	189457	9.35	282912	10.23	111151	13.50	133489	16.07	76714	6.84
ZZZZZZ	312893	9.36	471180	10.23	185074	13.51	220929	16.07	116678	6.85
ZZZZZZ	303559	9.35	455700	10.23	178703	13.51	213259	16.07	97338	6.84
ZZZZZZ	300041	9.35	455714	10.23	176853	13.50	208784	16.07	128705	6.84
ZZZZZZ	304802	9.35	459119	10.23	182891	13.50	222961	16.07	113970	6.84

- IS 1 = Pentafluorobenzene
- IS 2 = 1,4-Difluorobenzene
- IS 3 = Chlorobenzene-D5
- IS 4 = 1,4-Dichlorobenzene-d4
- IS 5 = Tert Butyl Alcohol-D9

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
 (b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

6.5.1
6

Volatile Internal Standard Area Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSV901-CC864	Injection Date:	09/26/13
Lab File ID:	V23530.D	Injection Time:	11:00
Instrument ID:	GCMSV	Method:	SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	360198	6.57	519458	7.75	298699	11.08	281260	13.29	95051	3.51
Upper Limit ^a	720396	7.07	1038916	8.25	597398	11.58	562520	13.79	190102	4.01
Lower Limit ^b	180099	6.07	259729	7.25	149350	10.58	140630	12.79	47526	3.01

Lab Sample ID	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
MSV901-BS	360198	6.57	519458	7.75	298699	11.08	281260	13.29	95051	3.51
MSV901-BSD	363817	6.56	529334	7.75	306360	11.08	286490	13.29	97920	3.50
MSV901-MB	331550	6.57	493744	7.75	278909	11.08	256148	13.29	91079	3.51
ZZZZZZ	321081	6.57	478588	7.75	277566	11.08	246940	13.29	89781	3.51
MC24449-2	320340	6.57	483238	7.75	277937	11.08	248101	13.29	91133	3.51
ZZZZZZ	314129	6.57	473653	7.75	277029	11.08	245797	13.29	90441	3.51
ZZZZZZ	296142	6.57	442897	7.75	258073	11.08	232139	13.29	86483	3.51
ZZZZZZ	305538	6.57	454911	7.75	267188	11.08	234368	13.29	92193	3.51
MC24531-1	293182	6.57	445290	7.75	261339	11.08	232979	13.29	92546	3.51
ZZZZZZ	293949	6.56	440354	7.75	261937	11.08	230500	13.29	91404	3.50
ZZZZZZ	291315	6.57	433434	7.75	255869	11.08	226480	13.29	90943	3.50
ZZZZZZ	286401	6.57	430088	7.75	257784	11.08	225184	13.29	91044	3.51
ZZZZZZ	281433	6.57	423868	7.75	251958	11.08	222804	13.29	93879	3.51
MC24531-1MS	320218	6.56	456909	7.74	269134	11.08	257925	13.29	97389	3.50
MC24531-1MSD	332826	6.56	480333	7.74	281582	11.08	265674	13.29	105816	3.51
ZZZZZZ	328387	6.57	479485	7.75	278541	11.08	258368	13.29	101912	3.52
ZZZZZZ	343993	6.57	491826	7.75	286856	11.08	263567	13.29	110596	3.52
ZZZZZZ	363478	6.56	537754	7.74	337478	11.08	298636	13.29	122660	3.52
ZZZZZZ	372429	6.57	533695	7.75	305788	11.08	284805	13.29	94295	3.51
ZZZZZZ	339483	6.56	511683	7.75	293560	11.08	273984	13.29	89909	3.51
ZZZZZZ	339409	6.56	504944	7.74	288884	11.08	263846	13.29	90812	3.50
ZZZZZZ	326428	6.57	486658	7.75	279999	11.08	251928	13.29	86160	3.51
ZZZZZZ	328669	6.56	493068	7.74	285501	11.08	255696	13.29	87670	3.50
ZZZZZZ	319531	6.57	480961	7.75	277222	11.08	251051	13.29	81148	3.51

- IS 1 = Pentafluorobenzene
- IS 2 = 1,4-Difluorobenzene
- IS 3 = Chlorobenzene-D5
- IS 4 = 1,4-Dichlorobenzene-d4
- IS 5 = Tert Butyl Alcohol-D9

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
 (b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

6.5.2
6

Volatile Surrogate Recovery Summary

Job Number: MC24449

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8260B

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC24449-2	V23535.D	99.0	103.0	107.0
MC24531-1MS	V23544.D	98.0	105.0	105.0
MC24531-1MSD	V23545.D	97.0	105.0	106.0
MSV901-BS	V23530.D	95.0	105.0	105.0
MSV901-BSD	V23531.D	94.0	105.0	105.0
MSV901-MB	V23533.D	97.0	103.0	104.0

Surrogate
Compounds

Recovery
Limits

S1 = Dibromofluoromethane 70-130%
S2 = Toluene-D8 70-130%
S3 = 4-Bromofluorobenzene 70-130%

6.6.1

6

Volatile Surrogate Recovery Summary

Job Number: MC24449

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8260B

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC24449-3	M59677.D	75.0	83.0	90.0
MC24449-4	M59678.D	77.0	81.0	86.0
MC24680-13MS	M59673.D	87.0	76.0	106.0
MC24680-13MSD	M59674.D	84.0	75.0	109.0
MSM2067-BS	M59665.D	77.0	81.0	83.0
MSM2067-MB	M59668.D	77.0	81.0	85.0

Surrogate Compounds	Recovery Limits
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S1 = Dibromofluoromethane	70-130%
S2 = Toluene-D8	70-130%
S3 = 4-Bromofluorobenzene	70-130%

6.6.2

6

GC/MS Semi-volatiles

QC Data Summaries

7

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Surrogate Recovery Summaries

Method Blank Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-MB	R33874.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24449-3, MC24449-4

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	500	62	ug/kg	
95-57-8	2-Chlorophenol	ND	250	11	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	500	13	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	500	14	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	500	81	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1000	120	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	500	62	ug/kg	
95-48-7	2-Methylphenol	ND	500	20	ug/kg	
	3&4-Methylphenol	ND	500	24	ug/kg	
88-75-5	2-Nitrophenol	ND	500	13	ug/kg	
100-02-7	4-Nitrophenol	ND	1000	93	ug/kg	
87-86-5	Pentachlorophenol	ND	500	35	ug/kg	
108-95-2	Phenol	ND	250	14	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	500	12	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	500	12	ug/kg	
62-53-3	Aniline	ND	500	25	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	250	13	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	250	10	ug/kg	
100-51-6	Benzyl Alcohol	ND	500	25	ug/kg	
91-58-7	2-Chloronaphthalene	ND	250	13	ug/kg	
106-47-8	4-Chloroaniline	ND	500	12	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	250	12	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	250	15	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	250	18	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	250	15	ug/kg	
122-66-7	1,2-Diphenylhydrazine	ND	250	11	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	500	33	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	500	12	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	250	25	ug/kg	
132-64-9	Dibenzofuran	ND	100	14	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	250	26	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	250	7.8	ug/kg	
84-66-2	Diethyl phthalate	ND	250	12	ug/kg	
131-11-3	Dimethyl phthalate	ND	250	14	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	250	9.2	ug/kg	
118-74-1	Hexachlorobenzene	ND	250	16	ug/kg	

7.1.1
7

Method Blank Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-MB	R33874.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24449-3, MC24449-4

CAS No.	Compound	Result	RL	MDL	Units	Q
77-47-4	Hexachlorocyclopentadiene	ND	500	120	ug/kg	
67-72-1	Hexachloroethane	ND	250	12	ug/kg	
78-59-1	Isophorone	ND	250	11	ug/kg	
88-74-4	2-Nitroaniline	ND	500	12	ug/kg	
99-09-2	3-Nitroaniline	ND	500	27	ug/kg	
100-01-6	4-Nitroaniline	ND	500	12	ug/kg	
98-95-3	Nitrobenzene	ND	250	13	ug/kg	
62-75-9	n-Nitrosodimethylamine	ND	250	12	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	250	14	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	250	15	ug/kg	
110-86-1	Pyridine	ND	500	25	ug/kg	

CAS No.	Surrogate Recoveries	Limits	
367-12-4	2-Fluorophenol	77%	30-130%
4165-62-2	Phenol-d5	78%	30-130%
118-79-6	2,4,6-Tribromophenol	76%	30-130%
4165-60-0	Nitrobenzene-d5	71%	30-130%
321-60-8	2-Fluorobiphenyl	83%	30-130%
1718-51-0	Terphenyl-d14	84%	30-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Semi-Volatile		0	ug/kg	

7.1.1

7

Method Blank Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34956-MB	W14567.D	1	09/25/13	KR	09/24/13	OP34956	MSW658

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

MC24449-3, MC24449-4

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	5.0	0.58	ug/kg	
208-96-8	Acenaphthylene	ND	5.0	0.93	ug/kg	
120-12-7	Anthracene	ND	5.0	0.81	ug/kg	
56-55-3	Benzo(a)anthracene	ND	5.0	0.62	ug/kg	
50-32-8	Benzo(a)pyrene	ND	5.0	0.72	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	5.0	0.61	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	5.0	1.9	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	5.0	0.96	ug/kg	
218-01-9	Chrysene	ND	5.0	0.77	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	5.0	1.4	ug/kg	
206-44-0	Fluoranthene	ND	5.0	0.79	ug/kg	
86-73-7	Fluorene	ND	5.0	0.44	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5.0	1.3	ug/kg	
90-12-0	1-Methylnaphthalene	ND	10	10	ug/kg	
91-57-6	2-Methylnaphthalene	ND	5.0	1.1	ug/kg	
85-01-8	Phenanthrene	ND	5.0	0.98	ug/kg	
129-00-0	Pyrene	ND	5.0	1.7	ug/kg	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	41%	15-110%
4165-62-2	Phenol-d5	39%	15-110%
118-79-6	2,4,6-Tribromophenol	41%	15-110%
4165-60-0	Nitrobenzene-d5	79%	30-130%
321-60-8	2-Fluorobiphenyl	80%	30-130%
1718-51-0	Terphenyl-d14	93%	30-130%

7.1.2
7

Blank Spike Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-BS	R33875.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24449-3, MC24449-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
65-85-0	Benzoic acid	2440	2090	86	30-130
95-57-8	2-Chlorophenol	2440	2050	84	30-130
59-50-7	4-Chloro-3-methyl phenol	2440	2030	83	30-130
120-83-2	2,4-Dichlorophenol	2440	2210	90	30-130
105-67-9	2,4-Dimethylphenol	2440	1860	76	30-130
51-28-5	2,4-Dinitrophenol	2440	1450	59	30-130
534-52-1	4,6-Dinitro-o-cresol	2440	2020	83	30-130
95-48-7	2-Methylphenol	2440	2050	84	30-130
	3&4-Methylphenol	4890	4010	82	30-130
88-75-5	2-Nitrophenol	2440	2150	88	30-130
100-02-7	4-Nitrophenol	2440	1380	56	30-130
87-86-5	Pentachlorophenol	2440	975	40	30-130
108-95-2	Phenol	2440	2290	94	30-130
95-95-4	2,4,5-Trichlorophenol	2440	2250	92	30-130
88-06-2	2,4,6-Trichlorophenol	2440	2180	89	30-130
62-53-3	Aniline	2440	1520	62	40-140
101-55-3	4-Bromophenyl phenyl ether	2440	2190	90	40-140
85-68-7	Butyl benzyl phthalate	2440	2250	92	40-140
100-51-6	Benzyl Alcohol	2440	1880	77	40-140
91-58-7	2-Chloronaphthalene	2440	2170	89	40-140
106-47-8	4-Chloroaniline	2440	1650	68	40-140
111-91-1	bis(2-Chloroethoxy)methane	2440	1900	78	40-140
111-44-4	bis(2-Chloroethyl)ether	2440	1880	77	40-140
108-60-1	bis(2-Chloroisopropyl)ether	2440	2290	94	40-140
7005-72-3	4-Chlorophenyl phenyl ether	2440	2140	88	40-140
122-66-7	1,2-Diphenylhydrazine	2440	1840	75	40-140
121-14-2	2,4-Dinitrotoluene	2440	2220	91	40-140
606-20-2	2,6-Dinitrotoluene	2440	2120	87	40-140
91-94-1	3,3'-Dichlorobenzidine	2440	1990	81	40-140
132-64-9	Dibenzofuran	2440	1970	81	40-140
84-74-2	Di-n-butyl phthalate	2440	2210	90	40-140
117-84-0	Di-n-octyl phthalate	2440	2330	95	40-140
84-66-2	Diethyl phthalate	2440	2160	88	40-140
131-11-3	Dimethyl phthalate	2440	2180	89	40-140
117-81-7	bis(2-Ethylhexyl)phthalate	2440	2190	90	40-140
118-74-1	Hexachlorobenzene	2440	2060	84	40-140

* = Outside of Control Limits.

7.2.1



Blank Spike Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-BS	R33875.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24449-3, MC24449-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
77-47-4	Hexachlorocyclopentadiene	2440	846	35* a	40-140
67-72-1	Hexachloroethane	2440	1630	67	40-140
78-59-1	Isophorone	2440	1900	78	40-140
88-74-4	2-Nitroaniline	2440	2340	96	40-140
99-09-2	3-Nitroaniline	2440	1850	76	40-140
100-01-6	4-Nitroaniline	2440	1970	81	40-140
98-95-3	Nitrobenzene	2440	1670	68	40-140
62-75-9	n-Nitrosodimethylamine	2440	1720	70	40-140
621-64-7	N-Nitroso-di-n-propylamine	2440	1810	74	40-140
86-30-6	N-Nitrosodiphenylamine	2440	2170	89	40-140
110-86-1	Pyridine	2440	1370	56	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	80%	30-130%
4165-62-2	Phenol-d5	81%	30-130%
118-79-6	2,4,6-Tribromophenol	84%	30-130%
4165-60-0	Nitrobenzene-d5	72%	30-130%
321-60-8	2-Fluorobiphenyl	84%	30-130%
1718-51-0	Terphenyl-d14	90%	30-130%

(a) Outside control limits. Blank Spike meets program technical requirements.

* = Outside of Control Limits.

7.2.1

7

Blank Spike Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34956-BS	W14568.D	1	09/25/13	KR	09/24/13	OP34956	MSW658

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

MC24449-3, MC24449-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	2440	1890	77	40-140
208-96-8	Acenaphthylene	2440	1860	76	40-140
120-12-7	Anthracene	2440	1960	80	40-140
56-55-3	Benzo(a)anthracene	2440	2420	99	40-140
50-32-8	Benzo(a)pyrene	2440	1940	79	40-140
205-99-2	Benzo(b)fluoranthene	2440	2310	95	40-140
191-24-2	Benzo(g,h,i)perylene	2440	2060	84	40-140
207-08-9	Benzo(k)fluoranthene	2440	2180	89	40-140
218-01-9	Chrysene	2440	1890	77	40-140
53-70-3	Dibenzo(a,h)anthracene	2440	2100	86	40-140
206-44-0	Fluoranthene	2440	2030	83	40-140
86-73-7	Fluorene	2440	2060	84	40-140
193-39-5	Indeno(1,2,3-cd)pyrene	2440	2080	85	40-140
90-12-0	1-Methylnaphthalene	2440	1890	77	40-140
91-57-6	2-Methylnaphthalene	2440	1900	78	40-140
85-01-8	Phenanthrene	2440	1900	78	40-140
129-00-0	Pyrene	2440	1990	81	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	42%	15-110%
4165-62-2	Phenol-d5	42%	15-110%
118-79-6	2,4,6-Tribromophenol	47%	15-110%
4165-60-0	Nitrobenzene-d5	79%	30-130%
321-60-8	2-Fluorobiphenyl	81%	30-130%
1718-51-0	Terphenyl-d14	89%	30-130%

* = Outside of Control Limits.

7.2.2
7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-MS	R33876.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
OP34955-MSD	R33877.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
MC24409-24	R33878.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24449-3, MC24449-4

CAS No.	Compound	MC24409-24 Spike		MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q ug/kg						
65-85-0	Benzoic acid	560 U	2860	379	13* a	384	13* a	1	30-130/30
95-57-8	2-Chlorophenol	280 U	2860	2170	76	2160	75	0	30-130/30
59-50-7	4-Chloro-3-methyl phenol	560 U	2860	2140	75	2190	76	2	30-130/30
120-83-2	2,4-Dichlorophenol	560 U	2860	2240	78	2380	83	6	30-130/30
105-67-9	2,4-Dimethylphenol	560 U	2860	1910	67	1760	61	8	30-130/30
51-28-5	2,4-Dinitrophenol	1100 U	2860	525	18* a	954	33	58* b	30-130/30
534-52-1	4,6-Dinitro-o-cresol	560 U	2860	1620	57	1940	68	18	30-130/30
95-48-7	2-Methylphenol	560 U	2860	2190	77	2170	76	1	30-130/30
	3&4-Methylphenol	560 U	5710	4290	75	4240	74	1	30-130/30
88-75-5	2-Nitrophenol	560 U	2860	2190	77	2330	81	6	30-130/30
100-02-7	4-Nitrophenol	1100 U	2860	1510	53	1490	52	1	30-130/30
87-86-5	Pentachlorophenol	560 U	2860	1070	37	1100	38	3	30-130/30
108-95-2	Phenol	280 U	2860	2370	83	2370	83	0	30-130/30
95-95-4	2,4,5-Trichlorophenol	560 U	2860	2350	82	2500	87	6	30-130/30
88-06-2	2,4,6-Trichlorophenol	560 U	2860	2230	78	2290	80	3	30-130/30
62-53-3	Aniline	560 U	2860	1680	59	1660	58	1	40-140/30
101-55-3	4-Bromophenyl phenyl ether	280 U	2860	2320	81	2500	87	7	40-140/30
85-68-7	Butyl benzyl phthalate	280 U	2860	2470	86	2510	88	2	40-140/30
100-51-6	Benzyl Alcohol	560 U	2860	1970	69	2000	70	2	40-140/30
91-58-7	2-Chloronaphthalene	280 U	2860	2220	78	2410	84	8	40-140/30
106-47-8	4-Chloroaniline	560 U	2860	1860	65	1850	65	1	40-140/30
111-91-1	bis(2-Chloroethoxy)methane	280 U	2860	2000	70	2090	73	4	40-140/30
111-44-4	bis(2-Chloroethyl)ether	280 U	2860	2030	71	2070	72	2	40-140/30
108-60-1	bis(2-Chloroisopropyl)ether	280 U	2860	2430	85	2480	87	2	40-140/30
7005-72-3	4-Chlorophenyl phenyl ether	280 U	2860	2280	80	2400	84	5	40-140/30
122-66-7	1,2-Diphenylhydrazine	280 U	2860	1930	68	2090	73	8	40-140/30
121-14-2	2,4-Dinitrotoluene	560 U	2860	2430	85	2510	88	3	40-140/30
606-20-2	2,6-Dinitrotoluene	560 U	2860	2310	81	2430	85	5	40-140/30
91-94-1	3,3'-Dichlorobenzidine	280 U	2860	2170	76	2170	76	0	40-140/30
132-64-9	Dibenzofuran	110 U	2860	2030	71	2170	76	7	40-140/30
84-74-2	Di-n-butyl phthalate	280 U	2860	2390	84	2410	84	1	40-140/30
117-84-0	Di-n-octyl phthalate	280 U	2860	2630	92	2610	91	1	40-140/30
84-66-2	Diethyl phthalate	280 U	2860	2350	82	2330	81	1	40-140/30
131-11-3	Dimethyl phthalate	280 U	2860	2360	83	2370	83	0	40-140/30
117-81-7	bis(2-Ethylhexyl)phthalate	280 U	2860	2460	86	2390	83	3	40-140/30
118-74-1	Hexachlorobenzene	280 U	2860	2170	76	2260	79	4	40-140/30

* = Outside of Control Limits.

7.3.1
 7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-MS	R33876.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
OP34955-MSD	R33877.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
MC24409-24	R33878.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24449-3, MC24449-4

CAS No.	Compound	MC24409-24 Spike ug/kg	Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
77-47-4	Hexachlorocyclopentadiene	560 U		2860	888	31* a	907	32* a	2	40-140/30
67-72-1	Hexachloroethane	280 U		2860	1650	58	1800	63	9	40-140/30
78-59-1	Isophorone	280 U		2860	1990	70	2050	72	3	40-140/30
88-74-4	2-Nitroaniline	560 U		2860	2450	86	2510	88	2	40-140/30
99-09-2	3-Nitroaniline	560 U		2860	2130	75	2090	73	2	40-140/30
100-01-6	4-Nitroaniline	560 U		2860	2250	79	2210	77	2	40-140/30
98-95-3	Nitrobenzene	280 U		2860	1690	59	1810	63	7	40-140/30
62-75-9	n-Nitrosodimethylamine	280 U		2860	1580	55	1720	60	8	40-140/30
621-64-7	N-Nitroso-di-n-propylamine	280 U		2860	1990	70	1950	68	2	40-140/30
86-30-6	N-Nitrosodiphenylamine	280 U		2860	2230	78	2310	81	4	40-140/30
110-86-1	Pyridine	560 U		2860	1080	38* a	1320	46	20	40-140/30

CAS No.	Surrogate Recoveries	MS	MSD	MC24409-24 Limits
367-12-4	2-Fluorophenol	72%	71%	30-130%
4165-62-2	Phenol-d5	73%	72%	30-130%
118-79-6	2,4,6-Tribromophenol	72%	73%	30-130%
4165-60-0	Nitrobenzene-d5	62%	66%	71% 30-130%
321-60-8	2-Fluorobiphenyl	73%	77%	80% 30-130%
1718-51-0	Terphenyl-d14	83%	83%	82% 30-130%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

(b) High RPD due to possible matrix interference and/or sample non-homogeneity.

* = Outside of Control Limits.

7.3.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34956-MS	W14569.D	1	09/25/13	KR	09/24/13	OP34956	MSW658
OP34956-MSD	W14570.D	1	09/25/13	KR	09/24/13	OP34956	MSW658
MC24444-3	W14571.D	1	09/25/13	KR	09/25/13	OP34956	MSW658

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

MC24449-3, MC24449-4

CAS No.	Compound	MC24444-3 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND	2690	1850	69	2000	74	8	40-140/30	
208-96-8	Acenaphthylene	ND	2690	1810	67	1970	73	8	40-140/30	
120-12-7	Anthracene	1.0	2690	1930	72	2120	78	9	40-140/30	
56-55-3	Benzo(a)anthracene	3.4	2690	2380	88	2630	97	10	40-140/30	
50-32-8	Benzo(a)pyrene	7.4	2690	1860	69	2090	77	12	40-140/30	
205-99-2	Benzo(b)fluoranthene	3.6	2690	2160	80	2400	89	11	40-140/30	
191-24-2	Benzo(g,h,i)perylene	6.7	2690	2080	77	2350	87	12	40-140/30	
207-08-9	Benzo(k)fluoranthene	3.3	2690	2220	82	2340	86	5	40-140/30	
218-01-9	Chrysene	3.4	2690	1870	69	2060	76	10	40-140/30	
53-70-3	Dibenzo(a,h)anthracene	5.4	2690	2080	77	2360	87	13	40-140/30	
206-44-0	Fluoranthene	7.7	2690	2170	80	2260	83	4	40-140/30	
86-73-7	Fluorene	ND	2690	1980	73	2150	80	8	40-140/30	
193-39-5	Indeno(1,2,3-cd)pyrene	6.7	2690	2080	77	2380	88	13	40-140/30	
90-12-0	1-Methylnaphthalene	ND	2690	1800	67	1940	72	7	40-140/30	
91-57-6	2-Methylnaphthalene	ND	2690	1800	67	1960	73	9	40-140/30	
85-01-8	Phenanthrene	3.0	2690	1860	69	2060	76	10	40-140/30	
129-00-0	Pyrene	6.1	2690	2090	77	2190	81	5	40-140/30	

CAS No.	Surrrogate Recoveries	MS	MSD	MC24444-3	Limits
367-12-4	2-Fluorophenol	35%	38%		15-110%
4165-62-2	Phenol-d5	34%	37%		15-110%
118-79-6	2,4,6-Tribromophenol	42%	44%		15-110%
4165-60-0	Nitrobenzene-d5	69%	74%	59%	30-130%
321-60-8	2-Fluorobiphenyl	72%	77%	59%	30-130%
1718-51-0	Terphenyl-d14	83%	86%	70%	30-130%

* = Outside of Control Limits.

7.3.2 7

Semivolatile Internal Standard Area Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSI3208-CC3155	Injection Date:	09/30/13
Lab File ID:	I86186.D	Injection Time:	11:00
Instrument ID:	GCMSI	Method:	SW846 8270C BY SIM

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	240245	4.13	670208	5.12	392886	6.57	647073	7.92	456678	10.69	614037	12.18
Upper Limit ^a	480490	4.63	1340416	5.62	785772	7.07	1294146	8.42	913356	11.19	1228074	12.68
Lower Limit ^b	120123	3.63	335104	4.62	196443	6.07	323537	7.42	228339	10.19	307019	11.68

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
OP35007-MB	194656	4.13	559201	5.12	321827	6.56	526346	7.92	355096	10.70	480631	12.17
OP35007-BS	196575	4.13	566965	5.12	322466	6.57	541262	7.92	420340	10.70	669579	12.18
ZZZZZZ	195177	4.13	556145	5.12	318271	6.56	525343	7.91	379030	10.70	533436	12.17
ZZZZZZ	217129	4.13	630711	5.12	362275	6.56	600307	7.92	450405	10.69	638974	12.18
MC24449-3	228373	4.13	672976	5.12	391386	6.57	660846	7.92	534225	10.70	848465	12.18
MC24449-4	224648	4.13	654474	5.12	377112	6.57	633960	7.92	500833	10.70	792040	12.18
ZZZZZZ	212893	4.13	624434	5.12	360863	6.57	612990	7.92	487954	10.70	787762	12.18
ZZZZZZ	252484	4.13	719015	5.12	413644	6.57	688809	7.92	547647	10.70	897092	12.18
ZZZZZZ	222365	4.13	633755	5.12	364899	6.57	623878	7.92	517525	10.70	859042	12.18
ZZZZZZ	212400	4.13	606768	5.12	350444	6.57	591529	7.92	479444	10.70	789784	12.18
ZZZZZZ	217046	4.13	624585	5.12	362025	6.57	598365	7.92	490394	10.70	824651	12.18

- IS 1 = 1,4-Dichlorobenzene-d4
- IS 2 = Naphthalene-d8
- IS 3 = Acenaphthene-D10
- IS 4 = Phenanthrene-d10
- IS 5 = Chrysene-d12
- IS 6 = Perylene-d12

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
 (b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

7.4.1
7

Semivolatile Internal Standard Area Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSR1232-CC1159	Injection Date:	09/30/13
Lab File ID:	R33867.D	Injection Time:	07:41
Instrument ID:	GCMSR	Method:	SW846 8270C

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	81131	3.83	294259	4.88	179871	6.39	307108	7.75	335223	10.66	312867	12.24
Upper Limit ^a	162262	4.33	588518	5.38	359742	6.89	614216	8.25	670446	11.16	625734	12.74
Lower Limit ^b	40566	3.33	147130	4.38	89936	5.89	153554	7.25	167612	10.16	156434	11.74

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
OP34883-MB	70621	3.83	261779	4.87	163585	6.39	290596	7.74	320787	10.66	309368	12.23
OP34883-BS	73812	3.83	263214	4.87	166300	6.39	282710	7.75	310547	10.66	302856	12.23
OP34883-MS	74836	3.83	283340	4.88	176457	6.39	307582	7.75	331529	10.66	320705	12.23
OP34883-MSD	74908	3.83	277319	4.87	170778	6.39	293957	7.75	316381	10.66	313295	12.23
MC24300-21	68800	3.83	255332	4.88	162221	6.39	283855	7.74	310218	10.65	301625	12.23
ZZZZZZ	84232	3.83	322157	4.87	200026	6.39	352089	7.76	383833	10.68	374309	12.24
OP34955-MB	78906	3.83	285896	4.87	177123	6.39	308064	7.74	347735	10.66	327162	12.23
OP34955-BS	79728	3.83	288568	4.87	178838	6.39	300394	7.75	332095	10.66	322449	12.23
OP34955-MS	77909	3.83	288959	4.87	179332	6.39	307103	7.75	341596	10.66	330793	12.23
OP34955-MSD	82457	3.83	293324	4.87	179723	6.39	305776	7.75	339694	10.66	332395	12.23
MC24409-24	73513	3.83	264084	4.88	167250	6.39	286377	7.74	311103	10.65	301119	12.23
ZZZZZZ	86298	3.83	311342	4.87	197448	6.39	337327	7.75	367271	10.66	361337	12.24
ZZZZZZ	79038	3.83	289059	4.87	180095	6.39	310633	7.74	340209	10.66	318987	12.23
ZZZZZZ	77049	3.83	280260	4.87	177348	6.39	296032	7.74	325920	10.66	313962	12.23
ZZZZZZ	81437	3.83	298505	4.87	186200	6.39	315687	7.74	350362	10.66	342454	12.23
ZZZZZZ	80163	3.83	290095	4.87	182178	6.39	312720	7.74	338546	10.66	333378	12.23
ZZZZZZ	74325	3.83	266484	4.87	167217	6.39	284945	7.74	306541	10.66	304346	12.23
ZZZZZZ	78010	3.83	284427	4.87	178783	6.39	308845	7.75	325727	10.67	326998	12.25
ZZZZZZ	78344	3.83	283643	4.87	177071	6.39	306220	7.75	313195	10.71	316807	12.29
ZZZZZZ	81250	3.83	295519	4.88	184627	6.39	314981	7.75	332782	10.69	337329	12.27
ZZZZZZ	80043	3.83	295345	4.87	192454	6.39	322090	7.75	356117	10.66	340034	12.24
ZZZZZZ	76409	3.83	291986	4.87	187650	6.39	317707	7.75	352754	10.66	336762	12.24
MC24449-3	78039	3.83	284952	4.88	178099	6.39	302653	7.74	335895	10.66	328437	12.23
MC24449-4	74889	3.83	277877	4.87	174825	6.39	292622	7.74	328016	10.66	317375	12.23
ZZZZZZ	76783	3.83	283573	4.87	173661	6.39	296531	7.74	331924	10.66	316160	12.24
ZZZZZZ	81303	3.83	294487	4.87	181894	6.39	313788	7.75	345137	10.66	328910	12.25
ZZZZZZ	75549	3.83	273821	4.87	168354	6.39	295549	7.75	319020	10.66	307490	12.24

- IS 1 = 1,4-Dichlorobenzene-d4
- IS 2 = Naphthalene-d8
- IS 3 = Acenaphthene-D10
- IS 4 = Phenanthrene-d10
- IS 5 = Chrysene-d12
- IS 6 = Perylene-d12

7.4.2
7

Semivolatile Internal Standard Area Summary

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSR1232-CC1159	Injection Date:	09/30/13
Lab File ID:	R33867.D	Injection Time:	07:41
Instrument ID:	GCMSR	Method:	SW846 8270C

Lab	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT

- (a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
- (b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

7.4.2

7

Semivolatile Internal Standard Area Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSW658-CC657	Injection Date:	09/25/13
Lab File ID:	W14563.D	Injection Time:	15:24
Instrument ID:	GCMSW	Method:	SW846 8270C BY SIM

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	57860	4.55	153760	5.69	80981	7.34	139355	8.72	123574	11.61	275358	13.59
Upper Limit ^a	115720	5.05	307520	6.19	161962	7.84	278710	9.22	247148	12.11	550716	14.09
Lower Limit ^b	28930	4.05	76880	5.19	40491	6.84	69678	8.22	61787	11.11	137679	13.09

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
OP34880-MB	72996	4.55	188113	5.69	98445	7.34	172615	8.72	151640	11.61	325494	13.59
OP34880-BS	54753	4.55	144487	5.69	74012	7.34	127067	8.72	111519	11.61	250609	13.59
OP34956-MB	52542	4.55	134871	5.69	67291	7.34	116872	8.72	95976	11.61	205618	13.58
OP34956-BS	54181	4.55	149740	5.69	81593	7.34	147164	8.72	144538	11.61	322264	13.59
OP34956-MS	56615	4.55	150201	5.69	77616	7.34	130846	8.72	110783	11.61	249862	13.59
OP34956-MSD	54694	4.55	144907	5.69	74458	7.34	125424	8.72	115087	11.61	274396	13.59
MC24444-3	54404	4.55	142542	5.69	73154	7.34	127243	8.72	107968	11.60	254020	13.59
ZZZZZZ	50052	4.55	129289	5.69	66270	7.34	114598	8.72	94547	11.61	222425	13.59
OP34880-MS	54712	4.56	145363	5.69	76569	7.34	134835	8.72	125034	11.61	279226	13.59
OP34880-MSD	41513	4.55	112411	5.69	61007	7.34	114748	8.72	115158	11.61	262801	13.59
MC24368-18	44941	4.56	117823	5.69	60402	7.34	106148	8.72	99733	11.61	237861	13.59
ZZZZZZ	51923	4.55	139161	5.69	73962	7.34	132654	8.72	126508	11.61	270496	13.59
ZZZZZZ	46093	4.55	122431	5.69	63315	7.34	111995	8.72	102474	11.61	236893	13.59
ZZZZZZ	77663	4.55	199002	5.69	105924	7.34	181829	8.72	153808	11.61	322616	13.59
ZZZZZZ	43788	4.55	119005	5.69	63382	7.34	115260	8.72	116696	11.61	259798	13.59
ZZZZZZ	46142	4.56	119281	5.69	62434	7.34	107838	8.72	92526	11.61	212804	13.59
ZZZZZZ	45109	4.56	120146	5.69	64148	7.34	113264	8.72	108168	11.61	239596	13.59
ZZZZZZ	44040	4.56	117747	5.69	60545	7.34	104273	8.72	101766	11.61	226397	13.59
ZZZZZZ	43023	4.56	114937	5.69	60402	7.34	107547	8.72	103483	11.61	235177	13.59
ZZZZZZ	43672	4.56	118607	5.69	62201	7.34	111487	8.72	110073	11.61	248704	13.59
ZZZZZZ	46540	4.56	123894	5.69	64389	7.34	110572	8.72	100282	11.61	226392	13.59
ZZZZZZ	45176	4.56	122855	5.69	64883	7.34	117730	8.72	114319	11.61	242922	13.59
ZZZZZZ	40958	4.56	109012	5.69	56454	7.34	99758	8.72	94857	11.61	214217	13.59
ZZZZZZ	44414	4.56	122923	5.69	66061	7.34	122978	8.72	118907	11.61	255312	13.59
ZZZZZZ	44102	4.56	121889	5.69	66494	7.34	122627	8.73	115306	11.61	239463	13.59
ZZZZZZ	61191	4.56	163347	5.69	88651	7.34	156326	8.73	145668	11.61	304484	13.59

- IS 1 = 1,4-Dichlorobenzene-d4
- IS 2 = Naphthalene-d8
- IS 3 = Acenaphthene-D10
- IS 4 = Phenanthrene-d10
- IS 5 = Chrysene-d12
- IS 6 = Perylene-d12

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.

7.4.3
7

Semivolatile Internal Standard Area Summary

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSW658-CC657	Injection Date:	09/25/13
Lab File ID:	W14563.D	Injection Time:	15:24
Instrument ID:	GCMSW	Method:	SW846 8270C BY SIM

Lab	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6						
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

7.4.3
7

Semivolatile Surrogate Recovery Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8270C	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
MC24449-3	R33890.D	75.0	72.0	66.0	66.0	76.0	80.0
MC24449-4	R33891.D	71.0	70.0	72.0	60.0	73.0	87.0
OP34955-BS	R33875.D	80.0	81.0	84.0	72.0	84.0	90.0
OP34955-MB	R33874.D	77.0	78.0	76.0	71.0	83.0	84.0
OP34955-MS	R33876.D	72.0	73.0	72.0	62.0	73.0	83.0
OP34955-MSD	R33877.D	71.0	72.0	73.0	66.0	77.0	83.0

Surrogate Compounds	Recovery Limits
S1 = 2-Fluorophenol	30-130%
S2 = Phenol-d5	30-130%
S3 = 2,4,6-Tribromophenol	30-130%
S4 = Nitrobenzene-d5	30-130%
S5 = 2-Fluorobiphenyl	30-130%
S6 = Terphenyl-d14	30-130%

7.5.1
7

GC Volatiles

QC Data Summaries



Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries

Method Blank Summary

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34909-MB	BK29872.D	1	09/25/13	NK	09/20/13	OP34909	GBK996

The QC reported here applies to the following samples:

Method: SW846 8011

MC24449-3, MC24449-4

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.4	0.60	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.4	0.90	ug/kg	

CAS No.	Surrogate Recoveries	Limits	
460-00-4	Bromofluorobenzene (S)	129%	61-167%
460-00-4	Bromofluorobenzene (S)	119%	61-167%

8.1.1

8

Method Blank Summary

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP35014-MB	BB51209A.D1		09/27/13	CZ	09/27/13	OP35014	GBB3020

The QC reported here applies to the following samples:

Method: SW846 8011

MC24449-1

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.0045	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.0097	ug/l	

CAS No.	Surrogate Recoveries		Limits
460-00-4	Bromofluorobenzene (S)	100%	36-173%
460-00-4	Bromofluorobenzene (S)	97%	36-173%

8.1.2

8

Method Blank Summary

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBH1839-MB	BH31516.D	1	09/24/13	TB	n/a	n/a	GBH1839

The QC reported here applies to the following samples:

Method: SW846 8015

MC24449-3, MC24449-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	5.0	1.1	mg/kg	

CAS No.	Surrogate Recoveries	Limits
	2,3,4-Trifluorotoluene	77% 61-116%

8.1.3

8

Blank Spike Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34909-BS	BK29873.D	1	09/25/13	NK	09/20/13	OP34909	GBK996

The QC reported here applies to the following samples:

Method: SW846 8011

MC24449-3, MC24449-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	32.73	46.0	141	59-142
106-93-4	1,2-Dibromoethane	32.73	43.7	134	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	152%	61-167%
460-00-4	Bromofluorobenzene (S)	127%	61-167%

8.2.1

8

* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP35014-BS	BB51210A.D1		09/27/13	CZ	09/27/13	OP35014	GBB3020

The QC reported here applies to the following samples:

Method: SW846 8011

MC24449-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.066	93	60-140
106-93-4	1,2-Dibromoethane	0.071	0.071	100	60-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	94%	36-173%
460-00-4	Bromofluorobenzene (S)	94%	36-173%

8.2.2

8

* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBH1839-BSP	BH31517.D	1	09/24/13	TB	n/a	n/a	GBH1839

The QC reported here applies to the following samples: Method: SW846 8015

MC24449-3, MC24449-4

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (VOA)	20	15.0	75	66-126

CAS No.	Surrogate Recoveries	BSP	Limits
	2,3,4-Trifluorotoluene	78%	61-116%

8.2.3

8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34909-MS	BK29874.D	1	09/25/13	NK	09/20/13	OP34909	GBK996
OP34909-MSD	BK29875.D	1	09/25/13	NK	09/20/13	OP34909	GBK996
MC24403-3	BK29876.D	1	09/25/13	NK	09/20/13	OP34909	GBK996

The QC reported here applies to the following samples:

Method: SW846 8011

MC24449-3, MC24449-4

CAS No.	Compound	MC24403-3 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	40.95	61.0	149	60.1	145	1	40-156/27	
106-93-4	1,2-Dibromoethane	ND	40.95	56.6	138	56.3	136	1	48-141/27	

8.3.1



CAS No.	Surrogate Recoveries	MS	MSD	MC24403-3	Limits
460-00-4	Bromofluorobenzene (S)	155%	159%	148%	61-167%
460-00-4	Bromofluorobenzene (S)	135%	133%	130%	61-167%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP35014-MS	BB51211A.D1		09/27/13	CZ	09/27/13	OP35014	GBB3020
OP35014-MSD	BB51212A.D1		09/27/13	CZ	09/27/13	OP35014	GBB3020
MC24800-3	BB51213A.D1		09/27/13	CZ	09/27/13	OP35014	GBB3020

The QC reported here applies to the following samples:

Method: SW846 8011

MC24449-1

CAS No.	Compound	MC24800-3 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.069	0.068	99	0.069	99	1	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.069	0.075	109	0.078	111	4	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC24800-3	Limits
460-00-4	Bromofluorobenzene (S)	110%	113%	112%	36-173%
460-00-4	Bromofluorobenzene (S)	102%	98%	99%	36-173%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24409-13MS	BH31520.D	1	09/24/13	TB	n/a	n/a	GBH1839
MC24409-13MSD	BH31521.D	1	09/24/13	TB	n/a	n/a	GBH1839
MC24409-13	BH31519.D	1	09/24/13	TB	n/a	n/a	GBH1839

The QC reported here applies to the following samples:

Method: SW846 8015

MC24449-3, MC24449-4

CAS No.	Compound	MC24409-13 Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (VOA)	2710	44.6	2550	-358* ^a	2560	-336* ^a	0 41-150/20
CAS No.	Surrogate Recoveries	MS	MSD	MC24409-13 Limits				
	2,3,4-Trifluorotoluene	112%	113%	119%* ^b	61-116%			

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Outside control limits due to possible matrix interference.

* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Job Number: MC24449

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8011

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC24449-1	BB51216.D	100.0	96.0
OP35014-BS	BB51210A.D	94.0	94.0
OP35014-MB	BB51209A.D	100.0	97.0
OP35014-MS	BB51211A.D	110.0	102.0
OP35014-MSD	BB51212A.D	113.0	98.0

Surrogate Compounds	Recovery Limits
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S1 = Bromofluorobenzene (S) 36-173%

(a) Recovery from GC signal #2

(b) Recovery from GC signal #1

8.4.1

8

Volatile Surrogate Recovery Summary

Job Number: MC24449

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8011

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC24449-3	BK29877.D	135.0	126.0
MC24449-4	BK29878.D	135.0	121.0
OP34909-BS	BK29873.D	152.0	127.0
OP34909-MB	BK29872.D	129.0	119.0
OP34909-MS	BK29874.D	155.0	135.0
OP34909-MSD	BK29875.D	159.0	133.0

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 61-167%

(a) Recovery from GC signal #2

(b) Recovery from GC signal #1

8.4.2

8

Volatile Surrogate Recovery Summary

Job Number: MC24449

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8015

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a
MC24449-3	BH31531.D	78.0
MC24449-4	BH31532.D	79.0
GBH1839-BSP	BH31517.D	78.0
GBH1839-MB	BH31516.D	77.0
MC24409-13MS	BH31520.D	112.0
MC24409-13MSD	BH31521.D	113.0

Surrogate Compounds	Recovery Limits
S1 = 2,3,4-Trifluorotoluene	61-116%

(a) Recovery from GC signal #1

8.4.3
8

GC Surrogate Retention Time Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBB3020-ICC3020	Injection Date:	09/27/13
Lab File ID:	BB51204.D	Injection Time:	18:52
Instrument ID:	GCBB	Method:	SW846 8011

S1^a S1^b
 RT RT

Check Std	4.65	4.45
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
ZZZZZZ	BB51207B.D	09/27/13	20:18	4.66	4.45
ZZZZZZ	BB51207A.D	09/27/13	20:18	4.66	4.45
OP35015-MB	BB51209.D	09/27/13	21:17	4.65	4.45
OP35014-MB	BB51209A.D	09/27/13	21:17	4.65	4.45
OP35015-BS	BB51210.D	09/27/13	21:48	4.65	4.45
OP35014-BS	BB51210A.D	09/27/13	21:48	4.65	4.45
OP35015-MS	BB51211.D	09/27/13	22:19	4.65	4.45
OP35014-MS	BB51211A.D	09/27/13	22:19	4.65	4.45
OP35014-MSD	BB51212A.D	09/27/13	22:51	4.65	4.45
OP35015-MSD	BB51212.D	09/27/13	22:51	4.65	4.45
MC24476-8	BB51213.D	09/27/13	23:22	4.65	4.45
MC24800-3	BB51213A.D	09/27/13	23:22	4.65	4.45
ZZZZZZ	BB51214.D	09/27/13	23:52	4.68	4.45
ZZZZZZ	BB51215.D	09/28/13	00:24	4.68	4.45
MC24449-1	BB51216.D	09/28/13	00:55	4.65	4.45
ZZZZZZ	BB51217.D	09/28/13	01:27	4.65	4.45
GBB3020-ECC3020	BB51218.D	09/28/13	01:58	4.65	4.45

Surrogate
 Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

8.5.1

8

GC Surrogate Retention Time Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBK996-ICC996	Injection Date:	09/25/13
Lab File ID:	BK29866.D	Injection Time:	12:06
Instrument ID:	GCBK	Method:	SW846 8011

S1^a S1^b
 RT RT

Check Std	4.11	5.11
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
OP34909-MB	BK29872.D	09/25/13	15:39	4.11	5.12
OP34909-BS	BK29873.D	09/25/13	16:02	4.12	5.12
OP34909-MS	BK29874.D	09/25/13	16:25	4.12	5.12
OP34909-MSD	BK29875.D	09/25/13	16:48	4.12	5.12
MC24403-3	BK29876.D	09/25/13	17:16	4.12	5.12
MC24449-3	BK29877.D	09/25/13	17:39	4.12	5.12
MC24449-4	BK29878.D	09/25/13	18:03	4.12	5.12
ZZZZZZ	BK29879.D	09/25/13	18:27	4.12	5.12
ZZZZZZ	BK29880.D	09/25/13	18:51	4.12	5.12
ZZZZZZ	BK29881.D	09/25/13	19:15	4.12	5.12

Surrogate
 Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

8.5.2

8

GC Surrogate Retention Time Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBH1839-CC1786	Injection Date:	09/24/13
Lab File ID:	BH31515.D	Injection Time:	15:57
Instrument ID:	GCBH	Method:	SW846 8015

S1^a
 RT

Check Std	20.21
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
GBH1839-MB	BH31516.D	09/24/13	16:32	20.21
GBH1839-BSP	BH31517.D	09/24/13	17:08	20.21
ZZZZZZ	BH31518.D	09/24/13	19:56	20.21
MC24409-13	BH31519.D	09/24/13	20:31	20.21
MC24409-13MS	BH31520.D	09/24/13	21:05	20.21
MC24409-13MSD	BH31521.D	09/24/13	21:40	20.21
ZZZZZZ	BH31524.D	09/24/13	23:23	20.21
ZZZZZZ	BH31525.D	09/24/13	23:57	20.21

Surrogate
 Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

8.5.3


GC Surrogate Retention Time Summary

Job Number: MC24449
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBH1839-CC1786	Injection Date:	09/25/13
Lab File ID:	BH31526.D	Injection Time:	00:32
Instrument ID:	GCBH	Method:	SW846 8015

S1 ^a
 RT

Check Std	20.20
-----------	-------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
ZZZZZZ	BH31527.D	09/25/13	01:06	20.21
ZZZZZZ	BH31528.D	09/25/13	01:40	20.21
ZZZZZZ	BH31529.D	09/25/13	02:14	20.21
ZZZZZZ	BH31530.D	09/25/13	02:49	20.21
MC24449-3	BH31531.D	09/25/13	03:23	20.20
MC24449-4	BH31532.D	09/25/13	03:58	20.21
ZZZZZZ	BH31533.D	09/25/13	04:32	20.21
ZZZZZZ	BH31534.D	09/25/13	05:06	20.21
ZZZZZZ	BH31535.D	09/25/13	05:40	20.21
ZZZZZZ	BH31536.D	09/25/13	06:15	20.21

Surrogate
 Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

8.5.4
 8

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Percent Solids Raw Data Summary



Percent Solids Raw Data Summary

Job Number: MC24449
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample: MC24449-3 Analyzed: 18-SEP-13 by HS Method: SM21 2540 B MOD.
ClientID: SVE38-091613 (34-36')

Wet Weight (Total)	35.356	g
Tare Weight	25.709	g
Dry Weight (Total)	33.66	g
Solids, Percent	82.4	%

Sample: MC24449-4 Analyzed: 18-SEP-13 by HS Method: SM21 2540 B MOD.
ClientID: SVE38-091613 (34-36')DUP

Wet Weight (Total)	33.915	g
Tare Weight	23.346	g
Dry Weight (Total)	32.085	g
Solids, Percent	82.7	%

9.1

9

Roxana SVE Extension 2013 Data Review

Laboratory SDG: MC24503

Data Reviewer: Melissa Mansker

Peer Reviewer: Elizabeth Kunkel

Date Reviewed: 10/15/2013

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

Sample Identification	Sample Identification
TB-091713-ST	TB-091713-HCL
SVE-39-091713 (34-36')	

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 VOC and SVOC LCS recoveries were outside evaluation criteria. VOC MS/MSD recoveries were outside of evaluation criteria in sample SVE-39-091713 (34-36'). The internal standard area recovery for tert butyl alcohol-d₉ in matrix spike duplicate SVE-39-091713 (34-36') MSD was outside evaluation criteria. These issues are addressed further in the appropriate sections below.

The cooler receipt form indicated samples were received by the laboratory at 1.0°C which is outside temperature criteria 4°C ± 2°C. All samples were received in good condition; no qualification of data was required.

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?

No

LCS ID	Parameter	Analyte	LCS Recovery	RPD	LCS Criteria
MSM2071-BS	VOCs	Acrolein	52	NA	70-130
MSM2071-BS	VOCs	2-Butanone (MEK)	135	NA	70-130

LCS ID	Parameter	Analyte	LCS Recovery	RPD	LCS Criteria
MSM2071-BS	VOCs	Vinyl acetate	56	NA	70-130
OP34955-BS	SVOCs	Hexachlorocyclopentadiene	35	NA	40-140

Analytical data that required qualification based on LCS data are included in the table below. Analytical data reported as non-detect and associated with LCS recoveries above evaluation criteria, indicating a possible high bias, did not require qualification.

Sample ID	Parameter	Analyte	Qualification
SVE-39-091713 (34-36')	VOCs	Acrolein	UJ
SVE-39-091713 (34-36')	VOCs	Vinyl acetate	UJ
SVE-39-091713 (34-36')	SVOCs	Hexachlorocyclopentadiene	UJ

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

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

Yes, although not requested, sample SVE-39-091713 (34-36') was spiked and analyzed for VOCs.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/ RPD Criteria
SVE-39-091713 (34-36')	VOCs	Acetone	112/141	22	70-130/30
SVE-39-091713 (34-36')	VOCs	Acrolein	31/39	22	70-130/30
SVE-39-091713 (34-36')	VOCs	2-Chloroethyl vinyl ether	0/0	NA	10-160/30
SVE-39-091713 (34-36')	VOCs	1,2-Dichlorobenzene	65/75	13	70-130/30
SVE-39-091713 (34-36')	VOCs	1,3-Dichlorobenzene	69/78	12	70-130/30
SVE-39-091713 (34-36')	VOCs	1,4-Dioxane	99/132	28	70-130/30
SVE-39-091713 (34-36')	VOCs	Hexachlorobutadiene	62/72	15	70-130/30
SVE-39-091713 (34-36')	VOCs	Naphthalene	63/74	16	70-130/30
SVE-39-091713 (34-36')	VOCs	1,2,3-Trichlorobenzene	51/62	19	70-130/30
SVE-39-091713 (34-36')	VOCs	1,2,4-Trichlorobenzene	58/68	15	70-130/30

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/ RPD Criteria
SVE-39-091713 (34-36')	VOCs	Vinyl acetate	53/63	16	70-130/30

USEPA National Functional Guidelines for Organic Data Review indicates that organic data does not require qualification based on MS/MSD data alone and LCS recoveries were within evaluation criteria with the exception of compounds listed and qualified as appropriate in Section 5.0 of this data review. No further qualification of the data was required.

