

May 23, 2017

Ms. Joyce Munie, P.E.  
Manager, Permit Section  
Illinois Environmental Protection Agency  
Bureau of Land  
1021 North Grand Avenue East  
Springfield, Illinois 62794

**Submittal of Corrected Information  
Groundwater Monitoring Well and Vapor Monitoring Point Installation Report  
Roxana, Illinois  
1191150002 – Madison County  
Equilon Enterprises LLC d/b/a Shell Oil Products US  
Log No. B-43R**

Dear Ms. Munie:

On behalf of Shell Oil Products US (SOPUS), AECOM Technical Services, Inc. (AECOM) hereby submits the enclosed addendum to the above-referenced report (the Report).

AECOM collects a variety of samples for SOPUS as part of the work performed in connection with the above-referenced site including the samples referenced and utilized in the Report. AECOM contracts with independent laboratories to analyze the samples collected. As noted in SOPUS' initial disclosure letter and our subsequent communications, Accutest Laboratories (Accutest) issued revised laboratory analyses in response to an internal evaluation performed of its process. Please note, the majority of the corrected analyses were issued only to include a revised footnote and the numeric value of the analytical results reported remained unchanged. If any numeric values of analytical results presented in the Report were updated by Accutest, the updated results are presented as part of the information included in the Report addendum. Moreover, based upon our evaluation of the Report and the revised information received from Accutest, the conclusion(s) of the Report as originally issued are unaffected.

The information provided within and the format of this addendum is as discussed during our meeting with IEPA on March 23, 2017. This addendum includes the following information:

- IEPA LPC form
- Data Review Addendum Table (summarizing changed information)
- Revised analytical results table
- Revised laboratory reports (on CD)



If you have any questions during your review, please contact Kevin Dyer, SOPUS Senior Principal Program Manager, at [kevin.dyer@shell.com](mailto:kevin.dyer@shell.com) (618/288-7237), or Bob Billman at [bob.billman@aecom.com](mailto:bob.billman@aecom.com) (314/743-4108).

Sincerely,

AECOM, on behalf of Shell Oil Products US

A handwritten signature in blue ink that reads "Robert B. Billman". The signature is written in a cursive style with a long, sweeping underline.

Robert Billman, PG  
Senior Project Manager

A handwritten signature in blue ink that reads "Robert E. Mooshegian". The signature is written in a cursive style with a long, sweeping underline.

Robert E. Mooshegian, CHMM  
Senior Program Manager

Enclosures: 2 copies

cc: Kevin Dyer, SOPUS  
Shannon Haney, Greensfelder, Hemker & Gale P.C.  
Repositories – Village Hall, Roxana Public Library, website  
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 Site No. (USEPA): ILD 080 012 305

### 2.0 OWNER INFORMATION

Name: Not Applicable  
 Mailing Address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Contact Name: \_\_\_\_\_  
 Contact Title: \_\_\_\_\_  
 Phone No.: \_\_\_\_\_

### 3.0 OPERATOR INFORMATION

Equilon Enterprises LLC dba Shell Oil Products US (SOPUS)  
 17 Junction Drive, PMB #399  
 Glen Carbon, IL 62034  
 \_\_\_\_\_  
 Kevin Dyer  
 Senior Principal Program Manager  
 618-288-7237

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

RFI Phase I Workplan/Report  
 RFI Phase II Workplan/Report  
 CMP Report; Phase \_\_\_\_\_  
 Other (describe):  
Multiple Document Addenda (see attached report list)  
Date of Submittal May 2017

IEPA Permit Log No. B-43R  
 Date of Last IEPA Letter  
 on Project January 18, 2017  
 Log No. of Last IEPA  
 Letter on Project B-43R-CA-59, -60, -69  
 Does this submittal include groundwater information:  Yes  No

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

Addenda to multiple documents. List of documents is provided on the Attachment 1. Addenda being issued due to revised laboratory reports.

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

Cover letter, RCRA Corrective Action Certification. Addenda to multiple documents identified on the attached list.