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

No

Sample ID	Parameter	Analyte	IS Area Recovery	IS Criteria
SVE-39-091713 (34-36') MSD	VOCs	Tert butyl alcohol-d ₉	187305	41284-165134

Matrix spike duplicate SVE-39-091713 (34-36') is a quality control sample and is not qualified; no qualification of data was required.

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

No

11.0 Sample Dilutions

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

Not applicable; samples analyzed did not require dilution.

12.0 Additional Qualifications

Were additional qualifications applied?

No



10/09/13

Technical Report for

Shell Oil

URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

21562850.18000

Accutest Job Number: MC24503

Sampling Date: 09/17/13

Report to:

URS Corporation

Melissa.mansker@urs.com

ATTN: Melissa Mansker

Total number of pages in report: 83



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

*Reviewed on
10/16/13
Reza Fand
Lab Director*

Client Service contact: Matthew Morrell 508-481-6200

Certifications: MA (M-MA136, SW846 NELAC) CT (PH-0109) NH (250210) RI (00071) ME (MA00136) FL (E87579) NY (11791) NJ (MA926) PA (6801121) ND (R-188) CO MN (11546AA) NC (653) IL (002337) WI (399080220) ISO 17025:2005 (L2235)

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Test results relate only to samples analyzed.

Table of Contents

Sections:



-1-

Section 1: Sample Summary	3
Section 2: Case Narrative/Conformance Summary	4
Section 3: Summary of Hits	6
Section 4: Sample Results	7
4.1: MC24503-1: TB-091713-ST	8
4.2: MC24503-2: TB-091713-HCL	9
4.3: MC24503-3: SVE39-091713(34-36')	12
Section 5: Misc. Forms	20
5.1: Chain of Custody	21
5.2: Internal Chain of Custody	24
Section 6: GC/MS Volatiles - QC Data Summaries	25
6.1: Method Blank Summary	26
6.2: Blank Spike Summary	32
6.3: Blank Spike/Blank Spike Duplicate Summary	35
6.4: Matrix Spike/Matrix Spike Duplicate Summary	38
6.5: Internal Standard Area Summaries	44
6.6: Surrogate Recovery Summaries	46
Section 7: GC/MS Semi-volatiles - QC Data Summaries	48
7.1: Method Blank Summary	49
7.2: Blank Spike Summary	52
7.3: Matrix Spike/Matrix Spike Duplicate Summary	55
7.4: Internal Standard Area Summaries	58
7.5: Surrogate Recovery Summaries	63
Section 8: GC Volatiles - QC Data Summaries	65
8.1: Method Blank Summary	66
8.2: Blank Spike Summary	69
8.3: Matrix Spike/Matrix Spike Duplicate Summary	72
8.4: Surrogate Recovery Summaries	75
8.5: GC Surrogate Retention Time Summaries	78
Section 9: General Chemistry - QC Data Summaries	82
9.1: Percent Solids Raw Data Summary	83



Sample Summary

Shell Oil

Job No: MC24503

URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
Project No: 21562850.18000

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
MC24503-1	09/17/13	00:00 EA	09/18/13	AQ	Trip Blank Water	TB-091713-ST ✓
MC24503-2	09/17/13	00:00 EA	09/18/13	AQ	Trip Blank Water	TB-091713-HCL ✓
MC24503-3	09/17/13	16:10 EA	09/18/13	SO	Soil	SVE39-091713(34-36') ✓

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Shell Oil

Job No MC24503

Site: URSMOSTL: Roxana SVE System Extension, 900 South Central Av

Report Date 10/3/2013 9:42:24 AM

1 Sample(s) and 2 Trip Blank(s) were collected on 09/17/2013 and were received at Accutest on 09/18/2013 properly preserved, at 1 Deg. C and intact. These Samples received an Accutest job number of MC24503. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AQ	Batch ID: MSV903
-----------	------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC24476-8MS, MC24476-8MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- MS/MSD Recovery(s) for 2-Chloroethyl vinyl ether, 2-Hexanone, Acetone are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.

Matrix SO	Batch ID: MSM2071
-----------	-------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC24503-3MS, MC24503-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- MSM2071-BS Recovery(s) for 2-Butanone (MEK), Acrolein, Vinyl Acetate are outside control limits. Blank Spike meets program technical requirements.
- Matrix Spike Recovery(s) for 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 2-Chloroethyl vinyl ether, Acrolein, Hexachlorobutadiene, Naphthalene, Vinyl Acetate are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,4-Dioxane, 2-Chloroethyl vinyl ether, Acetone, Acrolein, Vinyl Acetate are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- MC24503-3MSD for Tert Butyl Alcohol-D9: Outside control limits. Target analytes not associated with this internal standard.

Extractables by GCMS By Method SW846 8270C

Matrix SO	Batch ID: OP34955
-----------	-------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) MC24409-24MS, MC24409-24MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Blank Spike Recovery(s) for Hexachlorocyclopentadiene are outside control limits. Blank Spike meets program technical requirements.
- Matrix Spike Recovery(s) for 2,4-Dinitrophenol, Benzoic acid, Hexachlorocyclopentadiene, Pyridine are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for Benzoic acid, Hexachlorocyclopentadiene are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- RPD(s) for MSD for 2,4-Dinitrophenol are outside control limits for sample OP34955-MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.

Extractables by GCMS By Method SW846 8270C BY SIM

Matrix SO	Batch ID: OP34956
------------------	--------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) MC24444-3MS, MC24444-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8011

Matrix AQ	Batch ID: OP35014
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC24800-3MS, MC24800-3MSD were used as the QC samples indicated.

Matrix SO	Batch ID: OP34909
------------------	--------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) MC24403-3MS, MC24403-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8015

Matrix SO	Batch ID: GBH1842
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC24505-10MS, MC24505-10MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix SO	Batch ID: GN44364
------------------	--------------------------

- Sample(s) MC24503-3DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(MC24503).

Summary of Hits

Job Number: MC24503
Account: Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
Collected: 09/17/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

MC24503-1 TB-091713-ST

No hits reported in this sample.

MC24503-2 TB-091713-HCL

No hits reported in this sample.

MC24503-3 SVE39-091713(34-36')

Benzene	0.0012	0.00052	0.00026	mg/kg	SW846 8260B
sec-Butylbenzene	0.00029 J	0.0052	0.00016	mg/kg	SW846 8260B
Ethylbenzene	0.0028	0.0021	0.00018	mg/kg	SW846 8260B
n-Propylbenzene	0.00030 J	0.0052	0.00025	mg/kg	SW846 8260B
Toluene	0.0029 J	0.0052	0.00025	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	0.00062 J	0.0052	0.00021	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	0.00079 J	0.0052	0.00013	mg/kg	SW846 8260B
m,p-Xylene	0.00085 J	0.0021	0.00030	mg/kg	SW846 8260B
Xylene (total)	0.00085 J	0.0021	0.00021	mg/kg	SW846 8260B
Total TIC, Volatile	0.327 J			mg/kg	

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	TB-091713-ST	
Lab Sample ID:	MC24503-1	Date Sampled: 09/17/13
Matrix:	AQ - Trip Blank Water	Date Received: 09/18/13
Method:	SW846 8011 SW846 8011	Percent Solids: n/a
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB51217.D	1	09/28/13	CZ	09/27/13	OP35014	GBB3020
Run #2							

Run #	Initial Volume	Final Volume
Run #1	36.0 ml	2.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.0044	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.0094	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	100%		36-173%
460-00-4	Bromofluorobenzene (S)	96%		36-173%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID:	TB-091713-HCL	Date Sampled:	09/17/13
Lab Sample ID:	MC24503-2	Date Received:	09/18/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B	Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V23601.D	1	09/27/13	AMY	n/a	n/a	MSV903
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.8	ug/l	
107-02-8	Acrolein	ND	25	6.3	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.5	ug/l	
71-43-2	Benzene	ND	0.50	0.45	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	5.0	0.64	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.33	ug/l	
75-25-2	Bromoform	ND	1.0	0.42	ug/l	
74-83-9	Bromomethane	ND	2.0	1.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	1.6	ng/l	
104-51-8	n-Butylbenzene	ND	5.0	0.54	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.58	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.87	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.59	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.62	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.48	ug/l	
75-00-3	Chloroethane	ND	2.0	0.84	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	1.4	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.55	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.33	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.35	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.30	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.2	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.37	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.35	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.67	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.2
4

Report of Analysis

Client Sample ID:	TB-091713-HCL	Date Sampled:	09/17/13
Lab Sample ID:	MC24503-2	Date Received:	09/18/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.45	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.97	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.3	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.63	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.22	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.29	ug/l	
123-91-1	1,4-Dioxane	ND	25	16	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.38	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.3	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.3	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.64	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.55	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.43	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.3	ug/l	
74-95-3	Methylene bromide	ND	5.0	0.43	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.41	ug/l	
91-20-3	Naphthalene	ND	5.0	0.79	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.59	ug/l	
100-42-5	Styrene	ND	5.0	0.49	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.46	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.42	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.61	ug/l	
108-88-3	Toluene	ND	1.0	0.46	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.76	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.45	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.94	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.49	ng/l	
79-01-6	Trichloroethene	ND	1.0	0.45	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.61	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.70	ng/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	1.1	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.61	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.41	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.41	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB-091713-HCL	Date Sampled:	09/17/13
Lab Sample ID:	MC24503-2	Date Received:	09/18/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.2
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		70-130%
2037-26-5	Toluene-D8	104%		70-130%
460-00-4	4-Bromofluorobenzene	106%		70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SVE39-091713(34-36')	Date Sampled: 09/17/13
Lab Sample ID: MC24503-3	Date Received: 09/18/13
Matrix: SO - Soil	Percent Solids: 86.0
Method: SW846 8260B	
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M59774.D	1	09/30/13	KD	n/a	n/a	MSM2071
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.61 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.010	0.0040	mg/kg	
107-02-8	Acrolein	ND	0.026	0.0039	mg/kg	WJ
107-13-1	Acrylonitrile	ND	0.026	0.0014	mg/kg	
71-43-2	Benzene	0.0012	0.00052	0.00026	mg/kg	
108-86-1	Bromobenzene	ND	0.0052	0.00029	mg/kg	
74-97-5	Bromochloromethane	ND	0.0052	0.00060	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0021	0.00038	mg/kg	
75-25-2	Bromoform	ND	0.0021	0.00030	mg/kg	
74-83-9	Bromomethane	ND	0.0021	0.0010	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0052	0.0032	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0052	0.00018	mg/kg	
135-98-8	sec-Butylbenzene	0.00029	0.0052	0.00016	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.0052	0.00037	mg/kg	
75-15-0	Carbon disulfide	ND	0.0052	0.00016	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0021	0.0012	mg/kg	
108-90-7	Chlorobenzene	ND	0.0021	0.00028	mg/kg	
75-00-3	Chloroethane	ND	0.0052	0.00062	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0052	0.0049	mg/kg	
67-66-3	Chloroform	ND	0.0021	0.00030	mg/kg	
74-87-3	Chloromethane	ND	0.0052	0.0013	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0052	0.00042	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0052	0.00046	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0021	0.00044	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0021	0.00022	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0021	0.00023	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0021	0.00021	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0021	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0021	0.00034	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0021	0.00056	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0021	0.00054	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0021	0.00053	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0021	0.00046	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
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Report of Analysis

Client Sample ID:	SVE39-091713(34-36')	Date Sampled:	09/17/13
Lab Sample ID:	MC24503-3	Date Received:	09/18/13
Matrix:	SO - Soil	Percent Solids:	86.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.3
4

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0021	0.00044	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0052	0.00046	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0052	0.00068	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0052	0.00024	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0021	0.00030	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0021	0.00030	mg/kg	
123-91-1	1,4-Dioxane	ND	0.026	0.022	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0052	0.0034	mg/kg	
100-41-4	Ethylbenzene	0.0028	0.0021	0.00018	mg/kg	
87-68-3	Hexachlorobntadiene	ND	0.0052	0.00059	mg/kg	
591-78-6	2-Hexanone	ND	0.0052	0.0025	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0052	0.00029	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0052	0.00017	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0021	0.00041	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0052	0.0019	mg/kg	
74-95-3	Methylene bromide	ND	0.0052	0.00036	mg/kg	
75-09-2	Methylene chloride	ND	0.0021	0.0016	mg/kg	
91-20-3	Naphthalene	ND	0.0052	0.00082	mg/kg	
103-65-1	n-Propylbenzene	0.00030	0.0052	0.00025	mg/kg	J
100-42-5	Styrene	ND	0.0052	0.00021	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0052	0.00040	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0021	0.00031	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0021	0.00046	mg/kg	
108-88-3	Toluene	0.0029	0.0052	0.00025	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0052	0.00045	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0052	0.00038	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0021	0.00019	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0021	0.00036	mg/kg	
79-01-6	Trichloroethene	ND	0.0021	0.00049	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0021	0.0011	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0052	0.00040	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.00062	0.0052	0.00021	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.00079	0.0052	0.00013	mg/kg	J
108-05-4	Vinyl Acetate	ND	0.0052	0.0013	mg/kg	WJ
75-01-4	Vinyl chloride	ND	0.0021	0.00059	mg/kg	
	m,p-Xylene	0.00085	0.0021	0.00030	mg/kg	J
95-47-6	o-Xylene	ND	0.0021	0.00021	mg/kg	
1330-20-7	Xylene (total)	0.00085	0.0021	0.00021	mg/kg	J

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates valne exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE39-091713(34-36')	Date Sampled:	09/17/13
Lab Sample ID:	MC24503-3	Date Received:	09/18/13
Matrix:	SO - Soil	Percent Solids:	86.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
2037-26-5	Toluene-D8	82%		70-130%
460-00-4	4-Bromofluorobenzene	90%		70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
106-97-8	Butane	5.09	.067	mg/kg	JN
78-78-4	Bntane, 2-methyl-	6.07	.045	mg/kg	JN
109-66-0	Pentane	6.49	.021	mg/kg	JN
107-83-5	Pentane, 2-methyl-	7.83	.027	mg/kg	JN
16747-25-4	Hexane, 2,2,3-trimethyl-	8.15	.019	mg/kg	JN
110-54-3	Hexane	8.47	.0084	mg/kg	JN
108-08-7	Pentane, 2,4-dimethyl-	9.13	.023	mg/kg	JN
591-76-4	Hexane, 2-methyl-	9.87	.0075	mg/kg	JN
540-84-1	Pentane, 2,2,4-trimethyl-	10.42	.027	mg/kg	JN
108-87-2	Cyclohexane, methyl-	11.18	.02	mg/kg	JN
565-75-3	Pentane, 2,3,4-trimethyl-	11.63	.018	mg/kg	JN
560-21-4	Pentane, 2,3,3-trimethyl-	11.78	.025	mg/kg	JN
930-89-2	Cyclopentane, 1-ethyl-2-methyl-, c	12.41	.0065	mg/kg	JN
4926-78-7	Cyclohexane, 1-ethyl-4-methyl-, ci	14.09	.0072	mg/kg	JN
3728-54-9	Cyclohexane, 1-ethyl-2-methyl-	14.44	.0054	mg/kg	JN
	Total TIC, Volatile		.327	mg/kg	J

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SVE39-091713(34-36')	Date Sampled: 09/17/13
Lab Sample ID: MC24503-3	Date Received: 09/18/13
Matrix: SO - Soil	Percent Solids: 86.0
Method: SW846 8270C SW846 3546	
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R33894.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.8 g	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	0.56	0.070	mg/kg	
95-57-8	2-Chlorophenol	ND	0.28	0.013	mg/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	0.56	0.014	mg/kg	
120-83-2	2,4-Dichlorophenol	ND	0.56	0.016	mg/kg	
105-67-9	2,4-Dimethylphenol	ND	0.56	0.091	mg/kg	
51-28-5	2,4-Dinitrophenol	ND	1.1	0.14	mg/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	0.56	0.070	mg/kg	
95-48-7	2-Methylphenol	ND	0.56	0.022	mg/kg	
	3&4-Methylphenol	ND	0.56	0.027	mg/kg	
88-75-5	2-Nitrophenol	ND	0.56	0.015	mg/kg	
100-02-7	4-Nitrophenol	ND	1.1	0.10	mg/kg	
87-86-5	Pentachlorophenol	ND	0.56	0.039	mg/kg	
108-95-2	Phenol	ND	0.28	0.016	mg/kg	
95-95-4	2,4,5-Trichlorophenol	ND	0.56	0.014	mg/kg	
88-06-2	2,4,6-Trichlorophenol	ND	0.56	0.014	mg/kg	
62-53-3	Aniline	ND	0.56	0.028	mg/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	0.28	0.014	mg/kg	
85-68-7	Butyl benzyl phthalate	ND	0.28	0.011	mg/kg	
100-51-6	Benzyl Alcohol	ND	0.56	0.028	mg/kg	
91-58-7	2-Chloronaphthalene	ND	0.28	0.015	mg/kg	
106-47-8	4-Chloroaniline	ND	0.56	0.014	mg/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	0.28	0.013	mg/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	0.28	0.017	mg/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	0.28	0.020	mg/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	0.28	0.017	mg/kg	
122-66-7	1,2-Diphenylhydrazine	ND	0.28	0.013	mg/kg	
121-14-2	2,4-Dinitrotoluene	ND	0.56	0.037	mg/kg	
606-20-2	2,6-Dinitrotoluene	ND	0.56	0.014	mg/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	0.28	0.028	mg/kg	
132-64-9	Dibenzofuran	ND	0.11	0.015	mg/kg	
84-74-2	Di-n-butyl phthalate	ND	0.28	0.030	mg/kg	
117-84-0	Di-n-octyl phthalate	ND	0.28	0.0087	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
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Report of Analysis

Client Sample ID:	SVE39-091713(34-36')	Date Sampled:	09/17/13
Lab Sample ID:	MC24503-3	Date Received:	09/18/13
Matrix:	SO - Soil	Percent Solids:	86.0
Method:	SW846 8270C SW846 3546		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
84-66-2	Diethyl phthalate	ND	0.28	0.014	mg/kg	
131-11-3	Dimethyl phthalate	ND	0.28	0.016	mg/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	0.28	0.010	mg/kg	
118-74-1	Hexachlorobenzene	ND	0.28	0.017	mg/kg	
77-47-4	Hexachlorocyclopentadiene	ND	0.56	0.14	mg/kg	UJ
67-72-1	Hexachloroethane	ND	0.28	0.013	mg/kg	
78-59-1	Isophorone	ND	0.28	0.013	mg/kg	
88-74-4	2-Nitroaniline	ND	0.56	0.014	mg/kg	
99-09-2	3-Nitroaniline	ND	0.56	0.031	mg/kg	
100-01-6	4-Nitroaniline	ND	0.56	0.014	mg/kg	
98-95-3	Nitrobenzene	ND	0.28	0.015	mg/kg	
62-75-9	n-Nitrosodimethylamine	ND	0.28	0.013	mg/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	0.28	0.016	mg/kg	
86-30-6	N-Nitrosodiphenylamine	ND	0.28	0.017	mg/kg	
110-86-1	Pyridine	ND	0.56	0.028	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	53%		30-130%
4165-62-2	Phenol-d5	50%		30-130%
118-79-6	2,4,6-Tribromophenol	59%		30-130%
4165-60-0	Nitrobenzene-d5	46%		30-130%
321-60-8	2-Fluorobiphenyl	55%		30-130%
1718-51-0	Terphenyl-d14	70%		30-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Semi-Volatile		0	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SVE39-091713(34-36')	Date Sampled: 09/17/13
Lab Sample ID: MC24503-3	Date Received: 09/18/13
Matrix: SO - Soil	Percent Solids: 86.0
Method: SW846 8270C BY SIM SW846 3546	
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	186193.D	1	09/30/13	WK	09/24/13	OP34956	MSI3208
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.8 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.0056	0.00065	mg/kg	
208-96-8	Acenaphthylene	ND	0.0056	0.0010	mg/kg	
120-12-7	Anthracene	ND	0.0056	0.00090	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.0056	0.00069	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.0056	0.00081	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.0056	0.00068	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.0056	0.0022	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.0056	0.0011	mg/kg	
218-01-9	Chrysene	ND	0.0056	0.00086	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.0056	0.0016	mg/kg	
206-44-0	Fluoranthene	ND	0.0056	0.00089	mg/kg	
86-73-7	Fluorene	ND	0.0056	0.00049	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.0056	0.0014	mg/kg	
90-12-0	1-Methylnaphthalene	ND	0.011	0.011	mg/kg	
91-57-6	2-Methylnaphthalene	ND	0.0056	0.0012	mg/kg	
85-01-8	Phenanthrene	ND	0.0056	0.0011	mg/kg	
129-00-0	Pyrene	ND	0.0056	0.0020	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	26%		15-110%
4165-62-2	Phenol-d5	25%		15-110%
118-79-6	2,4,6-Tribromophenol	33%		15-110%
4165-60-0	Nitrobenzene-d5	57%		30-130%
321-60-8	2-Fluorobiphenyl	56%		30-130%
1718-51-0	Terphenyl-d14	75%		30-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
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Report of Analysis

Client Sample ID: SVE39-091713(34-36')	Date Sampled: 09/17/13
Lab Sample ID: MC24503-3	Date Received: 09/18/13
Matrix: SO - Soil	Percent Solids: 86.0
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK29879.D	1	09/25/13	NK	09/20/13	OP34909	GBK996
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.5 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0029	0.00070	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0029	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	131%		61-167%
460-00-4	Bromofluorobenzene (S)	117%		61-167%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID:	SVE39-091713(34-36')	
Lab Sample ID:	MC24503-3	Date Sampled: 09/17/13
Matrix:	SO - Soil	Date Received: 09/18/13
Method:	SW846 8015	Percent Solids: 86.0
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BH31584.D	1	09/27/13	TB	n/a	n/a	GBH1842
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.41 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	12	2.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	76%		61-116%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Misc. Forms



Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Internal Chain of Custody

Shell Oil Products Chain Of Custody Record

URS

LAB (LOCATION) _____

NEW REUSE

CHECKED BY: _____ DATE: _____

BY: _____ DATE: _____

Lab Ver: JCF# _____

Please Check Appropriate Box:

ENV SERVICES NOT IN A TAZ SHELL TEST

INITIAL BATCH CONTAINER TANK

SHELL FOR LBS OTHER _____

Print Bill To Contact Name: _____

INCIDENT # (ENV SERVICES): _____

DATE: 09/17/13

Page: _____ of _____

1001 HIGHLANDS PLAZA DRIVE, W. ST. - SUITE 300, ST. LOUIS, MO 63110

600 South Central Ave, ROSARIA

SVE System Extension 71322591800

Requested Analysis: _____

FIELD NOTES: _____

TEMPERATURE ON RECEIPT: _____

Container PID Readings or Laboratory Note: _____

SPECIAL INSTRUCTIONS OR NOTES:

Please include "R" values on Receipts

Please provide sample receipt upon login

SHALL CONTRACT RATE APPLIES

STATE REGULATION RATE APPLIES

NO NET NEEDED

INCLUDE VOLUME IN PROTECTED

PROVIDE LEAD BOOK

SAMPLING DATE	TIME	MATERIAL	PRESERVATIVE						NO OF CONT.	VOC BHT SL	SVOC B27C SL + TICS	PAH B27OLL	Percent Moisture	VOC B260B SL + top 15 TICS	TPH-GRO	PID (ppm)
			AC	CE	CEAN	CE	CE	CE								
9/17/13	18:30	WATER						2	X							
9/17/13	18:30	WATER						2					X			
9/17/13	18:30	WATER						3	X	X	X	X	X	X	17.2	

154,1034,114

REVISE

9/17/13

Signature: _____

FED EX

Signature: _____

9/17/13

1830

9-18-13

830

5.1
5

MC24503: Chain of Custody
Page 1 of 3

10°C

LAB (LOCATION)



Shell Oil Products Chain Of Custody Record

URS

RECD ()

CASCIEM ()

OTHER ()

SR ()

Lab Vendor # ()

Please Check Appropriate Box:

ENV. SERVICES

MOTIVA RETAIL

SHELL RETAIL

MOTIVA SERVICE

CONSULTANT

LURES

SHELL PIPELINE

OTHER ()

Print Bill To Contact Name: Bob Bitman

INCIDENT # (ENV SERVICES): 07210640

PO # ()

SAP # ()

DATE: 6/17/2013

PAGE: 1 of 1

SAMPLING COMPANY: URS CORPORATION

ADDRESS: 1001 HIGHLANDS PLAZA DRIVE WEST - SUITE 300, ST. LOUIS, MO 63110

CONTACT: Elizabeth Kunkel, Elizabeth.Kunkel@urs.com

PHONE: 314-420-0100, FAX: 314-420-0462

EMAIL: elizabeth.kunkel@urs.com & bob.bitman@urs.com

SITE ADDRESS: 900 South Central Ave. ROYANA

STATE: IL

CONSULTANT PROJECT NO: SVE System Extension 21562850-18000

LAB USE ONLY: MC24503

TURNAROUND TIME (CALENDAR DAYS):

STANDARD (10 DAY)

5 DAYS

3 DAYS

2 DAYS

24 HOURS

RESULTS NEEDED ON WEEKEND

LA - RWQCB REPORT FORMAT

LIST AGENCY

REQUESTED ANALYSIS

VOC 8011 SL	VOC 8270C SL + TICS	PAH 8270LL	Percent Moisture	VOC 8260B SL + top 15 TICS	TPH-GRO
-------------	---------------------	------------	------------------	----------------------------	---------

DEVIANCES: LEVEL 1 LEVEL 2 LEVEL 3 LEVEL 4 OTHER (SPECIFY) EDD

TEMPERATURE ON RECEIPT °C: Cooler #1 () Cooler #2 () Cooler #3 ()

SPECIAL INSTRUCTIONS OR NOTES:

- * Please include "J" values on Reports.
- * Please provide sample receipt upon login.
- SHELL CONTRACT RATE APPLIES
- STATE REIMBURSEMENT RATE APPLIES
- EDD NOT NEEDED
- RECEIPT VERIFICATION REQUESTED
- PROVIDE LIDG DISK

LAB USE ONLY	Field Sample Identification		SAMPLING		MATRIX	PRESERVATIVE					NO. OF CONT.	VOC 8011 SL	VOC 8270C SL + TICS	PAH 8270LL	Percent Moisture	VOC 8260B SL + top 15 TICS	TPH-GRO	PID (ppm)	FIELD NOTES:
	DATE	TIME	DATE	TIME		HCL	HNO3	H2SO4	HNO2	OTHER									
	TB-091613-ST		6/17/2013		WATER						2	2	X						
	TB-091613-HCL		6/17/2013		WATER	2						2				X			
3	SVE39-091713 (34-35)		6/17/2013	1610	SOLID						3	5	8	X	X	X	X	X	17.2

TEMPERATURE ON RECEIPT °C

Container PPM Readings or Laboratory Notes

15A, 10B4, 1I4

Released by (Signature): <i>[Signature]</i>	Received by (Signature):	Date: 9/17/13	Time: 1830
Released by (Signature): <i>FSDX</i>	Received by (Signature): <i>[Signature]</i>	Date: 9-18-13	Time: 830
Released by (Signature):	Received by (Signature):	Date:	Time:

1.0°C

5.1



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC24503 Client: URS Immediate Client Services Action Required: No
 Date / Time Received: 9/18/2013 Delivery Method: _____ Client Service Action Required at Login: No
 Project: 900 SOUTH CENTRAL No. Coolers: 1 Airbill #'s: _____

Cooler Security Y or N Y or N
 1. Custody Seals Present: 3. COC Present:
 2. Custody Seals Intact: 4. Smpl Dates/Time OK

Cooler Temperature Y or N
 1. Temp criteria achieved:
 2. Cooler temp verification: Infrared gun
 3. Cooler media: Ice (bag)

Quality Control Preservation Y or N N/A
 1. Trip Blank present / cooler:
 2. Trip Blank listed on COC:
 3. Samples preserved properly:
 4. VOCs headspace free:

Sample Integrity - Documentation Y or N
 1. Sample labels present on bottles:
 2. Container labeling complete:
 3. Sample container label / COC agree:

Sample Integrity - Condition Y or N
 1. Sample recvd within HT:
 2. All containers accounted for:
 3. Condition of sample: Intact

Sample Integrity - Instructions Y or N N/A
 1. Analysis requested is clear:
 2. Bottles received for unspecified tests:
 3. Sufficient volume recvd for analysis:
 4. Compositing instructions clear:
 5. Filtering instructions clear:

Comments

5.1
5

Accutest Internal Chain of Custody

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
 Received: 09/18/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC24503-1.1	VOC Ref #1	Michael Rolo	09/27/13 07:13	Retrieve from Storage
MC24503-1.1	Michael Rolo		09/30/13 07:07	Depleted
MC24503-2.1	VOC Ref #1	Amy Min Yang	09/27/13 16:20	Retrieve from Storage
MC24503-2.1	Amy Min Yang	GCMSV	09/27/13 16:20	Load on Instrument
MC24503-2.1	GCMSV	Amy Min Yang	09/30/13 10:09	Unload from Instrument
MC24503-2.1	Amy Min Yang	VOC Ref #1	09/30/13 10:09	Return to Storage
MC24503-3.1	Walk In Ref #9	Hamid Siamak	09/19/13 08:52	Retrieve from Storage
MC24503-3.1	Hamid Siamak	Walk In Ref #9	09/19/13 11:20	Return to Storage
MC24503-3.2	Walk In Ref #9	Chris Cataldo	09/20/13 15:47	Retrieve from Storage
MC24503-3.2	Chris Cataldo	Walk In Ref #9	09/20/13 23:22	Return to Storage
MC24503-3.2	Walk In Ref #9	Chris Cataldo	09/24/13 07:37	Retrieve from Storage
MC24503-3.2	Chris Cataldo	Walk In Ref #9	09/24/13 15:04	Return to Storage
MC24503-3.2	Walk In Ref #9	Krysten Dufort	09/30/13 12:31	Retrieve from Storage
MC24503-3.2	Krysten Dufort	Walk In Ref #9	09/30/13 12:32	Return to Storage
MC24503-3.5	VOC Ref #10	Krysten Dufort	09/30/13 11:19	Retrieve from Storage
MC24503-3.5	Krysten Dufort	GCMSM	09/30/13 11:19	Load on Instrument
MC24503-3.5	GCMSM	Krysten Dufort	10/02/13 10:23	Unload from Instrument
MC24503-3.5	Krysten Dufort	VOC Ref #10	10/02/13 10:23	Return to Storage
MC24503-3.7	VOC Ref #10	Gary Krasinski	09/20/13 09:52	Retrieve from Storage
MC24503-3.7	Gary Krasinski	VOC Ref #10	09/23/13 09:57	Return to Storage
MC24503-3.7	VOC Ref #10	Todd Bahosh	09/27/13 19:08	Retrieve from Storage
MC24503-3.7	Todd Bahosh	GCBH	09/27/13 19:08	Load on Instrument
MC24503-3.7	GCBH	Todd Bahosh	09/30/13 17:14	Unload from Instrument
MC24503-3.7	Todd Bahosh	VOC Ref #10	09/30/13 17:14	Return to Storage

5.2


GC/MS Volatiles



QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Surrogate Recovery Summaries

Method Blank Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV903-MB	V23588.D	1	09/27/13	AMY	n/a	n/a	MSV903

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-2

6.1.1



CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.8	ug/l	
107-02-8	Acrolein	ND	25	6.3	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.5	ug/l	
71-43-2	Benzene	ND	0.50	0.45	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	5.0	0.64	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.33	ug/l	
75-25-2	Bromoform	ND	1.0	0.42	ug/l	
74-83-9	Bromomethane	ND	2.0	1.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	1.6	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.54	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.58	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.87	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.59	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.62	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.48	ug/l	
75-00-3	Chloroethane	ND	2.0	0.84	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	1.4	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.55	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.33	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.35	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.30	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.2	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.37	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.35	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.67	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.45	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.97	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.3	ug/l	
563-58-6	1,1-Dichloropropane	ND	5.0	0.63	ug/l	

Method Blank Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV903-MB	V23588.D	1	09/27/13	AMY	n/a	n/a	MSV903

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-2

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.22	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.29	ug/l	
123-91-1	1,4-Dioxane	ND	25	16	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.38	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.3	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.3	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.64	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.55	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.43	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.3	ug/l	
74-95-3	Methylene bromide	ND	5.0	0.43	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.41	ug/l	
91-20-3	Naphthalene	ND	5.0	0.79	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.59	ug/l	
100-42-5	Styrene	ND	5.0	0.49	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.46	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.42	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.61	ug/l	
108-88-3	Toluene	ND	1.0	0.46	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.76	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.45	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.94	ng/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.49	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.45	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.61	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.70	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	1.1	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.61	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.41	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.41	ug/l	

6.1.1



Method Blank Summary

Job Number: MC24503
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV903-MB	V23588.D	1	09/27/13	AMY	n/a	n/a	MSV903

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-2

6.1.1



CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	94%	70-130%
2037-26-5	Toluene-D8	102%	70-130%
460-00-4	4-Bromofluorobenzene	106%	70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

Method Blank Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2071-MB	M59772.D	1	09/30/13	KD	n/a	n/a	MSM2071

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.9	ug/kg	
107-02-8	Acrolein	ND	25	3.8	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.25	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.27	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.58	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.36	ug/kg	
75-25-2	Bromoform	ND	2.0	0.29	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.97	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	3.1	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.17	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.16	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.36	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.15	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	1.2	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.27	ug/kg	
75-00-3	Chloroethane	ND	5.0	0.60	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	4.7	ug/kg	
67-66-3	Chloroform	ND	2.0	0.29	ug/kg	
74-87-3	Chloromethane	ND	5.0	1.2	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	0.41	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.44	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.43	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.21	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.22	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.20	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.33	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.54	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.52	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.51	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.45	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.42	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.45	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.66	ug/kg	
563-58-6	1,1-Dichloropropane	ND	5.0	0.23	ug/kg	

6.1.2



Method Blank Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2071-MB	M59772.D	1	09/30/13	KD	n/a	n/a	MSM2071

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.29	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.29	ug/kg	
123-91-1	1,4-Dioxane	ND	25	21	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	3.3	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.18	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.57	ug/kg	
591-78-6	2-Hexanone	ND	5.0	2.4	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.28	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.16	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.40	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.8	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.35	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.5	ug/kg	
91-20-3	Naphthalene	ND	5.0	0.79	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	0.24	ug/kg	
100-42-5	Styrene	ND	5.0	0.21	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.39	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.29	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.44	ug/kg	
108-88-3	Toluene	ND	5.0	0.24	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.43	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.36	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.18	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.35	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.47	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	1.0	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.39	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.13	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.57	ug/kg	
	m,p-Xylene	ND	2.0	0.29	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.20	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.20	ug/kg	

6.1.2



Method Blank Summary

Job Number: MC24503
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2071-MB	M59772.D	1	09/30/13	KD	n/a	n/a	MSM2071

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-3

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	79%	70-130%
2037-26-5	Toluene-D8	81%	70-130%
460-00-4	4-Bromofluorobenzene	86%	70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/kg	

6.1.2



Blank Spike Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2071-BS	M59769.D	1	09/30/13	KD	n/a	n/a	MSM2071

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	50	53.1	106	70-130
107-02-8	Acrolein	250	129	52* a	70-130
107-13-1	Acrylonitrile	50	54.2	108	70-130
71-43-2	Benzene	50	55.9	112	70-130
108-86-1	Bromobenzene	50	59.3	119	70-130
74-97-5	Bromochloromethane	50	62.0	124	70-130
75-27-4	Bromodichloromethane	50	57.0	114	70-130
75-25-2	Bromoform	50	57.2	114	70-130
74-83-9	Bromomethane	50	59.5	119	70-130
78-93-3	2-Butanone (MEK)	50	67.4	135* a	70-130
104-51-8	n-Butylbenzene	50	62.3	125	70-130
135-98-8	sec-Butylbenzene	50	56.9	114	70-130
98-06-6	tert-Butylbenzene	50	55.4	111	70-130
75-15-0	Carbon disulfide	50	60.8	122	70-130
56-23-5	Carbon tetrachloride	50	63.8	128	70-130
108-90-7	Chlorobenzene	50	54.3	109	70-130
75-00-3	Chloroethane	50	60.6	121	70-130
110-75-8	2-Chloroethyl vinyl ether	50	38.3	77	10-160
67-66-3	Chloroform	50	61.3	123	70-130
74-87-3	Chloromethane	50	63.5	127	70-130
95-49-8	o-Chlorotoluene	50	55.0	110	70-130
106-43-4	p-Chlorotoluene	50	58.3	117	70-130
124-48-1	Dibromochloromethane	50	55.6	111	70-130
95-50-1	1,2-Dichlorobenzene	50	56.4	113	70-130
541-73-1	1,3-Dichlorobenzene	50	58.2	116	70-130
106-46-7	1,4-Dichlorobenzene	50	61.8	124	70-130
75-71-8	Dichlorodifluoromethane	50	58.1	116	70-130
75-34-3	1,1-Dichloroethane	50	63.3	127	70-130
107-06-2	1,2-Dichloroethane	50	55.9	112	70-130
75-35-4	1,1-Dichloroethene	50	59.6	119	70-130
156-59-2	cis-1,2-Dichloroethene	50	55.6	111	70-130
156-60-5	trans-1,2-Dichloroethene	50	58.1	116	70-130
78-87-5	1,2-Dichloropropane	50	55.4	111	70-130
142-28-9	1,3-Dichloropropane	50	51.7	103	70-130
594-20-7	2,2-Dichloropropane	50	63.8	128	70-130
563-58-6	1,1-Dichloropropene	50	59.0	118	70-130

* = Outside of Control Limits.

6.2.1



Blank Spike Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2071-BS	M59769.D	1	09/30/13	KD	n/a	n/a	MSM2071

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	55.0	110	70-130
10061-02-6	trans-1,3-Dichloropropene	50	58.8	118	70-130
123-91-1	1,4-Dioxane	250	247	99	70-130
97-63-2	Ethyl methacrylate	50	46.1	92	76-141
100-41-4	Ethylbenzene	50	56.4	113	70-130
87-68-3	Hexachlorobutadiene	50	59.7	119	70-130
591-78-6	2-Hexanone	50	58.7	117	70-130
98-82-8	Isopropylbenzene	50	56.6	113	70-130
99-87-6	p-Isopropyltoluene	50	62.8	126	70-130
1634-04-4	Methyl Tert Butyl Ether	50	53.9	108	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	50.9	102	70-130
74-95-3	Methylene bromide	50	60.8	122	70-130
75-09-2	Methylene chloride	50	59.5	119	70-130
91-20-3	Naphthalene	50	54.4	109	70-130
103-65-1	n-Propylbenzene	50	56.9	114	70-130
100-42-5	Styrene	50	58.2	116	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	54.0	108	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	52.5	105	70-130
127-18-4	Tetrachloroethene	50	62.4	125	70-130
108-88-3	Toluene	50	58.9	118	70-130
87-61-6	1,2,3-Trichlorobenzene	50	59.4	119	70-130
120-82-1	1,2,4-Trichlorobenzene	50	64.5	129	70-130
71-55-6	1,1,1-Trichloroethane	50	63.3	127	70-130
79-00-5	1,1,2-Trichloroethane	50	54.3	109	70-130
79-01-6	Trichloroethene	50	56.1	112	70-130
75-69-4	Trichlorofluoromethane	50	60.2	120	70-130
96-18-4	1,2,3-Trichloropropane	50	52.7	105	70-130
95-63-6	1,2,4-Trimethylbenzene	50	58.6	117	70-130
108-67-8	1,3,5-Trimethylbenzene	50	58.0	116	70-130
108-05-4	Vinyl Acetate	50	27.8	56* a	70-130
75-01-4	Vinyl chloride	50	49.1	98	70-130
	m,p-Xylene	100	113	113	70-130
95-47-6	o-Xylene	50	54.1	108	70-130
1330-20-7	Xylene (total)	150	167	111	70-130

* = Outside of Control Limits.

6.2.1



Blank Spike Summary

Job Number: MC24503
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2071-BS	M59769.D	1	09/30/13	KD	n/a	n/a	MSM2071

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-3

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	79%	70-130%
2037-26-5	Toluene-D8	82%	70-130%
460-00-4	4-Bromofluorobenzene	82%	70-130%

(a) Outside control limits. Blank Spike meets program technical requirements.

* = Outside of Control Limits.

6.2.1



Blank Spike/Blank Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV903-BS	V23584.D	1	09/27/13	AMY	n/a	n/a	MSV903
MSV903-BSD	V23585.D	1	09/27/13	AMY	n/a	n/a	MSV903

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	47.4	95	50.9	102	7	70-130/25
107-02-8	Acrolein	250	272	109	276	110	1	70-130/25
107-13-1	Acrylonitrile	50	47.2	94	47.4	95	0	70-130/25
71-43-2	Benzene	50	53.7	107	52.7	105	2	70-130/25
108-86-1	Bromobenzene	50	55.0	110	54.8	110	0	70-130/25
74-97-5	Bromochloromethane	50	53.3	107	53.0	106	1	70-130/25
75-27-4	Bromodichloromethane	50	53.3	107	51.8	104	3	70-130/25
75-25-2	Bromoform	50	45.2	90	45.0	90	0	70-130/25
74-83-9	Bromomethane	50	55.1	110	54.0	108	2	70-130/25
78-93-3	2-Butanone (MEK)	50	58.0	116	58.8	118	1	70-130/25
104-51-8	n-Butylbenzene	50	57.1	114	56.8	114	1	70-130/25
135-98-8	sec-Butylbenzene	50	58.0	116	57.1	114	2	70-130/25
98-06-6	tert-Butylbenzene	50	57.6	115	56.2	112	2	70-130/25
75-15-0	Carbon disulfide	50	56.7	113	54.8	110	3	70-130/25
56-23-5	Carbon tetrachloride	50	52.2	104	50.4	101	4	70-130/25
108-90-7	Chlorobenzene	50	45.2	90	44.4	89	2	70-130/25
75-00-3	Chloroethane	50	59.8	120	57.3	115	4	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	38.7	77	39.1	78	1	70-130/25
67-66-3	Chloroform	50	56.1	112	54.9	110	2	70-130/25
74-87-3	Chloromethane	50	57.7	115	56.4	113	2	70-130/25
95-49-8	o-Chlorotoluene	50	57.1	114	56.7	113	1	70-130/25
106-43-4	p-Chlorotoluene	50	57.3	115	55.9	112	2	70-130/25
124-48-1	Dibromochloromethane	50	47.7	95	46.8	94	2	70-130/25
95-50-1	1,2-Dichlorobenzene	50	50.7	101	50.5	101	0	70-130/25
541-73-1	1,3-Dichlorobenzene	50	52.0	104	51.8	104	0	70-130/25
106-46-7	1,4-Dichlorobenzene	50	52.0	104	51.7	103	1	70-130/25
75-71-8	Dichlorodifluoromethane	50	51.4	103	46.2	92	11	70-130/25
75-34-3	1,1-Dichloroethane	50	63.1	126	61.7	123	2	70-130/25
107-06-2	1,2-Dichloroethane	50	47.0	94	46.1	92	2	70-130/25
75-35-4	1,1-Dichloroethene	50	57.3	115	55.8	112	3	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	57.7	115	57.2	114	1	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	56.0	112	55.1	110	2	70-130/25
78-87-5	1,2-Dichloropropane	50	52.1	104	51.8	104	1	70-130/25
142-28-9	1,3-Dichloropropane	50	50.3	101	50.2	100	0	70-130/25
594-20-7	2,2-Dichloropropane	50	58.2	116	55.5	111	5	70-130/25
563-58-6	1,1-Dichloropropene	50	57.8	116	56.6	113	2	70-130/25

* = Outside of Control Limits.

6.3.1

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV903-BS	V23584.D	1	09/27/13	AMY	n/a	n/a	MSV903
MSV903-BSD	V23585.D	1	09/27/13	AMY	n/a	n/a	MSV903

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	50	49.6	99	48.7	97	2	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	51.2	102	50.2	100	2	70-130/25
123-91-1	1,4-Dioxane	250	237	95	256	102	8	70-130/25
97-63-2	Ethyl methacrylate	50	51.1	102	51.1	102	0	77-137/25
100-41-4	Ethylbenzene	50	51.7	103	50.5	101	2	70-130/25
87-68-3	Hexachlorobutadiene	50	60.6	121	61.7	123	2	70-130/25
591-78-6	2-Hexanone	50	50.9	102	51.4	103	1	70-130/25
98-82-8	Isopropylbenzene	50	57.8	116	56.7	113	2	70-130/25
99-87-6	p-Isopropyltolnene	50	58.6	117	58.1	116	1	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	57.3	115	57.0	114	1	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	47.4	95	47.5	95	0	70-130/25
74-95-3	Methylene bromide	50	53.9	108	52.5	105	3	70-130/25
75-09-2	Methylene chloride	50	55.1	110	53.9	108	2	70-130/25
91-20-3	Naphthalene	50	52.0	104	54.2	108	4	70-130/25
103-65-1	n-Propylbenzene	50	56.9	114	56.0	112	2	70-130/25
100-42-5	Styrene	50	51.5	103	50.6	101	2	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	46.1	92	45.2	90	2	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	52.5	105	52.7	105	0	70-130/25
127-18-4	Tetrachloroethene	50	55.8	112	54.6	109	2	70-130/25
108-88-3	Toluene	50	58.0	116	57.2	114	1	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	54.2	108	56.7	113	5	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	54.4	109	55.7	111	2	70-130/25
71-55-6	1,1,1-Trichloroethane	50	54.7	109	53.2	106	3	70-130/25
79-00-5	1,1,2-Trichloroethane	50	51.2	102	49.9	100	3	70-130/25
79-01-6	Trichloroethene	50	50.1	100	48.8	98	3	70-130/25
75-69-4	Trichlorofluoromethane	50	45.9	92	43.9	88	4	70-130/25
96-18-4	1,2,3-Trichloropropane	50	54.2	108	54.8	110	1	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	54.8	110	53.5	107	2	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	55.0	110	53.9	108	2	70-130/25
108-05-4	Vinyl Acetate	50	45.1	90	44.7	89	1	70-130/25
75-01-4	Vinyl chloride	50	45.9	92	44.5	89	3	70-130/25
	m,p-Xylene	100	102	102	100	100	2	70-130/25
95-47-6	o-Xylene	50	48.8	98	47.9	96	2	70-130/25
1330-20-7	Xylene (total)	150	151	101	148	99	2	70-130/25

* = Outside of Control Limits.



Blank Spike/Blank Spike Duplicate Summary

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV903-BS	V23584.D	1	09/27/13	AMY	n/a	n/a	MSV903
MSV903-BSD	V23585.D	1	09/27/13	AMY	n/a	n/a	MSV903

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-2

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	93%	92%	70-130%
2037-26-5	Toluene-D8	104%	104%	70-130%
460-00-4	4-Bromofluorobenzene	105%	105%	70-130%

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24476-8MS	V23595.D	1	09/27/13	AMY	n/a	n/a	MSV903
MC24476-8MSD	V23596.D	1	09/27/13	AMY	n/a	n/a	MSV903
MC24476-8	V23592.D	1	09/27/13	AMY	n/a	n/a	MSV903

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-2

CAS No.	Compound	MC24476-8 ug/l	Spike Q	ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	50	25.3	51* a	27.4	55* a	8	70-130/30	
107-02-8	Acrolein	ND	250	250	100	256	102	2	70-130/30	
107-13-1	Acrylonitrile	ND	50	49.8	100	50.4	101	1	70-130/30	
71-43-2	Benzene	ND	50	53.5	107	53.6	107	0	70-130/30	
108-86-1	Bromobenzene	ND	50	54.9	110	54.7	109	0	70-130/30	
74-97-5	Bromochloromethane	ND	50	53.6	107	54.9	110	2	70-130/30	
75-27-4	Bromodichloromethane	ND	50	55.5	111	55.4	111	0	70-130/30	
75-25-2	Bromoform	ND	50	46.8	94	47.7	95	2	70-130/30	
74-83-9	Bromomethane	ND	50	56.7	113	55.5	111	2	70-130/30	
78-93-3	2-Butanone (MEK)	ND	50	36.7	73	37.7	75	3	70-130/30	
104-51-8	n-Butylbenzene	ND	50	55.9	112	55.9	112	0	70-130/30	
135-98-8	sec-Butylbenzene	ND	50	56.9	114	56.2	112	1	70-130/30	
98-06-6	tert-Butylbenzene	ND	50	57.7	115	57.3	115	1	70-130/30	
75-15-0	Carbon disulfide	ND	50	56.0	112	55.8	112	0	70-130/30	
56-23-5	Carbon tetrachloride	ND	50	56.5	113	55.2	110	2	70-130/30	
108-90-7	Chlorobenzene	ND	50	44.5	89	44.6	89	0	70-130/30	
75-00-3	Chloroethane	ND	50	61.8	124	59.6	119	4	70-130/30	
110-75-8	2-Chloroethyl vinyl ether	ND	50	ND	0* a	ND	0* a	nc	70-130/30	
67-66-3	Chloroform	ND	50	58.0	116	57.3	115	1	70-130/30	
74-87-3	Chloromethane	ND	50	58.5	117	58.8	118	1	70-130/30	
95-49-8	o-Chlorotolene	ND	50	57.0	114	56.3	113	1	70-130/30	
106-43-4	p-Chlorotoluene	ND	50	57.2	114	56.5	113	1	70-130/30	
124-48-1	Dibromochloromethane	ND	50	49.0	98	49.6	99	1	70-130/30	
95-50-1	1,2-Dichlorobenzene	ND	50	50.6	101	50.8	102	0	70-130/30	
541-73-1	1,3-Dichlorobenzene	ND	50	51.5	103	51.8	104	1	70-130/30	
106-46-7	1,4-Dichlorobenzene	ND	50	50.9	102	51.1	102	0	70-130/30	
75-71-8	Dichlorodifluoromethane	ND	50	55.2	110	55.9	112	1	70-130/30	
75-34-3	1,1-Dichloroethane	ND	50	63.6	127	63.5	127	0	70-130/30	
107-06-2	1,2-Dichloroethane	ND	50	51.1	102	50.7	101	1	70-130/30	
75-35-4	1,1-Dichloroethene	ND	50	56.7	113	56.3	113	1	70-130/30	
156-59-2	cis-1,2-Dichloroethene	ND	50	56.9	114	57.0	114	0	70-130/30	
156-60-5	trans-1,2-Dichloroethene	ND	50	55.7	111	55.9	112	0	70-130/30	
78-87-5	1,2-Dichloropropane	ND	50	52.2	104	52.5	105	1	70-130/30	
142-28-9	1,3-Dichloropropane	ND	50	50.5	101	51.5	103	2	70-130/30	
594-20-7	2,2-Dichloropropane	ND	50	58.8	118	57.0	114	3	70-130/30	
563-58-6	1,1-Dichloropropene	ND	50	59.6	119	58.7	117	2	70-130/30	

* = Outside of Control Limits.

6.4.1


Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24476-8MS	V23595.D	1	09/27/13	AMY	n/a	n/a	MSV903
MC24476-8MSD	V23596.D	1	09/27/13	AMY	n/a	n/a	MSV903
MC24476-8	V23592.D	1	09/27/13	AMY	n/a	n/a	MSV903

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-2

CAS No.	Compound	MC24476-8 ug/l	Spike Q	ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	50	48.7	97	49.1	98	1	70-130/30	
10061-02-6	trans-1,3-Dichloropropene	ND	50	53.3	107	53.0	106	1	70-130/30	
123-91-1	1,4-Dioxane	ND	250	236	94	246	98	4	70-130/30	
97-63-2	Ethyl methacrylate	ND	50	53.9	108	54.4	109	1	72-139/30	
100-41-4	Ethylbenzene	ND	50	50.7	101	51.2	102	1	70-130/30	
87-68-3	Hexachlorobutadiene	ND	50	58.0	116	60.7	121	5	70-130/30	
591-78-6	2-Hexanone	ND	50	30.0	60* a	31.8	64* a	6	70-130/30	
98-82-8	Isopropylbenzene	ND	50	57.0	114	56.4	113	1	70-130/30	
99-87-6	p-Isopropyltoluene	ND	50	57.6	115	57.5	115	0	70-130/30	
1634-04-4	Methyl Tert Butyl Ether	ND	50	58.7	117	59.7	119	2	70-130/30	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	50	48.0	96	48.3	97	1	70-130/30	
74-95-3	Methylene bromide	ND	50	56.7	113	56.9	114	0	70-130/30	
75-09-2	Methylene chloride	ND	50	54.1	108	54.4	109	1	70-130/30	
91-20-3	Naphthalene	ND	50	47.4	95	55.4	111	16	70-130/30	
103-65-1	n-Propylbenzene	ND	50	55.6	111	55.4	111	0	70-130/30	
100-42-5	Styrene	ND	50	49.7	99	50.4	101	1	70-130/30	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	45.5	91	46.8	94	3	70-130/30	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	53.3	107	54.7	109	3	70-130/30	
127-18-4	Tetrachloroethene	ND	50	54.9	110	54.6	109	1	70-130/30	
108-88-3	Toluene	ND	50	58.2	116	57.7	115	1	70-130/30	
87-61-6	1,2,3-Trichlorobenzene	ND	50	48.8	98	56.4	113	14	70-130/30	
120-82-1	1,2,4-Trichlorobenzene	ND	50	51.0	102	54.4	109	6	70-130/30	
71-55-6	1,1,1-Trichloroethane	ND	50	56.9	114	55.7	111	2	70-130/30	
79-00-5	1,1,2-Trichloroethane	ND	50	52.9	106	52.8	106	0	70-130/30	
79-01-6	Trichloroethene	ND	50	50.5	101	50.5	101	0	70-130/30	
75-69-4	Trichlorofluoromethane	ND	50	49.6	99	47.7	95	4	70-130/30	
96-18-4	1,2,3-Trichloropropane	ND	50	56.9	114	57.7	115	1	70-130/30	
95-63-6	1,2,4-Trimethylbenzene	ND	50	53.7	107	52.9	106	2	70-130/30	
108-67-8	1,3,5-Trimethylbenzene	ND	50	54.1	108	53.6	107	1	70-130/30	
108-05-4	Vinyl Acetate	ND	50	45.7	91	45.6	91	0	70-130/30	
75-01-4	Vinyl chloride	ND	50	45.5	91	44.9	90	1	70-130/30	
	m,p-Xylene	ND	100	100	100	99.6	100	0	70-130/30	
95-47-6	o-Xylene	ND	50	47.1	94	47.6	95	1	70-130/30	
1330-20-7	Xylene (total)	ND	150	147	98	147	98	0	70-130/30	

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24476-8MS	V23595.D	1	09/27/13	AMY	n/a	n/a	MSV903
MC24476-8MSD	V23596.D	1	09/27/13	AMY	n/a	n/a	MSV903
MC24476-8	V23592.D	1	09/27/13	AMY	n/a	n/a	MSV903

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-2

6.4.1



CAS No.	Surrogate Recoveries	MS	MSD	MC24476-8	Limits
1868-53-7	Dibromofluoromethane	96%	96%	97%	70-130%
2037-26-5	Toluene-D8	105%	105%	102%	70-130%
460-00-4	4-Bromofluorobenzene	106%	105%	107%	70-130%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24503-3MS	M59777.D	1	09/30/13	KD	n/a	n/a	MSM2071
MC24503-3MSD	M59778.D	1	09/30/13	KD	n/a	n/a	MSM2071
MC24503-3	M59774.D	1	09/30/13	KD	n/a	n/a	MSM2071

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-3

CAS No.	Compound	MC24503-3 ug/kg	Spike Q	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
67-64-1	Acetone	ND		56.8	63.8	112	79.5	141* a	22	70-130/30
107-02-8	Acrolein	ND		284	88.0	31* a	110	39* a	22	70-130/30
107-13-1	Acrylonitrile	ND		56.8	53.2	94	61.0	108	14	70-130/30
71-43-2	Benzene	1.2		56.8	43.8	75	48.1	83	9	70-130/30
108-86-1	Bromobenzene	ND		56.8	42.7	75	48.8	87	13	70-130/30
74-97-5	Bromochloromethane	ND		56.8	48.5	85	56.1	99	15	70-130/30
75-27-4	Bromodichloromethane	ND		56.8	44.5	78	49.9	88	11	70-130/30
75-25-2	Bromoform	ND		56.8	48.6	86	57.4	102	17	70-130/30
74-83-9	Bromomethane	ND		56.8	46.7	82	51.4	91	10	70-130/30
78-93-3	2-Butanone (MEK)	ND		56.8	55.6	98	68.5	121	21	70-130/30
104-51-8	n-Butylbenzene	ND		56.8	42.8	75	48.8	87	13	70-130/30
135-98-8	sec-Butylbenzene	0.29	J	56.8	41.4	72	46.2	81	11	70-130/30
98-06-6	tert-Butylbenzene	ND		56.8	40.3	71	45.1	80	11	70-130/30
75-15-0	Carbon disulfide	ND		56.8	45.1	79	49.6	88	10	70-130/30
56-23-5	Carbon tetrachloride	ND		56.8	46.8	82	51.9	92	10	70-130/30
108-90-7	Chlorobenzene	ND		56.8	41.5	73	45.1	80	8	70-130/30
75-00-3	Chloroethane	ND		56.8	49.2	87	55.7	99	12	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND		56.8	ND	0* a	ND	0* a	nc	10-160/30
67-66-3	Chloroform	ND		56.8	47.0	83	52.4	93	11	70-130/30
74-87-3	Chloromethane	ND		56.8	52.2	92	60.0	106	14	70-130/30
95-49-8	o-Chlorotoluene	ND		56.8	39.9	70	44.6	79	11	70-130/30
106-43-4	p-Chlorotoluene	ND		56.8	41.9	74	46.5	82	10	70-130/30
124-48-1	Dibromochloromethane	ND		56.8	44.5	78	51.1	91	14	70-130/30
95-50-1	1,2-Dichlorobenzene	ND		56.8	37.0	65* a	42.1	75	13	70-130/30
541-73-1	1,3-Dichlorobenzene	ND		56.8	38.9	69* a	44.0	78	12	70-130/30
106-46-7	1,4-Dichlorobenzene	ND		56.8	41.1	72	46.1	82	11	70-130/30
75-71-8	Dichlorodifluoromethane	ND		56.8	46.4	82	48.3	86	4	70-130/30
75-34-3	1,1-Dichloroethane	ND		56.8	47.9	84	52.7	93	10	70-130/30
107-06-2	1,2-Dichloroethane	ND		56.8	44.2	78	52.3	93	17	70-130/30
75-35-4	1,1-Dichloroethene	ND		56.8	42.3	75	48.2	85	13	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND		56.8	41.9	74	46.9	83	11	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND		56.8	44.4	78	48.4	86	9	70-130/30
78-87-5	1,2-Dichloropropane	ND		56.8	42.6	75	47.9	85	12	70-130/30
142-28-9	1,3-Dichloropropane	ND		56.8	43.4	76	49.7	88	14	70-130/30
594-20-7	2,2-Dichloropropane	ND		56.8	46.3	82	50.7	90	9	70-130/30
563-58-6	1,1-Dichloropropene	ND		56.8	44.3	78	49.8	88	12	70-130/30

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24503-3MS	M59777.D	1	09/30/13	KD	n/a	n/a	MSM2071
MC24503-3MSD	M59778.D	1	09/30/13	KD	n/a	n/a	MSM2071
MC24503-3	M59774.D	1	09/30/13	KD	n/a	n/a	MSM2071

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-3

CAS No.	Compound	MC24503-3 ug/kg	Spike Q	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
10061-01-5	cis-1,3-Dichloropropene	ND		56.8	41.8	74	48.5	86	15	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		56.8	45.8	81	53.3	94	15	70-130/30
123-91-1	1,4-Dioxane	ND		284	280	99	373	132* a	28	70-130/30
97-63-2	Ethyl methacrylate	ND		56.8	43.6	77	52.9	94	19	41-160/30
100-41-4	Ethylbenzene	2.8		56.8	46.4	77	49.7	83	7	70-130/30
87-68-3	Hexachlorobutadiene	ND		56.8	35.0	62* a	40.7	72	15	70-130/30
591-78-6	2-Hexanone	ND		56.8	53.2	94	67.4	119	24	70-130/30
98-82-8	Isopropylbenzene	ND		56.8	42.5	75	46.6	83	9	70-130/30
99-87-6	p-Isopropyltoluene	ND		56.8	45.0	79	50.2	89	11	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		56.8	43.6	77	52.9	94	19	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		56.8	54.4	96	70.2	124	25	70-130/30
74-95-3	Methylene bromide	ND		56.8	50.0	88	59.0	105	17	70-130/30
75-09-2	Methylene chloride	ND		56.8	45.8	81	52.0	92	13	70-130/30
91-20-3	Naphthalene	ND		56.8	35.5	63* a	41.7	74	16	70-130/30
103-65-1	n-Propylbenzene	0.30	J	56.8	42.9	75	47.1	83	9	70-130/30
100-42-5	Styrene	ND		56.8	40.9	72	45.1	80	10	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		56.8	41.6	73	45.8	81	10	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		56.8	47.0	83	55.9	99	17	70-130/30
127-18-4	Tetrachloroethene	ND		56.8	48.2	85	51.8	92	7	70-130/30
108-88-3	Toluene	2.9	J	56.8	47.8	79	52.9	89	10	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		56.8	29.2	51* a	35.2	62* a	19	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		56.8	32.8	58* a	38.2	68* a	15	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		56.8	46.3	82	50.0	89	8	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		56.8	44.7	79	52.8	94	17	70-130/30
79-01-6	Trichloroethene	ND		56.8	43.2	76	47.5	84	9	70-130/30
75-69-4	Trichlorofluoromethane	ND		56.8	42.4	75	47.6	84	12	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		56.8	49.6	87	60.8	108	20	70-130/30
95-63-6	1,2,4-Trimethylbenzene	0.62	J	56.8	42.6	74	47.5	83	11	70-130/30
108-67-8	1,3,5-Trimethylbenzene	0.79	J	56.8	42.9	74	46.9	82	9	70-130/30
108-05-4	Vinyl Acetate	ND		56.8	30.3	53* a	35.4	63* a	16	70-130/30
75-01-4	Vinyl chloride	ND		56.8	39.9	70	45.0	80	12	70-130/30
	m,p-Xylene	0.85	J	114	86.3	75	92.8	82	7	70-130/30
95-47-6	o-Xylene	ND		56.8	41.0	72	44.7	79	9	70-130/30
1330-20-7	Xylene (total)	0.85	J	170	127	74	137	80	8	70-130/30

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24503-3MS	M59777.D	1	09/30/13	KD	n/a	n/a	MSM2071
MC24503-3MSD	M59778.D	1	09/30/13	KD	n/a	n/a	MSM2071
MC24503-3	M59774.D	1	09/30/13	KD	n/a	n/a	MSM2071

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24503-3

6.4.2
6

CAS No.	Surrogate Recoveries	MS	MSD	MC24503-3	Limits
1868-53-7	Dibromofluoromethane	80%	80%	82%	70-130%
2037-26-5	Toluene-D8	81%	82%	82%	70-130%
460-00-4	4-Bromofluorobenzene	84%	85%	90%	70-130%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

* = Outside of Control Limits.

Volatile Internal Standard Area Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSM2071-CC2064	Injection Date:	09/30/13
Lab File ID:	M59768.D	Injection Time:	10:01
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	238735	9.35	371216	10.23	157963	13.51	193400	16.07	82567	6.84
Upper Limit ^a	477470	9.85	742432	10.73	315926	14.01	386800	16.57	165134	7.34
Lower Limit ^b	119368	8.85	185608	9.73	78982	13.01	96700	15.57	41284	6.34

Lab Sample ID	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
MSM2071-BS	249042	9.35	387112	10.23	166264	13.50	200755	16.07	85030	6.84
MSM2071-MB	237752	9.35	369122	10.23	143815	13.50	174363	16.07	85052	6.84
ZZZZZ	235197	9.35	368140	10.23	144395	13.51	170705	16.07	87994	6.84
MC24503-3	230211	9.35	365266	10.23	147756	13.51	177301	16.07	156799	6.85
ZZZZZ	224029	9.35	353229	10.23	140024	13.51	167840	16.07	159527	6.84
ZZZZZ	224571	9.35	354407	10.23	143683	13.51	165305	16.07	180818 ^c	6.84
MC24503-3MS	247363	9.35	387108	10.23	162937	13.51	197981	16.07	164979	6.84
MC24503-3MSD	252759	9.35	391405	10.23	168977	13.51	201086	16.07	187305 ^c	6.84
ZZZZZ	255403	9.36	397478	10.23	163918	13.50	208887	16.07	160799	6.85
ZZZZZ	302705	9.35	458190	10.23	183736	13.50	225824	16.07	196789 ^c	6.85
ZZZZZ	292392	9.36	449689	10.23	179591	13.50	225222	16.07	198454 ^c	6.84
ZZZZZ	285126	9.35	438637	10.23	174181	13.50	218673	16.07	186929 ^c	6.84
ZZZZZ	281019	9.35	429562	10.23	173062	13.51	215647	16.07	183590 ^c	6.84
ZZZZZ	274962	9.35	422981	10.23	169030	13.51	209238	16.07	185160 ^c	6.84
ZZZZZ	273187	9.35	421748	10.23	165646	13.51	193302	16.07	124990	6.84
ZZZZZ	262618	9.35	405497	10.23	161575	13.51	190895	16.07	116672	6.84
ZZZZZ	265236	9.35	408068	10.23	166846	13.51	201014	16.07	112087	6.84
ZZZZZ	267165	9.35	410816	10.23	165567	13.50	203426	16.07	103341	6.84
ZZZZZ	271493	9.35	418789	10.23	166800	13.50	199142	16.07	111071	6.84
ZZZZZ	259039	9.35	403086	10.23	159996	13.51	196554	16.07	99513	6.84

- IS 1 = Pentafluorobenzene
- IS 2 = 1,4-Difluorobenzene
- IS 3 = Chlorobenzene-D5
- IS 4 = 1,4-Dichlorobenzene-d4
- IS 5 = Tert Bntyl Alcohol-D9

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
 (b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.
 (c) Outside control limits. Target analytes not associated with this internal standard.

6.5.1



Volatile Internal Standard Area Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std: MSV903-CC864	Injection Date: 09/27/13
Lab File ID: V23584.D	Injection Time: 11:03
Instrument ID: GCMSV	Method: SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	385824	6.55	562372	7.74	318603	11.07	301593	13.28	102706	3.49
Upper Limit ^a	771648	7.05	1124744	8.24	637206	11.57	603186	13.78	205412	3.99
Lower Limit ^b	192912	6.05	281186	7.24	159302	10.57	150797	12.78	51353	2.99

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSV903-BS	385824	6.55	562372	7.74	318603	11.07	301593	13.28	102706	3.49
MSV903-BSD	388008	6.55	564130	7.74	318924	11.07	300819	13.28	105178	3.50
MSV903-MB	345438	6.56	518153	7.74	291106	11.07	267240	13.28	96104	3.50
ZZZZZZ	338126	6.55	504277	7.74	289260	11.07	262807	13.28	99850	3.50
ZZZZZZ	333208	6.56	494396	7.74	280333	11.07	256016	13.28	98622	3.51
ZZZZZZ	329975	6.56	489538	7.74	280470	11.07	257204	13.28	98781	3.51
MC24476-8	324191	6.56	490576	7.74	279769	11.07	252458	13.28	96380	3.50
ZZZZZZ	316630	6.55	471778	7.74	269743	11.07	245279	13.28	95100	3.50
ZZZZZZ	322165	6.56	468630	7.74	269340	11.07	250007	13.28	97017	3.51
MC24476-8MS	338026	6.56	485597	7.74	282089	11.07	267825	13.28	97828	3.51
MC24476-8MSD	342465	6.55	491478	7.74	282971	11.07	271309	13.28	102686	3.50
ZZZZZZ	332429	6.55	497095	7.74	284980	11.07	262837	13.28	100954	3.50
ZZZZZZ	320579	6.56	475723	7.74	275471	11.07	249699	13.28	96585	3.50
ZZZZZZ	310125	6.56	463469	7.74	267718	11.07	245852	13.28	85419	3.50
ZZZZZZ	301324	6.56	455944	7.74	262761	11.07	237090	13.28	85758	3.50
MC24503-2	296249	6.56	441106	7.74	258128	11.07	231490	13.28	84405	3.50
ZZZZZZ	301956	6.55	451861	7.73	260699	11.07	235335	13.28	88406	3.50
ZZZZZZ	311507	6.55	460321	7.73	270644	11.07	246400	13.28	78034	3.50
ZZZZZZ	299652	6.55	452408	7.73	260491	11.07	237406	13.28	76127	3.50
ZZZZZZ	293736	6.55	440872	7.74	260502	11.07	233275	13.28	77338	3.50
ZZZZZZ	288234	6.55	434953	7.74	253084	11.07	227218	13.28	77270	3.50
ZZZZZZ	287478	6.56	435919	7.74	257738	11.07	223076	13.28	74679	3.50

- IS 1 = Pentafluorobenzene
- IS 2 = 1,4-Difluorobenzene
- IS 3 = Chlorobenzene-D5
- IS 4 = 1,4-Dichlorobenzene-d4
- IS 5 = Tert Butyl Alcohol-D9

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

6.5.2



Volatile Surrogate Recovery Summary

Job Number: MC24503
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8260B	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC24503-2	V23601.D	99.0	104.0	106.0
MC24476-8MS	V23595.D	96.0	105.0	106.0
MC24476-8MSD	V23596.D	96.0	105.0	105.0
MSV903-BS	V23584.D	93.0	104.0	105.0
MSV903-BSD	V23585.D	92.0	104.0	105.0
MSV903-MB	V23588.D	94.0	102.0	106.0

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	70-130%
S2 = Toluene-D8	70-130%
S3 = 4-Bromofluorobenzene	70-130%

6.6.1



Volatile Surrogate Recovery Summary

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8260B

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC24503-3	M59774.D	82.0	82.0	90.0
MC24503-3MS	M59777.D	80.0	81.0	84.0
MC24503-3MSD	M59778.D	80.0	82.0	85.0
MSM2071-BS	M59769.D	79.0	82.0	82.0
MSM2071-MB	M59772.D	79.0	81.0	86.0

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	70-130%
S2 = Toluene-D8	70-130%
S3 = 4-Bromofluorobenzene	70-130%

6.6.2



GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Surrogate Recovery Summaries

7

Method Blank Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-MB	R33874.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24503-3

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	500	62	ug/kg	
95-57-8	2-Chlorophenol	ND	250	11	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	500	13	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	500	14	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	500	81	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1000	120	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	500	62	ug/kg	
95-48-7	2-Methylphenol	ND	500	20	ug/kg	
	3&4-Methylphenol	ND	500	24	ug/kg	
88-75-5	2-Nitrophenol	ND	500	13	ug/kg	
100-02-7	4-Nitrophenol	ND	1000	93	ug/kg	
87-86-5	Pentachlorophenol	ND	500	35	ug/kg	
108-95-2	Phenol	ND	250	14	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	500	12	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	500	12	ug/kg	
62-53-3	Aniline	ND	500	25	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	250	13	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	250	10	ug/kg	
100-51-6	Benzyl Alcohol	ND	500	25	ug/kg	
91-58-7	2-Chloronaphthalene	ND	250	13	ug/kg	
106-47-8	4-Chloroaniline	ND	500	12	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	250	12	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	250	15	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	250	18	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	250	15	ug/kg	
122-66-7	1,2-Diphenylhydrazine	ND	250	11	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	500	33	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	500	12	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	250	25	ug/kg	
132-64-9	Dibenzofuran	ND	100	14	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	250	26	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	250	7.8	ug/kg	
84-66-2	Diethyl phthalate	ND	250	12	ug/kg	
131-11-3	Dimethyl phthalate	ND	250	14	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	250	9.2	ug/kg	
118-74-1	Hexachlorobenzene	ND	250	16	ug/kg	

7.1.1



Method Blank Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-MB	R33874.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24503-3

CAS No.	Compound	Result	RL	MDL	Units	Q
77-47-4	Hexachlorocyclopentadiene	ND	500	120	ug/kg	
67-72-1	Hexachloroethane	ND	250	12	ug/kg	
78-59-1	Isophorone	ND	250	11	ug/kg	
88-74-4	2-Nitroaniline	ND	500	12	ug/kg	
99-09-2	3-Nitroaniline	ND	500	27	ug/kg	
100-01-6	4-Nitroaniline	ND	500	12	ug/kg	
98-95-3	Nitrobenzene	ND	250	13	ug/kg	
62-75-9	n-Nitrosodimethylamine	ND	250	12	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	250	14	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	250	15	ug/kg	
110-86-1	Pyridine	ND	500	25	ug/kg	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	77% 30-130%
4165-62-2	Phenol-d5	78% 30-130%
118-79-6	2,4,6-Tribromophenol	76% 30-130%
4165-60-0	Nitrobenzene-d5	71% 30-130%
321-60-8	2-Fluorobiphenyl	83% 30-130%
1718-51-0	Terphenyl-d14	84% 30-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Semi-Volatile		0	ug/kg	

7.1.1
7

Method Blank Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34956-MB	W14567.D	1	09/25/13	KR	09/24/13	OP34956	MSW658

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

MC24503-3

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	5.0	0.58	ug/kg	
208-96-8	Acenaphthylene	ND	5.0	0.93	ug/kg	
120-12-7	Anthracene	ND	5.0	0.81	ug/kg	
56-55-3	Benzo(a)anthracene	ND	5.0	0.62	ug/kg	
50-32-8	Benzo(a)pyrene	ND	5.0	0.72	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	5.0	0.61	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	5.0	1.9	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	5.0	0.96	ug/kg	
218-01-9	Chrysene	ND	5.0	0.77	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	5.0	1.4	ug/kg	
206-44-0	Fluoranthene	ND	5.0	0.79	ug/kg	
86-73-7	Fluorene	ND	5.0	0.44	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5.0	1.3	ug/kg	
90-12-0	1-Methylnaphthalene	ND	10	10	ng/kg	
91-57-6	2-Methylnaphthalene	ND	5.0	1.1	ug/kg	
85-01-8	Phenanthrene	ND	5.0	0.98	ug/kg	
129-00-0	Pyrene	ND	5.0	1.7	ug/kg	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	41%	15-110%
4165-62-2	Phenol-d5	39%	15-110%
118-79-6	2,4,6-Tribromophenol	41%	15-110%
4165-60-0	Nitrobenzene-d5	79%	30-130%
321-60-8	2-Fluorobiphenyl	80%	30-130%
1718-51-0	Terphenyl-d14	93%	30-130%

7.1.2
7

Blank Spike Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-BS	R33875.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24503-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
65-85-0	Benzoic acid	2440	2090	86	30-130
95-57-8	2-Chlorophenol	2440	2050	84	30-130
59-50-7	4-Chloro-3-methyl phenol	2440	2030	83	30-130
120-83-2	2,4-Dichlorophenol	2440	2210	90	30-130
105-67-9	2,4-Dimethylphenol	2440	1860	76	30-130
51-28-5	2,4-Dinitrophenol	2440	1450	59	30-130
534-52-1	4,6-Dinitro-o-cresol	2440	2020	83	30-130
95-48-7	2-Methylphenol	2440	2050	84	30-130
	3&4-Methylphenol	4890	4010	82	30-130
88-75-5	2-Nitrophenol	2440	2150	88	30-130
100-02-7	4-Nitrophenol	2440	1380	56	30-130
87-86-5	Pentachlorophenol	2440	975	40	30-130
108-95-2	Phenol	2440	2290	94	30-130
95-95-4	2,4,5-Trichlorophenol	2440	2250	92	30-130
88-06-2	2,4,6-Trichlorophenol	2440	2180	89	30-130
62-53-3	Aniline	2440	1520	62	40-140
101-55-3	4-Bromophenyl phenyl ether	2440	2190	90	40-140
85-68-7	Butyl benzyl phthalate	2440	2250	92	40-140
100-51-6	Benzyl Alcohol	2440	1880	77	40-140
91-58-7	2-Chloronaphthalene	2440	2170	89	40-140
106-47-8	4-Chloroaniline	2440	1650	68	40-140
111-91-1	bis(2-Chloroethoxy)methane	2440	1900	78	40-140
111-44-4	bis(2-Chloroethyl)ether	2440	1880	77	40-140
108-60-1	bis(2-Chloroisopropyl)ether	2440	2290	94	40-140
7005-72-3	4-Chlorophenyl phenyl ether	2440	2140	88	40-140
122-66-7	1,2-Diphenylhydrazine	2440	1840	75	40-140
121-14-2	2,4-Dinitrotoluene	2440	2220	91	40-140
606-20-2	2,6-Dinitrotoluene	2440	2120	87	40-140
91-94-1	3,3'-Dichlorobenzidine	2440	1990	81	40-140
132-64-9	Dibenzofuran	2440	1970	81	40-140
84-74-2	Di-n-butyl phthalate	2440	2210	90	40-140
117-84-0	Di-n-octyl phthalate	2440	2330	95	40-140
84-66-2	Diethyl phthalate	2440	2160	88	40-140
131-11-3	Dimethyl phthalate	2440	2180	89	40-140
117-81-7	bis(2-Ethylhexyl)phthalate	2440	2190	90	40-140
118-74-1	Hexachlorobenzene	2440	2060	84	40-140

* = Outside of Control Limits.

7.2.1



Blank Spike Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-BS	R33875.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24503-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
77-47-4	Hexachlorocyclopentadiene	2440	846	35* a	40-140
67-72-1	Hexachloroethane	2440	1630	67	40-140
78-59-1	Isophorone	2440	1900	78	40-140
88-74-4	2-Nitroaniline	2440	2340	96	40-140
99-09-2	3-Nitroaniline	2440	1850	76	40-140
100-01-6	4-Nitroaniline	2440	1970	81	40-140
98-95-3	Nitrobenzene	2440	1670	68	40-140
62-75-9	n-Nitrosodimethylamine	2440	1720	70	40-140
621-64-7	N-Nitroso-di-n-propylamine	2440	1810	74	40-140
86-30-6	N-Nitrosodiphenylamine	2440	2170	89	40-140
110-86-1	Pyridine	2440	1370	56	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	80%	30-130%
4165-62-2	Phenol-d5	81%	30-130%
118-79-6	2,4,6-Tribromophenol	84%	30-130%
4165-60-0	Nitrobenzene-d5	72%	30-130%
321-60-8	2-Fluorobiphenyl	84%	30-130%
1718-51-0	Terphenyl-d14	90%	30-130%

(a) Outside control limits. Blank Spike meets program technical requirements.

* = Outside of Control Limits.

7.2.1
 7

Blank Spike Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34956-BS	W14568.D	1	09/25/13	KR	09/24/13	OP34956	MSW658

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

MC24503-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	2440	1890	77	40-140
208-96-8	Acenaphthylene	2440	1860	76	40-140
120-12-7	Anthracene	2440	1960	80	40-140
56-55-3	Benzo(a)anthracene	2440	2420	99	40-140
50-32-8	Benzo(a)pyrene	2440	1940	79	40-140
205-99-2	Benzo(b)fluoranthene	2440	2310	95	40-140
191-24-2	Benzo(g,h,i)perylene	2440	2060	84	40-140
207-08-9	Benzo(k)fluoranthene	2440	2180	89	40-140
218-01-9	Chrysene	2440	1890	77	40-140
53-70-3	Dibenzo(a,h)anthracene	2440	2100	86	40-140
206-44-0	Fluoranthene	2440	2030	83	40-140
86-73-7	Fluorene	2440	2060	84	40-140
193-39-5	Indeno(1,2,3-cd)pyrene	2440	2080	85	40-140
90-12-0	1-Methylnaphthalene	2440	1890	77	40-140
91-57-6	2-Methylnaphthalene	2440	1900	78	40-140
85-01-8	Phenanthrene	2440	1900	78	40-140
129-00-0	Pyrene	2440	1990	81	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	42%	15-110%
4165-62-2	Phenol-d5	42%	15-110%
118-79-6	2,4,6-Tribromophenol	47%	15-110%
4165-60-0	Nitrobenzene-d5	79%	30-130%
321-60-8	2-Fluorobiphenyl	81%	30-130%
1718-51-0	Terphenyl-d14	89%	30-130%

* = Outside of Control Limits.

7.2.2
7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-MS	R33876.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
OP34955-MSD	R33877.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
MC24409-24	R33878.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24503-3

CAS No.	Compound	MC24409-24 Spike		MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q ug/kg						
65-85-0	Benzoic acid	560 U	2860	379	13* a	384	13* a	1	30-130/30
95-57-8	2-Chlorophenol	280 U	2860	2170	76	2160	75	0	30-130/30
59-50-7	4-Chloro-3-methyl phenol	560 U	2860	2140	75	2190	76	2	30-130/30
120-83-2	2,4-Dichlorophenol	560 U	2860	2240	78	2380	83	6	30-130/30
105-67-9	2,4-Dimethylphenol	560 U	2860	1910	67	1760	61	8	30-130/30
51-28-5	2,4-Dinitrophenol	1100 U	2860	525	18* a	954	33	58* b	30-130/30
534-52-1	4,6-Dinitro-o-cresol	560 U	2860	1620	57	1940	68	18	30-130/30
95-48-7	2-Methylphenol	560 U	2860	2190	77	2170	76	1	30-130/30
	3&4-Methylphenol	560 U	5710	4290	75	4240	74	1	30-130/30
88-75-5	2-Nitrophenol	560 U	2860	2190	77	2330	81	6	30-130/30
100-02-7	4-Nitrophenol	1100 U	2860	1510	53	1490	52	1	30-130/30
87-86-5	Pentachlorophenol	560 U	2860	1070	37	1100	38	3	30-130/30
108-95-2	Phenol	280 U	2860	2370	83	2370	83	0	30-130/30
95-95-4	2,4,5-Trichlorophenol	560 U	2860	2350	82	2500	87	6	30-130/30
88-06-2	2,4,6-Trichlorophenol	560 U	2860	2230	78	2290	80	3	30-130/30
62-53-3	Aniline	560 U	2860	1680	59	1660	58	1	40-140/30
101-55-3	4-Bromophenyl phenyl ether	280 U	2860	2320	81	2500	87	7	40-140/30
85-68-7	Butyl benzyl phthalate	280 U	2860	2470	86	2510	88	2	40-140/30
100-51-6	Benzyl Alcohol	560 U	2860	1970	69	2000	70	2	40-140/30
91-58-7	2-Chloronaphthalene	280 U	2860	2220	78	2410	84	8	40-140/30
106-47-8	4-Chloroaniline	560 U	2860	1860	65	1850	65	1	40-140/30
111-91-1	bis(2-Chloroethoxy)methane	280 U	2860	2000	70	2090	73	4	40-140/30
111-44-4	bis(2-Chloroethyl)ether	280 U	2860	2030	71	2070	72	2	40-140/30
108-60-1	bis(2-Chloroisopropyl)ether	280 U	2860	2430	85	2480	87	2	40-140/30
7005-72-3	4-Chlorophenyl phenyl ether	280 U	2860	2280	80	2400	84	5	40-140/30
122-66-7	1,2-Diphenylhydrazine	280 U	2860	1930	68	2090	73	8	40-140/30
121-14-2	2,4-Dinitrotoluene	560 U	2860	2430	85	2510	88	3	40-140/30
606-20-2	2,6-Dinitrotoluene	560 U	2860	2310	81	2430	85	5	40-140/30
91-94-1	3,3'-Dichlorobenzidine	280 U	2860	2170	76	2170	76	0	40-140/30
132-64-9	Dibenzofuran	110 U	2860	2030	71	2170	76	7	40-140/30
84-74-2	Di-n-butyl phthalate	280 U	2860	2390	84	2410	84	1	40-140/30
117-84-0	Di-n-octyl phthalate	280 U	2860	2630	92	2610	91	1	40-140/30
84-66-2	Diethyl phthalate	280 U	2860	2350	82	2330	81	1	40-140/30
131-11-3	Dimethyl phthalate	280 U	2860	2360	83	2370	83	0	40-140/30
117-81-7	bis(2-Ethylhexyl)phthalate	280 U	2860	2460	86	2390	83	3	40-140/30
118-74-1	Hexachlorobenzene	280 U	2860	2170	76	2260	79	4	40-140/30

* = Outside of Control Limits.

7.3.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34955-MS	R33876.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
OP34955-MSD	R33877.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232
MC24409-24	R33878.D	1	09/30/13	KR	09/24/13	OP34955	MSR1232

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24503-3

CAS No.	Compound	MC24409-24 Spike ug/kg	Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
77-47-4	Hexachlorocyclopentadiene	560 U		2860	888	31* a	907	32* a	2	40-140/30
67-72-1	Hexachloroethane	280 U		2860	1650	58	1800	63	9	40-140/30
78-59-1	Isophorone	280 U		2860	1990	70	2050	72	3	40-140/30
88-74-4	2-Nitroaniline	560 U		2860	2450	86	2510	88	2	40-140/30
99-09-2	3-Nitroaniline	560 U		2860	2130	75	2090	73	2	40-140/30
100-01-6	4-Nitroaniline	560 U		2860	2250	79	2210	77	2	40-140/30
98-95-3	Nitrobenzene	280 U		2860	1690	59	1810	63	7	40-140/30
62-75-9	n-Nitrosodimethylamine	280 U		2860	1580	55	1720	60	8	40-140/30
621-64-7	N-Nitroso-di-n-propylamine	280 U		2860	1990	70	1950	68	2	40-140/30
86-30-6	N-Nitrosodiphenylamine	280 U		2860	2230	78	2310	81	4	40-140/30
110-86-1	Pyridine	560 U		2860	1080	38* a	1320	46	20	40-140/30

CAS No.	Surrogate Recoveries	MS	MSD	MC24409-24 Limits
367-12-4	2-Fluorophenol	72%	71%	30-130%
4165-62-2	Phenol-d5	73%	72%	30-130%
118-79-6	2,4,6-Tribromophenol	72%	73%	30-130%
4165-60-0	Nitrobenzene-d5	62%	66%	71% 30-130%
321-60-8	2-Fluorobiphenyl	73%	77%	80% 30-130%
1718-51-0	Terphenyl-d14	83%	83%	82% 30-130%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

(b) High RPD due to possible matrix interference and/or sample non-homogeneity.

* = Outside of Control Limits.

7.3.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34956-MS	W14569.D	1	09/25/13	KR	09/24/13	OP34956	MSW658
OP34956-MSD	W14570.D	1	09/25/13	KR	09/24/13	OP34956	MSW658
MC24444-3	W14571.D	1	09/25/13	KR	09/25/13	OP34956	MSW658

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

MC24503-3

CAS No.	Compound	MC24444-3 ug/kg	Spikc Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND	2690	1850	69	2000	74	8	40-140/30	
208-96-8	Acenaphthylene	ND	2690	1810	67	1970	73	8	40-140/30	
120-12-7	Anthracene	1.0	2690	1930	72	2120	78	9	40-140/30	
56-55-3	Benzo(a)anthracene	3.4	2690	2380	88	2630	97	10	40-140/30	
50-32-8	Benzo(a)pyrene	7.4	2690	1860	69	2090	77	12	40-140/30	
205-99-2	Benzo(b)fluoranthene	3.6	2690	2160	80	2400	89	11	40-140/30	
191-24-2	Benzo(g,h,i)perylene	6.7	2690	2080	77	2350	87	12	40-140/30	
207-08-9	Benzo(k)fluoranthene	3.3	2690	2220	82	2340	86	5	40-140/30	
218-01-9	Chrysene	3.4	2690	1870	69	2060	76	10	40-140/30	
53-70-3	Dibenzo(a,h)anthracene	5.4	2690	2080	77	2360	87	13	40-140/30	
206-44-0	Fluoranthene	7.7	2690	2170	80	2260	83	4	40-140/30	
86-73-7	Fluorene	ND	2690	1980	73	2150	80	8	40-140/30	
193-39-5	Indeno(1,2,3-cd)pyrene	6.7	2690	2080	77	2380	88	13	40-140/30	
90-12-0	1-Methylnaphthalene	ND	2690	1800	67	1940	72	7	40-140/30	
91-57-6	2-Methylnaphthalene	ND	2690	1800	67	1960	73	9	40-140/30	
85-01-8	Phenanthrene	3.0	2690	1860	69	2060	76	10	40-140/30	
129-00-0	Pyrene	6.1	2690	2090	77	2190	81	5	40-140/30	

CAS No.	Surrogate Recoveries	MS	MSD	MC24444-3	Limits
367-12-4	2-Fluorophenol	35%	38%		15-110%
4165-62-2	Phenol-d5	34%	37%		15-110%
118-79-6	2,4,6-Tribromophenol	42%	44%		15-110%
4165-60-0	Nitrobenzene-d5	69%	74%	59%	30-130%
321-60-8	2-Fluorobiphenyl	72%	77%	59%	30-130%
1718-51-0	Terphenyl-d14	83%	86%	70%	30-130%

* = Outside of Control Limits.

7.3.2
7

Semivolatile Internal Standard Area Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSI3208-CC3155	Injection Date:	09/30/13
Lab File ID:	I86186.D	Injection Time:	11:00
Instrument ID:	GCMSI	Method:	SW846 8270C BY SIM

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	240245	4.13	670208	5.12	392886	6.57	647073	7.92	456678	10.69	614037	12.18
Upper Limit ^a	480490	4.63	1340416	5.62	785772	7.07	1294146	8.42	913356	11.19	1228074	12.68
Lower Limit ^b	120123	3.63	335104	4.62	196443	6.07	323537	7.42	228339	10.19	307019	11.68

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
OP35007-MB	194656	4.13	559201	5.12	321827	6.56	526346	7.92	355096	10.70	480631	12.17
OP35007-BS	196575	4.13	566965	5.12	322466	6.57	541262	7.92	420340	10.70	669579	12.18
ZZZZZZ	195177	4.13	556145	5.12	318271	6.56	525343	7.91	379030	10.70	533436	12.17
ZZZZZZ	217129	4.13	630711	5.12	362275	6.56	600307	7.92	450405	10.69	638974	12.18
ZZZZZZ	228373	4.13	672976	5.12	391386	6.57	660846	7.92	534225	10.70	848465	12.18
ZZZZZZ	224648	4.13	654474	5.12	377112	6.57	633960	7.92	500833	10.70	792040	12.18
MC24503-3	212893	4.13	624434	5.12	360863	6.57	612990	7.92	487954	10.70	787762	12.18
ZZZZZZ	252484	4.13	719015	5.12	413644	6.57	688809	7.92	547647	10.70	897092	12.18
ZZZZZZ	222365	4.13	633755	5.12	364899	6.57	623878	7.92	517525	10.70	859042	12.18
ZZZZZZ	212400	4.13	606768	5.12	350444	6.57	591529	7.92	479444	10.70	789784	12.18
ZZZZZZ	217046	4.13	624585	5.12	362025	6.57	598365	7.92	490394	10.70	824651	12.18

- IS 1 = 1,4-Dichlorobenzene-d4
- IS 2 = Naphthalene-d8
- IS 3 = Acenaphthene-D10
- IS 4 = Phenanthrene-d10
- IS 5 = Chrysene-d12
- IS 6 = Perylene-d12

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
 (b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

7.4.1
7

Semivolatile Internal Standard Area Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std: MSR1232-CC1159	Injection Date: 09/30/13
Lab File ID: R33867.D	Injection Time: 07:41
Instrument ID: GCMSR	Method: SW846 8270C

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	81131	3.83	294259	4.88	179871	6.39	307108	7.75	335223	10.66	312867	12.24
Upper Limit ^a	162262	4.33	588518	5.38	359742	6.89	614216	8.25	670446	11.16	625734	12.74
Lower Limit ^b	40566	3.33	147130	4.38	89936	5.89	153554	7.25	167612	10.16	156434	11.74

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
OP34883-MB	70621	3.83	261779	4.87	163585	6.39	290596	7.74	320787	10.66	309368	12.23
OP34883-BS	73812	3.83	263214	4.87	166300	6.39	282710	7.75	310547	10.66	302856	12.23
OP34883-MS	74836	3.83	283340	4.88	176457	6.39	307582	7.75	331529	10.66	320705	12.23
OP34883-MSD	74908	3.83	277319	4.87	170778	6.39	293957	7.75	316381	10.66	313295	12.23
MC24300-21	68800	3.83	255332	4.88	162221	6.39	283855	7.74	310218	10.65	301625	12.23
ZZZZZZ	84232	3.83	322157	4.87	200026	6.39	352089	7.76	383833	10.68	374309	12.24
OP34955-MB	78906	3.83	285896	4.87	177123	6.39	308064	7.74	347735	10.66	327162	12.23
OP34955-BS	79728	3.83	288568	4.87	178838	6.39	300394	7.75	332095	10.66	322449	12.23
OP34955-MS	77909	3.83	288959	4.87	179332	6.39	307103	7.75	341596	10.66	330793	12.23
OP34955-MSD	82457	3.83	293324	4.87	179723	6.39	305776	7.75	339694	10.66	332395	12.23
MC24409-24	73513	3.83	264084	4.88	167250	6.39	286377	7.74	311103	10.65	301119	12.23
ZZZZZZ	86298	3.83	311342	4.87	197448	6.39	337327	7.75	367271	10.66	361337	12.24
ZZZZZZ	79038	3.83	289059	4.87	180095	6.39	310633	7.74	340209	10.66	318987	12.23
ZZZZZZ	77049	3.83	280260	4.87	177348	6.39	296032	7.74	325920	10.66	313962	12.23
ZZZZZZ	81437	3.83	298505	4.87	186200	6.39	315687	7.74	350362	10.66	342454	12.23
ZZZZZZ	80163	3.83	290095	4.87	182178	6.39	312720	7.74	338546	10.66	333378	12.23
ZZZZZZ	74325	3.83	266484	4.87	167217	6.39	284945	7.74	306541	10.66	304346	12.23
ZZZZZZ	78010	3.83	284427	4.87	178783	6.39	308845	7.75	325727	10.67	326998	12.25
ZZZZZZ	78344	3.83	283643	4.87	177071	6.39	306220	7.75	313195	10.71	316807	12.29
ZZZZZZ	81250	3.83	295519	4.88	184627	6.39	314981	7.75	332782	10.69	337329	12.27
ZZZZZZ	80043	3.83	295345	4.87	192454	6.39	322090	7.75	356117	10.66	340034	12.24
ZZZZZZ	76409	3.83	291986	4.87	187650	6.39	317707	7.75	352754	10.66	336762	12.24
ZZZZZZ	78039	3.83	284952	4.88	178099	6.39	302653	7.74	335895	10.66	328437	12.23
ZZZZZZ	74889	3.83	277877	4.87	174825	6.39	292622	7.74	328016	10.66	317375	12.23
ZZZZZZ	76783	3.83	283573	4.87	173661	6.39	296531	7.74	331924	10.66	316160	12.24
ZZZZZZ	81303	3.83	294487	4.87	181894	6.39	313788	7.75	345137	10.66	328910	12.25
MC24503-3	75549	3.83	273821	4.87	168354	6.39	295549	7.75	319020	10.66	307490	12.24

- IS 1 = 1,4-Dichlorobenzene-d4
- IS 2 = Naphthalene-d8
- IS 3 = Acenaphthene-D10
- IS 4 = Phenanthrene-d10
- IS 5 = Chrysene-d12
- IS 6 = Perylene-d12

7.4.2
7

Semivolatile Internal Standard Area Summary

Job Number: MC24503
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSR1232-CC1159	Injection Date:	09/30/13
Lab File ID:	R33867.D	Injection Time:	07:41
Instrument ID:	GCMSR	Method:	SW846 8270C

Lab	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT

- (a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
- (b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

7.4.2
7

Semivolatile Internal Standard Area Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSW658-CC657	Injection Date:	09/25/13
Lab File ID:	W14563.D	Injection Time:	15:24
Instrument ID:	GCMSW	Method:	SW846 8270C BY SIM

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	57860	4.55	153760	5.69	80981	7.34	139355	8.72	123574	11.61	275358	13.59
Upper Limit ^a	115720	5.05	307520	6.19	161962	7.84	278710	9.22	247148	12.11	550716	14.09
Lower Limit ^b	28930	4.05	76880	5.19	40491	6.84	69678	8.22	61787	11.11	137679	13.09

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
OP34880-MB	72996	4.55	188113	5.69	98445	7.34	172615	8.72	151640	11.61	325494	13.59
OP34880-BS	54753	4.55	144487	5.69	74012	7.34	127067	8.72	111519	11.61	250609	13.59
OP34956-MB	52542	4.55	134871	5.69	67291	7.34	116872	8.72	95976	11.61	205618	13.58
OP34956-BS	54181	4.55	149740	5.69	81593	7.34	147164	8.72	144538	11.61	322264	13.59
OP34956-MS	56615	4.55	150201	5.69	77616	7.34	130846	8.72	110783	11.61	249862	13.59
OP34956-MSD	54694	4.55	144907	5.69	74458	7.34	125424	8.72	115087	11.61	274396	13.59
MC24444-3	54404	4.55	142542	5.69	73154	7.34	127243	8.72	107968	11.60	254020	13.59
ZZZZZZ	50052	4.55	129289	5.69	66270	7.34	114598	8.72	94547	11.61	222425	13.59
OP34880-MS	54712	4.56	145363	5.69	76569	7.34	134835	8.72	125034	11.61	279226	13.59
OP34880-MSD	41513	4.55	112411	5.69	61007	7.34	114748	8.72	115158	11.61	262801	13.59
MC24368-18	44941	4.56	117823	5.69	60402	7.34	106148	8.72	99733	11.61	237861	13.59
ZZZZZZ	51923	4.55	139161	5.69	73962	7.34	132654	8.72	126508	11.61	270496	13.59
ZZZZZZ	46093	4.55	122431	5.69	63315	7.34	111995	8.72	102474	11.61	236893	13.59
ZZZZZZ	77663	4.55	199002	5.69	105924	7.34	181829	8.72	153808	11.61	322616	13.59
ZZZZZZ	43788	4.55	119005	5.69	63382	7.34	115260	8.72	116696	11.61	259798	13.59
ZZZZZZ	46142	4.56	119281	5.69	62434	7.34	107838	8.72	92526	11.61	212804	13.59
ZZZZZZ	45109	4.56	120146	5.69	64148	7.34	113264	8.72	108168	11.61	239596	13.59
ZZZZZZ	44040	4.56	117747	5.69	60545	7.34	104273	8.72	101766	11.61	226397	13.59
ZZZZZZ	43023	4.56	114937	5.69	60402	7.34	107547	8.72	103483	11.61	235177	13.59
ZZZZZZ	43672	4.56	118607	5.69	62201	7.34	111487	8.72	110073	11.61	248704	13.59
ZZZZZZ	46540	4.56	123894	5.69	64389	7.34	110572	8.72	100282	11.61	226392	13.59
ZZZZZZ	45176	4.56	122855	5.69	64883	7.34	117730	8.72	114319	11.61	242922	13.59
ZZZZZZ	40958	4.56	109012	5.69	56454	7.34	99758	8.72	94857	11.61	214217	13.59
ZZZZZZ	44414	4.56	122923	5.69	66061	7.34	122978	8.72	118907	11.61	255312	13.59
ZZZZZZ	44102	4.56	121889	5.69	66494	7.34	122627	8.73	115306	11.61	239463	13.59
ZZZZZZ	61191	4.56	163347	5.69	88651	7.34	156326	8.73	145668	11.61	304484	13.59

- IS 1 = 1,4-Dichlorobenzene-d4
- IS 2 = Naphthalene-d8
- IS 3 = Acenaphthene-D10
- IS 4 = Phenanthrene-d10
- IS 5 = Chrysene-d12
- IS 6 = Perylene-d12

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.