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

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

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

A person is a duly authorized representative only if:

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

Owner Signature: \_\_\_\_\_ (Date) \_\_\_\_\_

Title: \_\_\_\_\_

Operator Signature: Kevin Edger \_\_\_\_\_ 5/17/18 \_\_\_\_\_  
(Date)

Title: Senior Principal Program Manager

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

Professional's Signature: Robert B. Billman \_\_\_\_\_ 5/17/17 \_\_\_\_\_  
Date

Professional's Name: Robert B. Billman

Professional's Address: AECOM Technical Services, Inc.

1001 Highlands Plaza Drive West, Suite 300

St. Louis, MO 63110

Professional's Phone No.: 314-429-0100



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: See Attachment 2

Signature of Laboratory \_\_\_\_\_  
Responsible Officer \_\_\_\_\_ Date \_\_\_\_\_

Mailing Address of Laboratory: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Name and Title of Laboratory Responsible Officer

**Attachment 1  
List of Documents**

<b>Submittal</b>	<b>Date of Submittal</b>
Roxana 3Q12 Groundwater Monitoring Report	10/15/2012
Roxana 4Q12 Groundwater Monitoring Report	1/15/2013
Roxana 4Q13 Soil Vapor Report	1/31/2014
Roxana 1Q14 Soil Vapor Report	4/30/2014
Roxana 2Q14 Soil Vapor Report	7/30/2014
Roxana 3Q14 Soil Vapor Report	10/30/2014
Roxana 2Q15 Soil Vapor Report	7/29/2015
GWP-28 Installation Plan	11/27/2012
Public Work Yard Soil Sampling Report	3/13/2013
<b>GW Monitoring Well and Vapor Monitoring Point Installation Report</b>	<b>4/3/2013</b>
April 30, 2013-Groundwater Profile Delineation Report	4/30/2013
Addendum to Monitoring Well & Vapor Monitoring Point Installation Report - Supplemental Investigation Activities	5/22/2013
SVE Expansion-Construction Completion Rpt Addendum 2	1/9/2014
SVE System Construction Completion Rpt Addendum 3	3/4/2015

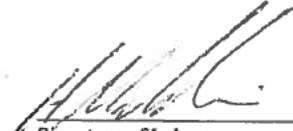
Note: Highlighted row represents subject Addendum

**ATTACHMENT 2**

**LABORATORY CERTIFICATION**

Revisions to previously reported laboratory data were required following a laboratory quality review. These revisions were performed in accordance with industry standards for testing laboratories accredited by the National Environmental Laboratory Accreditation Conference (NELAC). I certify the information contained in the revised and reissued laboratory reports are, to the best of my knowledge and belief, true, accurate and complete.

Name of Laboratory: SGS Accutest


5.17.17  
 Signature of Laboratory Responsible Officer      Date

Mailing Address of Laboratory:  
50 D'Angelo Drive  
495 Technology Center West, Building 1  
Marlboro, MA 01752

HASSAN (BABU) MADAVAN  
 Name and Title of Laboratory Responsible Officer  
LAB Director

LEGAL REVIEWED  
 BY: MD  
 DATE: 5.17.17

Laboratory Report (Sample Delivery Group[SDG])			
mc12669	mc23880	mc17144	mc18856
mc12784	mc26889	mc17324	mc18890
mc12833	mc27073	mc17401	mc18895
mc12905	mc23933	mc16336	mc18752
mc12941	mc32497	mc16445	mc24546
mc12942	mc32521	mc16475	mc32549
mc13051	mc38153	mc16587	mc32591
mc15232	mc38192	mc16644	mc32628
mc15892	mc14777	mc16798	mc32660
mc16960	mc14814	mc16889	mc32763
mc23682	mc16999	mc17501	mc33045