7.4.3
7

Semivolatile Internal Standard Area Summary

Job Number: MC24503
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSW658-CC657	Injection Date:	09/25/13
Lab File ID:	W14563.D	Injection Time:	15:24
Instrument ID:	GCMSW	Method:	SW846 8270C BY SIM

Lab	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT

(h) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

7.4.3

7

Semivolatile Surrogate Recovery Summary

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8270C

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
MC24503-3	R33894.D	53.0	50.0	59.0	46.0	55.0	70.0
OP34955-BS	R33875.D	80.0	81.0	84.0	72.0	84.0	90.0
OP34955-MB	R33874.D	77.0	78.0	76.0	71.0	83.0	84.0
OP34955-MS	R33876.D	72.0	73.0	72.0	62.0	73.0	83.0
OP34955-MSD	R33877.D	71.0	72.0	73.0	66.0	77.0	83.0

Surrogate Compounds	Recovery Limits
S1 = 2-Fluorophenol	30-130%
S2 = Phenol-d5	30-130%
S3 = 2,4,6-Tribromophenol	30-130%
S4 = Nitrobenzene-d5	30-130%
S5 = 2-Fluorobiphenyl	30-130%
S6 = Terphenyl-d14	30-130%

7.5.1

7

Semivolatile Surrogate Recovery Summary

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8270C BY SIM	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
MC24503-3	186193.D	26.0	25.0	33.0	57.0	56.0	75.0
OP34956-BS	W14568.D	42.0	42.0	47.0	79.0	81.0	89.0
OP34956-MB	W14567.D	41.0	39.0	41.0	79.0	80.0	93.0
OP34956-MS	W14569.D	35.0	34.0	42.0	69.0	72.0	83.0
OP34956-MSD	W14570.D	38.0	37.0	44.0	74.0	77.0	86.0

Surrogate Compounds	Recovery Limits
S1 = 2-Fluorophenol	15-110%
S2 = Phenol-d5	15-110%
S3 = 2,4,6-Tribromophenol	15-110%
S4 = Nitrobenzene-d5	30-130%
S5 = 2-Fluorobiphenyl	30-130%
S6 = Terphenyl-d14	30-130%

7.5.2
7

GC Volatiles

QC Data Summaries



Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries

Method Blank Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34909-MB	BK29872.D	1	09/25/13	NK	09/20/13	OP34909	GBK996

The QC reported here applies to the following samples:

Method: SW846 8011

MC24503-3

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.4	0.60	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.4	0.90	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	129% 61-167%
460-00-4	Bromofluorobenzene (S)	119% 61-167%

8.1.1


Method Blank Summary

Job Number: MC24503
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP35014-MB	BB51209A.D1		09/27/13	CZ	09/27/13	OP35014	GBB3020

The QC reported here applies to the following samples:

Method: SW846 8011

MC24503-1

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.0045	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.0097	ug/l	

CAS No.	Surrogate Recoveries		Limits
460-00-4	Bromofluorobenzene (S)	100%	36-173%
460-00-4	Bromofluorobenzene (S)	97%	36-173%

8.1.2



Method Blank Summary

Page 1 of 1

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBH1842-MB	BH31579.D	1	09/27/13	TB	n/a	n/a	GBH1842

The QC reported here applies to the following samples:

Method: SW846 8015

MC24503-3

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	5.0	1.1	mg/kg	

CAS No.	Surrogate Recoveries	Limits
	2,3,4-Trifluorotoluene	77% 61-116%

8.1.3



Blank Spike Summary

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34909-BS	BK29873.D	1	09/25/13	NK	09/20/13	OP34909	GBK996

The QC reported here applies to the following samples:

Method: SW846 8011

MC24503-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	32.73	46.0	141	59-142
106-93-4	1,2-Dibromoethane	32.73	43.7	134	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	152%	61-167%
460-00-4	Bromofluorobenzene (S)	127%	61-167%

8.2.1



* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC24503
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP35014-BS	BB51210A.D1		09/27/13	CZ	09/27/13	OP35014	GBB3020

The QC reported here applies to the following samples:

Method: SW846 8011

MC24503-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.066	93	60-140
106-93-4	1,2-Dibromoethane	0.071	0.071	100	60-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	94%	36-173%
460-00-4	Bromofluorobenzene (S)	94%	36-173%

8.2.2



* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC24503
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBH1842-BSP	BH31580.D	1	09/27/13	TB	n/a	n/a	GBH1842

The QC reported here applies to the following samples:

Method: SW846 8015

MC24503-3

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (VOA)	20	15.7	79	66-126

CAS No.	Surrogate Recoveries	BSP	Limits
	2,3,4-Trifluorotoluene	77%	61-116%

8.2.3



* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34909-MS	BK29874.D	1	09/25/13	NK	09/20/13	OP34909	GBK996
OP34909-MSD	BK29875.D	1	09/25/13	NK	09/20/13	OP34909	GBK996
MC24403-3	BK29876.D	1	09/25/13	NK	09/20/13	OP34909	GBK996

The QC reported here applies to the following samples:

Method: SW846 8011

MC24503-3

CAS No.	Compound	MC24403-3 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Ree/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND		40.95	61.0	149	60.1	145	1	40-156/27
106-93-4	1,2-Dibromoethane	ND		40.95	56.6	138	56.3	136	1	48-141/27

8.3.1



CAS No.	Surrogate Recoveries	MS	MSD	MC24403-3	Limits
460-00-4	Bromofluorobenzene (S)	155%	159%	148%	61-167%
460-00-4	Bromofluorobenzene (S)	135%	133%	130%	61-167%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP35014-MS	BB51211A.D1		09/27/13	CZ	09/27/13	OP35014	GBB3020
OP35014-MSD	BB51212A.D1		09/27/13	CZ	09/27/13	OP35014	GBB3020
MC24800-3	BB51213A.D1		09/27/13	CZ	09/27/13	OP35014	GBB3020

The QC reported here applies to the following samples:

Method: SW846 8011

MC24503-1

CAS No.	Compound	MC24800-3 ug/l	Spike Q	ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.069	0.068	99	0.069	99	1	64-141/29	
106-93-4	1,2-Dibromoethane	ND	0.069	0.075	109	0.078	111	4	63-163/27	

CAS No.	Surrogate Recoveries	MS	MSD	MC24800-3	Limits
460-00-4	Bromofluorobenzene (S)	110%	113%	112%	36-173%
460-00-4	Bromofluorobenzene (S)	102%	98%	99%	36-173%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24505-10MS	BH31595.D	1	09/28/13	TB	n/a	n/a	GBH1842
MC24505-10MSD	BH31596.D	1	09/28/13	TB	n/a	n/a	GBH1842
MC24505-10	BH31594.D	1	09/28/13	TB	n/a	n/a	GBH1842

The QC reported here applies to the following samples:

Method: SW846 8015

MC24503-3

CAS No.	Compound	MC24505-10 Spike mg/kg	Q	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD	
	TPH-GRO (VOA)	10 U		41.5	31.5	76	34.9	84	10	41-150/20
CAS No.	Surrogate Recoveries	MS	MSD	MC24505-10 Limits						
	2,3,4-Trifluorotoluene	77%	77%	76%	61-116%					

8.3.3



* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8011

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC24503-1	BB51217.D	100.0	96.0
OP35014-BS	BB51210A.D	94.0	94.0
OP35014-MB	BB51209A.D	100.0	97.0
OP35014-MS	BB51211A.D	110.0	102.0
OP35014-MSD	BB51212A.D	113.0	98.0

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = Bromofluorobenzene (S) 36-173%

(a) Recovery from GC signal #2

(b) Recovery from GC signal #1

8.4.1



Volatile Surrogate Recovery Summary

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8011	Matrix: SO
--------------------	------------

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC24503-3	BK29879.D	131.0	117.0
OP34909-BS	BK29873.D	152.0	127.0
OP34909-MB	BK29872.D	129.0	119.0
OP34909-MS	BK29874.D	155.0	135.0
OP34909-MSD	BK29875.D	159.0	133.0

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = Bromofluorobenzene (S) 61-167%

(a) Recovery from GC signal #2

(b) Recovery from GC signal #1

8.4.2



Volatile Surrogate Recovery Summary

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8015

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a
MC24503-3	BH31584.D	76.0
GBH1842-BSP	BH31580.D	77.0
GBH1842-MB	BH31579.D	77.0
MC24505-10MS	BH31595.D	77.0
MC24505-10MSD	BH31596.D	77.0

Surrogate Compounds	Recovery Limits
S1 = 2,3,4-Trifluorotoluene	61-116%

(a) Recovery from GC signal #1

8.4.3

8

GC Surrogate Retention Time Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBB3020-ICC3020	Injection Date:	09/27/13
Lab File ID:	BB51204.D	Injection Time:	18:52
Instrument ID:	GCBB	Method:	SW846 8011

	S1 ^a RT	S1 ^b RT
Check Std	4.65	4.45

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
ZZZZZZ	BB51207B.D	09/27/13	20:18	4.66	4.45
ZZZZZZ	BB51207A.D	09/27/13	20:18	4.66	4.45
OP35015-MB	BB51209.D	09/27/13	21:17	4.65	4.45
OP35014-MB	BB51209A.D	09/27/13	21:17	4.65	4.45
OP35015-BS	BB51210.D	09/27/13	21:48	4.65	4.45
OP35014-BS	BB51210A.D	09/27/13	21:48	4.65	4.45
OP35015-MS	BB51211.D	09/27/13	22:19	4.65	4.45
OP35014-MS	BB51211A.D	09/27/13	22:19	4.65	4.45
OP35014-MSD	BB51212A.D	09/27/13	22:51	4.65	4.45
OP35015-MSD	BB51212.D	09/27/13	22:51	4.65	4.45
MC24476-8	BB51213.D	09/27/13	23:22	4.65	4.45
MC24800-3	BB51213A.D	09/27/13	23:22	4.65	4.45
ZZZZZZ	BB51214.D	09/27/13	23:52	4.68	4.45
ZZZZZZ	BB51215.D	09/28/13	00:24	4.68	4.45
ZZZZZZ	BB51216.D	09/28/13	00:55	4.65	4.45
MC24503-1	BB51217.D	09/28/13	01:27	4.65	4.45
GBB3020-ECC302	BB51218.D	09/28/13	01:58	4.65	4.45

Surrogate
Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

8.5.1
8

GC Surrogate Retention Time Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBK996-ICC996	Injection Date:	09/25/13
Lab File ID:	BK29866.D	Injection Time:	12:06
Instrument ID:	GCBK	Method:	SW846 8011

S1^a S1^b
 RT RT

Check Std	4.11	5.11
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
OP34909-MB	BK29872.D	09/25/13	15:39	4.11	5.12
OP34909-BS	BK29873.D	09/25/13	16:02	4.12	5.12
OP34909-MS	BK29874.D	09/25/13	16:25	4.12	5.12
OP34909-MSD	BK29875.D	09/25/13	16:48	4.12	5.12
MC24403-3	BK29876.D	09/25/13	17:16	4.12	5.12
ZZZZZZ	BK29877.D	09/25/13	17:39	4.12	5.12
ZZZZZZ	BK29878.D	09/25/13	18:03	4.12	5.12
MC24503-3	BK29879.D	09/25/13	18:27	4.12	5.12
ZZZZZZ	BK29880.D	09/25/13	18:51	4.12	5.12
ZZZZZZ	BK29881.D	09/25/13	19:15	4.12	5.12

Surrogate
 Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

8.5.2



GC Surrogate Retention Time Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBH1842-CC1786	Injection Date:	09/27/13
Lab File ID:	BH31578.D	Injection Time:	15:40
Instrument ID:	GCBH	Method:	SW846 8015

S1^a
 RT

Check Std	20.20
-----------	-------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
GBH1842-MB	BH31579.D	09/27/13	16:15	20.20
GBH1842-BSP	BH31580.D	09/27/13	16:50	20.20
ZZZZZZ	BH31581.D	09/27/13	20:29	20.21
ZZZZZZ	BH31582.D	09/27/13	21:03	20.20
ZZZZZZ	BH31583.D	09/27/13	21:38	20.20
MC24503-3	BH31584.D	09/27/13	22:12	20.20
ZZZZZZ	BH31585.D	09/27/13	22:46	20.20
ZZZZZZ	BH31586.D	09/27/13	23:21	20.20
ZZZZZZ	BH31587.D	09/27/13	23:55	20.20
ZZZZZZ	BH31588.D	09/28/13	00:29	20.20

Surrogate
 Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

8.5.3


GC Surrogate Retention Time Summary

Job Number: MC24503
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBH1842-CC1786	Injection Date:	09/28/13
Lab File ID:	BH31589.D	Injection Time:	01:03
Instrument ID:	GCBH	Method:	SW846 8015

S1^a
RT

Check Std	20.20
-----------	-------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
ZZZZZZ	BH31590.D	09/28/13	01:38	20.20
ZZZZZZ	BH31591.D	09/28/13	02:12	20.20
ZZZZZZ	BH31592.D	09/28/13	02:46	20.20
ZZZZZZ	BH31593.D	09/28/13	03:20	20.20
MC24505-10	BH31594.D	09/28/13	03:55	20.20
MC24505-10MS	BH31595.D	09/28/13	04:29	20.20
MC24505-10MSD	BH31596.D	09/28/13	05:03	20.20
ZZZZZZ	BH31597.D	09/28/13	05:37	20.20
ZZZZZZ	BH31598.D	09/28/13	06:12	20.20
ZZZZZZ	BH31599.D	09/28/13	06:46	20.20

Surrogate
Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

8.5.4
8

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Percent Solids Raw Data Summary



Percent Solids Raw Data Summary

Job Number: MC24503

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample: MC24503-3 Analyzed: 19-SEP-13 by HS Method: SM21 2540 B MOD.
ClientID: SVE39-091713(34-36')

Wet Weight (Total)	37.134	g
Tare Weight	23.928	g
Dry Weight (Total)	35.281	g
Solids, Percent	86	%

9.1



Roxana SVE Extension 2013 Data Review

Laboratory SDG: MC24546

Data Reviewer: Melissa Mansker

Peer Reviewer: Elizabeth Kunkel

Date Reviewed: 10/16/2013

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

Sample Identification	Sample Identification
TB-091813-ST	TB-091813-HCL
SVE-40-091813 (30-32')	

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 VOC and SVOC LCS recoveries were outside evaluation criteria. SVOC MS/MSD recoveries were outside of evaluation criteria in sample SVE-40-091813 (30-32'). These issues are addressed further in the appropriate sections below.

The cooler receipt form indicated samples were received by the laboratory at 1.8°C which is outside temperature criteria 4°C ± 2°C. All samples were received in good condition; no qualification of data was required.

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?

No

LCS ID	Parameter	Analyte	LCS Recovery	RPD	LCS Criteria
MSM2074-BS	VOCs	Acetone	142	NA	70-130
MSM2074-BS	VOCs	Acrolein	62	NA	70-130
MSM2074-BS	VOCs	2-Butanone (MEK)	157	NA	70-130
MSM2074-BS	VOCs	2-Hexanone	132	NA	70-130

LCS ID	Parameter	Analyte	LCS Recovery	RPD	LCS Criteria
MSM2074-BS	VOCs	Vinyl acetate	68	NA	70-130
OP34998-BS	SVOCs	Hexachlorocyclopentadiene	35	NA	40-140

Analytical data that required qualification based on LCS data are included in the table below. Analytical data reported as non-detect and associated with LCS recoveries above evaluation criteria, indicating a possible high bias, did not require qualification.

Sample ID	Parameter	Analyte	Qualification
SVE-40-091813 (30-32')	VOCs	Acrolein	UJ
SVE-40-091813 (30-32')	VOCs	Vinyl acetate	UJ
SVE-40-091813 (30-32')	SVOCs	Hexachlorocyclopentadiene	UJ

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

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

Yes, although not requested, sample SVE-40-091813 (30-32') was spiked and analyzed for SVOCs.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/ RPD Criteria
SVE-40-091813 (30-32')	SVOCs	Benzoic acid	12/12	2	30-130/30
SVE-40-091813 (30-32')	SVOCs	2,4-Dinitrophenol	0/7	200	30-130/30
SVE-40-091813 (30-32')	SVOCs	4,6-Dinitro-o-cresol	31/54	55	30-130/30
SVE-40-091813 (30-32')	SVOCs	Hexachlorocyclopentadiene	27/33	20	40-140/30

USEPA National Functional Guidelines for Organic Data Review indicates that organic data does not require qualification based on MS/MSD data alone and LCS recoveries were within evaluation criteria with the exception of compounds listed and qualified as appropriate in Section 5.0 of this data review. No further qualification of the data was required.

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

No

11.0 Sample Dilutions

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

Not applicable; samples analyzed did not require dilution.

12.0 Additional Qualifications

Were additional qualifications applied?

No



10/09/13

Technical Report for

Shell Oil

URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

21562850.18000

Accutest Job Number: MC24546

Sampling Date: 09/18/13

Report to:

URS Corporation

Melissa.mansker@urs.com

ATTN: Melissa Mansker

Total number of pages in report: 82



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

*Reviewed on
10/16/13
Reza Fard
Lab Director*

Client Service contact: Matthew Morrell 508-481-6200

Certifications: MA (M-MA136, SW846 NELAC) CT (PH-0109) NH (250210) RI (00071) ME (MA00136) FL (E87579) NY (11791) NJ (MA926) PA (6801121) ND (R-188) CO MN (11546AA) NC (653) IL (002337) WI (399080220) ISO 17025:2005 (L2235)

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Test results relate only to samples analyzed.

Table of Contents

Sections:



-1-

Section 1: Sample Summary	3
Section 2: Case Narrative/Conformance Summary	4
Section 3: Summary of Hits	6
Section 4: Sample Results	7
4.1: MC24546-1: TB-091813-ST	8
4.2: MC24546-2: TB-091813-HCL	9
4.3: MC24546-3: SVE-40-091813(30-32')	12
Section 5: Misc. Forms	20
5.1: Chain of Custody	21
5.2: Sample Tracking Chronicle	24
5.3: Internal Chain of Custody	25
Section 6: GC/MS Volatiles - QC Data Summaries	26
6.1: Method Blank Summary	27
6.2: Blank Spike Summary	33
6.3: Blank Spike/Blank Spike Duplicate Summary	36
6.4: Matrix Spike/Matrix Spike Duplicate Summary	39
6.5: Internal Standard Area Summaries	45
6.6: Surrogate Recovery Summaries	47
Section 7: GC/MS Semi-volatiles - QC Data Summaries	49
7.1: Method Blank Summary	50
7.2: Blank Spike Summary	53
7.3: Matrix Spike/Matrix Spike Duplicate Summary	56
7.4: Internal Standard Area Summaries	59
7.5: Surrogate Recovery Summaries	61
Section 8: GC Volatiles - QC Data Summaries	63
8.1: Method Blank Summary	64
8.2: Blank Spike Summary	67
8.3: Matrix Spike/Matrix Spike Duplicate Summary	70
8.4: Surrogate Recovery Summaries	73
8.5: GC Surrogate Retention Time Summaries	76
Section 9: General Chemistry - QC Data Summaries	81
9.1: Percent Solids Raw Data Summary	82



Sample Summary

Shell Oil

Job No: MC24546

URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
Project No: 21562850.18000

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
MC24546-1	09/18/13	00:00 EA	09/19/13	AQ	Trip Blank Water	TB-091813-ST ✓
MC24546-2	09/18/13	00:00 EA	09/19/13	AQ	Trip Blank Water	TB-091813-HCL ✓
MC24546-3	09/18/13	12:10 EA	09/19/13	SO	Soil	SVE-40-091813(30-32') ✓

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Shell Oil **Job No** MC24546
Site: URSMOSTL: Roxana SVE System Extension, 900 South Central Av **Report Date** 10/4/2013 1:41:29 PM

1 Sample(s), 2 Trip Blank(s) were collected on 09/18/2013 and were received at Accutest on 09/19/2013 properly preserved, at 1.8 Deg. C and intact. These Samples received an Accutest job number of MC24546. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix: AQ	Batch ID: MSV907
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- ☛ All samples were analyzed within the recommended method holding time.
- ☛ Sample(s) MC24544-5MS, MC24544-5MSD were used as the QC samples indicated.
- ☛ All method blanks for this batch meet method specific criteria.
- ☛ Matrix Spike Recovery(s) for 2-Chloroethyl vinyl ether, 2-Hexanone, Acetone, Hexachlorobutadiene, Naphthalene are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- ☛ Matrix Spike Duplicate Recovery(s) for 2-Chloroethyl vinyl ether, 2-Hexanone, Acetone, Naphthalene are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.

Matrix: SO	Batch ID: MSM2074
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- ☛ All samples were analyzed within the recommended method holding time.
- ☛ Sample(s) MC24582-5MS, MC24582-5MSD were used as the QC samples indicated.
- ☛ All method blanks for this batch meet method specific criteria.
- ☛ Blank Spike Recovery(s) for 2-Butanone (MEK), 2-Hexanone, Acetone, Acrolein, Vinyl Acetate are outside control limits. Blank Spike meets program technical requirements.
- ☛ Matrix Spike Recovery(s) for 1,1,1,2-Tetrachloroethane, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,4-Dioxane, 2-Butanone (MEK), 2-Chloroethyl vinyl ether, Acetone, Acrolein, Benzene, Bromobenzene, Chlorobenzene, cis-1,3-Dichloropropene, Ethylbenzene, Hexachlorobutadiene, m,p-Xylene, n-Butylbenzene, n-Propylbenzene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Isopropyltoluene, sec-Butylbenzene, Styrene, tert-Butylbenzene, Toluene, Vinyl Acetate, Xylene (total) are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- ☛ Matrix Spike Duplicate Recovery(s) for 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-Butanone (MEK), 2-Chloroethyl vinyl ether, Acrolein, Acrylonitrile, Bromobenzene, Chlorobenzene, Hexachlorobutadiene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, Styrene, Vinyl Acetate, 1,4-Dioxane, Acetone are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- ☛ RPD(s) for MSD for 1,4-Dioxane, Acetone are outside control limits for sample MC24582-5MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.

Extractables by GCMS By Method SW846 8270C

Matrix: SO	Batch ID: OP34998
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- ☞ All samples were extracted within the recommended method holding time.
- ☞ All samples were analyzed within the recommended method holding time.
- ☞ Sample(s) MC24546-3MS, MC24546-3MSD were used as the QC samples indicated.
- ☞ All method blanks for this batch meet method specific criteria.
- ☞ Blank Spike Recovery(s) for Hexachlorocyclopentadiene are outside control limits. Blank Spike meets program technical requirements.
- ☞ MS/MSD Recovery(s) for 2,4-Dinitrophenol, Benzoic acid, Hexachlorocyclopentadiene are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- ☞ RPD(s) for MSD for 2,4-Dinitrophenol, 4,6-Dinitro-o-cresol are outside control limits for sample OP34998-MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.

Extractables by GCMS By Method SW846 8270C BY SIM

Matrix: SO	Batch ID: OP34999
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- ☞ All samples were extracted within the recommended method holding time.
- ☞ All samples were analyzed within the recommended method holding time.
- ☞ All method blanks for this batch meet method specific criteria.
- ☞ Sample(s) MC24546-3MS, MC24546-3MSD were used as the QC samples indicated.

Volatiles by GC By Method SW846 8011

Matrix: AQ	Batch ID: OP35070
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- ☞ All samples were analyzed within the recommended method holding time.
- ☞ Sample(s) MC24800-9MS, MC24800-9MSD were used as the QC samples indicated.
- ☞ All method blanks for this batch meet method specific criteria.

Matrix: SO	Batch ID: OP34909
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- ☞ All samples were extracted within the recommended method holding time.
- ☞ All samples were analyzed within the recommended method holding time.
- ☞ All method blanks for this batch meet method specific criteria.
- ☞ Sample(s) MC24403-3MS, MC24403-3MSD were used as the QC samples indicated.

Volatiles by GC By Method SW846 8015

Matrix: SO	Batch ID: GBH1842
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- ☞ All samples were analyzed within the recommended method holding time.
- ☞ All method blanks for this batch meet method specific criteria.
- ☞ Sample(s) MC24505-10MS, MC24505-10MSD were used as the QC samples indicated.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix: SO	Batch ID: GN44399
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- ☞ Sample(s) MC24546-3DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(MC24546).

Summary of Hits

Job Number: MC24546
Account: Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
Collected: 09/18/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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MC24546-1 TB-091813-ST

No hits reported in this sample.

MC24546-2 TB-091813-HCL

No hits reported in this sample.

MC24546-3 SVE-40-091813(30-32')

Benzene	0.0010	0.00062	0.00030	mg/kg	SW846 8260B
Ethylbenzene	0.0026	0.0025	0.00022	mg/kg	SW846 8260B
Toluene	0.0030 J	0.0062	0.00030	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	0.00043 J	0.0062	0.00025	mg/kg	SW846 8260B
m,p-Xylene	0.00070 J	0.0025	0.00035	mg/kg	SW846 8260B
Xylene (total)	0.00070 J	0.0025	0.00025	mg/kg	SW846 8260B
Total TIC, Volatile	0.0349 J			mg/kg	

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	TB-091813-ST	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-1	Date Received:	09/19/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8011 SW846 8011		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ84347.D	1	10/02/13	CZ	10/02/13	OP35070	GYZ7320
Run #2							

Run #	Initial Volume	Final Volume
Run #1	35.0 ml	2.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.0045	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.0097	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	92%		36-173%
460-00-4	Bromofluorobenzene (S)	89%		36-173%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID:	TB-091813-HCL	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-2	Date Received:	09/19/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V23704.D	1	10/01/13	AMY	n/a	n/a	MSV907
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.8	ug/l	
107-02-8	Acrolein	ND	25	6.3	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.5	ug/l	
71-43-2	Benzene	ND	0.50	0.45	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	5.0	0.64	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.33	ug/l	
75-25-2	Bromoform	ND	1.0	0.42	ug/l	
74-83-9	Bromomethane	ND	2.0	1.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	1.6	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.54	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.58	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.87	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.59	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.62	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.48	ug/l	
75-00-3	Chloroethane	ND	2.0	0.84	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	1.4	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.55	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.33	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.35	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.30	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.2	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.37	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.35	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.67	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB-091813-HCL	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-2	Date Received:	09/19/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.2
4

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.45	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.97	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.3	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.63	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.22	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.29	ug/l	
123-91-1	1,4-Dioxane	ND	25	16	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.38	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.3	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.3	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.64	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.55	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.43	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.3	ug/l	
74-95-3	Methylene bromide	ND	5.0	0.43	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.41	ug/l	
91-20-3	Naphthalene	ND	5.0	0.79	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.59	ug/l	
100-42-5	Styrene	ND	5.0	0.49	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.46	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.42	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.61	ug/l	
108-88-3	Toluene	ND	1.0	0.46	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.76	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.45	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.94	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.49	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.45	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.61	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.70	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	1.1	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.61	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.41	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.41	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB-091813-HCL	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-2	Date Received:	09/19/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B	Project:	
URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL			

4.2
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		70-130%
2037-26-5	Toluene-D8	103%		70-130%
460-00-4	4-Bromofluorobenzene	105%		70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE-40-091813(30-32')	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	85.0
Method:	SW846 8260B	Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M59856.D	1	10/02/13	KD	n/a	n/a	MSM2074
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.77 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.012	0.0048	mg/kg	
107-02-8	Acrolein	ND	0.031	0.0046	mg/kg	u5
107-13-1	Acrylonitrile	ND	0.031	0.0017	mg/kg	
71-43-2	Benzene	0.0010	0.00062	0.00030	mg/kg	
108-86-1	Bromobenzene	ND	0.0062	0.00034	mg/kg	
74-97-5	Bromochloromethane	ND	0.0062	0.00072	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0025	0.00045	mg/kg	
75-25-2	Bromoform	ND	0.0025	0.00036	mg/kg	
74-83-9	Bromomethane	ND	0.0025	0.0012	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0062	0.0038	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0062	0.00021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0062	0.00020	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0062	0.00044	mg/kg	
75-15-0	Carbon disulfide	ND	0.0062	0.00019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0025	0.0014	mg/kg	
108-90-7	Chlorobenzene	ND	0.0025	0.00033	mg/kg	
75-00-3	Chloroethane	ND	0.0062	0.00074	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0062	0.0058	mg/kg	
67-66-3	Chloroform	ND	0.0025	0.00036	mg/kg	
74-87-3	Chloromethane	ND	0.0062	0.0015	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0062	0.00050	mg/kg	
106-43-4	p-Cblorotoluene	ND	0.0062	0.00054	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0025	0.00052	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0025	0.00026	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0025	0.00027	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0025	0.00025	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0025	0.0014	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0025	0.00041	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0025	0.00067	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0025	0.00064	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0025	0.00063	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0025	0.00055	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID:	SVE-40-091813(30-32')	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	85.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0025	0.00052	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0062	0.00055	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0062	0.00081	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0062	0.00029	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0025	0.00036	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0025	0.00036	mg/kg	
123-91-1	1,4-Dioxane	ND	0.031	0.026	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0062	0.0041	mg/kg	
100-41-4	Ethylbenzene	0.0026	0.0025	0.00022	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0062	0.00070	mg/kg	
591-78-6	2-Hexanone	ND	0.0062	0.0030	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0062	0.00034	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0062	0.00020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0025	0.00049	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0062	0.0023	mg/kg	
74-95-3	Methylene bromide	ND	0.0062	0.00043	mg/kg	
75-09-2	Methylene chloride	ND	0.0025	0.0019	mg/kg	
91-20-3	Naphthalene	ND	0.0062	0.00097	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0062	0.00030	mg/kg	
100-42-5	Styrene	ND	0.0062	0.00025	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0062	0.00048	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0025	0.00036	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0025	0.00055	mg/kg	
108-88-3	Toluene	0.0030	0.0062	0.00030	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0062	0.00053	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0062	0.00045	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0025	0.00022	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0025	0.00043	mg/kg	
79-01-6	Trichloroethene	ND	0.0025	0.00058	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0025	0.0013	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0062	0.00048	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.00043	0.0062	0.00025	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	ND	0.0062	0.00016	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0062	0.0015	mg/kg	WJ
75-01-4	Vinyl chloride	ND	0.0025	0.00070	mg/kg	
	m,p-Xylene	0.00070	0.0025	0.00035	mg/kg	J
95-47-6	o-Xylene	ND	0.0025	0.00025	mg/kg	
1330-20-7	Xylene (total)	0.00070	0.0025	0.00025	mg/kg	J

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE-40-091813(30-32')	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	85.0
Method:	SW846 8260B	Project:	
URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL			

4.3
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	83%		70-130%
2037-26-5	Toluene-D8	83%		70-130%
460-00-4	4-Bromofluorobenzene	87%		70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
78-78-4	Butane, 2-methyl-	6.07	.015	mg/kg	JN
109-66-0	Pentane	6.49	.012	mg/kg	JN
425-26-3	Heptafluorobutyric acid, n-pentyl ester	7.84	.0079	mg/kg	JN
	Total TIC, Volatile		.0349	mg/kg	J

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presmptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE-40-091813(30-32')	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	85.0
Method:	SW846 8270C SW846 3546		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R33855.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.6 g	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	0.57	0.071	mg/kg	
95-57-8	2-Chlorophenol	ND	0.29	0.013	mg/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	0.57	0.014	mg/kg	
120-83-2	2,4-Dichlorophenol	ND	0.57	0.016	mg/kg	
105-67-9	2,4-Dimethylphenol	ND	0.57	0.093	mg/kg	
51-28-5	2,4-Dinitrophenol	ND	1.1	0.14	mg/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	0.57	0.071	mg/kg	
95-48-7	2-Methylphenol	ND	0.57	0.023	mg/kg	
	3&4-Methylphenol	ND	0.57	0.028	mg/kg	
88-75-5	2-Nitrophenol	ND	0.57	0.015	mg/kg	
100-02-7	4-Nitrophenol	ND	1.1	0.11	mg/kg	
87-86-5	Pentachlorophenol	ND	0.57	0.040	mg/kg	
108-95-2	Phenol	ND	0.29	0.016	mg/kg	
95-95-4	2,4,5-Trichlorophenol	ND	0.57	0.014	mg/kg	
88-06-2	2,4,6-Trichlorophenol	ND	0.57	0.014	mg/kg	
62-53-3	Aniline	ND	0.57	0.029	mg/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	0.29	0.014	mg/kg	
85-68-7	Butyl benzyl phthalate	ND	0.29	0.012	mg/kg	
100-51-6	Benzyl Alcohol	ND	0.57	0.029	mg/kg	
91-58-7	2-Chloronaphthalene	ND	0.29	0.015	mg/kg	
106-47-8	4-Chloroaniline	ND	0.57	0.014	mg/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	0.29	0.013	mg/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	0.29	0.017	mg/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	0.29	0.021	mg/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	0.29	0.017	mg/kg	
122-66-7	1,2-Diphenylhydrazine	ND	0.29	0.013	mg/kg	
121-14-2	2,4-Dinitrotoluene	ND	0.57	0.038	mg/kg	
606-20-2	2,6-Dinitrotoluene	ND	0.57	0.014	mg/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	0.29	0.029	mg/kg	
132-64-9	Dibenzofuran	ND	0.11	0.016	mg/kg	
84-74-2	Di-n-butyl phthalate	ND	0.29	0.030	mg/kg	
117-84-0	Di-n-octyl phthalate	ND	0.29	0.0089	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE-40-091813(30-32')	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	85.0
Method:	SW846 8270C SW846 3546		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

4.3
4

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
84-66-2	Diethyl phthalate	ND	0.29	0.014	mg/kg	
131-11-3	Dimethyl phthalate	ND	0.29	0.017	mg/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	0.29	0.011	mg/kg	
118-74-1	Hexachlorobenzene	ND	0.29	0.018	mg/kg	
77-47-4	Hexachlorocyclopentadiene	ND	0.57	0.14	mg/kg	J
67-72-1	Hexachloroethane	ND	0.29	0.014	mg/kg	
78-59-1	Isophorone	ND	0.29	0.013	mg/kg	
88-74-4	2-Nitroaniline	ND	0.57	0.014	mg/kg	
99-09-2	3-Nitroaniline	ND	0.57	0.031	mg/kg	
100-01-6	4-Nitroaniline	ND	0.57	0.014	mg/kg	
98-95-3	Nitrobenzene	ND	0.29	0.015	mg/kg	
62-75-9	n-Nitrosodimethylamine	ND	0.29	0.014	mg/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	0.29	0.016	mg/kg	
86-30-6	N-Nitrosodiphenylamine	ND	0.29	0.017	mg/kg	
110-86-1	Pyridine	ND	0.57	0.029	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	73%		30-130%
4165-62-2	Phenol-d5	70%		30-130%
118-79-6	2,4,6-Tribromophenol	72%		30-130%
4165-60-0	Nitrobenzene-d5	65%		30-130%
321-60-8	2-Fluorobiphenyl	74%		30-130%
1718-51-0	Terphenyl-d14	82%		30-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Semi-Volatile		0	mg/kg	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	SVE-40-091813(30-32')	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	85.0
Method:	SW846 8270C BY SIM SW846 3546		
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W14641.D	1	09/27/13	KR	09/26/13	OP34999	MSW660
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.6 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.0057	0.00066	mg/kg	
208-96-8	Acenaphthylene	ND	0.0057	0.0011	mg/kg	
120-12-7	Anthracene	ND	0.0057	0.00093	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.0057	0.00071	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.0057	0.00083	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.0057	0.00070	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.0057	0.0022	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.0057	0.0011	mg/kg	
218-01-9	Chrysene	ND	0.0057	0.00088	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.0057	0.0017	mg/kg	
206-44-0	Fluoranthene	ND	0.0057	0.00091	mg/kg	
86-73-7	Fluorene	ND	0.0057	0.00050	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.0057	0.0015	mg/kg	
90-12-0	1-Methylnaphthalene	ND	0.011	0.011	mg/kg	
91-57-6	2-Methylnaphthalene	ND	0.0057	0.0012	mg/kg	
85-01-8	Phenanthrene	ND	0.0057	0.0011	mg/kg	
129-00-0	Pyrene	ND	0.0057	0.0020	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	37%		15-110%
4165-62-2	Phenol-d5	36%		15-110%
118-79-6	2,4,6-Tribromophenol	41%		15-110%
4165-60-0	Nitrobenzene-d5	76%		30-130%
321-60-8	2-Fluorobiphenyl	72%		30-130%
1718-51-0	Terphenyl-d14	95%		30-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SVE-40-091813(30-32')		Date Sampled:	09/18/13
Lab Sample ID:	MC24546-3		Date Received:	09/19/13
Matrix:	SO - Soil		Percent Solids:	85.0
Method:	SW846 8011 SW846 3550B		Project:	
Project:	URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK29880.D	1	09/25/13	NK	09/20/13	OP34909	GBK996
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0029	0.00072	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0029	0.0011	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	135%		61-167%		
460-00-4	Bromofluorohenzene (S)	120%		61-167%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID:	SVE-40-091813(30-32')	Date Sampled:	09/18/13
Lab Sample ID:	MC24546-3	Date Received:	09/19/13
Matrix:	SO - Soil	Percent Solids:	85.0
Method:	SW846 8015	Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BH31604.D	1	09/28/13	TB	n/a	n/a	GBH1842
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.29 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	15	3.2	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	2,3,4-Trifluorotoluene	76%		61-116%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Misc. Forms



Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

LAB (LOCATION)

- KEMCO
 - CASCH
 - OTHER
 - SPL
- Lab Vendor # _____



Shell Oil Products Chain Of Custody Record

URS

Please Check Appropriate Box:

ENV. SERVICES
 NOTVA RETAIL
 NOTVA SOACH
 SHELL PIPELINE

NOTVA RETAIL
 CONSULTANT
 OTHER _____

Print Bill To Contact Name: Bob Bitman
 PO # _____
 PH # _____

INCIDENT # (ENV SERVICES) 9 7 2 1 6 4 0
 DATE 6/18/2013
 PAGE: 1 of 1

LABORING COMPANY
 URS CORPORATION
 1001 HIGHLANDS PLAZA DRIVE WEST - SUITE 300, ST. LOUIS, MO 63110

PROJECT CONTACT (Primary or POC) Elizabeth Kurkel
 Elizabeth.Kurkel@urs.com

TELEPHONE 314-420-0100 FAX 314-420-0462
 E-MAIL elizabeth.kurkel@urs.com & bob.bitman@urs.com

BILL ADDRESS: Street and City
 900 South Central Ave. ROXANA
 STATE IL ZIP CODE 62451

CONTRACT PROJECT NO. SVE System Extension 21562850.18000

LAB USE ONLY
 MC24546

TURNAROUND TIME (CALENDAR DAYS)
 STANDARD (10 DAY) 5 DAYS 3 DAYS 2 DAYS 24 HOURS

LA - RWQOC REPORT FORMAT UST AGENCY

DELIVERABLES LEVEL 1 LEVEL 2 LEVEL 3 LEVEL 4 OTHER (SPECIFY) EDD

REQUESTED ANALYSIS

FIELD NOTES:
 TEMPERATURE ON RECEIPT °C

SPECIAL INSTRUCTIONS OR NOTES:
 * Please include "J" values on Reports.
 * Please provide sample receipt upon login

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

LAB USE ONLY	Field Sample Identification	SAMPLING		MATRIX	PRESERVATIVE						NO. OF CONT.	VOC 8011 SL	SVOC 8270C SL + TICS	PAH 8270LL	Percent Moisture	VOC 8260B SL + top 18 TICS	TPH-GRO	PID (ppm)	Container PID Readings or Laboratory Note
		DATE	TIME		HCl	HNO3	H2SO4	HNO2	OTHER										
	TB-091813-ST	9/17/2013		WATER						2	2	X							
	TB-091813-HCL	9/17/2013		WATER	2						2				X				
	SVE39-091813 (30-32)	9/17/2013	1210	SOLID						3	5	8	X	X	X	X	X	10.1	

Prepared by (Signature) *[Signature]* Received by (Signature) *[Signature]* Date 9/18/13 Time 1800

Prepared by (Signature) *FEDX* Received by (Signature) *[Signature]* Date 9-18-13 Time 930

187L



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC24546 Client: URS Immediate Client Services Action Required: No
 Date / Time Received: 9/19/2013 Delivery Method: _____ Client Service Action Required at Login: No
 Project: 900 SOUTH CENTRAL No. Coolers: 1 Airbill #'s: _____

Cooler Security Y or N Y or N
 1. Custody Seals Present: 3. COC Present:
 2. Custody Seals Intact: 4. Smpl Dates/Time OK

Cooler Temperature Y or N
 1. Temp criteria achieved:
 2. Cooler temp verification: Infrared gun
 3. Cooler media: Ice (bag)

Quality Control Preservation Y or N N/A
 1. Trip Blank present / cooler:
 2. Trip Blank listed on COC:
 3. Samples preserved properly:
 4. VOCs headspace free:

Sample Integrity - Documentation Y or N
 1. Sample labels present on bottles:
 2. Container labeling complete:
 3. Sample container label / COC agree:

Sample Integrity - Condition Y or N
 1. Sample recvd within HT:
 2. All containers accounted for:
 3. Condition of sample: Intact

Sample Integrity - Instructions Y or N N/A
 1. Analysis requested is clear:
 2. Bottles received for unspecified tests
 3. Sufficient volume recvd for analysis:
 4. Compositing instructions clear:
 5. Filtering instructions clear:

Comments

Accutest Laboratories 495 Technology Center West, Bldg One Marlborough, MA
 V 508 481.6200 F 508 481 7753 www.accutest.com

MC24546: Chain of Custody
 Page 3 of 3

Internal Sample Tracking Chronicle

Shell Oil

Job No: MC24546

URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
 Project No: 21562850.18000

5.2



Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC24546-1 Collected: 18-SEP-13 00:00 By: EA Received: 19-SEP-13 By: AF TB-091813-ST						
MC24546-1	SW846 8011	02-OCT-13 13:46	CZ	02-OCT-13	MR	V8011SL
MC24546-2 Collected: 18-SEP-13 00:00 By: EA Received: 19-SEP-13 By: AF TB-091813-HCL						
MC24546-2	SW846 8260B	01-OCT-13 12:31	AMY			V8260SL+
MC24546-3 Collected: 18-SEP-13 12:10 By: EA Received: 19-SEP-13 By: AF SVE-40-091813(30-32')						
MC24546-3	SM21 2540 B MOD.	23-SEP-13	HS			%SOL
MC24546-3	SW846 8011	25-SEP-13 18:51	NK	20-SEP-13	NE	V8011SL
MC24546-3	SW846 8270C	27-SEP-13 14:42	KR	26-SEP-13	MT	AB8270SL+
MC24546-3	SW846 8270C BY SIM	27-SEP-13 20:15	KR	26-SEP-13	MT	B8270SIMSL
MC24546-3	SW846 8015	28-SEP-13 09:37	TB			V8015GRO
MC24546-3	SW846 8260B	02-OCT-13 15:51	KD			V8260SL+

Accutest Internal Chain of Custody

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL
 Received: 09/19/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC24546-1.1	VOC Ref #1	Michael Rolo	10/02/13 06:48	Retrieve from Storage
MC24546-1.1	Michael Rolo		10/03/13 07:45	Depleted
MC24546-2.1	VOC Ref #1	Amy Min Yang	10/01/13 12:11	Retrieve from Storage
MC24546-2.1	Amy Min Yang	GCMSV	10/01/13 12:12	Load on Instrument
MC24546-2.1	GCMSV	Amy Min Yang	10/02/13 16:23	Unload from Instrument
MC24546-2.1	Amy Min Yang	VOC Ref #1	10/02/13 16:23	Return to Storage
MC24546-3.1	Walk In Ref #9	Hamid Siamak	09/23/13 08:55	Retrieve from Storage
MC24546-3.1	Hamid Siamak	Walk In Ref #9	09/23/13 08:55	Return to Storage
MC24546-3.3	Walk In Ref #9	Chris Cataldo	09/20/13 15:47	Retrieve from Storage
MC24546-3.3	Chris Cataldo	Walk In Ref #9	09/20/13 23:22	Return to Storage
MC24546-3.3	Walk In Ref #9	Nicole Estey	09/26/13 16:54	Retrieve from Storage
MC24546-3.3	Nicole Estey	Walk In Ref #9	09/26/13 22:32	Return to Storage
MC24546-3.4	VOC Ref #10	Krysten Dufort	10/02/13 10:23	Retrieve from Storage
MC24546-3.4	Krysten Dufort	GCMSM	10/02/13 10:23	Load on Instrument
MC24546-3.4	GCMSM	Krysten Dufort	10/03/13 09:55	Unload from Instrument
MC24546-3.4	Krysten Dufort	VOC Ref #10	10/03/13 09:55	Return to Storage
MC24546-3.8	VOC Ref #10	Jaime Maslowski	09/20/13 15:10	Retrieve from Storage
MC24546-3.8	Jaine Maslowski	VOC Ref #10	09/23/13 10:19	Return to Storage
MC24546-3.8	VOC Ref #10	Todd Bahosh	09/27/13 19:08	Retrieve from Storage
MC24546-3.8	Todd Bahosh	GCBH	09/27/13 19:08	Load on Instrument
MC24546-3.8	GCBH	Todd Bahosh	09/30/13 17:14	Unload from Instrument
MC24546-3.8	Todd Bahosh	VOC Ref #10	09/30/13 17:14	Return to Storage

5.3


GC/MS Volatiles



QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Surrogate Recovery Summaries

Method Blank Summary

Page 1 of 3

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV907-MB	V23703.D	1	10/01/13	AMY	n/a	n/a	MSV907

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-2

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.8	ug/l	
107-02-8	Acrolein	ND	25	6.3	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.5	ug/l	
71-43-2	Benzene	ND	0.50	0.45	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	5.0	0.64	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.33	ug/l	
75-25-2	Bromoform	ND	1.0	0.42	ug/l	
74-83-9	Bromomethane	ND	2.0	1.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	1.6	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.54	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.58	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.87	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.59	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.62	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.48	ug/l	
75-00-3	Chloroethane	ND	2.0	0.84	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	1.4	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.55	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.33	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.35	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.30	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.2	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.37	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.35	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.67	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.45	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.97	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.3	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.63	ug/l	

6.1.1



Method Blank Summary

Page 2 of 3

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV907-MB	V23703.D	1	10/01/13	AMY	n/a	n/a	MSV907

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-2

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.22	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.29	ug/l	
123-91-1	1,4-Dioxane	ND	25	16	ng/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.38	ug/l	
87-68-3	Hexachlorobntadiene	ND	5.0	1.3	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.3	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.64	ug/l	
99-87-6	p-Isopropyltolnene	ND	5.0	0.55	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.43	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.3	ug/l	
74-95-3	Methylene bromide	ND	5.0	0.43	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.41	ug/l	
91-20-3	Naphthalene	ND	5.0	0.79	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.59	ug/l	
100-42-5	Styrene	ND	5.0	0.49	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.46	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.42	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.61	ng/l	
108-88-3	Toluene	ND	1.0	0.46	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.76	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.45	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.94	ng/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.49	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.45	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.61	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.70	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	1.1	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.61	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.41	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.41	ug/l	

6.1.1



Method Blank Summary

Job Number: MC24546
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV907-MB	V23703.D	1	10/01/13	AMY	n/a	n/a	MSV907

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-2

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	95%	70-130%
2037-26-5	Toluene-D8	102%	70-130%
460-00-4	4-Bromofluorobenzene	105%	70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

6.1.1



Method Blank Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extensiou, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2074-MB	M59846.D	1	10/02/13	KD	n/a	n/a	MSM2074

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.9	ug/kg	
107-02-8	Acrolein	ND	25	3.8	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ng/kg	
71-43-2	Benzene	ND	0.50	0.25	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.27	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.58	ug/kg	
75-27-4	Bromodichloroethane	ND	2.0	0.36	ug/kg	
75-25-2	Bromoform	ND	2.0	0.29	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.97	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	3.1	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.17	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.16	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.36	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.15	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	1.2	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.27	ug/kg	
75-00-3	Chloroethane	ND	5.0	0.60	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	4.7	ug/kg	
67-66-3	Chloroform	ND	2.0	0.29	ug/kg	
74-87-3	Chloromethane	ND	5.0	1.2	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	0.41	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.44	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.43	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.21	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.22	ng/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.20	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.33	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.54	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.52	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.51	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.45	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.42	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.45	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.66	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.23	ug/kg	

6.1.2



Method Blank Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2074-MB	M59846.D	1	10/02/13	KD	n/a	n/a	MSM2074

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.29	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.29	ng/kg	
123-91-1	1,4-Dioxane	ND	25	21	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	3.3	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.18	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.57	ug/kg	
591-78-6	2-Hexanone	ND	5.0	2.4	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.28	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.16	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.40	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.8	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.35	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.5	ug/kg	
91-20-3	Naphthalene	ND	5.0	0.79	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	0.24	ug/kg	
100-42-5	Styrene	ND	5.0	0.21	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.39	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.29	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.44	ug/kg	
108-88-3	Toluene	ND	5.0	0.24	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.43	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.36	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.18	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.35	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.47	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	1.0	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.39	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.13	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ng/kg	
75-01-4	Vinyl chloride	ND	2.0	0.57	ug/kg	
	m,p-Xylene	ND	2.0	0.29	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.20	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.20	ug/kg	

6.1.2



Method Blank Summary

Job Number: MC24546
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2074-MB	M59846.D	1	10/02/13	KD	n/a	n/a	MSM2074

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-3

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	80%	70-130%
2037-26-5	Toluene-D8	82%	70-130%
460-00-4	4-Bromofluorobenzene	86%	70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/kg	

6.1.2



Blank Spike Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prerp Batch	Analytical Batch
MSM2074-BS	M59843.D	1	10/02/13	KD	n/a	n/a	MSM2074

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	50	71.0	142* a	70-130
107-02-8	Acrolein	250	156	62* a	70-130
107-13-1	Acrylonitrile	50	59.8	120	70-130
71-43-2	Benzene	50	55.9	112	70-130
108-86-1	Bromobenzene	50	57.9	116	70-130
74-97-5	Bromochloromethane	50	63.8	128	70-130
75-27-4	Bromodichloromethane	50	57.1	114	70-130
75-25-2	Bromoform	50	61.4	123	70-130
74-83-9	Bromomethane	50	57.1	114	70-130
78-93-3	2-Butanone (MEK)	50	78.3	157* a	70-130
104-51-8	n-Butylbenzene	50	61.0	122	70-130
135-98-8	sec-Butylbenzene	50	55.2	110	70-130
98-06-6	tert-Butylbenzene	50	53.5	107	70-130
75-15-0	Carbon disulfide	50	57.1	114	70-130
56-23-5	Carbon tetrachloride	50	62.4	125	70-130
108-90-7	Chlorobenzene	50	54.9	110	70-130
75-00-3	Chloroethane	50	61.8	124	70-130
110-75-8	2-Chloroethyl vinyl ether	50	40.0	80	10-160
67-66-3	Chloroform	50	61.7	123	70-130
74-87-3	Chloromethane	50	61.5	123	70-130
95-49-8	o-Chlorotoluene	50	53.8	108	70-130
106-43-4	p-Chlorotoluene	50	57.4	115	70-130
124-48-1	Dibromochloromethane	50	57.2	114	70-130
95-50-1	1,2-Dichlorobenzene	50	55.6	111	70-130
541-73-1	1,3-Dichlorobenzene	50	58.1	116	70-130
106-46-7	1,4-Dichlorobenzene	50	60.2	120	70-130
75-71-8	Dichlorodifluoromethane	50	51.7	103	70-130
75-34-3	1,1-Dichloroethane	50	62.5	125	70-130
107-06-2	1,2-Dichloroethane	50	56.4	113	70-130
75-35-4	1,1-Dichloroethene	50	58.0	116	70-130
156-59-2	cis-1,2-Dichloroethene	50	55.8	112	70-130
156-60-5	trans-1,2-Dichloroethene	50	59.6	119	70-130
78-87-5	1,2-Dichloropropane	50	55.3	111	70-130
142-28-9	1,3-Dichloropropane	50	53.2	106	70-130
594-20-7	2,2-Dichloropropane	50	62.3	125	70-130
563-58-6	1,1-Dichloropropene	50	57.8	116	70-130

* = Outside of Control Limits.

6.2.1



Blank Spike Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2074-BS	M59843.D	1	10/02/13	KD	n/a	n/a	MSM2074

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	56.9	114	70-130
10061-02-6	trans-1,3-Dichloropropene	50	59.9	120	70-130
123-91-1	1,4-Dioxane	250	294	118	70-130
97-63-2	Ethyl methacrylate	50	50.9	102	76-141
100-41-4	Ethylbenzene	50	56.4	113	70-130
87-68-3	Hexachlorobutadiene	50	58.0	116	70-130
591-78-6	2-Hexanone	50	65.9	132* a	70-130
98-82-8	Isopropylbenzene	50	55.7	111	70-130
99-87-6	p-Isopropyltoluene	50	61.3	123	70-130
1634-04-4	Methyl Tert Butyl Ether	50	55.8	112	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	57.8	116	70-130
74-95-3	Methylene bromide	50	63.1	126	70-130
75-09-2	Methylene chloride	50	59.1	118	70-130
91-20-3	Naphthalene	50	58.0	116	70-130
103-65-1	n-Propylbenzene	50	55.9	112	70-130
100-42-5	Styrene	50	58.4	117	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	54.4	109	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	55.0	110	70-130
127-18-4	Tetrachloroethene	50	62.4	125	70-130
108-88-3	Toluene	50	58.4	117	70-130
87-61-6	1,2,3-Trichlorobenzene	50	59.8	120	70-130
120-82-1	1,2,4-Trichlorobenzene	50	64.8	130	70-130
71-55-6	1,1,1-Trichloroethane	50	61.6	123	70-130
79-00-5	1,1,2-Trichloroethane	50	57.0	114	70-130
79-01-6	Trichloroethene	50	56.0	112	70-130
75-69-4	Trichlorofluoromethane	50	53.9	108	70-130
96-18-4	1,2,3-Trichloropropane	50	56.9	114	70-130
95-63-6	1,2,4-Trimethylbenzene	50	57.3	115	70-130
108-67-8	1,3,5-Trimethylbenzene	50	56.7	113	70-130
108-05-4	Vinyl Acetate	50	34.2	68* a	70-130
75-01-4	Vinyl chloride	50	48.8	98	70-130
	m,p-Xylene	100	113	113	70-130
95-47-6	o-Xylene	50	54.2	108	70-130
1330-20-7	Xylene (total)	150	168	112	70-130

* = Outside of Control Limits.

6.2.1



Blank Spike Summary

Page 3 of 3

Job Number: MC24546

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2074-BS	M59843.D	1	10/02/13	KD	n/a	n/a	MSM2074

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-3

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	80%	70-130%
2037-26-5	Toluene-D8	81%	70-130%
460-00-4	4-Bromofluorobenzene	81%	70-130%

(a) Outside control limits. Blank Spike meets program technical requirements.

* = Outside of Control Limits.



Blank Spike/Blank Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV907-BS	V23699.D	1	10/01/13	AMY	n/a	n/a	MSV907
MSV907-BSD	V23700.D	1	10/01/13	AMY	n/a	n/a	MSV907

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	49.2	98	51.3	103	4	70-130/25
107-02-8	Acrolein	250	271	108	271	108	0	70-130/25
107-13-1	Acrylonitrile	50	47.1	94	46.6	93	1	70-130/25
71-43-2	Benzene	50	55.1	110	53.4	107	3	70-130/25
108-86-1	Bromobenzene	50	55.6	111	54.5	109	2	70-130/25
74-97-5	Bromochloromethane	50	54.5	109	53.3	107	2	70-130/25
75-27-4	Bromodichloromethane	50	54.7	109	53.5	107	2	70-130/25
75-25-2	Bromoform	50	46.7	93	45.2	90	3	70-130/25
74-83-9	Bromomethane	50	54.9	110	53.1	106	3	70-130/25
78-93-3	2-Butanone (MEK)	50	57.4	115	56.0	112	2	70-130/25
104-51-8	n-Butylbenzene	50	58.0	116	55.1	110	5	70-130/25
135-98-8	sec-Butylbenzene	50	58.3	117	56.2	112	4	70-130/25
98-06-6	tert-Butylbenzene	50	58.7	117	56.7	113	3	70-130/25
75-15-0	Carbon disulfide	50	56.8	114	55.0	110	3	70-130/25
56-23-5	Carbon tetrachloride	50	55.0	110	52.2	104	5	70-130/25
108-90-7	Chlorobenzene	50	46.2	92	45.1	90	2	70-130/25
75-00-3	Chloroethane	50	60.1	120	58.1	116	3	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	37.1	74	36.5	73	2	70-130/25
67-66-3	Chloroform	50	56.7	113	55.6	111	2	70-130/25
74-87-3	Chloromethane	50	57.8	116	55.4	111	4	70-130/25
95-49-8	o-Chlorotoluene	50	57.1	114	55.8	112	2	70-130/25
106-43-4	p-Chlorotoluene	50	57.4	115	55.6	111	3	70-130/25
124-48-1	Dibromochloromethane	50	49.0	98	48.3	97	1	70-130/25
95-50-1	1,2-Dichlorobenzene	50	50.8	102	50.5	101	1	70-130/25
541-73-1	1,3-Dichlorobenzene	50	52.8	106	51.4	103	3	70-130/25
106-46-7	1,4-Dichlorobenzene	50	52.1	104	51.2	102	2	70-130/25
75-71-8	Dichlorodifluoromethane	50	48.9	98	48.2	96	1	70-130/25
75-34-3	1,1-Dichloroethane	50	63.6	127	62.0	124	3	70-130/25
107-06-2	1,2-Dichloroethane	50	47.7	95	46.8	94	2	70-130/25
75-35-4	1,1-Dichloroethene	50	58.2	116	56.2	112	3	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	58.5	117	56.7	113	3	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	56.4	113	55.6	111	1	70-130/25
78-87-5	1,2-Dichloropropane	50	53.3	107	52.4	105	2	70-130/25
142-28-9	1,3-Dichloropropane	50	50.5	101	50.0	100	1	70-130/25
594-20-7	2,2-Dichloropropane	50	58.4	117	56.2	112	4	70-130/25
563-58-6	1,1-Dichloropropene	50	59.4	119	57.8	116	3	70-130/25

* = Outside of Control Limits.

6.3.1



Blank Spike/Blank Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV907-BS	V23699.D	1	10/01/13	AMY	n/a	n/a	MSV907
MSV907-BSD	V23700.D	1	10/01/13	AMY	n/a	n/a	MSV907

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	50	50.9	102	49.7	99	2	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	51.9	104	51.1	102	2	70-130/25
123-91-1	1,4-Dioxane	250	256	102	240	96	6	70-130/25
97-63-2	Ethyl methacrylate	50	52.0	104	51.5	103	1	77-137/25
100-41-4	Ethylbenzene	50	52.3	105	51.3	103	2	70-130/25
87-68-3	Hexachlorobutadiene	50	63.8	128	60.8	122	5	70-130/25
591-78-6	2-Hexanone	50	47.3	95	48.0	96	1	70-130/25
98-82-8	Isopropylbenzene	50	58.4	117	56.7	113	3	70-130/25
99-87-6	p-Isopropyltoluene	50	59.6	119	57.5	115	4	70-130/25
1634-04-4	Methyl Tert Bntyl Ether	50	58.1	116	57.5	115	1	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	47.2	94	46.9	94	1	70-130/25
74-95-3	Methylene bromide	50	54.5	109	53.6	107	2	70-130/25
75-09-2	Methylene chloride	50	55.1	110	54.0	108	2	70-130/25
91-20-3	Naphthalene	50	53.1	106	52.8	106	1	70-130/25
103-65-1	n-Propylbenzene	50	56.9	114	54.9	110	4	70-130/25
100-42-5	Styrene	50	51.9	104	51.1	102	2	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	46.7	93	46.0	92	2	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	52.2	104	51.3	103	2	70-130/25
127-18-4	Tetrachloroethene	50	58.1	116	56.1	112	4	70-130/25
108-88-3	Toluene	50	59.5	119	58.1	116	2	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	57.2	114	56.2	112	2	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	56.3	113	54.3	109	4	70-130/25
71-55-6	1,1,1-Trichloroethane	50	55.6	111	54.3	109	2	70-130/25
79-00-5	1,1,2-Trichloroethane	50	51.7	103	51.2	102	1	70-130/25
79-01-6	Trichloroethene	50	51.6	103	50.0	100	3	70-130/25
75-69-4	Trichlorofluoromethane	50	47.2	94	44.3	89	6	70-130/25
96-18-4	1,2,3-Trichloropropane	50	52.6	105	52.4	105	0	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	54.8	110	52.9	106	4	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	55.0	110	53.5	107	3	70-130/25
108-05-4	Vinyl Acetate	50	45.0	90	44.3	89	2	70-130/25
75-01-4	Vinyl chloride	50	44.7	89	43.6	87	2	70-130/25
	m,p-Xylene	100	103	103	101	101	2	70-130/25
95-47-6	o-Xylene	50	49.3	99	48.0	96	3	70-130/25
1330-20-7	Xylene (total)	150	152	101	149	99	2	70-130/25

* = Outside of Control Limits.

6.3.1


Blank Spike/Blank Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV907-BS	V23699.D	1	10/01/13	AMY	n/a	n/a	MSV907
MSV907-BSD	V23700.D	1	10/01/13	AMY	n/a	n/a	MSV907

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-2

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	92%	92%	70-130%
2037-26-5	Toluene-D8	104%	105%	70-130%
460-00-4	4-Bromofluorobenzene	104%	105%	70-130%

6.3.1
6

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24544-5MS	V23713.D	1	10/01/13	AMY	n/a	n/a	MSV907
MC24544-5MSD	V23714.D	1	10/01/13	AMY	n/a	n/a	MSV907
MC24544-5	V23707.D	1	10/01/13	AMY	n/a	n/a	MSV907

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-2

CAS No.	Compound	MC24544-5 ug/l	Spike Q	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	50	25.0	50* a	24.6	49* a	2	70-130/30
107-02-8	Acrolein	ND	250	243	97	242	97	0	70-130/30
107-13-1	Acrylonitrile	ND	50	47.9	96	47.1	94	2	70-130/30
71-43-2	Benzene	22.8	50	75.6	106	74.3	103	2	70-130/30
108-86-1	Bromobenzene	ND	50	55.1	110	55.4	111	1	70-130/30
74-97-5	Bromochloromethane	ND	50	53.9	108	53.1	106	1	70-130/30
75-27-4	Bromodichloromethane	ND	50	55.7	111	54.3	109	3	70-130/30
75-25-2	Bromoform	ND	50	48.1	96	48.0	96	0	70-130/30
74-83-9	Bromomethane	ND	50	55.9	112	55.0	110	2	70-130/30
78-93-3	2-Butanone (MEK)	ND	50	36.4	73	35.8	72	2	70-130/30
104-51-8	n-Butylbenzene	ND	50	58.8	118	57.6	115	2	70-130/30
135-98-8	sec-Butylbenzene	ND	50	58.7	117	58.2	116	1	70-130/30
98-06-6	tert-Butylbenzene	ND	50	59.0	118	58.0	116	2	70-130/30
75-15-0	Carbon disulfide	ND	50	58.1	116	57.8	116	1	70-130/30
56-23-5	Carbon tetrachloride	ND	50	58.6	117	56.7	113	3	70-130/30
108-90-7	Chlorobenzene	ND	50	44.6	89	44.6	89	0	70-130/30
75-00-3	Chloroethane	ND	50	60.9	122	60.3	121	1	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	50	ND	0* a	ND	0* a	nc	70-130/30
67-66-3	Chloroform	ND	50	58.4	117	57.2	114	2	70-130/30
74-87-3	Chloromethane	ND	50	58.8	118	58.7	117	0	70-130/30
95-49-8	o-Chlorotoluene	ND	50	57.5	115	56.1	112	2	70-130/30
106-43-4	p-Chlorotoluene	ND	50	57.6	115	56.9	114	1	70-130/30
124-48-1	Dibromochloromethane	ND	50	48.7	97	48.4	97	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	50	51.4	103	51.6	103	0	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	50	52.5	105	52.1	104	1	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	50	52.0	104	52.2	104	0	70-130/30
75-71-8	Dichlorodifluoromethane	ND	50	56.1	112	55.2	110	2	70-130/30
75-34-3	1,1-Dichloroethane	ND	50	64.7	129	63.8	128	1	70-130/30
107-06-2	1,2-Dichloroethane	ND	50	49.8	100	48.6	97	2	70-130/30
75-35-4	1,1-Dichloroethene	ND	50	59.2	118	58.4	117	1	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	50	58.7	117	57.5	115	2	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	50	57.4	115	57.5	115	0	70-130/30
78-87-5	1,2-Dichloropropane	ND	50	52.9	106	52.3	105	1	70-130/30
142-28-9	1,3-Dichloropropane	ND	50	50.0	100	50.3	101	1	70-130/30
594-20-7	2,2-Dichloropropane	ND	50	59.6	119	58.7	117	2	70-130/30
563-58-6	1,1-Dichloropropene	ND	50	61.9	124	60.2	120	3	70-130/30

* = Outside of Control Limits.

6.4.1



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24544-5MS	V23713.D	1	10/01/13	AMY	n/a	n/a	MSV907
MC24544-5MSD	V23714.D	1	10/01/13	AMY	n/a	n/a	MSV907
MC24544-5	V23707.D	1	10/01/13	AMY	n/a	n/a	MSV907

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-2

CAS No.	Compound	MC24544-5 ug/l	Spike Q	ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	50	49.9	100	49.0	98	2	70-130/30	
10061-02-6	trans-1,3-Dichloropropene	ND	50	53.0	106	51.8	104	2	70-130/30	
123-91-1	1,4-Dioxane	ND	250	233	93	216	86	8	70-130/30	
97-63-2	Ethyl methacrylate	ND	50	56.3	113	56.8	114	1	72-139/30	
100-41-4	Ethylbenzene	ND	50	51.9	104	51.4	103	1	70-130/30	
87-68-3	Hexachlorobutadiene	ND	50	65.7	131* a	62.9	126	4	70-130/30	
591-78-6	2-Hexanone	ND	50	33.9	68* a	33.3	67* a	2	70-130/30	
98-82-8	Isopropylbenzene	ND	50	58.6	117	58.1	116	1	70-130/30	
99-87-6	p-Isopropyltoluene	ND	50	59.9	120	59.0	118	2	70-130/30	
1634-04-4	Methyl Tert Butyl Ether	ND	50	58.6	117	59.3	119	1	70-130/30	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	50	50.6	101	50.2	100	1	70-130/30	
74-95-3	Methylene bromide	ND	50	55.3	111	54.6	109	1	70-130/30	
75-09-2	Methylene chloride	ND	50	54.8	110	54.6	109	0	70-130/30	
91-20-3	Naphthalene	ND	50	65.7	131* a	66.9	134* a	2	70-130/30	
103-65-1	n-Propylbenzene	ND	50	56.8	114	56.3	113	1	70-130/30	
100-42-5	Styrene	ND	50	51.3	103	50.3	101	2	70-130/30	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	46.4	93	46.4	93	0	70-130/30	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	55.4	111	56.0	112	1	70-130/30	
127-18-4	Tetrachloroethene	ND	50	56.8	114	56.8	114	0	70-130/30	
108-88-3	Toluene	ND	50	59.2	118	58.7	117	1	70-130/30	
87-61-6	1,2,3-Trichlorobenzene	ND	50	64.9	130	62.7	125	3	70-130/30	
120-82-1	1,2,4-Trichlorobenzene	ND	50	59.6	119	58.6	117	2	70-130/30	
71-55-6	1,1,1-Trichloroethane	ND	50	58.2	116	57.5	115	1	70-130/30	
79-00-5	1,1,2-Trichloroethane	ND	50	51.9	104	51.8	104	0	70-130/30	
79-01-6	Trichloroethene	ND	50	51.9	104	50.6	101	3	70-130/30	
75-69-4	Trichlorofluoromethane	ND	50	51.1	102	50.1	100	2	70-130/30	
96-18-4	1,2,3-Trichloropropane	ND	50	55.9	112	56.7	113	1	70-130/30	
95-63-6	1,2,4-Trimethylbenzene	ND	50	54.4	109	54.4	109	0	70-130/30	
108-67-8	1,3,5-Trimethylbenzene	ND	50	55.4	111	54.7	109	1	70-130/30	
108-05-4	Vinyl Acetate	ND	50	44.6	89	44.5	89	0	70-130/30	
75-01-4	Vinyl chloride	ND	50	46.3	93	45.8	92	1	70-130/30	
	m,p-Xylene	ND	100	102	102	101	101	1	70-130/30	
95-47-6	o-Xylene	ND	50	48.8	98	48.3	97	1	70-130/30	
1330-20-7	Xylene (total)	ND	150	151	101	150	100	1	70-130/30	

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24544-5MS	V23713.D	1	10/01/13	AMY	n/a	n/a	MSV907
MC24544-5MSD	V23714.D	1	10/01/13	AMY	n/a	n/a	MSV907
MC24544-5	V23707.D	1	10/01/13	AMY	n/a	n/a	MSV907

The QC reported here applies to the following samples:


Method: SW846 8260B

MC24546-2

CAS No.	Surrogate Recoveries	MS	MSD	MC24544-5	Limits
1868-53-7	Dibromofluoromethane	93%	92%	93%	70-130%
2037-26-5	Toluene-D8	105%	104%	103%	70-130%
460-00-4	4-Bromofluorobenzene	104%	104%	105%	70-130%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

* = Outside of Control Limits.

6.4.1


Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24582-5MS	M59858.D	1	10/02/13	KD	n/a	n/a	MSM2074
MC24582-5MSD	M59859.D	1	10/02/13	KD	n/a	n/a	MSM2074
MC24582-5	M59857.D	1	10/02/13	KD	n/a	n/a	MSM2074

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-3

CAS No.	Compound	MC24582-5 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	53.5	91.6	171* ^a	143	257* ^a	44* ^b	15	70-130/30
107-02-8	Acrolein	ND	268	80.6	30* ^a	93.6	34* ^a	15	15	70-130/30
107-13-1	Acrylonitrile	ND	53.5	61.3	115	79.7	143* ^a	26	26	70-130/30
71-43-2	Benzene	6.9	53.5	43.4	68* ^a	53.4	84	21	21	70-130/30
108-86-1	Bromobenzene	ND	53.5	28.2	53* ^a	32.3	58* ^a	14	14	70-130/30
74-97-5	Bromochloromethane	ND	53.5	48.4	90	60.9	110	23	23	70-130/30
75-27-4	Bromodichloromethane	ND	53.5	41.7	78	48.9	88	16	16	70-130/30
75-25-2	Bromoform	ND	53.5	38.6	72	43.1	77	11	11	70-130/30
74-83-9	Bromomethane	ND	53.5	46.9	88	61.6	111	27	27	70-130/30
78-93-3	2-Butanone (MEK)	ND	53.5	70.0	131* ^a	93.5	168* ^a	29	29	70-130/30
104-51-8	n-Butylbenzene	ND	53.5	33.1	62* ^a	41.3	74	22	22	70-130/30
135-98-8	sec-Butylbenzene	ND	53.5	35.1	66* ^a	43.8	79	22	22	70-130/30
98-06-6	tert-Butylbenzene	ND	53.5	36.4	68* ^a	45.0	81	21	21	70-130/30
75-15-0	Carbon disulfide	ND	53.5	47.7	89	59.3	107	22	22	70-130/30
56-23-5	Carbon tetrachloride	ND	53.5	50.1	94	62.8	113	22	22	70-130/30
108-90-7	Chlorobenzene	ND	53.5	30.4	57* ^a	35.1	63* ^a	14	14	70-130/30
75-00-3	Chloroethane	ND	53.5	50.7	95	66.3	119	27	27	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	53.5	ND	0* ^a	ND	0* ^a	nc	nc	10-160/30
67-66-3	Chloroform	ND	53.5	47.0	88	58.2	105	21	21	70-130/30
74-87-3	Chloromethane	ND	53.5	51.4	96	66.1	119	25	25	70-130/30
95-49-8	o-Chlorotoluene	ND	53.5	29.8	56* ^a	34.7	62* ^a	15	15	70-130/30
106-43-4	p-Chlorotoluene	ND	53.5	28.3	53* ^a	32.3	58* ^a	13	13	70-130/30
124-48-1	Dibromochloromethane	ND	53.5	39.0	73	46.0	83	16	16	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	53.5	21.3	40* ^a	23.1	42* ^a	8	8	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	53.5	23.5	44* ^a	26.1	47* ^a	10	10	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	53.5	23.5	44* ^a	25.7	46* ^a	9	9	70-130/30
75-71-8	Dichlorodifluoromethane	ND	53.5	44.2	83	57.4	103	26	26	70-130/30
75-34-3	1,1-Dichloroethane	ND	53.5	49.6	93	61.3	110	21	21	70-130/30
107-06-2	1,2-Dichloroethane	ND	53.5	43.5	81	52.9	95	20	20	70-130/30
75-35-4	1,1-Dichloroethene	ND	53.5	48.9	91	60.8	109	22	22	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	53.5	41.8	78	52.2	94	22	22	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	53.5	45.5	85	56.7	102	22	22	70-130/30
78-87-5	1,2-Dichloropropane	ND	53.5	40.1	75	49.0	88	20	20	70-130/30
142-28-9	1,3-Dichloropropane	ND	53.5	39.1	73	46.5	84	17	17	70-130/30
594-20-7	2,2-Dichloropropane	ND	53.5	50.4	94	63.2	114	23	23	70-130/30
563-58-6	1,1-Dichloropropene	ND	53.5	44.8	84	55.7	100	22	22	70-130/30

* = Outside of Control Limits.

6.4.2

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24582-5MS	M59858.D	1	10/02/13	KD	n/a	n/a	MSM2074
MC24582-5MSD	M59859.D	1	10/02/13	KD	n/a	n/a	MSM2074
MC24582-5	M59857.D	1	10/02/13	KD	n/a	n/a	MSM2074

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-3

CAS No.	Compound	MC24582-5 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND		53.5	37.1	69* a	44.4	80	18	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		53.5	38.3	72	44.9	81	16	70-130/30
123-91-1	1,4-Dioxane	ND		268	364	136* a	534	192* a	38* b	70-130/30
97-63-2	Ethyl methacrylate	ND		53.5	39.8	74	46.0	83	14	41-160/30
100-41-4	Ethylbenzene	0.75		53.5	36.1	66* a	43.7	77	19	70-130/30
87-68-3	Hexachlorobutadiene	ND		53.5	27.2	51* a	36.2	65* a	28	70-130/30
591-78-6	2-Hexanone	ND		53.5	53.4	100	69.5	125	26	70-130/30
98-82-8	Isopropylbenzene	ND		53.5	38.2	71	47.1	85	21	70-130/30
99-87-6	p-Isopropyltoluene	ND		53.5	36.6	68* a	45.2	81	21	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		53.5	46.8	87	57.9	104	21	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		53.5	58.8	110	69.1	124	16	70-130/30
74-95-3	Methylene bromide	ND		53.5	48.0	90	58.3	105	19	70-130/30
75-09-2	Methylene chloride	ND		53.5	46.8	87	58.7	106	23	70-130/30
91-20-3	Naphthalene	ND		53.5	11.1	21* a	12.4	22* a	11	70-130/30
103-65-1	n-Propylbenzene	ND		53.5	35.3	66* a	43.0	77	20	70-130/30
100-42-5	Styrene	ND		53.5	24.0	45* a	28.2	51* a	16	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		53.5	35.4	66* a	42.2	76	18	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		53.5	39.5	74	45.9	83	15	70-130/30
127-18-4	Tetrachloroethene	ND		53.5	44.0	82	54.9	99	22	70-130/30
108-88-3	Toluene	4.1		53.5	40.6	68* a	49.3	81	19	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		53.5	13.4	25* a	15.4	28* a	14	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		53.5	15.4	29* a	17.9	32* a	15	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		53.5	50.4	94	61.9	111	20	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		53.5	40.9	76	48.4	87	17	70-130/30
79-01-6	Trichloroethene	ND		53.5	40.9	76	49.5	89	19	70-130/30
75-69-4	Trichlorofluoromethane	ND		53.5	48.9	91	59.3	107	19	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		53.5	42.8	80	49.2	88	14	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND		53.5	31.4	59* a	36.5	66* a	15	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		53.5	33.9	63* a	40.4	73	17	70-130/30
108-05-4	Vinyl Acetate	ND		53.5	29.3	55* a	36.9	66* a	23	70-130/30
75-01-4	Vinyl chloride	ND		53.5	41.9	78	53.2	96	24	70-130/30
	m,p-Xylene	0.90		107	67.6	62* a	80.5	72	17	70-130/30
95-47-6	o-Xylene	ND		53.5	31.3	58* a	36.7	66* a	16	70-130/30
1330-20-7	Xylene (total)	0.90		161	98.8	61* a	117	70	17	70-130/30

* = Outside of Control Limits.

6.4.2


Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24582-5MS	M59858.D	1	10/02/13	KD	n/a	n/a	MSM2074
MC24582-5MSD	M59859.D	1	10/02/13	KD	n/a	n/a	MSM2074
MC24582-5	M59857.D	1	10/02/13	KD	n/a	n/a	MSM2074

The QC reported here applies to the following samples:

Method: SW846 8260B

MC24546-3

CAS No.	Surrogate Recoveries	MS	MSD	MC24582-5	Limits
1868-53-7	Dibromofluoromethane	83%	83%	83%	70-130%
2037-26-5	Toluene-D8	81%	81%	81%	70-130%
460-00-4	4-Bromofluorobenzene	90%	90%	93%	70-130%

- (a) Outside control limits due to possible matrix interference. Refer to Blank Spike.
- (b) High RPD due to possible matrix interference and/or sample non-homogeneity.

* = Outside of Control Limits.



Volatile Internal Standard Area Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSM2074-CC2064	Injection Date:	10/02/13
Lab File ID:	M59842.D	Injection Time:	08:59
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	258611	9.36	398687	10.23	172210	13.51	213084	16.07	104032	6.84
Upper Limit ^a	517222	9.86	797374	10.73	344420	14.01	426168	16.57	208064	7.34
Lower Limit ^b	129306	8.86	199344	9.73	86105	13.01	106542	15.57	52016	6.34

Lab	IS 1	IS 2	IS 3	IS 4	IS 5					
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSM2074-BS	258868	9.36	404389	10.23	172976	13.51	212579	16.07	107228	6.85
MSM2074-MB	248203	9.35	388596	10.23	156398	13.51	188219	16.07	102756	6.85
ZZZZZZ	234854	9.35	369275	10.23	151348	13.51	184119	16.07	168198	6.84
ZZZZZZ	242890	9.35	381260	10.23	153377	13.51	180094	16.07	91871	6.84
ZZZZZZ	240578	9.35	381710	10.23	155086	13.50	182098	16.07	99866	6.85
ZZZZZZ	237998	9.35	370346	10.23	150955	13.50	175318	16.07	92999	6.84
ZZZZZZ	239937	9.35	378793	10.23	152259	13.51	178306	16.07	94762	6.84
ZZZZZZ	241504	9.35	378852	10.23	153437	13.51	180253	16.07	99025	6.84
ZZZZZZ	240875	9.35	379453	10.23	153021	13.51	183372	16.07	99025	6.84
ZZZZZZ	238206	9.35	367918	10.23	149828	13.50	174340	16.07	100333	6.84
ZZZZZZ	241279	9.35	374900	10.23	154333	13.51	182042	16.07	103028	6.85
MC24546-3	220886	9.35	350650	10.23	144416	13.51	171891	16.07	171136	6.84
MC24582-5	210930	9.35	333356	10.23	130365	13.51	140924	16.07	176859	6.84
MC24582-5MS	235287	9.35	370722	10.23	155624	13.51	174075	16.07	186008	6.84
MC24582-5MSD	223343	9.36	351608	10.23	144756	13.51	159748	16.07	195814	6.84
ZZZZZZ	242502	9.35	377645	10.23	155543	13.50	187829	16.07	168470	6.84
ZZZZZZ	237991	9.36	376795	10.23	155283	13.51	185473	16.07	182936	6.84
ZZZZZZ	243938	9.36	382969	10.23	158275	13.51	191926	16.07	135160	6.84
ZZZZZZ	238887	9.35	376982	10.23	155949	13.51	186516	16.07	155178	6.84
ZZZZZZ	241700	9.36	387139	10.23	156905	13.50	199216	16.07	139553	6.84
ZZZZZZ	203820	9.35	325821	10.23	137889	13.50	163164	16.07	140749	6.84
ZZZZZZ	230951	9.35	362442	10.23	148676	13.51	175604	16.07	95443	6.84
ZZZZZZ	229878	9.35	360065	10.23	146534	13.51	173515	16.07	87658	6.84
ZZZZZZ	222321	9.35	355494	10.23	144870	13.51	176770	16.07	160431	6.84

- IS 1 = Pentafluorobenzene
- IS 2 = 1,4-Difluorobenzene
- IS 3 = Chlorobenzene-D5
- IS 4 = 1,4-Dichlorobenzene-d4
- IS 5 = Tert Butyl Alcohol-D9

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
 (b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

6.5.1

Volatile Internal Standard Area Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSV907-CC864	Injection Date:	10/01/13
Lab File ID:	V23699.D	Injection Time:	10:16
Instrument ID:	GCMSV	Method:	SW846 8260B

	IS 1	IS 2	IS 3	IS 4	IS 5
	AREA	RT	AREA	RT	AREA
Check Std	369960	6.57	531401	7.75	302298
Upper Limit ^a	739920	7.07	1062802	8.25	604596
Lower Limit ^b	184980	6.07	265701	7.25	151149

Lab	IS 1	IS 2	IS 3	IS 4	IS 5
Sample ID	AREA	RT	AREA	RT	AREA
MSV907-BS	369960	6.57	531401	7.75	302298
MSV907-BSD	372071	6.58	539618	7.76	308388
MSV907-MB	325775	6.58	494065	7.76	280559
MC24546-2	336902	6.58	503999	7.76	289306
ZZZZZZ	315692	6.57	475665	7.75	275983
MC24647-2	313435	6.58	464174	7.76	271740
MC24544-5	314530	6.58	461412	7.76	271063
ZZZZZZ	302254	6.58	451662	7.76	262707
ZZZZZZ	297676	6.58	442224	7.75	262228
ZZZZZZ	294785	6.58	444505	7.76	261630
MC24647-2MS	325391	6.58	467463	7.76	275914
MC24647-2MSD	332060	6.58	481256	7.76	284322
MC24544-5MS	345466	6.58	494109	7.76	289566
MC24544-5MSD	350295	6.58	508066	7.76	293995
ZZZZZZ	319216	6.58	477679	7.76	275052
ZZZZZZ	313744	6.58	467579	7.76	269347
ZZZZZZ	332977	6.58	463304	7.76	275733
ZZZZZZ	328984	6.58	494412	7.76	283716
ZZZZZZ	326752	6.58	487899	7.76	280401
ZZZZZZ	344839	6.58	496858	7.76	290370
ZZZZZZ	360490	6.58	515486	7.76	301136
ZZZZZZ	353548	6.58	524411	7.76	297647
ZZZZZZ	329514	6.57	492107	7.75	281605

- IS 1 = Pentafluorobenzene
- IS 2 = 1,4-Difluorobenzene
- IS 3 = Chlorobenzene-D5
- IS 4 = 1,4-Dichlorobenzene-d4
- IS 5 = Tert Butyl Alcohol-D9

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

6.5.2

Volatile Surrogate Recovery Summary

Job Number: MC24546

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8260B

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC24546-2	V23704.D	94.0	103.0	105.0
MC24544-5MS	V23713.D	93.0	105.0	104.0
MC24544-5MSD	V23714.D	92.0	104.0	104.0
MSV907-BS	V23699.D	92.0	104.0	104.0
MSV907-BSD	V23700.D	92.0	105.0	105.0
MSV907-MB	V23703.D	95.0	102.0	105.0

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	70-130%
S2 = Toluene-D8	70-130%
S3 = 4-Bromofluorobenzene	70-130%

6.6.1



Volatile Surrogate Recovery Summary

Job Number: MC24546

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8260B	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC24546-3	M59856.D	83.0	83.0	87.0
MC24582-5MS	M59858.D	83.0	81.0	90.0
MC24582-5MSD	M59859.D	83.0	81.0	90.0
MSM2074-BS	M59843.D	80.0	81.0	81.0
MSM2074-MB	M59846.D	80.0	82.0	86.0

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	70-130%
S2 = Toluene-D8	70-130%
S3 = 4-Bromofluorobenzene	70-130%

6.6.2


GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Surrogate Recovery Summaries

Method Blank Summary

Page 1 of 2

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34998-MB	R33851.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24546-3

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	490	61	ug/kg	
95-57-8	2-Chlorophenol	ND	240	11	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	490	12	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	490	14	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	490	79	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	970	120	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	490	61	ug/kg	
95-48-7	2-Methylphenol	ND	490	19	ug/kg	
	3&4-Methylphenol	ND	490	24	ug/kg	
88-75-5	2-Nitrophenol	ND	490	13	ug/kg	
100-02-7	4-Nitrophenol	ND	970	91	ug/kg	
87-86-5	Pentachlorophenol	ND	490	34	ug/kg	
108-95-2	Phenol	ND	240	14	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	490	12	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	490	12	ug/kg	
62-53-3	Aniline	ND	490	24	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	240	12	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	240	9.9	ug/kg	
100-51-6	Benzyl Alcohol	ND	490	24	ug/kg	
91-58-7	2-Chloronaphthalene	ND	240	13	ug/kg	
106-47-8	4-Chloroaniline	ND	490	12	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	240	11	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	240	15	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	240	17	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	240	15	ug/kg	
122-66-7	1,2-Diphenylhydrazine	ND	240	11	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	490	33	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	490	12	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	240	24	ug/kg	
132-64-9	Dibenzofuran	ND	97	13	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	240	26	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	240	7.6	ug/kg	
84-66-2	Diethyl phthalate	ND	240	12	ug/kg	
131-11-3	Dimethyl phthalate	ND	240	14	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	240	9.0	ug/kg	
118-74-1	Hexachlorobenzene	ND	240	15	ug/kg	

7.1.1



Method Blank Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34998-MB	R33851.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24546-3

CAS No.	Compound	Result	RL	MDL	Units	Q
77-47-4	Hexachlorocyclopentadiene	ND	490	120	ug/kg	
67-72-1	Hexachloroethane	ND	240	12	ug/kg	
78-59-1	Isophorone	ND	240	11	ug/kg	
88-74-4	2-Nitroaniline	ND	490	12	ug/kg	
99-09-2	3-Nitroaniline	ND	490	27	ug/kg	
100-01-6	4-Nitroaniline	ND	490	12	ug/kg	
98-95-3	Nitrobenzene	ND	240	13	ug/kg	
62-75-9	n-Nitrosodimethylamine	ND	240	12	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	240	14	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	240	15	ug/kg	
110-86-1	Pyridine	ND	490	24	ug/kg	

CAS No.	Surrogate Recoveries	Limits
367-12-4	2-Fluorophenol	82% 30-130%
4165-62-2	Phenol-d5	82% 30-130%
118-79-6	2,4,6-Tribromophenol	84% 30-130%
4165-60-0	Nitrobenzene-d5	74% 30-130%
321-60-8	2-Fluorobiphenyl	86% 30-130%
1718-51-0	Terphenyl-d14	88% 30-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Semi-Volatile		0	ug/kg	

7.1.1



Method Blank Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34999-MB	W14637.D	1	09/27/13	KR	09/26/13	OP34999	MSW660

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

MC24546-3

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	4.9	0.57	ug/kg	
208-96-8	Acenaphthylene	ND	4.9	0.91	ug/kg	
120-12-7	Anthracene	ND	4.9	0.79	ug/kg	
56-55-3	Benzo(a)anthracene	ND	4.9	0.60	ug/kg	
50-32-8	Benzo(a)pyrene	ND	4.9	0.71	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	4.9	0.59	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	4.9	1.9	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	4.9	0.94	ug/kg	
218-01-9	Chrysene	ND	4.9	0.75	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	4.9	1.4	ug/kg	
206-44-0	Fluoranthene	ND	4.9	0.77	ug/kg	
86-73-7	Fluorene	ND	4.9	0.43	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	4.9	1.2	ug/kg	
90-12-0	1-Methylnaphthalene	ND	9.7	9.7	ug/kg	
91-57-6	2-Methylnaphthalene	ND	4.9	1.0	ug/kg	
85-01-8	Phenanthrene	ND	4.9	0.96	ng/kg	
129-00-0	Pyrene	ND	4.9	1.7	ug/kg	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	42%	15-110%
4165-62-2	Phenol-d5	40%	15-110%
118-79-6	2,4,6-Tribromophenol	45%	15-110%
4165-60-0	Nitrobenzene-d5	85%	30-130%
321-60-8	2-Fluorobiphenyl	80%	30-130%
1718-51-0	Terphenyl-d14	105%	30-130%

7.1.2



Blank Spike Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prcp Date	Prep Batch	Analytical Batch
OP34998-BS	R33852.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24546-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
65-85-0	Benzoic acid	2410	2190	91	30-130
95-57-8	2-Chlorophenol	2410	2160	90	30-130
59-50-7	4-Chloro-3-methyl phenol	2410	2040	85	30-130
120-83-2	2,4-Dichlorophenol	2410	2300	95	30-130
105-67-9	2,4-Dimethylphenol	2410	2050	85	30-130
51-28-5	2,4-Dinitrophenol	2410	1350	56	30-130
534-52-1	4,6-Dinitro-o-cresol	2410	1720	71	30-130
95-48-7	2-Methylphenol	2410	2210	92	30-130
	3&4-Methylphenol	4820	4230	88	30-130
88-75-5	2-Nitrophenol	2410	2240	93	30-130
100-02-7	4-Nitrophenol	2410	1740	72	30-130
87-86-5	Pentachlorophenol	2410	1950	81	30-130
108-95-2	Phenol	2410	2330	97	30-130
95-95-4	2,4,5-Trichlorophenol	2410	2360	98	30-130
88-06-2	2,4,6-Trichlorophenol	2410	2300	95	30-130
62-53-3	Aniline	2410	1710	71	40-140
101-55-3	4-Bromophenyl phenyl ether	2410	2310	96	40-140
85-68-7	Butyl benzyl phthalate	2410	2470	102	40-140
100-51-6	Benzyl Alcohol	2410	2020	84	40-140
91-58-7	2-Chloronaphthalene	2410	2290	95	40-140
106-47-8	4-Chloroaniline	2410	1760	73	40-140
111-91-1	bis(2-Chloroethoxy)methane	2410	2030	84	40-140
111-44-4	bis(2-Chloroethyl)ether	2410	2070	86	40-140
108-60-1	bis(2-Chloroisopropyl)ether	2410	2570	107	40-140
7005-72-3	4-Chlorophenyl phenyl ether	2410	2350	97	40-140
122-66-7	1,2-Diphenylhydrazine	2410	1980	82	40-140
121-14-2	2,4-Dinitrotolene	2410	2340	97	40-140
606-20-2	2,6-Dinitrotoluene	2410	2290	95	40-140
91-94-1	3,3'-Dichlorobenzidine	2410	2340	97	40-140
132-64-9	Dibenzofuran	2410	2060	85	40-140
84-74-2	Di-n-butyl phthalate	2410	2410	100	40-140
117-84-0	Di-n-octyl phthalate	2410	2570	107	40-140
84-66-2	Diethyl phthalate	2410	2340	97	40-140
131-11-3	Dimethyl phthalate	2410	2320	96	40-140
117-81-7	bis(2-Ethylhexyl)phthalate	2410	2390	99	40-140
118-74-1	Hexachlorohenzene	2410	2170	90	40-140

* = Outside of Control Limits.

7.2.1
7

Blank Spike Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34998-BS	R33852.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24546-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
77-47-4	Hexachlorocyclopentadiene	2410	853	35* a	40-140
67-72-1	Hexachloroethane	2410	1850	77	40-140
78-59-1	Isophorone	2410	2040	85	40-140
88-74-4	2-Nitroaniline	2410	2400	100	40-140
99-09-2	3-Nitroaniline	2410	1960	81	40-140
100-01-6	4-Nitroaniline	2410	2220	92	40-140
98-95-3	Nitrobenzene	2410	1790	74	40-140
62-75-9	n-Nitrosodimethylamine	2410	1860	77	40-140
621-64-7	N-Nitroso-di-n-propylamine	2410	1990	83	40-140
86-30-6	N-Nitrosodiphenylamine	2410	2280	95	40-140
110-86-1	Pyridine	2410	1510	63	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	87%	30-130%
4165-62-2	Phenol-d5	85%	30-130%
118-79-6	2,4,6-Tribromophenol	89%	30-130%
4165-60-0	Nitrobenzene-d5	76%	30-130%
321-60-8	2-Fluorobiphenyl	89%	30-130%
1718-51-0	Terphenyl-d14	95%	30-130%

(a) Outside control limits. Blank Spike meets program technical requirements.

* = Outside of Control Limits.

7.2.1
 7

Blank Spike Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34999-BS	W14638.D	1	09/27/13	KR	09/26/13	OP34999	MSW660

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

MC24546-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Accnaphthene	2410	1880	78	40-140
208-96-8	Accnaphthylene	2410	1820	75	40-140
120-12-7	Anthracene	2410	1930	80	40-140
56-55-3	Benzo(a)anthracene	2410	2410	100	40-140
50-32-8	Benzo(a)pyrene	2410	2120	88	40-140
205-99-2	Benzo(b)fluoranthene	2410	2550	106	40-140
191-24-2	Benzo(g,h,i)perylene	2410	2170	90	40-140
207-08-9	Benzo(k)fluoranthene	2410	2360	98	40-140
218-01-9	Chrysene	2410	1860	77	40-140
53-70-3	Dibenzo(a,h)anthracene	2410	2230	92	40-140
206-44-0	Fluoranthene	2410	2250	93	40-140
86-73-7	Fluorene	2410	2020	84	40-140
193-39-5	Indeno(1,2,3-cd)pyrene	2410	2250	93	40-140
90-12-0	1-Methylnaphthalene	2410	1930	80	40-140
91-57-6	2-Methylnaphthalene	2410	1950	81	40-140
85-01-8	Phenanthrene	2410	1880	78	40-140
129-00-0	Pyrene	2410	2150	89	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	42%	15-110%
4165-62-2	Phenol-d5	40%	15-110%
118-79-6	2,4,6-Tribromophenol	53%	15-110%
4165-60-0	Nitrobenzene-d5	87%	30-130%
321-60-8	2-Fluorobiphenyl	82%	30-130%
1718-51-0	Terphenyl-d14	105%	30-130%

* = Outside of Control Limits.

7.2.2
7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prpc Date	Prep Batch	Analytical Batch
OP34998-MS	R33853.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231
OP34998-MSD	R33854.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231
MC24546-3	R33855.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24546-3

CAS No.	Compound	MC24546-3 ug/kg	Spike Q	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
65-85-0	Benzoic acid	ND	2860	344	12* a	352	12* a	2	30-130/30
95-57-8	2-Chlorophenol	ND	2860	2070	72	2500	88	19	30-130/30
59-50-7	4-Chloro-3-methyl phenol	ND	2860	2020	71	2380	84	16	30-130/30
120-83-2	2,4-Dichlorophenol	ND	2860	2140	75	2640	93	21	30-130/30
105-67-9	2,4-Dimethylphenol	ND	2860	1800	63	2240	79	22	30-130/30
51-28-5	2,4-Dinitrophenol	ND	2860	ND	0* a	185	7* a	200* b	30-130/30
534-52-1	4,6-Dinitro-o-cresol	ND	2860	872	31	1530	54	55* b	30-130/30
95-48-7	2-Methylphenol	ND	2860	2090	73	2560	90	20	30-130/30
	3&4-Methylphenol	ND	5720	4030	70	4900	86	19	30-130/30
88-75-5	2-Nitrophenol	ND	2860	2150	75	2580	91	18	30-130/30
100-02-7	4-Nitrophenol	ND	2860	1760	62	1870	66	6	30-130/30
87-86-5	Pentachlorophenol	ND	2860	1830	64	2130	75	15	30-130/30
108-95-2	Phenol	ND	2860	2290	80	2680	94	16	30-130/30
95-95-4	2,4,5-Trichlorophenol	ND	2860	2410	84	2790	98	15	30-130/30
88-06-2	2,4,6-Trichlorophenol	ND	2860	2260	79	2570	90	13	30-130/30
62-53-3	Aniline	ND	2860	1640	57	2050	72	22	40-140/30
101-55-3	4-Bromophenyl phenyl ether	ND	2860	2390	84	2680	94	11	40-140/30
85-68-7	Butyl benzyl phthalate	ND	2860	2650	93	2800	98	6	40-140/30
100-51-6	Benzyl Alcohol	ND	2860	1850	65	2350	83	24	40-140/30
91-58-7	2-Chloronaphthalene	ND	2860	2200	77	2610	92	17	40-140/30
106-47-8	4-Chloroaniline	ND	2860	1750	61	2170	76	21	40-140/30
111-91-1	bis(2-Chloroethoxy)methane	ND	2860	1930	68	2400	84	22	40-140/30
111-44-4	bis(2-Chloroethyl)ether	ND	2860	1980	69	2460	86	22	40-140/30
108-60-1	bis(2-Chloroisopropyl)ether	ND	2860	2420	85	2910	102	18	40-140/30
7005-72-3	4-Chlorophenyl phenyl ether	ND	2860	2330	82	2620	92	12	40-140/30
122-66-7	1,2-Diphenylhydrazine	ND	2860	2010	70	2520	89	23	40-140/30
121-14-2	2,4-Dinitrotoluene	ND	2860	2460	86	2670	94	8	40-140/30
606-20-2	2,6-Dinitrotoluene	ND	2860	2320	81	2610	92	12	40-140/30
91-94-1	3,3'-Dichlorobenzidine	ND	2860	2610	91	2780	98	6	40-140/30
132-64-9	Dibenzofuran	ND	2860	2070	72	2440	86	16	40-140/30
84-74-2	Di-n-butyl phthalate	ND	2860	2530	89	2730	96	8	40-140/30
117-84-0	Di-n-octyl phthalate	ND	2860	2750	96	2940	103	7	40-140/30
84-66-2	Diethyl phthalate	ND	2860	2390	84	2760	97	14	40-140/30
131-11-3	Dimethyl phthalate	ND	2860	2330	82	2670	94	14	40-140/30
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2860	2600	91	2760	97	6	40-140/30
118-74-1	Hexachlorohenzene	ND	2860	2300	80	2600	91	12	40-140/30

* = Outside of Control Limits.

7.3.1
 7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34998-MS	R33853.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231
OP34998-MSD	R33854.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231
MC24546-3	R33855.D	1	09/27/13	KR	09/26/13	OP34998	MSR1231

The QC reported here applies to the following samples:

Method: SW846 8270C

MC24546-3

CAS No.	Compound	MC24546-3 ug/kg	Spike Q	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
77-47-4	Hexachlorocyclopentadiene	ND	2860	763	27* a	937	33* a	20	40-140/30
67-72-1	Hexachloroethane	ND	2860	1710	60	2180	77	24	40-140/30
78-59-1	Isophorone	ND	2860	1900	66	2320	82	20	40-140/30
88-74-4	2-Nitroaniline	ND	2860	2460	86	2750	97	11	40-140/30
99-09-2	3-Nitroaniline	ND	2860	2120	74	2510	88	17	40-140/30
100-01-6	4-Nitroaniline	ND	2860	2390	84	2620	92	9	40-140/30
98-95-3	Nitrobenzene	ND	2860	1720	60	2130	75	21	40-140/30
62-75-9	n-Nitrosodimethylamine	ND	2860	1750	61	2170	76	21	40-140/30
621-64-7	N-Nitroso-di-n-propylamine	ND	2860	1880	66	2320	82	21	40-140/30
86-30-6	N-Nitrosodiphenylamine	ND	2860	2410	84	2670	94	10	40-140/30
110-86-1	Pyridine	ND	2860	1410	49	1860	65	28	40-140/30

CAS No.	Surrogate Recoveries	MS	MSD	MC24546-3	Limits
367-12-4	2-Fluorophenol	70%	83%	73%	30-130%
4165-62-2	Phenol-d5	69%	83%	70%	30-130%
118-79-6	2,4,6-Tribromophenol	74%	82%	72%	30-130%
4165-60-0	Nitrobenzene-d5	62%	77%	65%	30-130%
321-60-8	2-Fluorobiphenyl	73%	87%	74%	30-130%
1718-51-0	Terphenyl-d14	86%	92%	82%	30-130%

- (a) Outside control limits due to possible matrix interference. Refer to Blank Spike.
- (b) High RPD dne to possible matrix interference aud/or sample non-homogeneity.

* = Outside of Control Limits.

7.3.1
7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34999-MS	W14639.D	1	09/27/13	KR	09/26/13	OP34999	MSW660
OP34999-MSD	W14640.D	1	09/27/13	KR	09/26/13	OP34999	MSW660
MC24546-3	W14641.D	1	09/27/13	KR	09/26/13	OP34999	MSW660

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

MC24546-3

CAS No.	Compound	MC24546-3 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND	2860	1860	65	2180	77	16	40-140/30
208-96-8	Acenaphthylene	ND	2860	1830	64	2140	75	16	40-140/30
120-12-7	Anthracene	ND	2860	2110	74	2270	80	7	40-140/30
56-55-3	Benzo(a)anthracene	ND	2860	2620	92	2790	98	6	40-140/30
50-32-8	Benzo(a)pyrene	ND	2860	2300	80	2460	86	7	40-140/30
205-99-2	Benzo(b)fluoranthene	ND	2860	2730	96	2930	103	7	40-140/30
191-24-2	Benzo(g,h,i)perylene	ND	2860	2320	81	2520	89	8	40-140/30
207-08-9	Benzo(k)fluoranthene	ND	2860	2590	91	2750	97	6	40-140/30
218-01-9	Chrysene	ND	2860	2010	70	2160	76	7	40-140/30
53-70-3	Dibenzo(a,h)anthracene	ND	2860	2370	83	2590	91	9	40-140/30
206-44-0	Fluoranthene	ND	2860	2460	86	2590	91	5	40-140/30
86-73-7	Fluorene	ND	2860	2080	73	2350	83	12	40-140/30
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2860	2390	84	2610	92	9	40-140/30
90-12-0	1-Methylnaphthalene	ND	2860	1900	66	2230	78	16	40-140/30
91-57-6	2-Methylnaphthalene	ND	2860	1930	68	2250	79	15	40-140/30
85-01-8	Phenanthrene	ND	2860	2030	71	2200	77	8	40-140/30
129-00-0	Pyrene	ND	2860	2340	82	2490	87	6	40-140/30

CAS No.	Surrogate Recoveries	MS	MSD	MC24546-3	Limits
367-12-4	2-Fluorophenol	35%	40%	37%	15-110%
4165-62-2	Phenol-d5	33%	39%	36%	15-110%
118-79-6	2,4,6-Tribromophenol	46%	51%	41%	15-110%
4165-60-0	Nitrobenzene-d5	72%	84%	76%	30-130%
321-60-8	2-Fluorobiphenyl	68%	81%	72%	30-130%
1718-51-0	Terphenyl-d14	99%	104%	95%	30-130%

* = Outside of Control Limits.