May 16, 2017

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-17-35	MC16336-2	11/26/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-17-35	MC16336-2	11/26/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-18-18	MC16336-7	11/28/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-18-18	MC16336-7	11/28/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-18-39	MC16336-8	11/28/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-18-39	MC16336-8	11/28/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-22-23	MC16445-3	11/29/2012	Acetone	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-22-23	MC16445-3	11/29/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-22-23	MC16445-3	11/29/2012	2-Butanone (MEK)	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-22-23-DUP	MC16445-4	11/29/2012	Acetone	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-22-23-DUP	MC16445-4	11/29/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-22-23-DUP	MC16445-4	11/29/2012	2-Butanone (MEK)	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-22-39	MC16445-5	11/29/2012	Acetone	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-22-39	MC16445-5	11/29/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-22-39	MC16445-5	11/29/2012	2-Butanone (MEK)	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-19-13	MC16475-1	12/03/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-19-13	MC16475-1	12/03/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-19-20	MC16475-2	12/03/2012	Acrolein	1.94	1.94	J	mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	J
SW846 8260B	MW-19-20	MC16475-2	12/03/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-19-32	MC16475-3	12/03/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-19-32	MC16475-3	12/03/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Acetone	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Acrolein	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Acrylonitrile	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Benzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Bromobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Bromochloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Bromodichloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Bromoform	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Bromomethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	2-Butanone (MEK)	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	n-Butylbenzene	0.0323	0.0323	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	sec-Butylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	tert-Butylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Carbon disulfide	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Carbon tetrachloride	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Chlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Chloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	2-Chloroethyl vinyl ether	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Chloroform	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Chloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	o-Chlorotoluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	p-Chlorotoluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Dibromochloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,2-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,3-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,4-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Dichlorodifluoromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,1-Dichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,2-Dichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,1-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	cis-1,2-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	trans-1,2-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,2-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,3-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	2,2-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,1-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	cis-1,3-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	trans-1,3-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,4-Dioxane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Ethyl methacrylate	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Ethylbenzene	0.0320	0.0320	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Hexachlorobutadiene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	2-Hexanone	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Isopropylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	p-Isopropyltoluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Methyl Tert Butyl Ether	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	4-Methyl-2-pentanone (MIBK)	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Methylene bromide	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Methylene chloride	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Naphthalene	0.201	0.201	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	n-Propylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Styrene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,1,1,2-Tetrachloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,1,2,2-Tetrachloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Tetrachloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Toluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,2,3-Trichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,2,4-Trichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,1,1-Trichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,1,2-Trichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Trichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Trichlorofluoromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,2,3-Trichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,2,4-Trimethylbenzene	0.0894	0.0894	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	1,3,5-Trimethylbenzene	0.0408	0.0408	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low. Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Vinyl chloride	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	m,p-Xylene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	o-Xylene	0.0400	0.0400	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-14	MC16587-1	12/04/2012	Xylene (total)	0.128	0.128	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Acetone	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Acrolein	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Acrylonitrile	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Benzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Bromobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Bromochloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Bromodichloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Bromoform	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Bromomethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	2-Butanone (MEK)	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	n-Butylbenzene	0.0233	0.0233	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	sec-Butylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	tert-Butylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Carbon disulfide	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Carbon tetrachloride	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Chlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Chloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	2-Chloroethyl vinyl ether	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Chloroform	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Chloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	o-Chlorotoluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	p-Chlorotoluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Dibromochloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,2-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,3-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,4-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Dichlorodifluoromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,1-Dichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,2-Dichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,1-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	cis-1,2-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	trans-1,2-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,2-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,3-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	2,2-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,1-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	cis-1,3-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	trans-1,3-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,4-Dioxane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Ethyl methacrylate	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Ethylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Hexachlorobutadiene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	2-Hexanone	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Isopropylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	p-Isopropyltoluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Methyl Tert Butyl Ether	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	4-Methyl-2-pentanone (MIBK)	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Methylene bromide	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Methylene chloride	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Naphthalene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	n-Propylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Styrene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,1,1,2-Tetrachloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,1,2,2-Tetrachloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Tetrachloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Toluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,2,3-Trichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,2,4-Trichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,1,1-Trichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,1,2-Trichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Trichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Trichlorofluoromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,2,3-Trichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,2,4-Trimethylbenzene	0.0467	0.0467	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	1,3,5-Trimethylbenzene	0.0286	0.0286	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low. Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	UJ
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Vinyl chloride	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	m,p-Xylene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	o-Xylene	0.0281	0.0281	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-27	MC16587-2	12/04/2012	Xylene (total)	0.0852	0.0852	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Acetone	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Acrolein	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Acrylonitrile	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Benzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Bromobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Bromochloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Bromodichloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Bromoform	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Bromomethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	2-Butanone (MEK)	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	n-Butylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	sec-Butylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	tert-Butylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Carbon disulfide	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Carbon tetrachloride	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Chlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Chloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	2-Chloroethyl vinyl ether	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Chloroform	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Chloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	o-Chlorotoluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	p-Chlorotoluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Dibromochloromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,2-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,3-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,4-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Dichlorodifluoromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,1-Dichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,2-Dichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,1-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	cis-1,2-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	trans-1,2-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,2-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,3-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	2,2-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,1-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	cis-1,3-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	trans-1,3-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,4-Dioxane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Ethyl methacrylate	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Ethylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Hexachlorobutadiene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	2-Hexanone	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Isopropylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	p-Isopropyltoluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Methyl Tert Butyl Ether	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	4-Methyl-2-pentanone (MIBK)	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Methylene bromide	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Methylene chloride	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Naphthalene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	n-Propylbenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Styrene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,1,1,2-Tetrachloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,1,2,2-Tetrachloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Tetrachloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Toluene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,2,3-Trichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,2,4-Trichlorobenzene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,1,1-Trichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,1,2-Trichloroethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Trichloroethene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Trichlorofluoromethane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,2,3-Trichloropropane	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,2,4-Trimethylbenzene	0.0197	0.0197	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	1,3,5-Trimethylbenzene	0.0131	0.0131	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low. Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	UJ
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Vinyl chloride	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	m,p-Xylene	ND	ND		mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	o-Xylene	0.0157	0.0157	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-16-37	MC16587-3	12/04/2012	Xylene (total)	0.0454	0.0454	J	mg/kg	Inj: Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.	J