7.3.2
7

Semivolatiles Internal Standard Area Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSR1231-CC1159	Injection Date:	09/27/13
Lab File ID:	R33837.D	Injection Time:	07:48
Instrument ID:	GCMSR	Method:	SW846 8270C

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	71081	3.83	266294	4.88	161625	6.39	285718	7.75	320038	10.66	300208	12.24
Upper Limit ^a	142162	4.33	532588	5.38	323250	6.89	571436	8.25	640076	11.16	600416	12.74
Lower Limit ^b	35541	3.33	133147	4.38	80813	5.89	142859	7.25	160019	10.16	150104	11.74

Lab Sample ID	IS 1 AREA	IS 1 RT	IS 2 AREA	IS 2 RT	IS 3 AREA	IS 3 RT	IS 4 AREA	IS 4 RT	IS 5 AREA	IS 5 RT	IS 6 AREA	IS 6 RT
OP34971-MB	69141	3.83	253156	4.87	154986	6.39	262679	7.74	276239	10.66	271774	12.23
OP34971-BS	70251	3.83	254225	4.88	156620	6.39	266699	7.75	287171	10.66	272501	12.23
ZZZZZZ	67642	3.83	239552	4.87	149777	6.39	255409	7.75	277966	10.66	264654	12.23
OP34972-MB	84129	3.83	299892	4.87	187524	6.39	325376	7.75	357264	10.66	348804	12.23
OP34972-BS	78607	3.83	285463	4.88	174089	6.39	302280	7.75	329562	10.66	319496	12.24
ZZZZZZ	79320	3.83	288025	4.87	181075	6.39	309165	7.75	341858	10.66	330155	12.23
ZZZZZZ	72344	3.83	264338	4.87	162695	6.39	283055	7.75	312862	10.66	303169	12.23
ZZZZZZ	75572	3.83	282434	4.87	174807	6.39	304295	7.75	335140	10.66	317723	12.23
ZZZZZZ	73588	3.83	274230	4.88	173842	6.39	294161	7.75	334389	10.66	320813	12.23
ZZZZZZ	75459	3.83	270187	4.87	171432	6.39	291245	7.75	328319	10.66	328074	12.23
ZZZZZZ	75960	3.83	267393	4.87	166225	6.39	296751	7.75	323919	10.66	318859	12.23
ZZZZZZ	77510	3.83	290588	4.87	179969	6.39	312465	7.74	341583	10.66	329193	12.24
ZZZZZZ	76698	3.83	278719	4.87	173950	6.39	299107	7.75	327559	10.66	328089	12.24
OP34998-MB	77543	3.83	278497	4.87	169910	6.39	285377	7.75	325133	10.66	312520	12.23
OP34998-BS	78587	3.83	287391	4.88	175848	6.39	301343	7.75	336974	10.66	328864	12.24
OP34998-MS	83092	3.83	305289	4.88	185401	6.39	313219	7.75	341617	10.66	332423	12.24
OP34998-MSD	78723	3.83	290315	4.87	179034	6.39	310199	7.75	345810	10.66	334520	12.23
MC24546-3	80467	3.83	293122	4.87	181984	6.39	315477	7.74	340877	10.66	329731	12.23
ZZZZZZ	78978	3.83	284077	4.87	178560	6.39	312929	7.74	340930	10.66	324198	12.23
ZZZZZZ	87016	3.86	264226	4.90	183572	6.40	303082	7.75	330296	10.66	314248	12.24
ZZZZZZ	75420	3.83	269854	4.87	163872	6.39	286691	7.75	309334	10.66	297324	12.23
ZZZZZZ	70705	3.83	258130	4.87	158011	6.39	276364	7.74	301279	10.66	286553	12.23
ZZZZZZ	69055	3.83	257834	4.87	158535	6.39	274032	7.74	301308	10.66	296222	12.23
ZZZZZZ	78891	3.83	297498	4.87	186188	6.39	316269	7.75	340182	10.67	336469	12.24

- IS 1 = 1,4-Dichlorobenzene-d4
- IS 2 = Naphthalene-d8
- IS 3 = Acenaphthene-D10
- IS 4 = Phenanthrene-d10
- IS 5 = Chrysene-d12
- IS 6 = Perylene-d12

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
 (b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

7.4.1
7

Semivolatiles Internal Standard Area Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	MSW660-CC657	Injection Date:	09/27/13
Lab File ID:	W14631.D	Injection Time:	16:14
Instrument ID:	GCM5W	Method:	SW846 8270C BY SIM

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	78082	4.52	200030	5.66	106261	7.31	177606	8.69	155352	11.57	296946	13.54
Upper Limit ^a	156164	5.02	400060	6.16	212522	7.81	355212	9.19	310704	12.07	593892	14.04
Lower Limit ^b	39041	4.02	100015	5.16	53131	6.81	88803	8.19	77676	11.07	148473	13.04

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
OP34882-MB	74592	4.52	193340	5.66	100688	7.31	170249	8.69	141053	11.57	279750	13.54
OP34882-BS	75263	4.52	194343	5.66	102803	7.31	172486	8.69	146830	11.57	281382	13.54
OP34882-MS	76188	4.52	197004	5.66	104404	7.31	173583	8.69	150027	11.57	287334	13.54
OP34882-MSD	65803	4.52	172660	5.66	91091	7.31	152437	8.70	131168	11.57	251603	13.54
MC24300-20	63596	4.52	168414	5.66	87506	7.31	148561	8.69	124012	11.56	244528	13.54
OP34999-MB	79601	4.52	204263	5.66	106998	7.31	178712	8.69	149263	11.57	284647	13.54
OP34999-BS	82226	4.52	210046	5.66	111043	7.31	184237	8.70	154017	11.57	288715	13.54
OP34999-MS	83395	4.52	215478	5.66	114528	7.31	188510	8.70	157345	11.57	297503	13.54
OP34999-MSD	73293	4.52	192497	5.66	100828	7.31	168796	8.69	142164	11.57	270514	13.54
MC24546-3	63784	4.52	167540	5.66	87335	7.31	148837	8.69	123833	11.57	245138	13.54
ZZZZZZ	73133	4.52	188261	5.66	97147	7.31	161257	8.69	131849	11.57	254538	13.54
ZZZZZZ	71743	4.52	185300	5.66	96741	7.31	157594	8.69	129378	11.57	247802	13.54
ZZZZZZ	65781	4.52	171935	5.66	90602	7.31	151028	8.69	124386	11.57	239063	13.54
ZZZZZZ	60914	4.52	162752	5.66	86057	7.31	146626	8.69	124653	11.57	245557	13.54
ZZZZZZ	63942	4.52	170429	5.66	89961	7.31	152504	8.69	129234	11.57	252365	13.54
ZZZZZZ	58287	4.52	156841	5.66	82094	7.31	138801	8.69	118710	11.57	233058	13.54
ZZZZZZ	59145	4.52	157065	5.66	82490	7.31	140997	8.69	119348	11.57	234092	13.54
ZZZZZZ	52828	4.52	143922	5.66	74218	7.31	126194	8.69	106707	11.57	211406	13.54
ZZZZZZ	59204	4.52	159855	5.66	84858	7.31	142673	8.69	122117	11.57	241530	13.54
ZZZZZZ	54147	4.52	144231	5.66	74787	7.31	122559	8.70	106158	11.57	212063	13.54
ZZZZZZ	51857	4.52	140290	5.66	73904	7.31	127208	8.69	107762	11.57	212348	13.54
ZZZZZZ	57164	4.52	150322	5.66	77857	7.31	127079	8.70	109452	11.57	217803	13.54

- IS 1 = 1,4-Dichlorobenzene-d4
- IS 2 = Naphthalene-d8
- IS 3 = Acenaphthene-D10
- IS 4 = Phenanthrene-d10
- IS 5 = Chrysene-d12
- IS 6 = Perylene-d12

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

7.4.2
7

Semivolatile Surrogate Recovery Summary

Job Number: MC24546

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8270C

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
MC24546-3	R33855.D	73.0	70.0	72.0	65.0	74.0	82.0
OP34998-BS	R33852.D	87.0	85.0	89.0	76.0	89.0	95.0
OP34998-MB	R33851.D	82.0	82.0	84.0	74.0	86.0	88.0
OP34998-MS	R33853.D	70.0	69.0	74.0	62.0	73.0	86.0
OP34998-MSD	R33854.D	83.0	83.0	82.0	77.0	87.0	92.0

Surrogate Compounds Recovery Limits

- S1 = 2-Fluorophenol 30-130%
- S2 = Phenol-d5 30-130%
- S3 = 2,4,6-Tribromophenol 30-130%
- S4 = Nitrobenzene-d5 30-130%
- S5 = 2-Fluorobiphenyl 30-130%
- S6 = Terphenyl-d14 30-130%

7.5.1
7

Semivolatile Surrogate Recovery Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8270C BY SIM	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
MC24546-3	W14641.D	37.0	36.0	41.0	76.0	72.0	95.0
OP34999-BS	W14638.D	42.0	40.0	53.0	87.0	82.0	105.0
OP34999-MB	W14637.D	42.0	40.0	45.0	85.0	80.0	105.0
OP34999-MS	W14639.D	35.0	33.0	46.0	72.0	68.0	99.0
OP34999-MSD	W14640.D	40.0	39.0	51.0	84.0	81.0	104.0

Surrogate Compounds	Recovery Limits
S1 = 2-Fluorophenol	15-110%
S2 = Phenol-d5	15-110%
S3 = 2,4,6-Tribromophenol	15-110%
S4 = Nitrobenzene-d5	30-130%
S5 = 2-Fluorobiphenyl	30-130%
S6 = Terphenyl-d14	30-130%

7.5.2
7

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries



Method Blank Summary

Job Number: MC24546
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34909-MB	BK29872.D	1	09/25/13	NK	09/20/13	OP34909	GBK996

The QC reported here applies to the following samples:

Method: SW846 8011

MC24546-3

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.4	0.60	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.4	0.90	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	129% 61-167%
460-00-4	Bromofluorobenzene (S)	119% 61-167%

8.1.1

8

Method Blank Summary

Job Number: MC24546
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP35070-MB	YZ84345.D	1	10/02/13	CZ	10/02/13	OP35070	GYZ7320

The QC reported here applies to the following samples:

Method: SW846 8011

MC24546-1

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.0045	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.0097	ug/l	

CAS No.	Surrogate Recoveries		Limits
460-00-4	Bromofluorobenzene (S)	85%	36-173%
460-00-4	Bromofluorobenzene (S)	82%	36-173%

8.1.2



Method Blank Summary

Job Number: MC24546
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBH1842-MB	BH31579.D	1	09/27/13	TB	n/a	n/a	GBH1842

The QC reported here applies to the following samples:

Method: SW846 8015

MC24546-3

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	5.0	1.1	mg/kg	

CAS No.	Surrogate Recoveries	Limits
	2,3,4-Trifluorotoluene	77% 61-116%

8.1.3



Blank Spike Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34909-BS	BK29873.D	1	09/25/13	NK	09/20/13	OP34909	GBK996

The QC reported here applies to the following samples:

Method: SW846 8011

MC24546-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	32.73	46.0	141	59-142
106-93-4	1,2-Dibromoethane	32.73	43.7	134	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	152%	6I-167%
460-00-4	Bromofluorobenzene (S)	127%	6I-167%

8.2.1


* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP35070-BS	YZ84346.D	1	10/02/13	CZ	10/02/13	OP35070	GYZ7320

The QC reported here applies to the following samples:

Method: SW846 8011

MC24546-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.066	93	60-140
106-93-4	1,2-Dibromoethane	0.071	0.063	89	60-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	90%	36-173%
460-00-4	Bromofluorobenzene (S)	89%	36-173%

8.2.2



* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBH1842-BSP	BH31580.D	1	09/27/13	TB	u/a	n/a	GBH1842

The QC reported here applies to the following samples:

Method: SW846 8015

MC24546-3

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (VOA)	20	15.7	79	66-126

CAS No.	Surrogate Recoveries	BSP	Limits
	2,3,4-Trifluorotoluene	77%	61-116%

8.2.3

8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP34909-MS	BK29874.D	1	09/25/13	NK	09/20/13	OP34909	GBK996
OP34909-MSD	BK29875.D	1	09/25/13	NK	09/20/13	OP34909	GBK996
MC24403-3	BK29876.D	1	09/25/13	NK	09/20/13	OP34909	GBK996

The QC reported here applies to the following samples:

Method: SW846 8011

MC24546-3

CAS No.	Compound	MC24403-3 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND		40.95	61.0	149	60.1	145	1	40-156/27
106-93-4	1,2-Dibromoethane	ND		40.95	56.6	138	56.3	136	1	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC24403-3	Limits
460-00-4	Bromofluorobenzene (S)	155%	159%	148%	61-167%
460-00-4	Bromofluorobenzene (S)	135%	133%	130%	61-167%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP35070-MS	YZ84348.D	1	10/02/13	CZ	10/02/13	OP35070	GYZ7320
OP35070-MSD	YZ84349.D	1	10/02/13	CZ	10/02/13	OP35070	GYZ7320
MC24800-9	YZ84350.D	1	10/02/13	CZ	10/02/13	OP35070	GYZ7320

The QC reported here applies to the following samples:

Method: SW846 8011

MC24546-1

CAS No.	Compound	MC24800-9 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.071	0.077	108	0.065	92	17	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.071	0.072	101	0.064	90	12	63-163/27



CAS No.	Surr ogate Recoveries	MS	MSD	MC24800-9	Limits
460-00-4	Bromofluorobenzene (S)	105%	97%	96%	36-173%
460-00-4	Bromofluorobenzene (S)	104%	94%	95%	36-173%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC24505-10MS	BH31595.D	1	09/28/13	TB	n/a	n/a	GBH1842
MC24505-10MSD	BH31596.D	1	09/28/13	TB	n/a	n/a	GBH1842
MC24505-10	BH31594.D	1	09/28/13	TB	n/a	n/a	GBH1842

The QC reported here applies to the following samples: Method: SW846 8015

MC24546-3

CAS No.	Compound	MC24505-10 Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD	
	TPH-GRO (VOA)	10 U	41.5	31.5	76	34.9	84	10	41-150/20
CAS No.	Surrogate Recoveries	MS	MSD	MC24505-10 Limits					
	2,3,4-Trifluorotoluene	77%	77%	76%	61-116%				



* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Job Number: MC24546

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8011

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC24546-1	YZ84347.D	92.0	89.0
OP35070-BS	YZ84346.D	90.0	89.0
OP35070-MB	YZ84345.D	85.0	82.0
OP35070-MS	YZ84348.D	105.0	104.0
OP35070-MSD	YZ84349.D	97.0	94.0

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 36-173%

(a) Recovery from GC signal #2

(b) Recovery from GC signal #1

8.4.1

8

Volatile Surrogate Recovery Summary

Job Number: MC24546
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8011

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC24546-3	BK29880.D	135.0	120.0
OP34909-BS	BK29873.D	152.0	127.0
OP34909-MB	BK29872.D	129.0	119.0
OP34909-MS	BK29874.D	155.0	135.0
OP34909-MSD	BK29875.D	159.0	133.0

Surrogate Compounds	Recovery Limits
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S1 = Bromofluorobenzene (S) 61-167%

(a) Recovery from GC signal #2

(b) Recovery from GC signal #1

8.4.2



Volatile Surrogate Recovery Summary

Job Number: MC24546

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Method: SW846 8015

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a
MC24546-3	BH31604.D	76.0
GBH1842-BSP	BH31580.D	77.0
GBH1842-MB	BH31579.D	77.0
MC24505-10MS	BH31595.D	77.0
MC24505-10MSD	BH31596.D	77.0

Surrogate Compounds	Recovery Limits
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S1 = 2,3,4-Trifluorotoluene 61-116%

(a) Recovery from GC signal #1

8.4.3

8

GC Surrogate Retention Time Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBK996-ICC996	Injection Date:	09/25/13
Lab File ID:	BK29866.D	Injection Time:	12:06
Instrument ID:	GCBK	Method:	SW846 8011

	S1 ^a RT	S1 ^b RT
Check Std	4.11	5.11

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
OP34909-MB	BK29872.D	09/25/13	15:39	4.11	5.12
OP34909-BS	BK29873.D	09/25/13	16:02	4.12	5.12
OP34909-MS	BK29874.D	09/25/13	16:25	4.12	5.12
OP34909-MSD	BK29875.D	09/25/13	16:48	4.12	5.12
MC24403-3	BK29876.D	09/25/13	17:16	4.12	5.12
ZZZZZZ	BK29877.D	09/25/13	17:39	4.12	5.12
ZZZZZZ	BK29878.D	09/25/13	18:03	4.12	5.12
ZZZZZZ	BK29879.D	09/25/13	18:27	4.12	5.12
MC24546-3	BK29880.D	09/25/13	18:51	4.12	5.12
ZZZZZZ	BK29881.D	09/25/13	19:15	4.12	5.12

Surrogate
Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

8.5.1
8

GC Surrogate Retention Time Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GYZ7320-ICC7320	Injection Date:	10/02/13
Lab File ID:	YZ84340.D	Injection Time:	10:49
Instrument ID:	GCRYZ	Method:	SW846 8011

S1^a S1^b
 RT RT

Check Std	3.11	3.02
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
ZZZZZZ	YZ84342A.D	10/02/13	11:40	3.11	3.02
OP35070-MB	YZ84345.D	10/02/13	12:56	3.11	3.02
OP35070-BS	YZ84346.D	10/02/13	13:21	3.11	3.02
MC24546-1	YZ84347.D	10/02/13	13:46	3.11	3.02
OP35070-MS	YZ84348.D	10/02/13	14:11	3.11	3.02
OP35070-MSD	YZ84349.D	10/02/13	14:36	3.11	3.02
MC24800-9	YZ84350.D	10/02/13	15:02	3.11	3.02
GYZ7320-ECC7320	YZ84351.D	10/02/13	15:27	3.11	3.02

Surrogate
 Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

8.5.2

GC Surrogate Retention Time Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBH1842-CC1786	Injection Date:	09/27/13
Lab File ID:	BH31578.D	Injection Time:	15:40
Instrument ID:	GCBH	Method:	SW846 8015

S1^a
RT

Check Std	20.20
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
GBH1842-MB	BH31579.D	09/27/13	16:15	20.20
GBH1842-BSP	BH31580.D	09/27/13	16:50	20.20
ZZZZZZ	BH31581.D	09/27/13	20:29	20.21
ZZZZZZ	BH31582.D	09/27/13	21:03	20.20
ZZZZZZ	BH31583.D	09/27/13	21:38	20.20
ZZZZZZ	BH31584.D	09/27/13	22:12	20.20
ZZZZZZ	BH31585.D	09/27/13	22:46	20.20
ZZZZZZ	BH31586.D	09/27/13	23:21	20.20
ZZZZZZ	BH31587.D	09/27/13	23:55	20.20
ZZZZZZ	BH31588.D	09/28/13	00:29	20.20

Surrogate
Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

8.5.3



GC Surrogate Retention Time Summary

Job Number: MC24546
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std: GBH1842-CC1786	Injection Date: 09/28/13
Lab File ID: BH31589.D	Injection Time: 01:03
Instrument ID: GCBH	Method: SW846 8015

S1^a
RT

Check Std	20.20
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
ZZZZZZ	BH31590.D	09/28/13	01:38	20.20
ZZZZZZ	BH31591.D	09/28/13	02:12	20.20
ZZZZZZ	BH31592.D	09/28/13	02:46	20.20
ZZZZZZ	BH31593.D	09/28/13	03:20	20.20
MC24505-10	BH31594.D	09/28/13	03:55	20.20
MC24505-10MS	BH31595.D	09/28/13	04:29	20.20
MC24505-10MSD	BH31596.D	09/28/13	05:03	20.20
ZZZZZZ	BH31597.D	09/28/13	05:37	20.20
ZZZZZZ	BH31598.D	09/28/13	06:12	20.20
ZZZZZZ	BH31599.D	09/28/13	06:46	20.20

Surrogate
Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

8.5.4
8

GC Surrogate Retention Time Summary

Job Number: MC24546
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Check Std:	GBH1842-CC1786	Injection Date:	09/28/13
Lab File ID:	BH31600.D	Injection Time:	07:20
Instrument ID:	GCBH	Method:	SW846 8015

S1^a
RT

Check Std	20.20
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
ZZZZZZ	BH31601.D	09/28/13	07:54	20.20
ZZZZZZ	BH31602.D	09/28/13	08:29	20.20
ZZZZZZ	BH31603.D	09/28/13	09:03	20.20
MC24546-3	BH31604.D	09/28/13	09:37	20.20

Surrogate
Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

8.5.5



General Chemistry

QC Data Summaries

Includes the following where applicable:

- Percent Solids Raw Data Summary



Percent Solids Raw Data Summary

Job Number: MC24546
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana SVE System Extension, 900 South Central Ave, IL

Sample: MC24546-3 Analyzed: 23-SEP-13 by HS Method: SM21 2540 B MOD.
ClientID: SVE-40-091813(30-32')

Wet Weight (Total)	38.757	g
Tare Weight	26.906	g
Dry Weight (Total)	36.977	g
Solids, Percent	85.18%	%

9.1





CODE TRAVELER - Field

Gross Mechanical Contractors, Inc.	Job Number 4847	Drawing Number Soil Vapor Extraction - Fig. 1			
Customer Name Phillips 66		System Extension Conceptual Design			
Pipe Spec: A106 Gr. B					
Paint Spec: REP 10-3-1 System					
Preheat Required Y Temp 50 F					
VT 100 %, RT 10% Field Welds, Flange Make-Up, Coating Protection for Underground Piping (Trenton Wax Tape)					
PWHT Required N NDE (Xray) after PWHT Required. N					
	QC Manager	Date	HP	Client	
Initial Review	<i>Jon Rey</i>	10/14/13			
Drawing/Sketch	<i>Jon Rey</i>	10/10/13			
Calculations	N/A	N/A			
Receiving Inspection Report	<i>Jon Rey</i>	10/10/13			
Material Test Report	N/A	N/A			
WPS Review	N/A	N/A			
Welder Qualification Review	N/A	N/A			
Original Data Report	N/A	N/A			
Pg. 2 Weld Joint I.D.	N/A	N/A			
NDE (Proced. And Quals.)	N/A	N/A			
Heat-Treatment	N/A	N/A			
NDE Paperwork Complete	N/A	N/A			
Non-Conformance reports	N/A	N/A			
N2 Pressure Test @ (10) PSIG	<i>Jon Rey</i>	10/17/13			
Pressure Gage No. ()	N/A	N/A			
Flange Make-UP	<i>Jon Rey</i>	10/21/13			
Holiday Testing of UG Pipeing	<i>Jon Rey</i>	10/12/13			
Final Review	<i>Jon Rey</i>	10/23/13			
Brief Description of Work : Field Installation of new 4" CS pipe from existing header at SVE #5 to Wells SVE-38, SVE-39, SVE-40 & SVE-41/					
Dimension and Orientation Verification.: <i>Jon Rey</i>					
Comments:					
Material List (SA/ A / SFA Specification and Dimension Required):					
See Receiving Inspection Report					
OR: Referance Bill of Material or Drawing List Bill of Material					

Pipe Test Report - Nitrogen Test

Job No. 4847 Test No. 4847-SVE Underground
Plant/Area WRR - North Property Sheet 1 of 1
System Soil Vapor Extraction Test Pressure 10.PSIG
Ref P&ID's N/A Test Medium Nitrogen

System inspected according to P&ID Check procedure Test Gauge Used gauge on N2 manifold
Ready for Testing N/A Calibration Date N/A
All Critical Instrumentation Disconnected or Blinded to Range 0-50 psi
Prevent Damage Yes Hold Time 10 min.

Contractor/Subcontractor Gross Mechanical Contractors, Inc., St. Louis, MO

Line No.	FROM	TO
----------	------	----

Tested new 4" underground piping for the additon of soil Vapor extraction from
Tie-In at SVE-#5 to SVE#41.

All flanged connections were checked for leakage prior to wrapping with Trenton \
Wax Tape.

No leaks were noted at time of examination.

Drawing No. SOIL VAPOR EXTRACTION (SVE) FIG. 1.

Date: Oct. 11, 2013_ Contractor/Suncontractor Gross Mechanical, Inc.

Date: Oct. 11, 2013_ GMC Inspector Jon Rogers
Record No. 4847-SVE Underground

URS Rep _____ Date _____

Coatings of Steel Pipe and Fittings with Trenton Was Tape

Drawing NO.

Soil Vapor Extraction
System Extension

Project Name:

SVE EXTENSION

Specification

CORE.255.REP 10-3-3 Rev. 2

LOCATION:

WEST OF OMC

Type of Wrap

TRENTON TYPE II

System:

WRR.

Soil Vapor

Pipe Size:

4"

Date Installed:

10/11/13

- 1) Surface Preparation
- 2) Priming
- 3) Type of Wrap
- 4) Inspection - Visual
- 5) Inspection - Spark Test
- 6) Voltage Setting
- 7) Equipment:

ALL

ALL

TRENTON TYPE II

ALL

FBE @ 2000V, TRENTON TAPE @ 4000V

2000V, 4000V

"SPY Holiday Detector Model 725

Comments

TESTED ALL UNDERGROUND PIPE FOR NEW
SOIL VAPOR EXTRACTION (SVE) FROM SVE #3
TIE-IN TO SVE #41 AS SHOWN ON SYSTEM
EXTENSION CONCEPTUAL DESIGN DRAFT.
FUSION BONDED EPOXY COATED PIPE TESTED AT
2000 VOLTS. AREAS REQUIRING REPAIR WAS COATED
WITH TRENTON TYPE II WAX TAPE AND RE-CHECKED
AT 4000 VOLTS.

Client:

Inspected by:

Jan Ragan

Date:

Oct. 14 2013



Procedure for Holiday Testing (Spark Testing) of FBE Coatings and Trenton #2 Wax Tape Coatings.

Fusion Bonded Epoxy Coatings – Field Testing

- 1) Visual Examination of the coatings. Visually examine the FBE coated piping system identifying any scratched, mars or other surface damaged areas. Measure the thickness of the FBE coating. Generally, the coating should be 14 to 16 mills.
 - 2) Holiday Testing of FBE coated pipe. The voltage shall be set at 125 VDC per mill thickness of the coating. Minimum voltage setting should be 2000V.
 - 3) Failures detected during visual examination or thickness readings should be repaired by patch compound for small areas or stripped and recoated for large areas. Failures detected during Holiday Testing should be repaired similar as noted or may have addition corrosion protection applied to the defective area. This included application of Trenton #2 Wax Tape and primer.
-

Trenton #2 Wax Tape with Trenton Wax Tape Primer – Field Testing

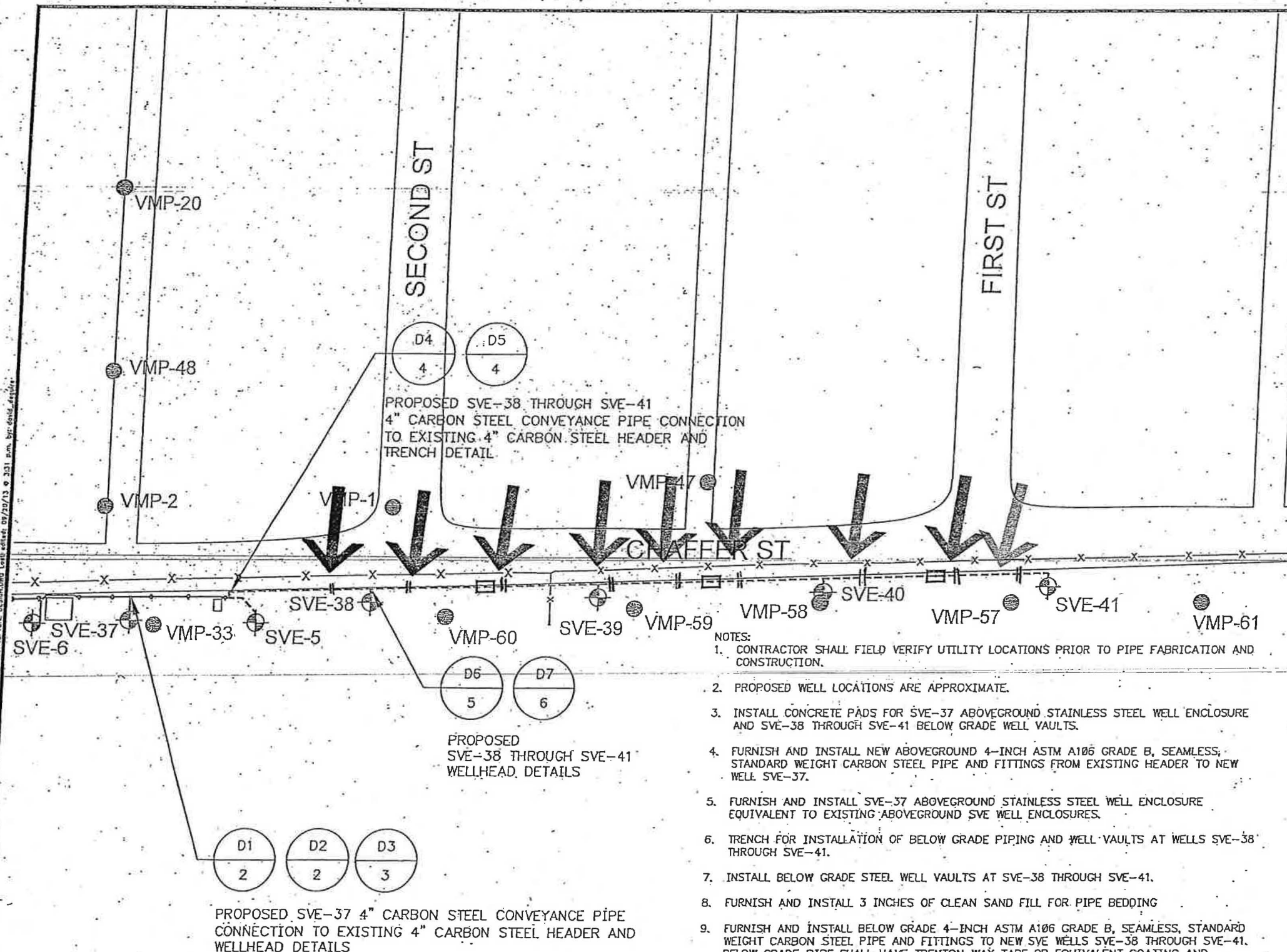
- 1) Visual examination. Prior to application of Wax Tape Primer, the pipe surface shall be cleaned to remove all dirt and loose rust/scale, etc.
 - 2) Apply Trenton Wax Tape Primer (brown) to the pipe/fitting by hand. Do not apply primer too thick and do not apply primer to top of wax tape.
 - 3) Apply Trenton #2 Wax Tape. Use clean gloves when applying the wax tape to pipe/fittings. Avoid additional application of primer to wax tape. Overlap the wax tape by a minimum of 1 inch covering the pipe and fittings 100%.
 - 4) Visually examine the wax tape coated pipe/fittings for complete coverage.
 - 5) Holiday test the wax tape at Manufactures recommended voltage settings of 5000V.
 - 6) Repair any areas where holiday testing shows failure and retest.
-

Document holiday testing on GMC's "Coating of Steel Pipe and Fittings with Trenton Wax Tape" form.

LEG NO.	SVE WELLS	COLOR	WELL SYMBOL
1	SVE-5 THROUGH SVE-9	RED	
2	SVE-3, SVE-4, SVE-25 & SVE-10 THROUGH SVE-12	BLUE	
3	SVE-13 THROUGH SVE-19 & SVE-36	GREEN	
4	SVE-20 THROUGH SVE-27	TEAL	
5	SVE-28 THROUGH SVE-33	PURPLE	
6	SVE-34 THROUGH SVE-35	BROWN	
7	SVE-37 THROUGH SVE-41	ORANGE	

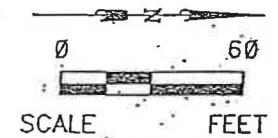
- LEGEND:**
- PROPOSED SVE EXTRACTION WELL
 - PROPOSED TEE FOR POTENTIAL FUTURE SVE WELL CONNECTION
 - UNDERGROUND PIPING
 - SVE EXTRACTION WELL (SEE TABLE FOR COLOR LEGEND)
 - VAPOR MONITORING POINT (VMP) LOCATION
 - PROPERTY BOUNDARY/FENCE LINE
 - U.G. PIPING FLANGE

PROPOSED SVE WELL NO.	SCREENED INTERVAL (BGS)
37	25-35
38	25-35
39	25-35
40	25-35
41	20-30



- NOTES:**
- CONTRACTOR SHALL FIELD VERIFY UTILITY LOCATIONS PRIOR TO PIPE FABRICATION AND CONSTRUCTION.
 - PROPOSED WELL LOCATIONS ARE APPROXIMATE.
 - INSTALL CONCRETE PADS FOR SVE-37 ABOVEGROUND STAINLESS STEEL WELL ENCLOSURE AND SVE-38 THROUGH SVE-41 BELOW GRADE WELL VAULTS.
 - FURNISH AND INSTALL NEW ABOVEGROUND 4-INCH ASTM A106 GRADE B, SEAMLESS, STANDARD WEIGHT CARBON STEEL PIPE AND FITTINGS FROM EXISTING HEADER TO NEW WELL SVE-37.
 - FURNISH AND INSTALL SVE-37 ABOVEGROUND STAINLESS STEEL WELL ENCLOSURE EQUIVALENT TO EXISTING ABOVEGROUND SVE WELL ENCLOSURES.
 - TRENCH FOR INSTALLATION OF BELOW GRADE PIPING AND WELL VAULTS AT WELLS SVE-38 THROUGH SVE-41.
 - INSTALL BELOW GRADE STEEL WELL VAULTS AT SVE-38 THROUGH SVE-41.
 - FURNISH AND INSTALL 3 INCHES OF CLEAN SAND FILL FOR PIPE BEDDING.
 - FURNISH AND INSTALL BELOW GRADE 4-INCH ASTM A106 GRADE B, SEAMLESS, STANDARD WEIGHT CARBON STEEL PIPE AND FITTINGS TO NEW SVE WELLS SVE-38 THROUGH SVE-41. BELOW GRADE PIPE SHALL HAVE TRENTON WAX TAPE OR EQUIVALENT COATING AND CATHODIC PROTECTION. PIPE SHALL BE INSTALLED AT A MINIMUM DEPTH OF 24-INCHES BELOW GRADE WITH A MINIMUM SLOPE OF 1/4" IN 10' TOWARD THE SVE WELLS.
 - CONTRACTOR TO PROVIDE THREE FLANGED TEE CONNECTIONS FOR POTENTIAL FUTURE SVE WELLS.
 - ALL GASKETS WILL BE OF COMPATIBLE FLUOROELASTOMER MATERIAL (E.G. VITON®).
 - PERFORM PRESSURE TESTING OF ALL ABOVEGROUND AND BELOW GROUND PIPING INSTALLATIONS.
 - BACKFILL PIPE TRENCH WITH CLEAN SAND FILL TO 6 INCHES ABOVE TOP OF PIPE, AND THEN FLOWABLE FILL TO EXISTING GRADE.
 - MILL FLOWABLE FILL TO 4" DEPTH AND ASPHALT PATCH PAVEMENT TO MATCH EXISTING PAVEMENT GRADE.
 - STRIP PARKING STALLS AFTER SITE RESTORATION IS COMPLETE.

FLANGE MAKE UP MAP



ALL FLANGES SHOWN ON UNDERGROUND PIPING HAVE BEEN VISUALLY EXAMINED AND TESTED TO ASSURE CORRECT FLANGE MAKE-UP, INCLUDING ALIGNMENT, GASKET, FASTENERS. THE UNDERGROUND PIPING RECEIVED A PNEUMATIC TEST AT 10 PSIG AND "SNOOP" TESTED EACH FLANGE CONN. NO LEAKS WERE OBSERVED. Jan Rogan 10/17/2013 GMC QC

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY: djd 9/20/13 DSGN. BY: iv CHKD. BY: bbb	Soil Vapor Extraction (SVE) System Extension Conceptual Design	FIG. NO. 1



CODE TRAVELER - Field

Gross Mechanical Contractors, Inc.	Job Number 4847	Drawing Number Soil Vapor Extraction - Fig. 2			
Customer Name Phillips 66		Installation Detail for Branch Connection Piping to SVE-37			
Pipe Spec: A106 Gr. B					
Paint Spec: REP: 10-3-1					
Preheat Required Y Temp 50 F					
VT 100 %, 10% RT Welds, Flange Make-Up, Coating Protection for Underground Piping (Trenton Wax Tape)					
PWHT Required N NDE (Xray) after PWHT Required N					
	QC Manager	Date	HP	Client	
Initial Review	<i>Jon Roy</i>	10/20/13			
Drawing/Sketch	<i>Jon Roy</i>	10/20/13			
Calculations	N/A	N/A			
Receiving Inspection Report	<i>Jon Roy</i>	10/22/13			
Material Test Report	N/A	N/A			
WPS Review	N/A	N/A			
Welder Qualification Review	N/A	N/A			
Original Data Report	N/A	N/A			
Pg. 2 Weld Joint I.D.	N/A	N/A			
NDE (Proced. And Quals.)	N/A	N/A			
Heat Treatment	N/A	N/A			
NDE Paperwork Complete	N/A	N/A			
Non-Conformance reports	N/A	N/A			
N2 Pressure Test @ (10) PSIG	<i>Jon Roy</i>				
Pressure Gage No. ()	<i>Jon Roy</i>	N/A			
Flange Make-UP	<i>Jon Roy</i>	10/20/13			
	N/A	N/A			
Final Review	<i>Jon Roy</i>	10/23/13			
Brief Description of Work : Field Installation of new 4" Branch Connection Detail to SVE-37					
Dimension and Orientation Verification: <i>Jon Roy</i>					
Comments:					
Material List (SA/ A / SFA Specification and Dimension Required):					
See Receiving Inspection Report					
OR: Referance Bill of Material or Drawing List Bill of Material					



CODE TRAVELER - Field

Gross Mechanical Contractors, Inc.	Job Number 4847	Drawing Number SVE 37 WELL HEAD DETAILS			
Customer Name Phillips 66		Tie-In to "RED" Line			
Pipe Spec:					
Paint Spec:					
Preheat Required Y Temp 50 F					
VT 100 %, RT-100% @ Tie-Ins, RT 10% Field Welds, MT or PT 10% Socket Welds or Branch Connections					
PWHT Required N NDE (Xray) after PWHT Required N					
	QC Manager	Date	HP	Client	
Initial Review	<i>Jon Reger</i>	10/22/13			
Drawing/Sketch	<i>Jon Reger</i>	10/22/13			
Calculations	N/A	N/A			
Receiving Inspection Report	<i>Jon Reger</i>	10/22/13			
Material Test Report	N/A	N/A			
WPS Review	<i>Jon Reger</i>	10/22/13			
Welder Qualification Review	<i>Jon Reger</i>	10/22/13			
Original Data Report	N/A	N/A			
Pg. 2 Weld Joint I.D.	<i>Jon Reger</i>	10/22/13			
NDE (Proced. And Quals.)	<i>Jon Reger</i>	10/22/13			
Heat Treatment	N/A	N/A			
NDE Paperwork Complete	<i>Jon Reger</i>	10/22/13			
Non-Conformance reports	N/A	N/A			
Pressure Test @ (450) PSIG	<i>Jon Reger</i>	10/22/13			
Pressure Gage No. (260)	<i>Jon Reger</i>	10/22/13			
Stamping / Nameplate	N/A	N/A			
Report Form ()	N/A	N/A			
Final Review	<i>Jon Reger</i>	10/22/13			
Brief Description of Work : Field installation of new 4" CS pipe from existing header to new SVE-37 Well.					
Dimension and Orientation Verification.: <i>Jon Reger</i>					
Comments:					
Material List (SA/ A / SFA Specification and Dimension Required):					
See Receiving Inspection Report					
OR: Referance Bill of Material or Drawing List Bill of Material					

Pipe HYDROSTATIC Test Report

Job No. 4847 Test No. FW-1 at Tie-In to SVE-37
Plant/Area Wood River, II Refinery, North Plant Sheet 1 of 1
System Soil Vapor Extraction (SVE) Test Pressure 450 PSIG
Ref P&ID's _____ Test Medium Water

System inspected according to P&ID Check procedure
Ready for Testing N/A Test Gauge 26D
All Critical Instrumentation Disconnected or Blinded to Calibration Date 11-7-13
Prevent Damage Yes Range 0-800 PSI
Hold Time 10 ~~30~~ Minutes minimum
WR

Contractor/Subcontractor Gross Mechanical Contractors, Inc., St. Louis, MO

Line No. Soil Vapor Extraction Piping - RED Line
From: Field Weld #1 at tie-in to SVE-37

Drawing No. SVE-37 Well Head , Details, Figure 2

Date: Oct. 04, 2013 Contractor/Suncontractor Gross Mechanical, Inc.

Date: 10/7/13 GMC Inspector *Jon Ray*
Record No. FW-1 at Tie-In to SVE-37

URS Rep. *G. A. [Signature]* Date 10/7/13

Pipe HYDROSTATIC Test Report

Job No. 4847 Test No. FW-2 at Tie-In to SVE-37
Plant/Area Wood River, II Refinery, North Plant Sheet 1 of 1
System Soil Vapor Extraction (SVE) Test Pressure 450 PSIG
Ref P&ID's _____ Test Medium Water

System inspected according to P&ID Check procedure Test Gauge 26 D
Ready for Testing N/A Calibration Date 11.7.2013
All Critical Instrumentation Disconnected or Blinded to Range 0 - 800 PSI
Prevent Damage Yes Hold Time 10-30 Minutes minimum
JK

Contractor/Subcontractor Gross Mechanical Contractors, Inc., St. Louis, MO

Line No. Soil Vapor Extraction Piping - RED Line
From: Field Weld #2 at tie-in to SVE-37

Drawing No. SVE-37 Well Head , Details, Figure 2

Date: Oct. 04, 2013 Contractor/Suncontractor Gross Mechanical, Inc.

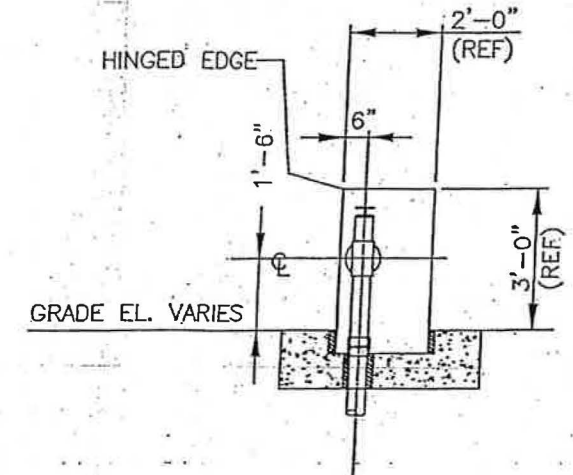
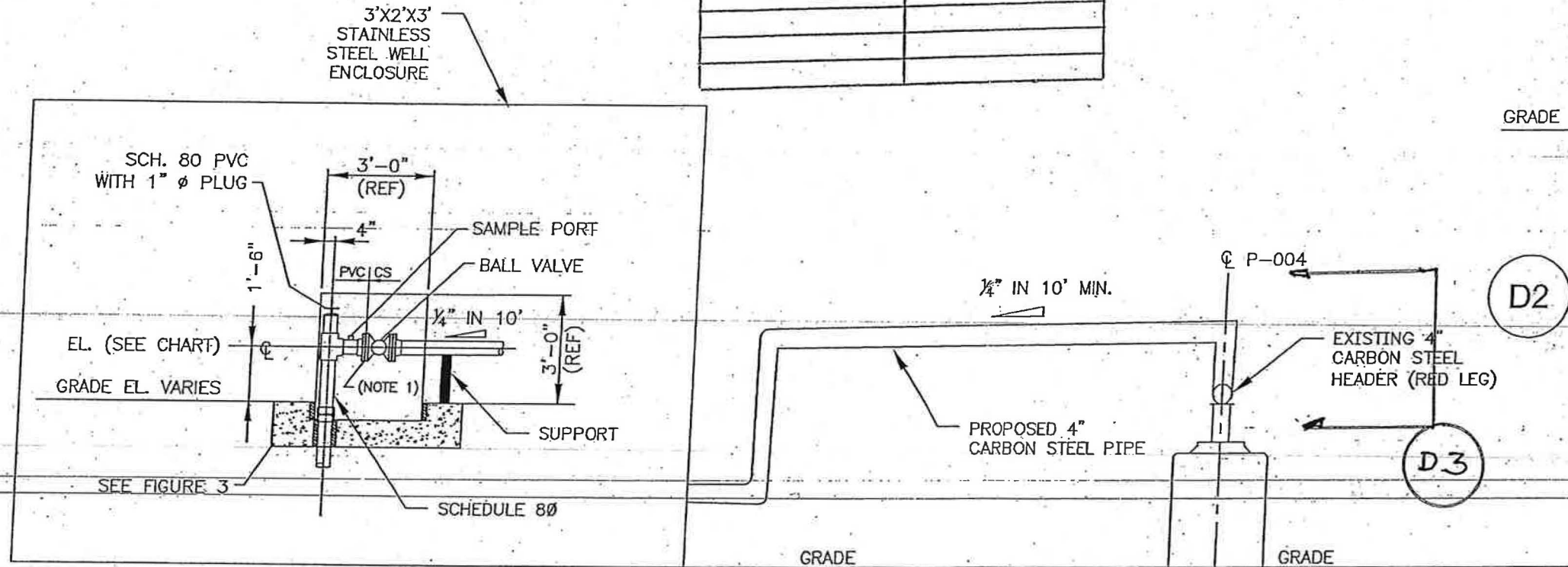
Date: 10/7/13 GMC Inspector *Jon Rog...*
Record No. FW-2 at Tie-In to SVE-37

URS Rep. *Gif...* Date 10/7/13

WELD MAP

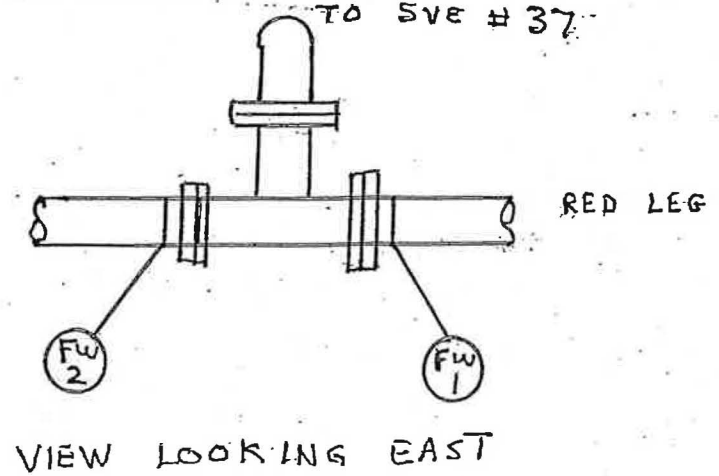
WELD PROCEDURE WPS NO. 1-12-1

Weld No.	Welder ID
FW-1	KR
FW-2	KR



D2 SVE-37 ELEVATION VIEW (LOOKING WEST)

D1 SVE-37 ELEVATION VIEW LOOKING SOUTH



VIEW LOOKING EAST

Attachment to
Pipe Test Report

FW-2 @ Tie-In to SVE # 37

WELD MAP

Attachment to
Pipe Test Report
FW-2 @ Tie-In to SVE # 37

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY: djd September 2013 DSGN. BY: st CHKD. BY: sd	SVE-37 Wellhead Details	FIG. NO. 2

NOT TO SCALE

P:\COMMERCIAL\LEVEL OF PRODUCT UPHILL OR PRODUCTS US 2015\1618180 - PRODUCE\1618180-01_SOL VAPOR STTUW INSTALLATION\PIPE ELEVATION\WELD MAP\WELD MAP.dwg
 DATE: 09/17/13 11:04 AM BY: djd



2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085
Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

Certificate of Calibration

SUBMITTED BY

GROSS MECHANICAL CO.
3622 GREENWOOD BLVD.
ST. LOUIS, MO 63143

SUBMITTED TO

ST. LOUIS TESTING LAB
2810 CLARK AVENUE
ST. LOUIS, MO 63103

CALIBRATION ITEM

WORK ORDER: 12P-6013-8
I.D.: 26-D
SERIAL NUMBER: 26-D
DESCRIPTION: Pressure Gauge, 0-800 psi
MANUFACTURER: Ashcroft
CALIBRATION PROCEDURE: PRESSURE-SLTL-001
LOCATION: ST. LOUIS TESTING LABS
DATE CALIBRATED: 11/7/2012

CALIBRATION DUE: 11/7/2013

The condition of this instrument was as follows:

As Received: In Tolerance

As Left: In Tolerance

GENERAL CONDITIONS

Temperature: 70°F
Relative Humidity: <50%

Notes

Standards & Calibration Equipment Used:

St. Louis Testing Laboratories certifies that the above listed Pressure Gage conforms to pressure and tolerances as specified in the applicable specifications as follows: ASME B40.1, ANSI / NCSL Z540-1-1994, Pressure-SLTL-001.

The calibration for this gage was accomplished using one or more of the following standards, directly traceable to the National Institute of Standards and Technology, Certificate #'s 1002/100239, 1002/100497, 0184/04-26041-A, 0798/CAL111067, 0798/CAL111064, 0798/CAL111066, 822/272103-5

ID#: 93227 Calibration Due Date: 08/01/2013

Tolerance of UUT (Unit Under Test) is ± 0.5% of span.