SW846 8260B	MW-20-11	MC16587-5	12/05/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-20-11	MC16587-5	12/05/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-20-21	MC16587-6	12/05/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-20-21	MC16587-6	12/05/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-20-41	MC16587-7	12/05/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-20-41	MC16587-7	12/05/2012	Vinyl Acetate	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-21-21	MC16644-1	12/06/2012	Acetone	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-21-21	MC16644-1	12/06/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-21-21	MC16644-1	12/06/2012	2-Butanone (MEK)	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-21-31	MC16644-2	12/06/2012	Acetone	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-21-31	MC16644-2	12/06/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	MW-21-31	MC16644-2	12/06/2012	2-Butanone (MEK)	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-21-31 DUP	MC16644-3	12/06/2012	Acetone	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	MW-21-31 DUP	MC16644-3	12/06/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	MW-21-31 DUP	MC16644-3	12/06/2012	2-Butanone (MEK)	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.	
SW846 8260B	VMP-47-12	MC16798-1	12/10/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-47-19	MC16798-2	12/10/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-47-29	MC16798-3	12/10/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	VMP-48-13	MC16798-5	12/11/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-48-21	MC16798-6	12/11/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-48-27	MC16798-7	12/11/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-50-13	MC16798-8	12/11/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-50-21	MC16798-9	12/11/2012	Acetone	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-50-21	MC16798-9	12/11/2012	2-Butanone (MEK)	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-50-21 DUP	MC16798-10	12/11/2012	Acetone	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-50-21 DUP	MC16798-10	12/11/2012	2-Butanone (MEK)	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	VMP-50-29	MC16798-11	12/11/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-49-11	MC16889-1	12/12/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-49-21	MC16889-2	12/12/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-49-31	MC16889-3	12/12/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP-51-14	MC16889-4	12/12/2012	Acrolein	ND	ND		mg/kg	Ana: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Acetone	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Acrolein	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low. Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Acrylonitrile	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Benzene	4.25	4.25		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Bromobenzene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Bromochloromethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Bromodichloromethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Bromoform	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Bromomethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	2-Butanone (MEK)	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	n-Butylbenzene	2.65	2.65		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	sec-Butylbenzene	0.996	0.996		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	tert-Butylbenzene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Carbon disulfide	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Carbon tetrachloride	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Chlorobenzene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Chloroethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	2-Chloroethyl vinyl ether	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low. Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Chloroform	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Chloromethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	o-Chlorotoluene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	p-Chlorotoluene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Dibromochloromethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,2-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,3-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,4-Dichlorobenzene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Dichlorodifluoromethane	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low. Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,1-Dichloroethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,2-Dichloroethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,1-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	cis-1,2-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	trans-1,2-Dichloroethene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,2-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,3-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	2,2-Dichloropropane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,1-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	cis-1,3-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	trans-1,3-Dichloropropene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,4-Dioxane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Ethyl methacrylate	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Ethylbenzene	22.8	22.8		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Hexachlorobutadiene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	2-Hexanone	ND	ND		mg/kg	Ana: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased high. Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Isopropylbenzene	2.59	2.59		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	p-Isopropyltoluene	0.679	0.679	J	mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Methyl Tert Butyl Ether	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	4-Methyl-2-pentanone (MIBK)	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Methylene bromide	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Methylene chloride	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Naphthalene	11.3	11.3		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	n-Propylbenzene	5.70	5.70		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Styrene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,1,1,2-Tetrachloroethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,1,2,2-Tetrachloroethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Tetrachloroethene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Toluene	10.8	10.8		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,2,3-Trichlorobenzene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,2,4-Trichlorobenzene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,1,1-Trichloroethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,1,2-Trichloroethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Trichloroethene	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Trichlorofluoromethane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,2,3-Trichloropropane	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,2,4-Trimethylbenzene	30.1	30.1		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	1,3,5-Trimethylbenzene	7.68	7.68		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Vinyl Acetate	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Vinyl chloride	ND	ND		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	UJ
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	m,p-Xylene	58.5	58.5		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	o-Xylene	24.8	24.8		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	P-55R-43	MC17501-1	01/10/2013	Xylene (total)	83.3	83.3		mg/kg	Inj: Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.	J