Nominal	UUT As Found
80 psi	80 psi
250 psi	250 psi
400 psi	400 psi
550 psi	550 psi
750 psi	750 psi

Performed by:

Steven P. Coplin
Steven P. Coplin

Approved by:

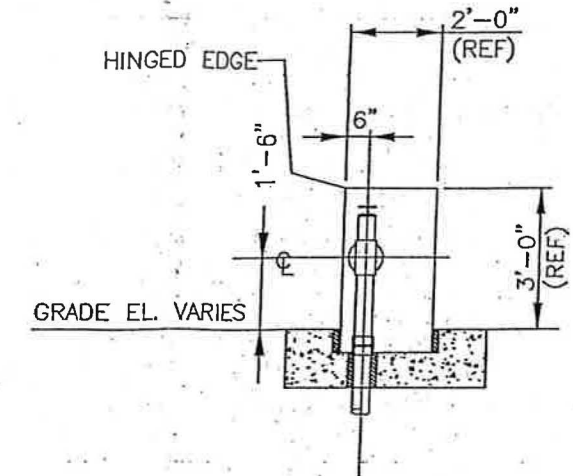
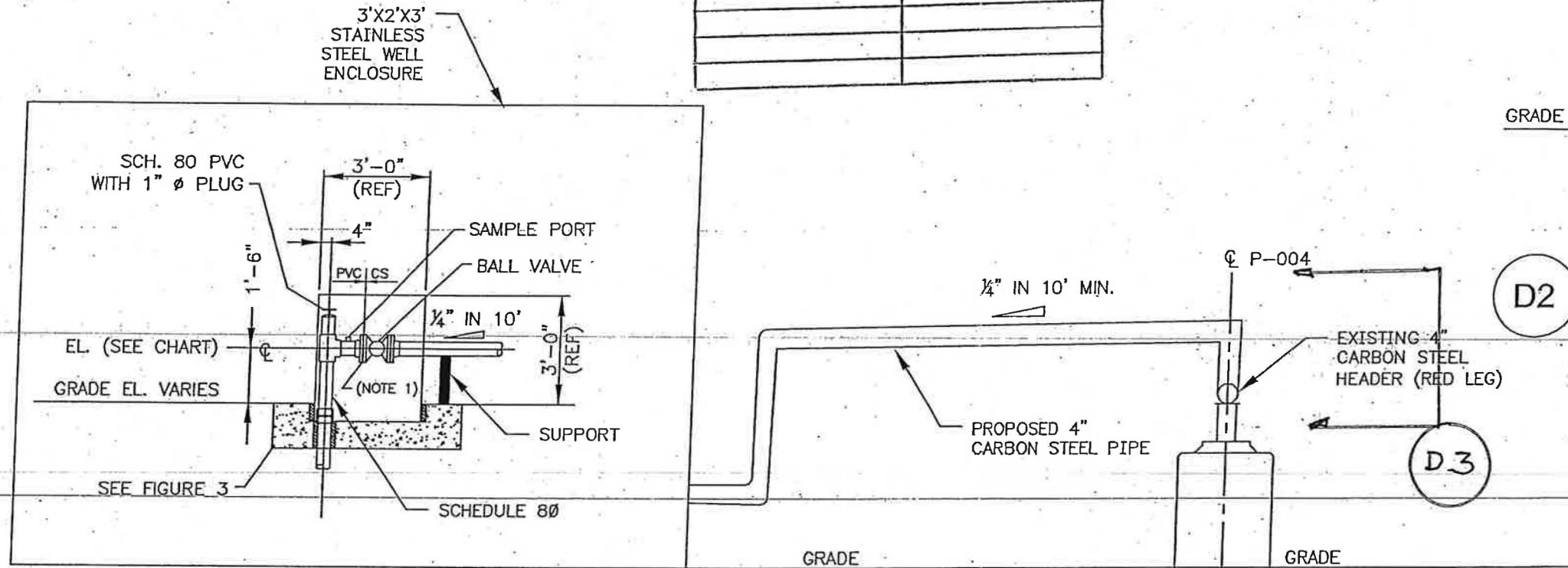
Karl Schmitz
Karl Schmitz, Director
Materials Testing



WELD MAP

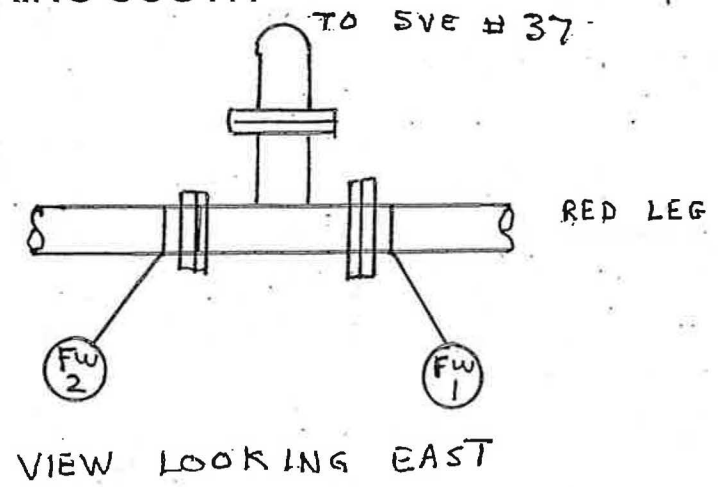
WELD PROCEDURE WPS NO. 1-12-1

Weld No.	Welder ID
FW-1	K.R.
FW-2	K.R.



D2 SVE-37 ELEVATION VIEW (LOOKING WEST)

D1 SVE-37 ELEVATION VIEW LOOKING SOUTH



VIEW LOOKING EAST

WELD MAP

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY: djd September 2013 DSGN. BY: st CHKD. BY: sd	SVE-37 Wellhead Details	FIG. NO. 2

NOT TO SCALE








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TEAM Industrial Services, Inc.


CM Division
 30 Broadway
 Roxana, Illinois 62087 (618) 251-4125

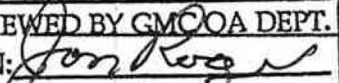
Date: 10-3-13 FWO # 12231284 P.O.# 4847

Form 20.6-316 REV3

Customer GROSS MECH		Type of Item PIPE WELD				Radiation Source IR-192 <input checked="" type="checkbox"/> CO-60 <input type="checkbox"/> X-Ray <input type="checkbox"/>				Penetrameter Type ASTM HOLE TYPE 12 2T		Film Type AGFA D4	Film Size 4.5"X10"										
Specification ASME B 31.3 2010		Drawing No. SVE 37 WELL HEAD				Source Strength or MA / KV 50 C				Penetrameter Material SS		Emulsion or Lot No. 1640625											
Procedure RT.ASME.1 R/15		Pipe Dia. 4"	Nom. Thickness .237"	Joint Type BUTT		Focal Spot Size .159"		Exposure Time 8 SEC		Penetrameter Location Film Side <input checked="" type="checkbox"/> Source Side <input type="checkbox"/>		Film Exp. Date 2015.07											
Acceptance Procedure PARA 8.6		Material C/S	Weld Process(es) SMWFCWLR			Source to Film Distance (SFD) 4.500"				Shim Material SS	Shim Thickness .062"	Film Technique Single Load <input checked="" type="checkbox"/> Double Load <input type="checkbox"/>											
Technique C		Surface Condition AS WELDED				Source to Object Distance (SOD) 4.263"				ID Placement FLASH		Backing Lead Thickness N/A											
Angle Viewing <input checked="" type="checkbox"/> Double <input type="checkbox"/>		Automatic <input type="checkbox"/>		Manual <input checked="" type="checkbox"/>		Screens Pb	Front .010	Ctr. N/A	Back .010	Locations Marker Placement F.S.		Backing Lead Location N/A											
Weld No.	Section Number	Geo. Unsharp "Ug"	Acc.	Rej	Por	SI	C	IF	IP	UC	BT	EI	TI	CC	InP	FA	Surface	Remarks/Comments	Welder ID	Pena. Density	Weld Density	Techniques	
FW-1	0-1	.008"	\																KR	3.38	3.50	A. Panoramic	
	1-2		\																		3.01	3.02	
	2-0		\																		3.02	3.00	
																		FW-1 @ TIE-IN					
																							
																							
																							
																							
Legend:		POR - Porosity		C-Crack			IP - Incomplete Penetration			BT- Burn Thru or Suck Back			Surf - Surface Indication			UC- Undercut							
		SI - Slag Inclusion		IF-Incomplete Fusion			CC -Concavity			InP- Internal Protrusion			FA - Film Artifact										
		EI- Elongated Indication		TI-Tungsten Inclusion																			

Level III Approval: _____ Date: _____ Inspector / Reviewed By: AARON HAUSMAN Level: II Date: 10-3-13

Client: _____ Date: _____ Inspector:  Level: II Date: 10-3-13

REVIEWED BY GCMCOA DEPT.
 SIGN: 
 DATE: 10-4-13

TEAM[®] Industrial Services, Inc.

ULTRASONIC THICKNESS TEST REPORT / TECHNIQUE

TCM Division
500 Broadway
South Roxana, IL 62087

Tel. (618) 251-4125

Fax. (618) 251-4148

Form 22.2-316
Rev.4

Client: GROSS MECHANICAL	Work Order No.: 1223 1278	Date: 9-30-2013
Address/Job Location: PHILLIPS 66 / NORTH PROPERTY	Job No.: 4847	Specification: ASME SECT. V
Part Identification / Job description: FW1 @ Tie-in to SVE-37, FW2 @ Tie-in to SVE-37, FW3 @ Tie-in to SVE-5 for future SVE-38 thru SVE41		Procedure: 22.A.7D-16 2/1
Type of Work: New <input type="checkbox"/> In-Service <input type="checkbox"/> Repair <input type="checkbox"/> Rework <input checked="" type="checkbox"/>		Acceptance: CLIENT Technique No.: N/A

Equipment Mfr./ Model / Serial No.: GE/DMS-2/01YB5N	Cal. Block Material & Serial No.: 4340 PE / CS	Couplant Type & Batch #: ECHO GEL / 12G069
Transducer Type: Single: <input type="checkbox"/> Dual: <input checked="" type="checkbox"/> Delay: <input type="checkbox"/>	Cal. Block Steps Verified (minimum of 3): .100", .200", .300", .400"	Coating Removed: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> UT ID Stickers Used: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Transducer Size and Frequency: .375" x 8MHz.	Sensitivity (db): 60dB	Cal. Block Temp.: 65°F
		Measurement Mode: Normal <input checked="" type="checkbox"/> Multi-Echo <input type="checkbox"/>

Item Nomenclature	Part Temperature	Thickness Measurement Locations (TML's)	Remarks
FW1	65°F	TOP	0.242"
	65°F	BOTTOM	0.235"
	65°F	EAST	0.244"
	65°F	WEST	0.245"
FW2	65°F	TOP	0.236"
	65°F	BOTTOM	0.233"
	65°F	EAST	0.244"
	65°F	WEST	0.248"
FW3	65°F	NORTH	0.259"
	65°F	SOUTH	0.266"
	65°F	EAST	0.261"
	65°F	WEST	0.266"

Inspector: SCOTT PARSONS  Level: II Date: 9-30-2013

Inspector: N/A Level: N/A Date: N/A

Attachment: Yes No



CODE TRAVELER - Field

Gross Mechanical Contractors, Inc.	Job Number 4847	Drawing Number Soil Vapor Extraction - Fig. 4
Customer Name Phillips 66		Installation Detail for Branch Connection Piping to SVE-38 through SVE-41

Pipe Spec: A106 Gr. B
 Paint Spec: REP: 10-3-1
 Preheat Required Y Temp 50 F
 VT 100 %, 10% RT Welds, Flange Make-Up, Coating Protection for Underground Piping (Trenton Wax Tape)
 PWHT Required N NDE (Xray) after PWHT Required N

	QC Manager	Date	HP	Client
Initial Review	<i>Jon Rog...</i>	10/20/13		
Drawing/Sketch	<i>Jon Rog...</i>	10/20/13		
Calculations	N/A	N/A		
Receiving Inspection Report	<i>Jon Rog...</i>	10/22/13		
Material Test Report	<i>N/A</i>	<i>N/A</i>		
WPS Review	N/A	N/A		
Welder Qualification Review	N/A	N/A		
Original Data Report	N/A	N/A		
Pg. 2 Weld Joint I.D.	N/A	N/A		
NDE (Proced. And Quals.)	N/A	N/A		
Heat-Treatment	N/A	N/A		
NDE Paperwork Complete	N/A	N/A		
Non-Conformance reports	N/A	N/A		
N2 Pressure Test @ (10) PSIG	<i>Jon Rog...</i>			
Pressure Gage No. ()	<i>N/A</i>	<i>N/A</i>		
Flange Make-UP	<i>Jon Rog...</i>	10/21/13		
	N/A	N/A		
Final Review	<i>Jon Rog...</i>	10/23/13		

Brief Description of Work : Field Installation of new 4" Branch Connection Detail to SVE-38 through SVE-41
 Dimension and Orientation Verification: *Jon Rog...*

Comments:
 Material List (SA/ A / SFA Specification and Dimension Required):
 See Receiving Inspection Report

OR: Reference Bill of Material or Drawing List Bill of Material

Pipe HYDROSTATIC Test Report

Job No. 4847 Test No. FW-3 at Tie-In to SVE-5
Plant/Area Wood River, II Refinery, North Plant Sheet 1 of 1
System Soil Vapor Extraction (SVE) Test Pressure 450 PSIG
Ref P&ID's _____ Test Medium Water

System inspected according to P&ID Check procedure Test Gauge 26 D
Ready for Testing N/A Calibration Date 11-7-2013
All Critical Instrumentation Disconnected or Blinded to Range 0 - 800 PSI
Prevent Damage Yes Hold Time 1030 Minutes minimum

Contractor/Subcontractor Gross Mechanical Contractors, Inc., St. Louis, MO

Line No. Soil Vapor Extraction Piping - RED Line
From: Field Weld #3 at tie-in to SVE-5

Drawing No. SVE-5 Well Head , Details, Figure 4

Date: Oct. 04, 2013 Contractor/Suncontractor Gross Mechanical, Inc.

Date: 10-7-2013 GMC Inspector Jan Ray
Record No. FW-3 at Tie-In to SVE-5

URS Rep. [Signature] Date 10/7/13



CODE TRAVELER - Field

Gross Mechanical Contractors, Inc.	Job Number 4847	Drawing Number Soil Vapor Extraction - Fig. 5			
Customer Name Phillips 66		SVE-38 through SVE-41 Well Head Details			
Pipe Spec: A106 Gr. B/PVC					
Paint Spec: Underground Piping: Fusion bonded Epoxy and Trenton Wax Tape Type II					
Preheat Required Y Temp 50 F					
VT 100 %, Flange Make-Up, Coating Protection for Underground Piping (Trenton Wax Tape)					
PWHT Required N NDE (Xray) after PWHT Required N					
	QC Manager	Date	HP	Client	
Initial Review	<i>Jon King</i>	<i>10/20/13</i>			
Drawing/Sketch	<i>Jon King</i>	<i>10/20/13</i>			
Calculations	N/A	N/A			
Receiving Inspection Report	<i>Jon King</i>	<i>10/21/13</i>			
Material Test Report					
WPS Review	N/A	N/A			
Welder Qualification Review	N/A	N/A			
Original Data Report	N/A	N/A			
Pg. 2 Weld Joint I.D.	N/A	N/A			
NDE (Proced. And Quals.)	N/A	N/A			
Heat Treatment	N/A	N/A			
NDE Paperwork Complete	N/A	N/A			
Non-Conformance reports	N/A	N/A			
N2 Pressure Test @ (10) PSIG	<i>Jon King</i>	<i>5/10/13</i>			
Pressure Gage No. ()	<i>N/A</i>	<i>10/20/13</i>			
Flange Make-UP	<i>Jon King</i>	<i>10/21/13</i>			
	N/A	N/A			
Final Review	<i>Jon King</i>	<i>10/23/13</i>			
Brief Description of Work : Field Installation of new Wellheads SVE-38 through SVE-41					
Dimension and Orientation Verification: <i>Jon King</i>					
Comments:					
Material List (SA/ A / SFA Specification and Dimension Required):					
See Receiving Inspection Report					
OR: Referance Bill of Material or Drawing List Bill of Material					



CODE TRAVELER - Shop

Gross Mechanical Contractors, Inc.	Job Number 4847	Drawing Number Sketch 1			
Customer Name P66	ASME Code Section B31.3 Normal Fluid Service				
Pipe Spec: AAAA1					
Paint Spec: REP 10-3-1 System 4					
Preheat Required Y Temp 50 F					
X-Ray 5%S, Brinell Hardness - N/R, MT 10% (Roots/Final/Branch Conn, Socket Welds), VT 100 %					
PWHT Required N NDE (Xray) after PWHT Required N					
	QC Manager	Date	HP	Client	
Initial Review	CBG	10/18			
Drawing/Sketch	CBG	10/18			
Calculations	N/A	N/A			
Receiving Inspection Report	CBG	10/18			
Material Test Report	CBG	10/18			
WPS Review	CBG	10/18			
Welder Qualification Review	CBG	10/18			
Original Data Report	N/A	N/A			
Pg. 2 Weld Joint I.D.	CBG	10/18			
NDE (Proced. And Quals.)	CBG	10/18			
Heat Treatment	N/A	N/A			
NDE Paperwork Complete	CBG	10/18			
Non-Conformance reports	CBG	10/18			
Pressure Test @ (450) PSIG	CBG	10/18			
Pressure Gage No. (169706)	CBG	10/18			
PMI Plugs	NA	NA			
Report Form ()	N/A	N/A			
Final Review	CBG	10/18			
Brief Description of Work (Include sketch if necessary): Shop fabrication of 1 spools					
Dimension and Orientation Verification.: CBG 10/18					
Comments:					
Material List (SA/ A / SFA Specification and Dimension Required):					
See Receiving Inspection Report					
OR: Referance Bill of Material or Drawing List Bill of Material					

CODE TRAVELER

Customer Name	Job Number	Drawing Number
P66	4847	Sketch 1

Joint I.D.	Welder ID/NDE/PWHT ID	QC Manager	Date	Client	Date
WPS: 1-57-1 W-1	Fit				
	Final	Y	CBG	10/1	
	NDE	VT, RT	CBG	10/1	
	PWHT				
WPS: 1-57-1 W-2	Fit				
	Final	Y	CBG	10/1	
	NDE	VT, RT	CBG	10/1	
	PWHT				
WPS: 1-57-1 W-3	Fit				
	Final	Y	CBG	10/1	
	NDE	VT, RT	CBG	10/1	
	PWHT				
WPS: 1-57-1 W-4	Fit				
	Final	Y	CBG	10/1	
	NDE	VT	CBG	10/1	
	PWHT				
WPS: 1-57-1 W-5	Fit				
	Final	408	CBG	10/1	
	NDE	VT, RT	CBG	10/1	
	PWHT				
WPS: 1-57-1 W-6	Fit				
	Final	408	CBG	10/1	
	NDE	VT	CBG	10/1	
	PWHT				
WPS: 1-57-1 W-7	Fit				
	Final	408	CBG	10/1	
	NDE	VT	CBG	10/1	
	PWHT				
WPS: 1-57-1 W-8	Fit				
	Final	324	CBG	10/1	
	NDE	VT	CBG	10/1	
	PWHT				
WPS: 1-57-1 W-9	Fit				
	Final	408	CBG	10/1	
	NDE	VT, RT	CBG	10/1	
	PWHT				
WPS: 1-57-1 W-10	Fit				
	Final	408	CBG	10/1	
	NDE	VT, RT	CBG	10/1	
	PWHT				

Joint I.D.	Welder ID/NDE/PWHT ID		QC Manager	Date	Client	Date
WPS: 1-57-1 W-11	Fit					
	Final	324	CBG	10/11		
	NDE	VT, RT	CBG	10/11		
	PWHT					
WPS: 1-57-1 W-12	Fit					
	Final	324	CBG	10/11		
	NDE	VT, RT	CBG	10/11		
	PWHT					
WPS: 1-57-1 W-13	Fit					
	Final	324	CBG	10/11		
	NDE	VT, RT	CBG	10/11		
	PWHT					
WPS: 1-3-1 W-75	Fit					
	Final	408	CBG	10/11		
	NDE	VT, MT	CBG	10/11		
	PWHT					



Pipe Test Report

Job No. 4847 Test No. Job 4847-1-1

Plant/Area SVE for URS/Shell Sheet 1 of 1

System _____ Test Pressure 450 psig

Ref P&ID's _____ Test Medium Water

System inspected according to P&ID Check procedure	Test Gauge	<u>159706</u>
Ready for Testing <u>Yes</u>	Calibration Date	<u>14-Aug</u>
All Critical Instrumentation Disconnected or Blinded to	Range	<u>5000</u>
Prevent Damage <u>Yes</u>	Hold Time	<u>30 Minutes minimum</u>

Contractor/Subcontractor Gross Mechanical Contractors, Inc.

Line No. | FROM TO

Spools 1+2 sketch 1

Date: _____ Contractor/Suncontractor Gross Mechanical Contractors, Inc.

Date: 10/1/13 Inspector [Signature]
Record No. Job 4847-1-1

Client Rep. [Signature] Date _____

4847 Spools 1 and 2

Serial number 159706

Model 5KPSIXP2I

Units PSI

Firmware version D0018

Message store _____

Run index 1

Logging Type Average

Logging Interval 30

Start time 9/26/2013 7:40

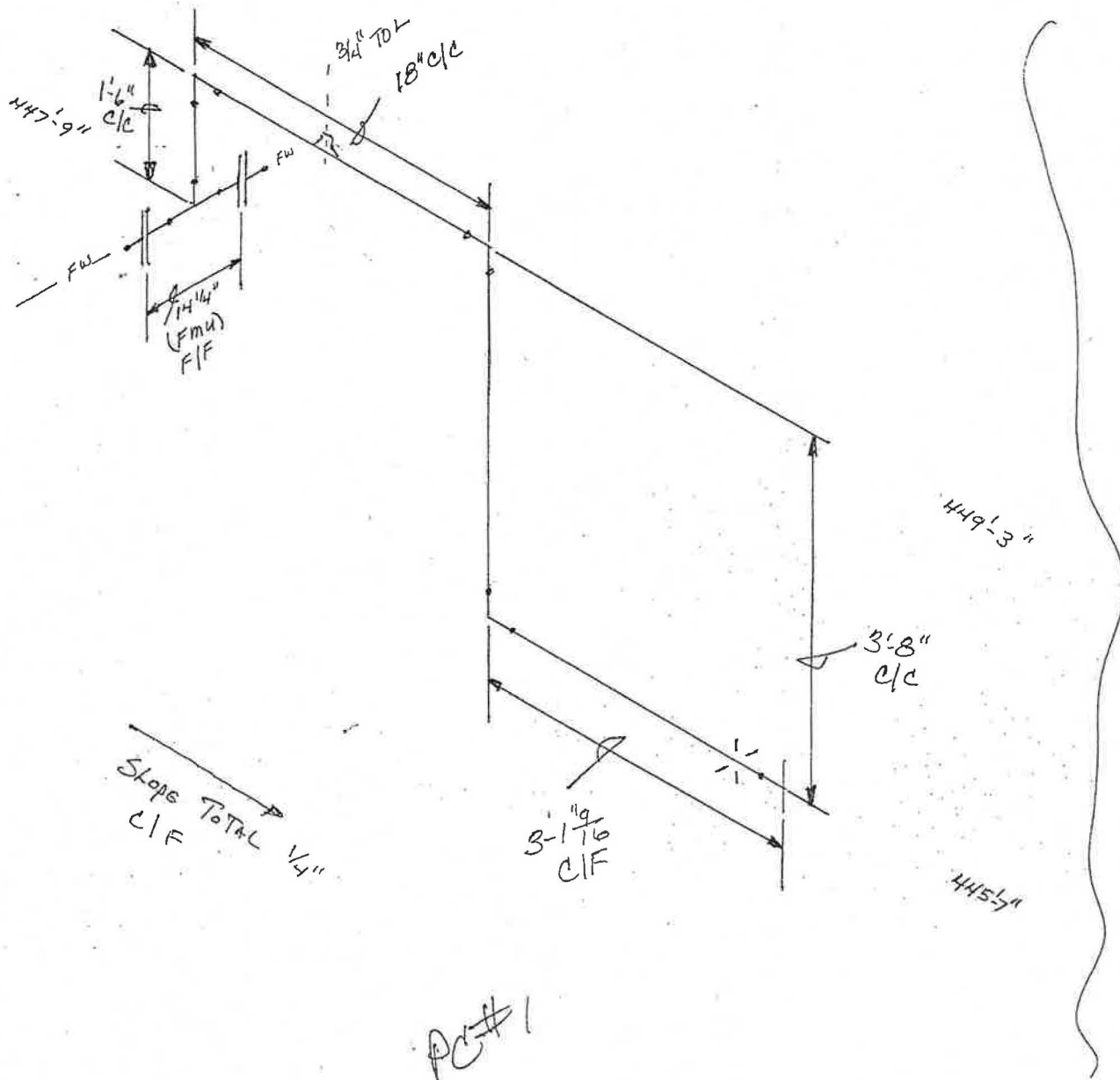
Stop time 9/26/2013 8:26

Time Average

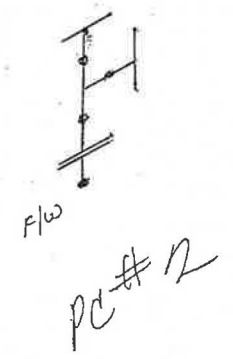
Time	Average
0	
0	
0	
0	473.1
30	473
60	472.9
90	472.4
120	472.1
150	471.8
180	471.5
210	471.1
240	470.7
270	470.3
300	470
330	469.6
360	469.1
390	468.8
420	468.4
450	468.1
480	467.8
510	467.4
540	467.1
570	466.7
600	466.4
630	466
660	465.7
690	465.4
720	465.1
750	464.8
780	464.5
810	464.1
840	463.9
870	463.6
900	463.5
930	463
960	462.8
990	462.4
1020	462.1
1050	461.8
1080	461.6
1110	461.2
1140	460.9
1170	460.7
1200	460.4
1230	460.1
1260	459.8
1290	459.5
1320	459.4
1350	459.1
1380	458.9
1410	458.6
1440	458.2
1470	458
1500	457.9
1530	457.7
1560	457.4
1590	457.2
1620	456.9
1650	456.6
1680	456.4
1710	456.2
1740	456.1
1770	455.7
1800	455.6
1830	455.3
1860	455.2
1890	454.9
1920	454.6

Pressure (PSI)

Event	Event Date	Time (hours)	Time (minutes)	Elapsed Time	Timestamp
Battery OK		0.00	0.00	0:00:00	9/26/13 7:40:20
Logging Interval, 30		0.00	0.00	0:00:00	9/26/13 7:40:20
Tare, 0.0		0.00	0.00	0:00:00	9/26/13 7:40:20
		0.00	0.00	0:00:00	9/26/13 7:40:20
		0.01	0.50	0:00:30	9/26/13 7:40:50
		0.02	1.00	0:01:00	9/26/13 7:41:20
		0.03	1.50	0:01:30	9/26/13 7:41:50
		0.03	2.00	0:02:00	9/26/13 7:42:20
		0.04	2.50	0:02:30	9/26/13 7:42:50
		0.05	3.00	0:03:00	9/26/13 7:43:20
		0.06	3.50	0:03:30	9/26/13 7:43:50
		0.07	4.00	0:04:00	9/26/13 7:44:20
		0.08	4.50	0:04:30	9/26/13 7:44:50
		0.08	5.00	0:05:00	9/26/13 7:45:20
		0.09	5.50	0:05:30	9/26/13 7:45:50
		0.10	6.00	0:06:00	9/26/13 7:46:20
		0.11	6.50	0:06:30	9/26/13 7:46:50
		0.12	7.00	0:07:00	9/26/13 7:47:20
		0.13	7.50	0:07:30	9/26/13 7:47:50
		0.13	8.00	0:08:00	9/26/13 7:48:20
		0.14	8.50	0:08:30	9/26/13 7:48:50
		0.15	9.00	0:09:00	9/26/13 7:49:20
		0.16	9.50	0:09:30	9/26/13 7:49:50
		0.17	10.00	0:10:00	9/26/13 7:50:20
		0.18	10.50	0:10:30	9/26/13 7:50:50
		0.18	11.00	0:11:00	9/26/13 7:51:20
		0.19	11.50	0:11:30	9/26/13 7:51:50
		0.20	12.00	0:12:00	9/26/13 7:52:20
		0.21	12.50	0:12:30	9/26/13 7:52:50
		0.22	13.00	0:13:00	9/26/13 7:53:20
		0.23	13.50	0:13:30	9/26/13 7:53:50
		0.23	14.00	0:14:00	9/26/13 7:54:20
		0.24	14.50	0:14:30	9/26/13 7:54:50
		0.25	15.00	0:15:00	9/26/13 7:55:20
		0.26	15.50	0:15:30	9/26/13 7:55:50
		0.27	16.00	0:16:00	9/26/13 7:56:20
		0.28	16.50	0:16:30	9/26/13 7:56:50
		0.28	17.00	0:17:00	9/26/13 7:57:20
		0.29	17.50	0:17:30	9/26/13 7:57:50
		0.30	18.00	0:18:00	9/26/13 7:58:20
		0.31	18.50	0:18:30	9/26/13 7:58:50
		0.32	19.00	0:19:00	9/26/13 7:59:20
		0.33	19.50	0:19:30	9/26/13 7:59:50
		0.33	20.00	0:20:00	9/26/13 8:00:20
		0.34	20.50	0:20:30	9/26/13 8:00:50
		0.35	21.00	0:21:00	9/26/13 8:01:20
		0.36	21.50	0:21:30	9/26/13 8:01:50
		0.37	22.00	0:22:00	9/26/13 8:02:20
		0.38	22.50	0:22:30	9/26/13 8:02:50
		0.38	23.00	0:23:00	9/26/13 8:03:20
		0.39	23.50	0:23:30	9/26/13 8:03:50
		0.40	24.00	0:24:00	9/26/13 8:04:20
		0.41	24.50	0:24:30	9/26/13 8:04:50
		0.42	25.00	0:25:00	9/26/13 8:05:20
		0.43	25.50	0:25:30	9/26/13 8:05:50
		0.43	26.00	0:26:00	9/26/13 8:06:20
		0.44	26.50	0:26:30	9/26/13 8:06:50
		0.45	27.00	0:27:00	9/26/13 8:07:20
		0.46	27.50	0:27:30	9/26/13 8:07:50
		0.47	28.00	0:28:00	9/26/13 8:08:20
		0.48	28.50	0:28:30	9/26/13 8:08:50
		0.48	29.00	0:29:00	9/26/13 8:09:20
		0.49	29.50	0:29:30	9/26/13 8:09:50
		0.50	30.00	0:30:00	9/26/13 8:10:20
		0.51	30.50	0:30:30	9/26/13 8:10:50
		0.52	31.00	0:31:00	9/26/13 8:11:20
		0.53	31.50	0:31:30	9/26/13 8:11:50
		0.53	32.00	0:32:00	9/26/13 8:12:20

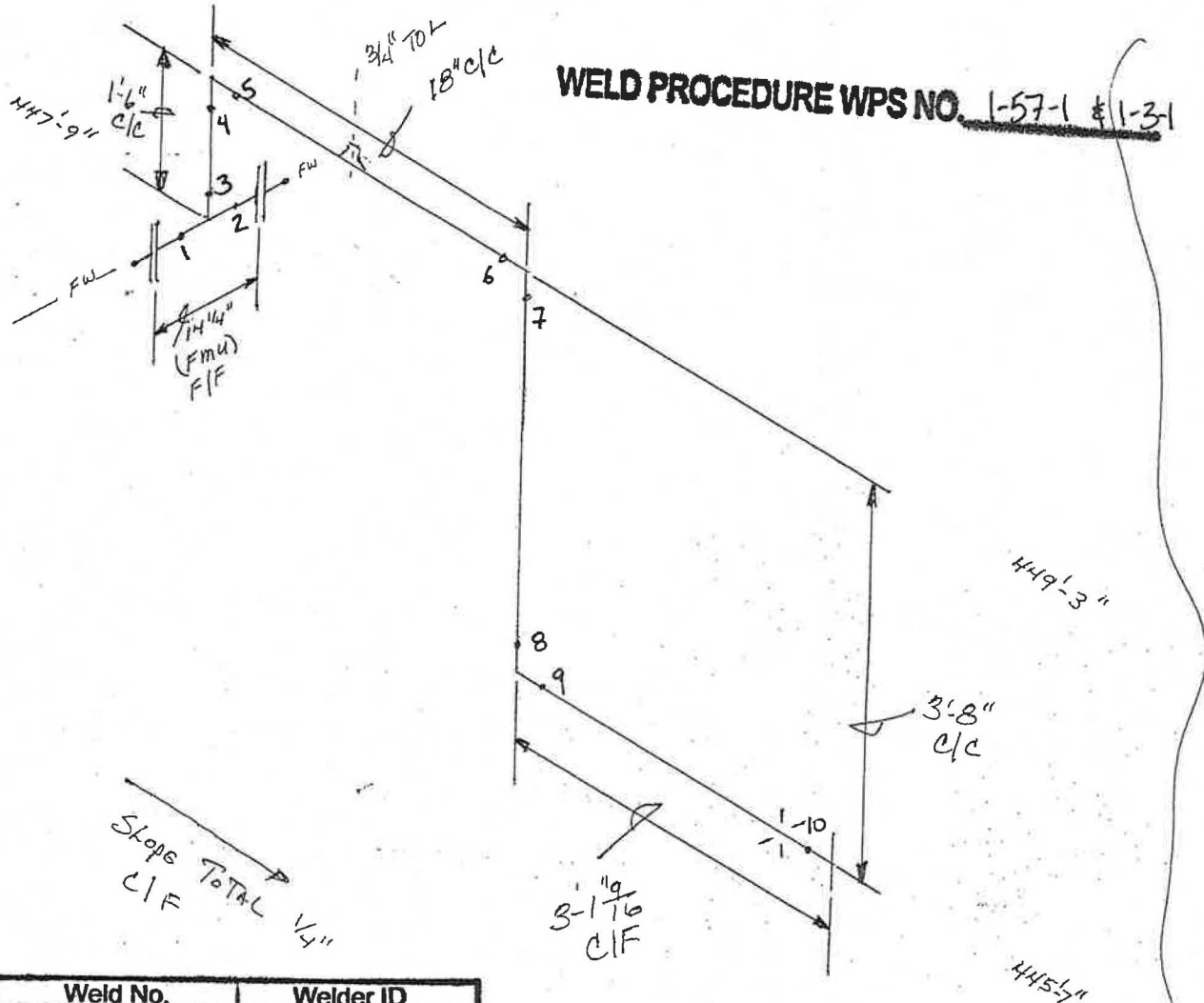


- 9- 4" 150# RFWN FLANGES
- 2- 4" STD TEE'S B/W
- 3- 4" STD 90° B/W
- 1- 3/4" ON 4" TOL
- 1- 4" 150# DIE-ELECT KIT
- 1- 4" 150# 1/8" THICK GASKETS (AS SPEC)
- 5- 4" 150# STUDS KITS w/ 2# NUTS
- 40'- 4" 150# 3/8" x 3 3/4" E/E
- 20LO 4" STD WT CIS A106 PIPE

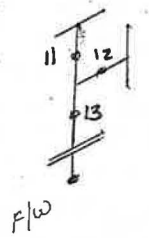


WELD MAP

WELD PROCEDURE WPS NO. 1-57-1 & 1-31



- 9- 4", 150# RFWW FLANGES
- 2- 4" STD TEE'S B/W
- 3- 4" STD 90° B/W
- 1- 3/4" ON 4" TOL
- 1- 4", 150# DIE-ELECT KIT
- 5- 4", 150# 1/8" THICK GASKETS (AS SPEC)
- 40'- 4", 150# STUDS KITS w/ 2H nuts (5/8" x 3 3/4" E/E)
- 20' 4", STD WT C/S A106 PIPE



PC # 2

Weld No.	Welder ID
1	Y
2	Y
3	Y
4	Y
5	403
6	402
7	402

Weld No.	Welder ID
8	374
9	402
10	402
11	374
12	374
13	374
75	402

Scale: 1" = 10'-0"







TEAM[®] Industrial Services, Inc.

TCM Division

500 Broadway
S.Roxana, Illinois 62087 (618) 251-4125

Date: 9-25-13 FWO # 12231191 P.O.# JOB#4847

Form 20.6-316 REV2

Customer GROSS MECHANICAL		Type of Item PIPE WELD			Radiation Source IR-192 <input checked="" type="checkbox"/> CO-60 <input type="checkbox"/> X-Ray <input type="checkbox"/>			Penetrameter Type ASTM HOLE TYPE 17 (1T)			Film Type AGFA D4		Film Size 4.5"X10"					
Specification ASME B31.3 NORMAL 2010		Drawing No. SVE SKETCH SP-1			Source Strength or MA / KV 55 Ci.			Penetrameter Material SS			Emulsion or Lot No. 2540613							
Procedure RT ASME.1 R/16		Pipe Dia. 4.500"	Nom. Thickness .237"+.125"		Focal Spot Size 0.124"		Exposure Time 20 SEC		Penetrameter Location Film Side <input checked="" type="checkbox"/> Source Side <input type="checkbox"/>			Film Exp. Date 2016.04						
Acceptance Procedure PARA 8.6		Joint Type BUTT	Material CS		Source to Film Distance (SFD) 5.000"			Shim Material N/A	Shim Thickness N/A		Film Technique Single Load <input checked="" type="checkbox"/> Double Load <input type="checkbox"/>							
Technique C		Surface Condition AS WELDED			Source to Object Distance (SOD) 4.638"			ID Placement FLASH			Backing Lead Thickness N/A							
Viewing Single <input checked="" type="checkbox"/> Double <input type="checkbox"/>		Automatic <input type="checkbox"/> Manual <input checked="" type="checkbox"/>			Screens PB	Front .010	Ctr. NA	Back .010	Locations Marker Placement FILM SIDE			Backing Lead Location N/A						
Weld No.	Section Number	Geo. Unsharp "Ug"	Acc.	Rej	Por	SI	C	IF	IP	UC	BT	FA	Surface	Remarks/Comments	Welder ID	Pene. Density	Weld Density	Techniques
W#1	0-1	.011"	\												Y	2.19	2.69	A. Panoramic
	1-2		\													2.31	2.57	
	2-0	↓	\													2.06	2.48	
W#2	0-1	.011"	\													2.29	2.56	B. Single Wall
	1-2		\									\				2.19	2.69	
	2-0	↓	\													2.24	2.75	
W#3	0-1	.011"	\									\		ID COUNTERBORE		3.28	3.24	C. Double Wall
	1-2		\													2.99	2.98	
	2-0	↓	\									\		ID COUNTERBORE	↓	2.96	3.06	
W#5	0-1	.011"	\												40D	2.89	3.18	D. Elliptical
	1-2		\													3.31	3.36	
	2-0	↓	\									\				2.47	2.77	E. Superimposed
W#9	0-1	.011"	\		\											3.19	3.21	
	1-2		\		\											2.75	3.18	F. Profile
	2-0	↓	\		\	\									↓	2.67	3.02	
Legend:		POR - Porosity SI - Slag Inclusion		C-Crack IF-Incomplete Fusion		IP - Incomplete Penetration		BT- Burn Thru or Suck Back		Surf - Surface Indication FA - Film Artifact			UC- Undercut					

Level III Approval: _____ Date: _____ Inspector / Reviewed By: Michael Wurster LF Date: 9-25-13

Client: CR Date: 10/1 Inspector: MICHAEL WURSTER Date: 9-25-13

TEAM[®] Industrial Services, Inc.

TCM Division

500 Broadway

S.Roxana, Illinois 62087 (618) 251-4125

Date: 9-25-13

FWO #







12231191

P.O.#

JOB#4847

Form 20.8-316 REV2

Customer GROSS MECHANICAL		Type of Item PIPE WELD		Radiation Source IR-192 <input checked="" type="checkbox"/> CO-60 <input type="checkbox"/> X-Ray <input type="checkbox"/>		Penetrameter Type ASTM HOLE TYPE 17 (1T)		Film Type AGFA D4	Film Size 4.5"X10"
Specification ASME B31.3 NORMAL 2010		Drawing No. SVE SKETCH SP-2		Source Strength or MA / KV 55 Ci.		Penetrameter Material SS		Emulsion or Lot No. 2540613	
Procedure RT ASME.1 R/16		Pipe Dia. 4.500"	Nom. Thickness .237"+.125"	Focal Spot Size 0.124"	Exposure Time 20 SEC	Penetrameter Location Film Side <input checked="" type="checkbox"/> Source Side <input type="checkbox"/>		Film Exp. Date 2016.04	
Acceptance Procedure PARA 8.6		Joint Type BUTT	Material CS	Source to Film Distance (SFD) 5.000"		Shim Material N/A	Shim Thickness N/A	Film Technique Single Load <input checked="" type="checkbox"/> Double Load <input type="checkbox"/>	
Technique C		Surface Condition AS WELDED		Source to Object Distance (SOD) 4.638"		ID Placement FLASH		Backing Lead Thickness N/A	
Viewing Single <input checked="" type="checkbox"/> Double <input type="checkbox"/>		Automatic <input type="checkbox"/> Manual <input checked="" type="checkbox"/>		Screens PB	Front .010	Ctr. NA	Back .010	Locations Marker Placement FILM SIDE	
								Backing Lead Location N/A	

Weld No.	Section Number	Geo. Unsharp "Ug"	Acc.	Rej	Por	SI	C	IF	IP	UC	BT	FA	Surface	Remarks/Comments	Welder ID	Pene. Density	Weld Density	Techniques
W#11	0-1	.011"	\												32U	2.69	3.19	A. Panoramic 
	1-2		\													2.25	2.42	
	2-0	↓	\													2.19	2.61	
W#12	0-1	.011"	\									\				2.32	2.68	B. Single Wall 
	1-2		\		\											2.19	2.36	
	2-0	↓	\													2.38	2.55	
W#13	0-1	.011"	\		\											2.46	2.87	C. Double Wall 
	1-2		\													2.61	3.04	
	2-0	↓	\											↓		2.38	2.89	
																		D. Elliptical 
																		E. Superimposed 
																		F. Profile 

Legend:	POR - Porosity	C-Crack	IP - Incomplete Penetration	BT- Burn Thru or Suck Back	Surf - Surface Indication	UC- Undercut
	SI - Slag Inclusion	IF-Incomplete Fusion			FA - Film Artifact	

Level III Approval: _____ Date: _____ Inspector / Reviewed By: Michael Wurster Date: 9-25-13

Client: CR Date: 10/1 Inspector: MICHAEL WURSTER Date: 9-25-13

TEAM Industrial Services, Inc.

TCM Division

500 Broadway
S.Roxana, Illinois 62087 (618) 251-4125

Date: 9-25-13







FWO #

12231191

P.O.#

JOB#4847

Form 20.6-316 REV2

Customer GROSS MECHANICAL			Type of Item PIPE WELD			Radiation Source IR-192 <input checked="" type="checkbox"/> CO-60 <input type="checkbox"/> X-Ray <input type="checkbox"/>			Penetrameter Type ASTM HOLE TYPE 17 (1T)			Film Type AGFA D4		Film Size 4.5"X10"					
Specification ASME B31.3 NORMAL 2010			Drawing No. SVE SKETCH SP-1			Source Strength or MA / KV 55 Ci.			Penetrameter Material SS			Emulsion or Lot No. 2540613							
Procedure RT ASME.1 R/16			Pipe Dia. 4.500"	Nom. Thickness .237" +.125"		Focal Spot Size 0.124"	Exposure Time 20 SEC		Penetrameter Location Film Side <input checked="" type="checkbox"/> Source Side <input type="checkbox"/>			Film Exp. Date 2016.04							
Acceptance Procedure PARA 8.6			Joint Type BUTT	Material CS		Source to Film Distance (SFD) 5.000"			Shim Material N/A	Shim Thickness N/A		Film Technique Single Load <input checked="" type="checkbox"/> Double Load <input type="checkbox"/>							
Technique C			Surface Condition AS WELDED			Source to Object Distance (SOD) 4.638"			ID Placement FLASH			Backing Lead Thickness N/A							
Viewing Single <input checked="" type="checkbox"/> Double <input type="checkbox"/>			Automatic <input type="checkbox"/> Manual <input checked="" type="checkbox"/>			Screens PB	Front .010	Ctr. NA	Back .010		Locations Marker Placement FILM SIDE			Backing Lead Location N/A					
Weld No.	Section Number	Geo. Unsharp "Ug"	Acc.	Rej	Por	SI	C	IF	IP	UC	BT	FA	Surface	Remarks/Comments	Welder ID	Pena. Density	Weld Density	Techniques	
W#10	0-1	.011"	\												40D	3.29	3.39	A. Panoramic	
	1-2		\																
	2-0	↓	\																
																		B. Single Wall	
																			
																		C. Double Wall	
																			
																		D. Elliptical	
																			
																		E. Superimposed	
																			
																		F. Profile	
																			
Legend:		POR - Porosity		C-Crack		IP - Incomplete Penetration		BT- Burn Thru or Suck Back		Surf - Surface Indication		FA - Film Artifact		UC - Undercut					
		SI - Slag Inclusion		IF-Incomplete Fusion															

Level III Approval: _____ Date: _____ Inspector / Reviewed By: Michael Wurster Date: 9-25-13

Client: CEL Date: 10/1 Inspector: MICHAEL WURSTER Date: 9-25-13

S6 #2



CODE TRAVELER - Shop

Gross Mechanical Contractors, Inc.	Job Number 4847	Drawing Number Sketch 2			
Customer Name P66	ASME Code Section B31.3 Normal Fluid Service				
Pipe Spec: AAAA1					
Paint Spec: REP 10-3-1 System 4					
Preheat Required Y Temp 50 F					
X-Ray 5%S, Brinell Hardness - N/R , MT 10% (Roots/Final/Branch Conn, Socket Welds), VT 100 %					
PWHT Required N NDE (Xray) after PWHT Required N					
	QC Manager	Date	HP	Client	
Initial Review	CBK	10/1			
Drawing/Sketch	CBK	10/1			
Calculations	N/A	N/A			
Receiving Inspection Report	CBK	10/1			
Material Test Report	CBK	10/1			
WPS Review	CBK	10/1			
Welder Qualification Review	CBK	10/1			
Original Data Report	N/A	N/A			
Pg. 2 Weld Joint I.D.	CBK	10/1			
NDE (Proced. And Quals.)	CBK	10/1			
Heat Treatment	N/A	N/A			
NDE Paperwork Complete	N/A	N/A			
Non-Conformance reports	CBK	10/1			
Pressure Test @ (450) PSIG	CBK	10/1			
Pressure Gage No. (1517a)	CBK	10/1			
PMI Plugs	NA	NA			
Report Form ()	N/A	N/A			
Final Review	CBK	10/1			
Brief Description of Work (Include sketch if necessary): Shop fabrication of 10 spools					
Dimension and Orientation Verification.: CBK					
Comments:					
Material List (SA/ A / SFA Specification and Dimension Required):					
See Receiving Inspection Report					
OR: Referance Bill of Material or Drawing List Bill of Material					

CODE TRAVELER

Customer Name		Job Number		Drawing Number	
P66		4847		Sketch 2	
Joint I.D.	Welder ID/NDE/PWHT ID	QC Manager	Date	Client	Date
WPS: 1-57-1 W-15	Fit				
	Final	400	CBG		10/1
	NDE	VT	CBG		10/1
	PWHT				
WPS: 1-57-1 W-16	Fit				
	Final	400	CBG		10/1
	NDE	VT	CBG		10/1
	PWHT				
WPS: 1-57-1 W-17	Fit				
	Final	400	CBG		10/1
	NDE	VT	CBG		10/1
	PWHT				
WPS: 1-57-1 W-18	Fit				
	Final	400	CBG		10/1
	NDE	VT	CBG		10/1
	PWHT				
WPS: 1-57-1 W-19	Fit				
	Final	400	CBG		10/1
	NDE	VT	CBG		10/1
	PWHT				
WPS: 1-57-1 W-20	Fit				
	Final	320	CBG		10/1
	NDE	VT	CBG		10/1
	PWHT				
WPS: 1-57-1 W-21	Fit				
	Final	400	CBG		10/1
	NDE	VT	CBG		10/1
	PWHT				
WPS: 1-57-1 W-22	Fit				
	Final	4	CBG		10/1
	NDE	VT	CBG		10/1
	PWHT				
WPS: 1-57-1 W-23	Fit				
	Final	4	CBG		10/1
	NDE	VT	CBG		10/1
	PWHT				
WPS: 1-57-1 W-24	Fit				
	Final	4	CBG		10/1
	NDE	VT	CBG		10/1
	PWHT				

Joint I.D.	Welder ID/NDE/PWHT ID		QC Manager	Date	Client	Date
WPS: 1-57-1 W-25	Fit					
	Final	Y	CBG	10/1		
	NDE	VT	UG	10/1		
	PWHT					
WPS: 1-57-1 W-26	Fit					
	Final	Y	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-27	Fit					
	Final	400	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-28	Fit					
	Final	400	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-29	Fit					
	Final	400	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-30	Fit					
	Final	400	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-31	Fit					
	Final	Y	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-32	Fit					
	Final	Y	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-33	Fit					
	Final	Y	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					

WPS: 1-57-1 W-34	Fit					
	Final	4	CB	10/1		
	NDE	VT	CB	10/1		
	PWHT					
WPS: 1-57-1 W-35	Fit					
	Final	400	CB	10/1		
	NDE	VT	CB	10/1		
	PWHT					
WPS: 1-57-1 W-36	Fit					
	Final	4	CB	10/1		
	NDE	VT	CB	10/1		
	PWHT					
WPS: 1-57-1 W-37	Fit					
	Final	400	CB	10/1		
	NDE	VT	CB	10/1		
	PWHT					
WPS: 1-57-1 W-38	Fit					
	Final	400	CB	10/1		
	NDE	VT	CB	10/1		
	PWHT					
WPS: 1-57-1 W-39	Fit					
	Final	400	CB	10/1		
	NDE	VT	CB	10/1		
	PWHT					
WPS: 1-57-1 W-40	Fit					
	Final	400	CB	10/1		
	NDE	VT	CB	10/1		
	PWHT					
WPS: 1-57-1 W-41	Fit					
	Final	400	CB	10/1		
	NDE	VT	CB	10/1		
	PWHT					
WPS: 1-57-1 W-42	Fit					
	Final	324	CB	10/1		
	NDE	VT	CB	10/1		
	PWHT					

WPS: 1-57-1 W-43	Fit					
	Final	4	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-44	Fit					
	Final	4	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-45	Fit					
	Final	30X	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-46	Fit					
	Final	30X	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-47	Fit					
	Final	30X	CBG	10/1		
	NDE	VT, RT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-48	Fit					
	Final	30X	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-49	Fit					
	Final	30N	CBG	10/1		
	NDE	VT, RT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-50	Fit					
	Final	4	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-51	Fit					
	Final	30X	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					

WPS: 1-57-1 W-52	Fit					
	Final	30X	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-53	Fit					
	Final	30X	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-54	Fit					
	Final	40X	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-55	Fit					
	Final	30X	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-56	Fit					
	Final	Y	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-57	Fit					
	Final	Y	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-58	Fit					
	Final	30N	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
WPS: 1-57-1 W-59	Fit					
	Final	30N	CBG	10/1		
	NDE	VT	CBG	10/1		
	PWHT					
	Fit					
	Final					
	NDE					
	PWHT					
	Fit					
	Final					
	NDE					
	PWHT					



Pipe Test Report

Job No. 4847 Test No. Job 4847-1-1
Plant/Area SVE for URS/Shell Sheet 1 of 1
System _____ Test Pressure 450 psig
Ref P&ID's _____ Test Medium Water

System inspected according to P&ID Check procedure Test Gauge _____ 159706
Ready for Testing Yes Calibration Date _____ 14-Aug
All Critical Instrumentation Disconnected or Blinded to Range _____ 5000
Prevent Damage Yes Hold Time _____ 30 Minutes minimum

Contractor/Subcontractor Gross Mechanical Contractors, Inc.

Line No.	FROM	TO
	Sketch 2	Spools A, B, + C - Test #1
		Spools D, E, F, G, H, I, J - Test #2

Date: _____ Contractor/Suncontractor Gross Mechanical Contractors, Inc.

Date: 10/1/13 Inspector [Signature]
Record No. Job 4847-1-1

Client Rep. [Signature] Date _____

Project 4847
Spools: A, B & C

Serial number 159706
 Model 5KPSIXP2
 Units PSI
 Firmware version D0018 Message store -----
 Run index 1
 Logging Type Average
 Logging Interval 30
 Start time 09/27/2013 9:21
 Stop time 09/27/2013 9:58
 Time Average

Pressure (PSI)

Time	Average	Event	Event Date	Time (hours)	Time (minutes)	Elapsed Time	Timestamp
0		Battery OK		0.00	0.00	0:00:00	9/27/13 9:21:45
0		Logging Interval, 30		0.00	0.00	0:00:00	9/27/13 9:21:45
0		Tare, 0.0		0.00	0.00	0:00:00	9/27/13 9:21:45
0				0.00	0.00	0:00:00	9/27/13 9:21:45
30	470.9			0.01	0.50	0:00:30	9/27/13 9:22:15
60	470.8			0.02	1.00	0:01:00	9/27/13 9:22:45
90	470.7			0.03	1.50	0:01:30	9/27/13 9:23:15
120	470.5			0.03	2.00	0:02:00	9/27/13 9:23:45
150	470.6			0.04	2.50	0:02:30	9/27/13 9:24:15
180	470.5			0.05	3.00	0:03:00	9/27/13 9:24:45
210	470.9			0.06	3.50	0:03:30	9/27/13 9:25:15
240	471			0.07	4.00	0:04:00	9/27/13 9:25:45
270	471.3			0.08	4.50	0:04:30	9/27/13 9:26:15
300	471.3			0.08	5.00	0:05:00	9/27/13 9:26:45
330	471.3			0.09	5.50	0:05:30	9/27/13 9:27:15
360	471.6			0.10	6.00	0:06:00	9/27/13 9:27:45
390	471.9			0.11	6.50	0:06:30	9/27/13 9:28:15
420	471.9			0.12	7.00	0:07:00	9/27/13 9:28:45
450	471.9			0.12	7.50	0:07:30	9/27/13 9:29:15
480	472.2			0.13	8.00	0:08:00	9/27/13 9:29:45
510	472.2			0.13	8.50	0:08:30	9/27/13 9:30:15
540	472.2			0.14	9.00	0:09:00	9/27/13 9:30:45
570	472.4			0.15	9.50	0:09:30	9/27/13 9:31:15
600	472.4			0.16	10.00	0:10:00	9/27/13 9:31:45
630	472.6			0.17	10.50	0:10:30	9/27/13 9:32:15
660	472.8			0.18	11.00	0:11:00	9/27/13 9:32:45
690	473			0.18	11.50	0:11:30	9/27/13 9:33:15
720	473.1			0.19	12.00	0:12:00	9/27/13 9:33:45
750	473.3			0.20	12.50	0:12:30	9/27/13 9:34:15
780	473.6			0.21	13.00	0:13:00	9/27/13 9:34:45
810	473.8			0.22	13.50	0:13:30	9/27/13 9:35:15
840	473.9			0.23	14.00	0:14:00	9/27/13 9:35:45
870	474.1			0.23	14.50	0:14:30	9/27/13 9:36:15
900	474.2			0.24	15.00	0:15:00	9/27/13 9:36:45
930	474.3			0.25	15.50	0:15:30	9/27/13 9:37:15
960	474.4			0.26	16.00	0:16:00	9/27/13 9:37:45
990	474.5			0.27	16.50	0:16:30	9/27/13 9:38:15
1020	474.7			0.28	17.00	0:17:00	9/27/13 9:38:45
1050	474.8			0.28	17.50	0:17:30	9/27/13 9:39:15
1080	475			0.29	18.00	0:18:00	9/27/13 9:39:45
1110	475.1			0.30	18.50	0:18:30	9/27/13 9:40:15
1140	475.4			0.31	19.00	0:19:00	9/27/13 9:40:45
1170	475.5			0.32	19.50	0:19:30	9/27/13 9:41:15
1200	475.6			0.33	20.00	0:20:00	9/27/13 9:41:45
1230	476			0.33	20.50	0:20:30	9/27/13 9:42:15
1260	476.1			0.34	21.00	0:21:00	9/27/13 9:42:45
1290	476.3			0.35	21.50	0:21:30	9/27/13 9:43:15
1320	476.4			0.36	22.00	0:22:00	9/27/13 9:43:45
1350	476.7			0.37	22.50	0:22:30	9/27/13 9:44:15
1380	476.7			0.38	23.00	0:23:00	9/27/13 9:44:45
1410	476.6			0.38	23.50	0:23:30	9/27/13 9:45:15
1440	476.8			0.39	24.00	0:24:00	9/27/13 9:45:45
1470	477			0.40	24.50	0:24:30	9/27/13 9:46:15
1500	477.3			0.41	25.00	0:25:00	9/27/13 9:46:45
1530	477.5			0.42	25.50	0:25:30	9/27/13 9:47:15
1560	477.6			0.43	26.00	0:26:00	9/27/13 9:47:45
1590	477.6			0.43	26.50	0:26:30	9/27/13 9:48:15
1620	477.4			0.44	27.00	0:27:00	9/27/13 9:48:45
1650	477.7			0.45	27.50	0:27:30	9/27/13 9:49:15
1680	477.9			0.46	28.00	0:28:00	9/27/13 9:49:45
1710	478.2			0.47	28.50	0:28:30	9/27/13 9:50:15
1740	478.3			0.48	29.00	0:29:00	9/27/13 9:50:45
1770	478.5			0.48	29.50	0:29:30	9/27/13 9:51:15
1800	478.7			0.49	30.00	0:30:00	9/27/13 9:51:45
1830	478.8			0.50	30.50	0:30:30	9/27/13 9:52:15
1860	478.9			0.51	31.00	0:31:00	9/27/13 9:52:45
1890	478.8			0.52	31.50	0:31:30	9/27/13 9:53:15
	478.7			0.53			

Project 4847

Spools D thru J

Serial number 159706

Pressure (PSI)

Model 5KPSIXP2I

Units PSI

Firmware version D0018 Message store -----

Run index 1

Logging Type Average

Logging Interval 30

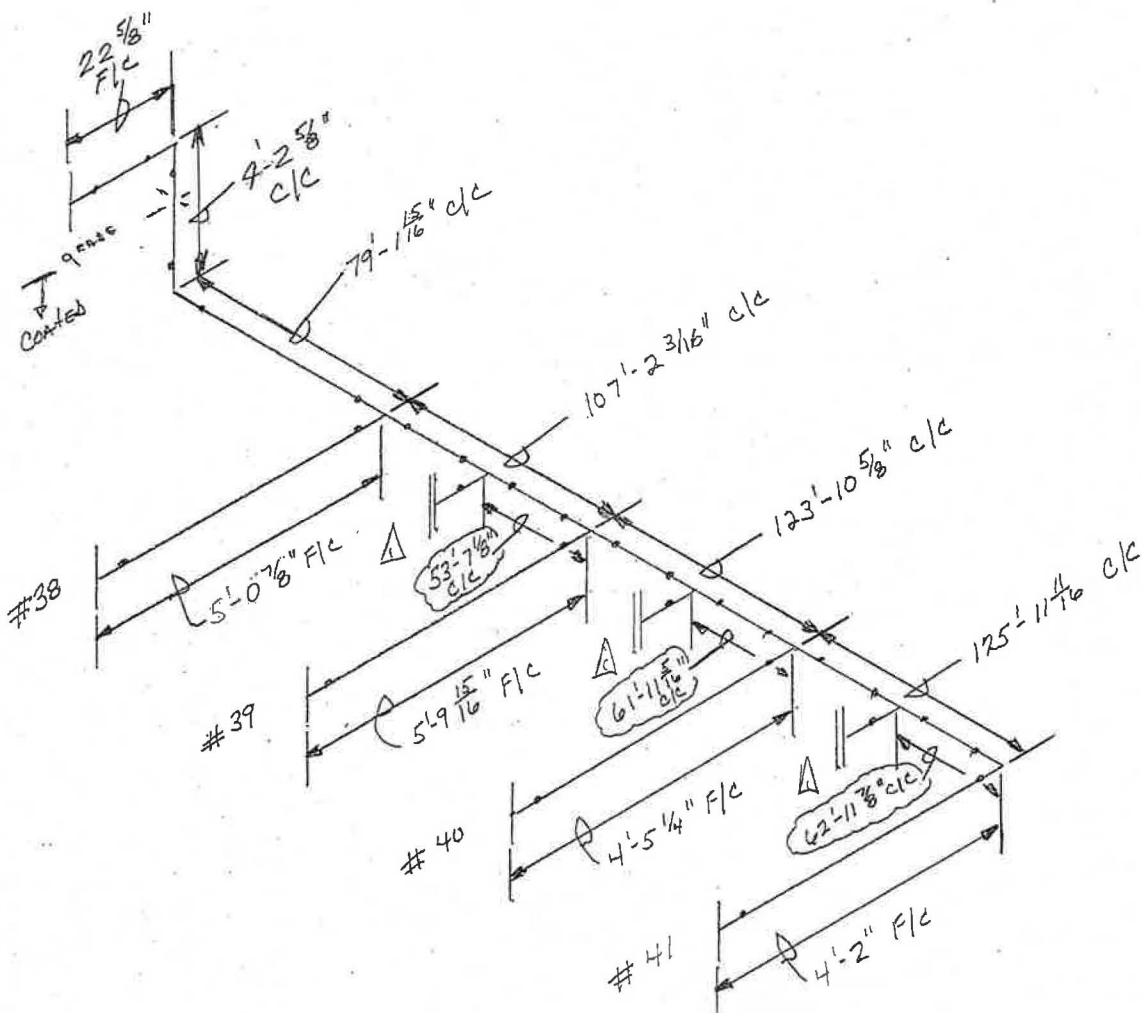
Start time 09/27/2013 13:24

Stop time 09/27/2013 14:05

Time Average

Time	Average
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0	
0	
0	479.6
30	486.9
60	494.9
90	502.9
120	509
150	513.6
180	519.7
210	526.1
240	531.3
270	457.1
300	473
330	473.7
360	469.6
390	470.7
420	470.3
450	470.5
480	468.9
510	472.6
540	474.6
570	469.1
600	475.3
630	470.6
660	471.6
690	470.8
720	471.7
750	471.1
780	472.7
810	472
840	470.7
870	469.2
900	470.4
930	472.5
960	468.9
990	470.2
1020	470.3
1050	469.9
1080	470.5
1110	470.3
1140	470.9
1170	471.4
1200	472
1230	471.7
1260	470.9
1290	470.8
1320	471
1350	468.4
1380	470.8
1410	467.4
1440	470.1
1470	470.2
1500	470.8
1530	470
1560	471
1590	469.7
1620	469.9
1650	470.2
1680	471.7
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1740	470.7
1770	470.1
1800	470.4
1830	469.6
1860	470
1890	471.4

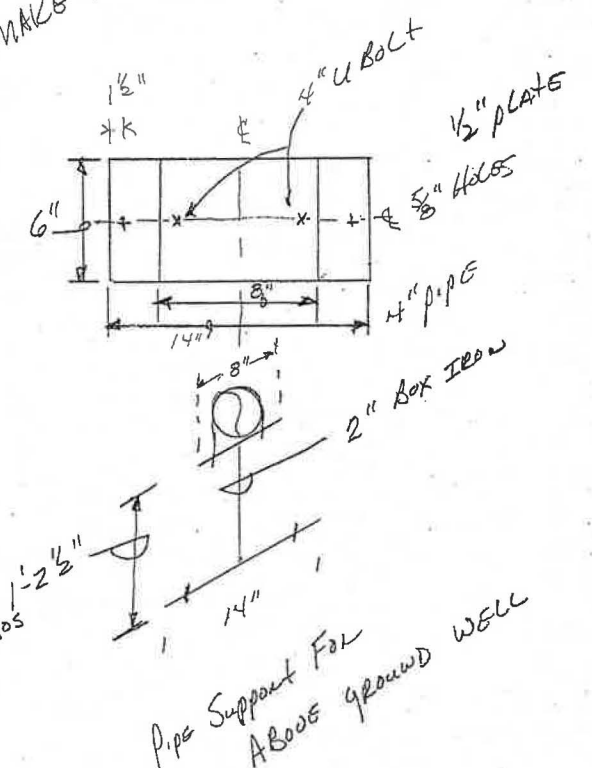
Event	Event Data	Time (hours)	Time (minutes)	Elapsed Time	Timestamp
Battery OK		0.00	0.00	0:00:00	9/27/13 13:24:54
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Tare, 0.0		0.00	0.00	0:00:00	9/27/13 13:24:54
		0.00	0.00	0:00:00	9/27/13 13:24:54
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		0.02	1.00	0:01:00	9/27/13 13:25:54
		0.03	1.50	0:01:30	9/27/13 13:26:24
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		0.04	2.50	0:02:30	9/27/13 13:27:24
		0.05	3.00	0:03:00	9/27/13 13:27:54
		0.06	3.50	0:03:30	9/27/13 13:28:24
		0.07	4.00	0:04:00	9/27/13 13:28:54
		0.08	4.50	0:04:30	9/27/13 13:29:24
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		0.09	5.50	0:05:30	9/27/13 13:30:24
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		0.41	24.50	0:24:30	9/27/13 13:49:24
		0.42	25.00	0:25:00	9/27/13 13:49:54
		0.43	25.50	0:25:30	9/27/13 13:50:24
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		0.45	27.00	0:27:00	9/27/13 13:51:54
		0.46	27.50	0:27:30	9/27/13 13:52:24
		0.47	28.00	0:28:00	9/27/13 13:52:54
		0.48	28.50	0:28:30	9/27/13 13:53:24
		0.48	29.00	0:29:00	9/27/13 13:53:54
		0.49	29.50	0:29:30	9/27/13 13:54:24
		0.50	30.00	0:30:00	9/27/13 13:54:54
		0.51	30.50	0:30:30	9/27/13 13:55:24
		0.52	31.00	0:31:00	9/27/13 13:55:54
		0.53	31.50	0:31:30	9/27/13 13:56:24



▲ - Install Blinds @ Shop.
 UNDERGROUND PIPE - COATED
 - TEST PIPE IN SHOP @ 450#.

4" - STD WALL c/s A106 PIPE
 4" - 150# RFW FLANGES
 4" - STD WT FITTINGS

MAKE 1

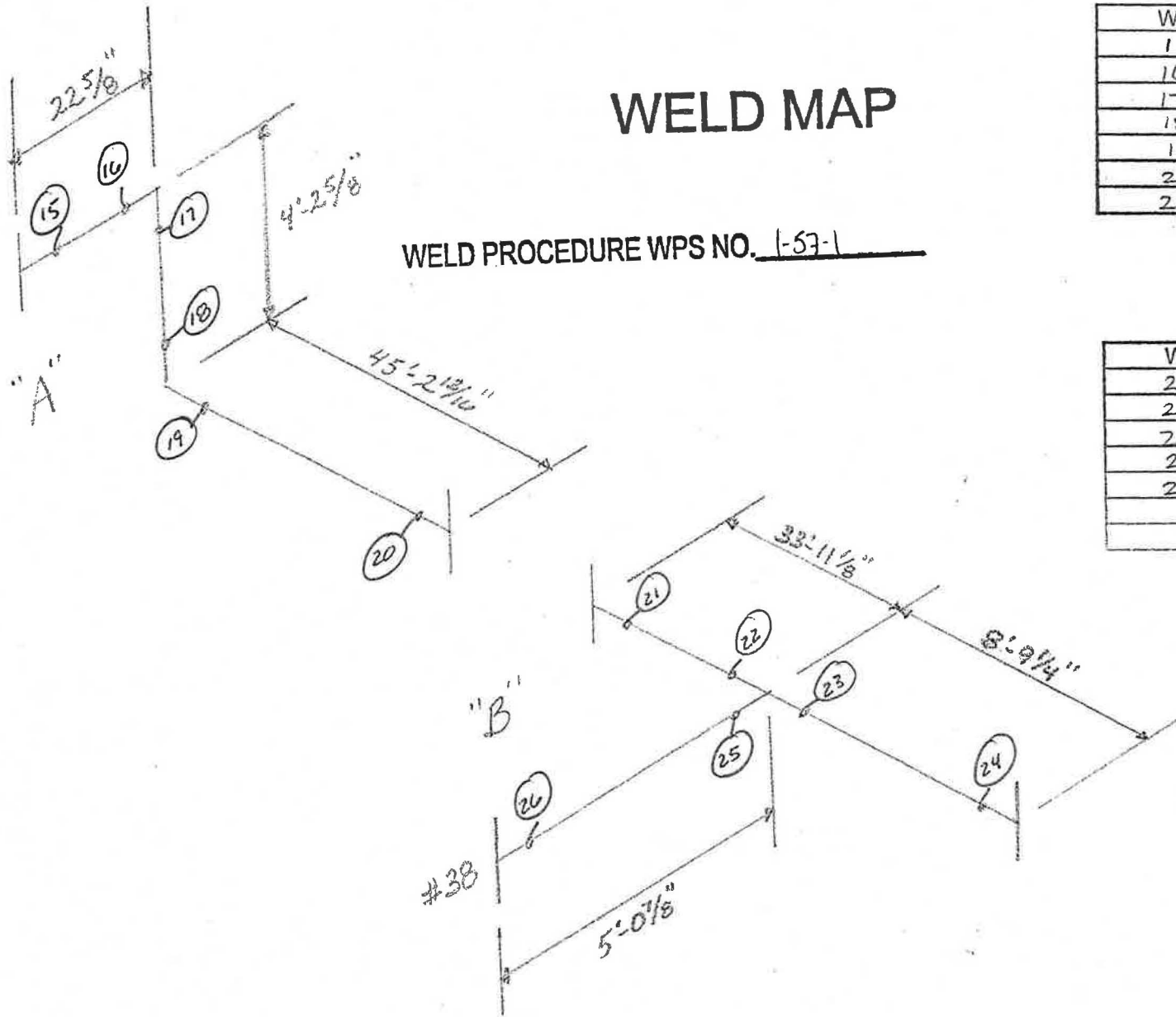


WELD MAP

Weld No.	Welder ID
15	40D
16	40D
17	40D
18	40D
19	40D
20	32u
21	40D

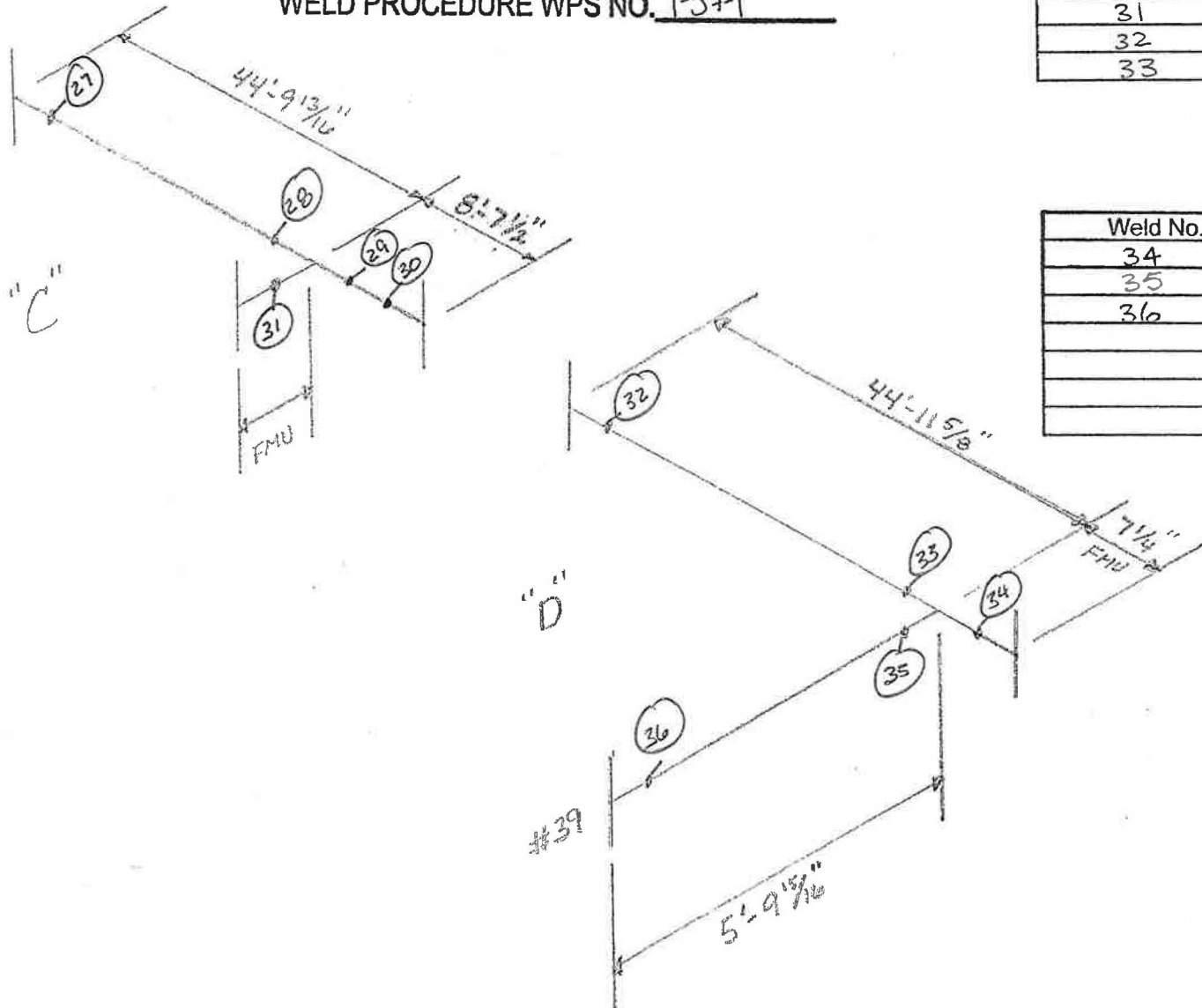
WELD PROCEDURE WPS NO. 1-57-1

Weld No.	Welder ID
22	Y
23	Y
24	Y
25	Y
26	Y



WELD MAP

WELD PROCEDURE WPS NO. 1-57-1

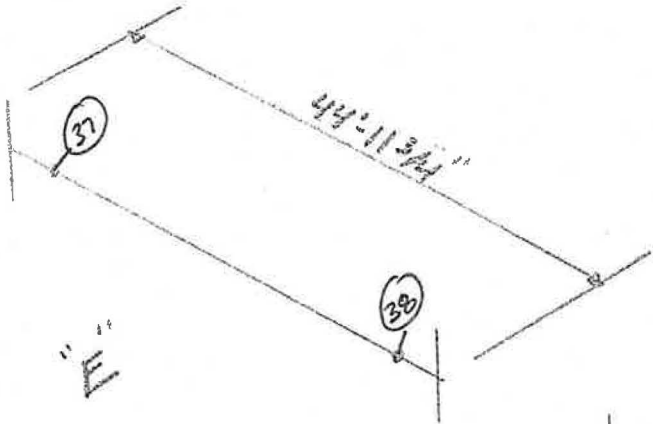


Weld No.	Welder ID
27	40D
28	40D
29	40D
30	40D
31	Y
32	Y
33	Y

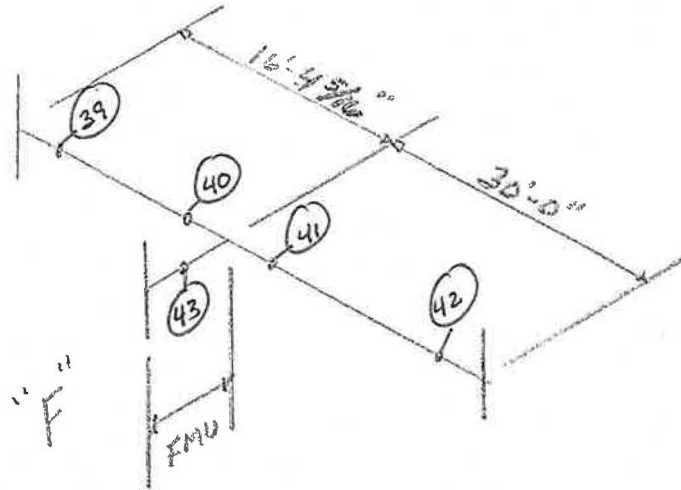
Weld No.	Welder ID
34	Y
35	40D
36	Y

WELD MAP 4847

Weld No.	Welder ID
37	40D
38	40D
39	40D
40	40D
41	40D
42	32U
43	Y



WELD MAP

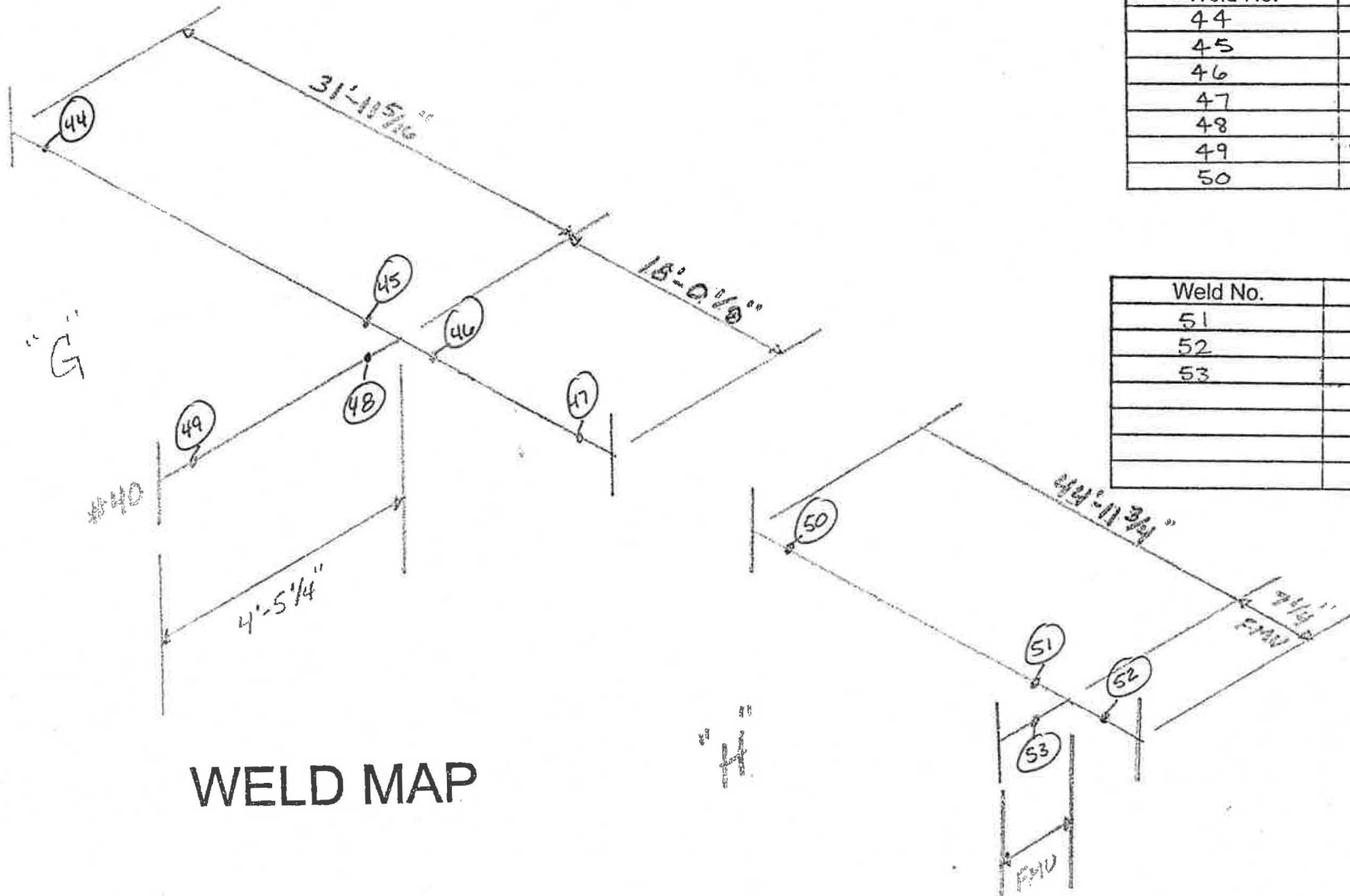


WELD PROCEDURE WPS NO. 1-57-1

WELD MAP 4847

Weld No.	Welder ID
44	Y
45	30X
46	30X
47	30X
48	30X
49	30N
50	Y

Weld No.	Welder ID
51	30X
52	30X
53	30X

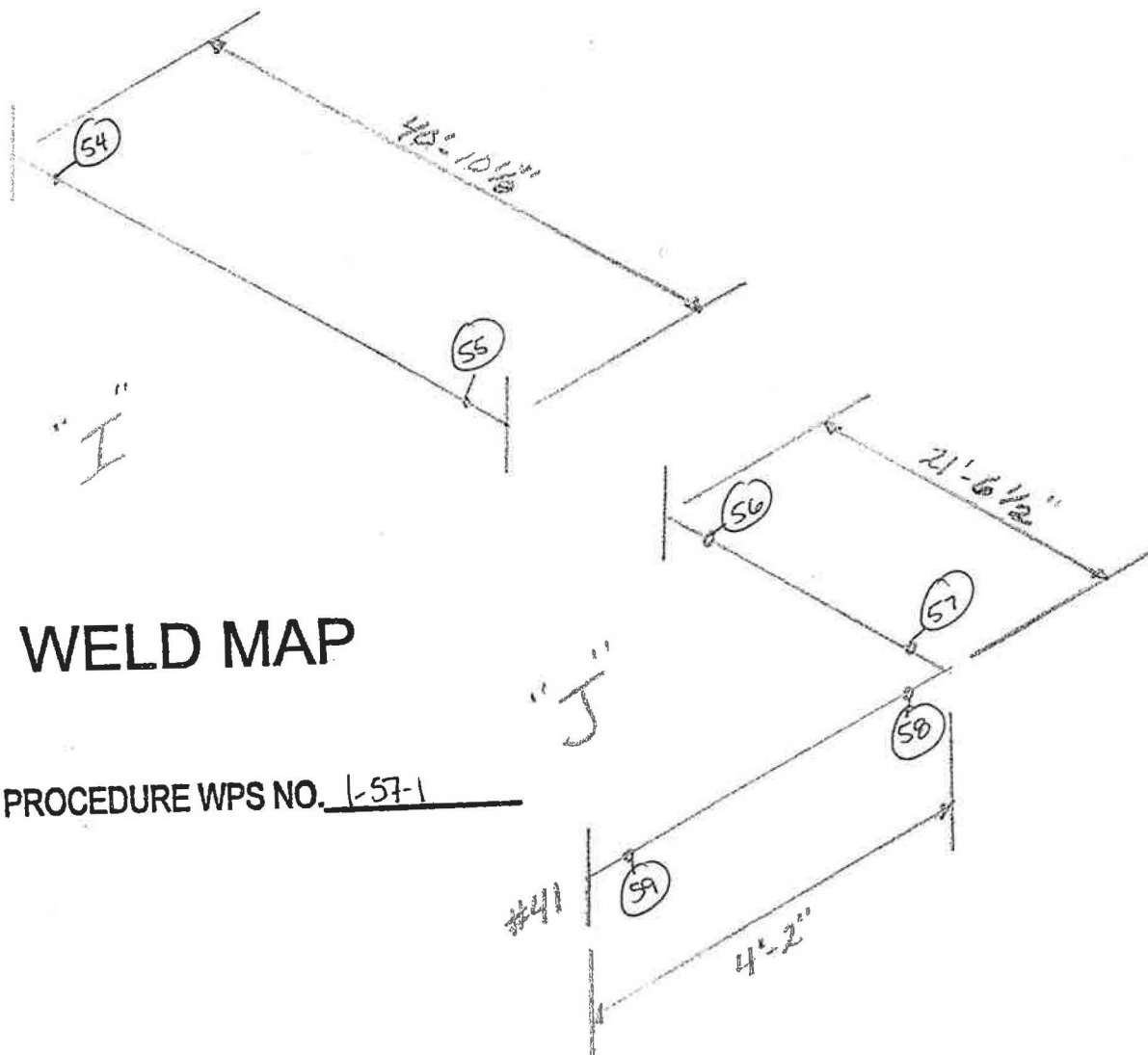


WELD MAP

WELD PROCEDURE WPS NO. 1-57-1

WELD MAP 4847

Weld No.	Welder ID
54	40D
55	30X
56	Y
57	Y
58	30N
59	30N



WELD MAP

WELD PROCEDURE WPS NO. 1-57-1

TEAM[®] Industrial Services, Inc.

TCM Division

500 Broadway

S.Roxana, Illinois 62087 (618) 251-4125

Date: 9-30-13

FWO #







12231276

P.O.#

4847

Form 20.6-316 REV2

Customer GROSS MECHANICAL			Type of Item PIPE WELD				Radiation Source IR-192 <input checked="" type="checkbox"/> CO-60 <input type="checkbox"/> X-Ray <input type="checkbox"/>				Penetrameter Type ASTM 1A			Film Type AGFA D4		Film Size 4.5" X 10"			
Specification ASME B31.3 2010 NORMAL NFS			Drawing No. SVE SKETCH				Source Strength or MA / KV 33 CI				Penetrameter Material SS			Emulsion or Lot No. 1640606					
Procedure RT.ASME.1 REV 15			Pipe Dia. 4"		Nom. Thickness .237"		Focal Spot Size .150"		Exposure Time 25 SEC		Penetrameter Location Film Side <input checked="" type="checkbox"/> Source Side <input type="checkbox"/>			Film Exp. Date 2015.07					
Acceptance Procedure PARA 8.2			Joint Type BUTT		Material C/S		Source to Film Distance (SFD) 4.5"				Shim Material N/A		Shim Thickness N/A		Film Technique Single Load <input checked="" type="checkbox"/> Double Load <input type="checkbox"/>				
Technique C			Surface Condition AS WELDED				Source to Object Distance (SOD) 4.263				ID Placement FLASH			Backing Lead Thickness NA					
Viewing Single <input checked="" type="checkbox"/> Double <input type="checkbox"/>			Film Processing Automatic <input type="checkbox"/> Manual <input checked="" type="checkbox"/>				Screens PB		Front .010"	Ctr. NA	Back .010"		Locations Marker Placement FILM SIDE			Backing Lead Location NA			

Weld No.	Section Number	Geo. Unsharp * Ug"	Acc.	Rej	Por	SI	C	IF	IP	UC	BT	FA	Surface	Remarks/Comments	Welder ID	Pene. Density	Weld Density	Techniques	
W47	0-1	.008"	\										\		32X	WIRE	2.45	A. Panoramic 	
	1-2		\														2.28		
	2-0		\									\			↓	↓	2.30		
W49	0-1		\												30N	WIRE	2.41	B. Single Wall 	
	1-2		\														2.48		
	2-0	↓	\		\							\			↓	↓	2.46		
																		C. Double Wall 	
																			D. Elliptical 
																			E. Superimposed 
																			F. Profile 

Legend:	POR - Porosity SI - Slag Inclusion	C-Crack IF-Incomplete Fusion	IP - Incomplete Penetration	BT- Burn Thru or Suck Back	Surf - Surface Indication FA - Film Artifact	UC- Undercut
----------------	---------------------------------------	---------------------------------	-----------------------------	----------------------------	-------------------------------------------------	--------------

Level III Approval: _____ Date: _____ Inspector / Reviewed By: JAY STEGMANN LEVEL 2 Date: 9-30-13

Client: CBG Date: 10/1 Inspector: [Signature] Date: 9-30-13

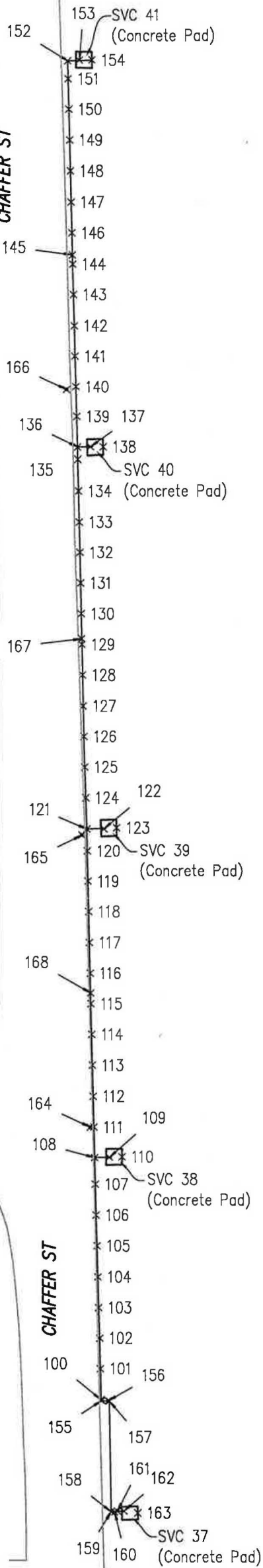


FIRST ST

CHAFFER ST

SECOND ST

CHAFFER ST



Point	Northing	Easting	Elevation	Description
100	793816.34	2322263.60	441.79	Top of Pipe
101	793826.34	2322263.36	441.76	Top of Pipe
102	793836.33	2322263.12	441.73	Top of Pipe
103	793846.33	2322262.82	441.72	Top of Pipe
104	793856.32	2322262.52	441.71	Top of Pipe
105	793866.32	2322262.23	441.70	Top of Pipe
106	793876.32	2322261.93	441.67	Top of Pipe
107	793886.31	2322261.66	441.63	Top of Pipe
108	793895.08	2322261.42	441.58	Top of Pipe-Tee
109	793895.16	2322266.24	441.54	Top of Flange Before Valve
110	793895.35	2322270.36	441.03	Top of Concrete
111	793905.08	2322261.18	441.57	Top of Pipe
112	793915.08	2322260.93	441.56	Top of Pipe
113	793925.07	2322260.69	441.56	Top of Pipe
114	793935.07	2322260.44	441.56	Top of Pipe
115	793945.07	2322260.19	441.55	Top of Pipe
116	793955.06	2322259.94	441.54	Top of Pipe
117	793965.06	2322259.69	441.51	Top of Pipe
118	793975.06	2322259.45	441.49	Top of Pipe
119	793985.05	2322259.20	441.48	Top of Pipe
120	793995.05	2322259.00	441.46	Top of Pipe
121	794002.26	2322258.85	441.44	Top of Pipe-Tee
122	794002.30	2322264.44	441.38	Top of Flange Before Valve
123	794002.64	2322268.56	440.96	Top of Concrete
124	794012.25	2322258.51	441.47	Top of Pipe
125	794022.24	2322258.17	441.51	Top of Pipe
126	794032.24	2322257.88	441.53	Top of Pipe
127	794042.24	2322257.66	441.55	Top of Pipe
128	794052.24	2322257.45	441.58	Top of Pipe
129	794062.23	2322257.23	441.63	Top of Pipe
130	794072.23	2322257.02	441.68	Top of Pipe
131	794082.23	2322256.82	441.71	Top of Pipe
132	794092.23	2322256.61	441.72	Top of Pipe
133	794102.23	2322256.40	441.74	Top of Pipe
134	794112.22	2322256.17	441.78	Top of Pipe
135	794122.22	2322255.91	441.83	Top of Pipe
136	794126.05	2322255.81	441.84	Top of Pipe-Tee
137	794126.18	2322260.06	441.92	Top of Flange Before Valve
138	794126.16	2322264.14	441.45	Top of Concrete
139	794136.05	2322255.54	441.83	Top of Pipe
140	794146.04	2322255.28	441.82	Top of Pipe
141	794156.04	2322255.02	441.80	Top of Pipe
142	794166.04	2322254.75	441.76	Top of Pipe
143	794176.03	2322254.50	441.74	Top of Pipe
144	794186.03	2322254.25	441.68	Top of Pipe
145	794188.97	2322254.17	441.67	Top of Pipe-Tee
146	794196.03	2322253.99	441.65	Top of Pipe
147	794206.02	2322253.72	441.64	Top of Pipe
148	794216.02	2322253.47	441.63	Top of Pipe
149	794226.02	2322253.23	441.60	Top of Pipe
150	794236.01	2322252.98	441.56	Top of Pipe
151	794246.01	2322252.74	441.53	Top of Pipe
152	794251.82	2322252.59	441.53	Top of Pipe-90 Bend
153	794252.04	2322256.42	441.47	Top of Flange Before Valve
154	794252.10	2322260.50	441.00	Top of Concrete
155	793815.95	2322263.71	446.04	Top of Pipe-90Bend @ Start
156	793815.92	2322265.83	446.09	Top of Valve @ Tie-in
157	793815.83	2322266.29	446.01	Top of Pipe-Tee
158	793779.85	2322266.88	447.93	Top of Pipe-Tee
159	793779.88	2322266.93	449.38	Top of Pipe-90Bend down
160	793779.82	2322268.04	449.38	Top of Pipe-90Bend West
161	793780.01	2322268.96	445.72	Top of Pipe-90Bend Up
162	793780.08	2322271.11	445.71	Top of Pipe @ Vault
163	793779.47	2322275.58	444.11	Top of Concrete
164	793905.04	2322259.98		Locator Box
165	794000.32	2322257.28		Locator Box
166	794145.12	2322252.21		Locator Box
167	794064.10	2322257.19	441.64	Top of Pipe-Tee
168	793948.56	2322260.11	441.55	Top of Pipe-Tee

Coordinate information based on the Illinois State Plane Coordinate System - West Zone NAD83 (2007)



2100 State Street, P.O. Box 1325 Granite City, IL 62040 618-877-1400 F. 618-452-5541 Professional Design Firm License No. 184.003389
 100 North Research Drive Edwardsville, IL 62025 618-659-0900 F. 618-659-0941
 330 N. Fourth Street, Suite 200 St. Louis, MO 63102 314-241-4444 F. 314-909-1331

SCALE: 1 inch = 40 feet

DWN. BY: D.C.C. DATE: 11.05.2013

CHK'D: R.G.B. DATE: 11.05.2013

JOB NO. 131703 CADD DRAWING NAME: 131703-01

DWG. NO.

SHELL OIL PRODUCTS, US - ROXANA, IL PROJECT
 PHASE III - REFINING PIPING - SVE EXPANSION
 AS BUILT DATA FOR 4" PIPELINE
 SURVEYED OCTOBER 14, 2013

Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
1

Date
8/20/2013

Description:
Looking southeast at the north end of the Red Line where the Red Line extension tie-in will occur.



Photo No.
2

Date
8/20/2013

Description:
Looking south along the Red Line at the proposed location for SVE-37 to be installed and connected to the Red Line.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
3

Date
8/23/2013

Description:
Looking west at
exploratory Transect T-2
excavation utilized to
locate underground
obstructions and utilities.



Photo No.
4

Date
8/23/2013

Description:
Looking west at
exploratory Transect T-2
excavation where an
underground utility has
been uncovered.

Standing water in the
excavation is surface
drainage from rain during
excavation activities.



Client Name: Shell Oil Products US	Site Location: SVE System Red Line Extension Wood River Refinery, North Property Roxana, Illinois	Project No. 21562850.18000
----------------------------------------------	-------------------------------------------------------------------------------------------------------------------	--------------------------------------

Photo No. 5	Date 9/27/2013
Description: Looking east at exploratory Transect T-3 excavation where an underground utility has been uncovered. Standing water in the excavation is surface drainage from rain during excavation activities.	



Photo No. 6	Date 9/27/2013
Description: Looking north from the Red Line tie-in location near SVE-5 at the hydro excavated trench to be utilized for the installation of the Red Line extension piping. Standing water in the excavation is surface drainage from rain during excavation activities.	



Client Name:

Shell Oil Products US

Site Location:SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois**Project No.**

21562850.18000

Photo No.**7****Date**

9/27/2013

Description:

Looking north from the location of SVE-5 at the hydro excavated trench to be utilized for the installation of the Red Line extension piping.

Standing water in the excavation is surface drainage from rain during excavation activities.

**Photo No.****8****Date**

9/27/2013

Description:

Looking north from the location of SVE-5 at the Contractor hydro excavating trench for the Red Line pipe extension and for the SVE-38 vault.

Standing water in the excavation is surface drainage from rain during excavation activities.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
9

Date
10/4/2013

Description:
Looking at the south flange at the tie-in location of SVE-37 to the Red Line.



Photo No.
10

Date
10/4/2013

Description:
Looking at the north flange at the tie-in location of SVE-37 to the Red Line.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
11

Date
10/4/2013

Description:

Looking at the south and north flanges at the tie-in location of SVE-37 to the Red Line.



Photo No.
12

Date
10/4/2013

Description:

Looking at the new flange (bottom) at the north tie-in location of the Red Line where the extension to the north begins.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
13

Date
10/4/2013

Description:
Looking east at the SVE-39 vault excavation.



Photo No.
14

Date
10/4/2013

Description:
Looking north from SVE-39 at the hydro excavated trench to be utilized for the installation of the Red Line extension piping.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
15

Date
10/8/2013

Description:
Looking west-northwest at the SVE-37 piping tied in to the Red Line and the concrete vault pad.



Photo No.
16

Date
10/8/2013

Description:
Looking northwest at the SVE-37 tie-in to the Red Line.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
17

Date
10/8/2013

Description:
Looking south-southwest
at the north end of the Red
Line where the extension
piping will tie-in and begin.



Photo No.
18

Date
10/8/2013

Description:
Looking north at the SVE
Red Line extension piping
being assembled.



Client Name: Shell Oil Products US	Site Location: SVE System Red Line Extension Wood River Refinery, North Property Roxana, Illinois	Project No. 21562850.18000
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Photo No. 19	Date 10/8/2013
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Description:
Looking north at an abandoned concrete structure/obstruction that will be broken up and removed.



Photo No. 20	Date 10/8/2013
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Description:
Looking north at the hydro excavated trench to be utilized for the installation of the Red Line extension piping.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
21

Date
10/8/2013

Description:
Looking northwest at the Contractor utilizing a backhoe with hoe ram attachment to break up the concrete obstruction.



Photo No.
22

Date
10/8/2013

Description:
Looking down at the Contractor utilizing a chipping hammer to remove the concrete bentonite material from the SVE-39 well casing down to grade in preparation for installation of the concrete vault pad.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
23

Date
10/8/2013

Description:
Looking down at the Contractor utilizing a chipping hammer to remove the concrete bentonite material from the SVE-39 well casing down to grade in preparation for installation of the concrete vault pad.



Photo No.
24

Date
10/9/2013

Description:
Looking down at the installed concrete vault pad at SVE-38.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
25

Date
10/16/2013

Description:
Looking north at the trench backfilled with sand to 6 inches above the SVE Red Line pipe extension.



Photo No.
26

Date
10/16/2013

Description:
Looking north at the installation of the SVE-38 vault. Contractor was in the process of grouting the space between the vault and the concrete vault pad.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
27

Date
10/16/2013

Description:
Looking down at the installation of the SVE-38 vault. Contractor was in the process of grouting the space between the vault and the concrete vault pad.



Photo No.
28

Date
10/16/2013

Description:
Looking northwest at the installation of the SVE-38 vault. Contractor was in the process of grouting the space between the vault and the concrete vault pad.



Client Name:

Shell Oil Products US

Site Location:SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois**Project No.**

21562850.18000

Photo No.**29****Date**

10/16/2013

Description:

Looking northwest at a flush mount cathodic protection inspection port located just north of SVE-38.

**Photo No.****30****Date**

10/16/2013

Description:

Looking north from SVE-39 along the SVE Red Line extension project at the trench backfilled with sand and SVE well vaults installed.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
31

Date
10/16/2013

Description:
Looking northeast and down at the SVE-41 well vault prepared to be grouted.



Photo No.
32

Date
10/17/2013

Description:
Looking north as the Contractor completed backfill of the excavation with flow fill up to within 4 inches of surface grade.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
33

Date
10/17/2013

Description:
Looking northwest at SVE-41 as the Contractor completes backfill of the excavation with flow fill up to within 4 inches of surface grade.



Photo No.
34

Date
10/21/2013

Description:
Looking north at the trench excavation after flow fill has been placed within 4 inches of finish surface.



Client Name:

Shell Oil Products US

Site Location:

SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.

21562850.18000

Photo No.

35

Date

10/21/2013

Description:

Looking northwest at SVE-38 after flow fill has been placed to within 4 inches of finish surface.



Photo No.

36

Date

10/21/2013

Description:

Looking northeast at the SVE-41 vault excavation after flow fill has been placed to within 4 inches of finish surface.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
37

Date
10/21/2013

Description:
Looking north at the trench excavation after flow fill has been placed to within 4 inches of finish surface.



Photo No.
38

Date
10/21/2013

Description:
Looking north along the SVE Red Line extension as the Contractor installs hot mix asphalt.



Client Name:
Shell Oil Products US

Site Location:
SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois

Project No.
21562850.18000

Photo No.
39

Date
10/22/2013

Description:
Looking west at the SVE Red Line extension tie-in location as the Contractor completes striping of the parking stalls.



Photo No.
40

Date
10/22/2013

Description:
Looking north from SVE-5 along the SVE Red Line extension as the Contractor completes striping of the parking stalls.



Client Name:

Shell Oil Products US

Site Location:SVE System Red Line Extension
Wood River Refinery, North Property
Roxana, Illinois**Project No.**

21562850.18000

Photo No.**41****Date**

10/22/2013

Description:

Looking north from SVE-38 along the SVE Red Line extension as the Contractor completes striping of the parking stalls.

**Photo No.****42****Date**

10/22/2013

Description:

Looking north from SVE-39 along the SVE Red Line extension as the Contractor completes striping of the parking stalls.