**LABORATORY QUALIFIERS:**

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

ND = Not detected.

**AECOM QUALIFIERS:**

J = The result is estimated.

UJ = Estimated nondetect.





















**Table 3**  
**Summary of Soil Analytical Data**

Location	Sample ID	Depth	Sample Date	Vinyl acetate			Vinyl chloride			Xylenes (total)		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
MW-16	MW-16-14	14 ft	12/4/2012	< 0.56	U	UJ	< 0.23	U		0.128	J	J
	MW-16-27	27 ft	12/4/2012	< 0.56	U	UJ	< 0.22	U		0.0852	J	J
	MW-16-37	37 ft	12/4/2012	< 0.27	U	UJ	< 0.11	U		0.0454	J	J
MW-17	MW-17-14	14 ft	11/26/2012	< 0.0052	U	UJ	< 0.0021	U		< 0.0021	U	
	MW-17-21	21 ft	11/26/2012	< 0.0051	U	UJ	< 0.0021	U		< 0.0021	U	
	MW-17-35	35 ft	11/26/2012	< 3.3	U	UJ	< 1.3	U		32.3		
MW-18	MW-18-12	12 ft	11/28/2012	< 0.0056	U	UJ	< 0.0022	U		< 0.0022	U	
	MW-18-18	18 ft	11/28/2012	< 7.5	U	UJ	< 3	U		972		
	MW-18-39	39 ft	11/28/2012	< 0.58	U	UJ	< 0.23	U		39.3		
MW-19	MW-19-13	13 ft	12/3/2012	< 13	U	UJ	< 5.2	U		613		
	MW-19-20	20 ft	12/3/2012	< 0.74	U	UJ	< 0.29	U		3.34		
	MW-19-32	32 ft	12/3/2012	< 0.67	U	UJ	< 0.27	U		4.7		
MW-20	MW-20-11	11 ft	12/5/2012	< 0.57	U	UJ	< 0.23	U		0.0803	J	
	MW-20-21	21 ft	12/5/2012	< 0.62	U	UJ	< 0.25	U		< 0.25	U	
	MW-20-41	41 ft	12/5/2012	< 0.57	U	UJ	< 0.23	U		0.0398	J	
MW-21	MW-21-21	21 ft	12/6/2012	< 0.57	U		< 0.23	U		< 0.23	U	
	MW-21-31	31 ft	12/6/2012	< 0.57	U		< 0.23	U		< 0.23	U	
	MW-21-31-DUP	31 ft	12/6/2012	< 2	U		< 0.81	U		< 0.81	U	
MW-22	MW-21-41	41 ft	12/6/2012	< 0.0081	U		< 0.0032	U		0.0065		
	MW-22-12	12 ft	11/29/2012	< 0.0064	U	UJ	< 0.0026	U		0.0024	J	
	MW-22-12-DUP	12 ft	11/29/2012	< 0.0076	U	UJ	< 0.003	U		0.0026	J	
	MW-22-23	23 ft	11/29/2012	< 12	U		< 4.6	U		1150		
P-55R	MW-22-23-DUP	23 ft	11/29/2012	< 13	U		< 5.1	U		1080		
	MW-22-39	39 ft	11/29/2012	< 0.77	U		< 0.31	U		2.34		
	P-55R-43	43 ft	1/10/2013	< 0.93	U	UJ	< 0.37	U	UJ	83.3		J
VMP-47	P-55R-51	51 ft	1/10/2013	0.0245			< 0.0022	U		0.0236		
	VMP-47-12	12 ft	12/10/2012	< 0.0059	U		< 0.0023	U		0.0018	J	
	VMP-47-19	19 ft	12/10/2012	< 0.0057	U		< 0.0023	U		0.0018	J	
VMP-48	VMP-47-29	29 ft	12/10/2012	< 0.0056	U		< 0.0022	U		0.00063	J	
	VMP-48-13	13 ft	12/11/2012	< 0.0057	U		< 0.0023	U		0.001	J	
	VMP-48-21	21 ft	12/11/2012	< 0.0058	U		< 0.0023	U		0.0013	J	
VMP-49	VMP-48-27	27 ft	12/11/2012	< 0.0071	U		< 0.0029	U		0.0018	J	
	VMP-49-11	11 ft	12/12/2012	< 0.0067	U	UJ	< 0.0027	U	UJ	0.0023	J	J
	VMP-49-21	21 ft	12/12/2012	< 0.0095	U		< 0.0038	U		0.0021	J	
VMP-50	VMP-49-31	31 ft	12/12/2012	< 0.0053	U		< 0.0021	U		0.0024		
	VMP-50-13	13 ft	12/11/2012	< 0.0091	U		0.0017	J		0.002	J	
	VMP-50-21	21 ft	12/11/2012	< 3	U	UJ	< 1.2	U		164		
VMP-51	VMP-50-21-DUP	21 ft	12/11/2012	< 2.7	U	UJ	< 1.1	U		177		
	VMP-50-29	29 ft	12/11/2012	< 0.0048	U		0.00074	J		0.192		
	VMP-51-14	14 ft	12/12/2012	< 0.0056	U		< 0.0023	U		< 0.0023	U	
VMP-52	VMP-51-21	21 ft	12/12/2012	< 0.0052	U		< 0.0021	U		0.0011	J	
	VMP-51-31	31 ft	12/12/2012	< 0.0054	U		< 0.0022	U		0.0011	J	
	VMP-52-13	13 ft	12/13/2012	< 0.0054	U		< 0.0022	U		< 0.0022	U	
VMP-53	VMP-52-25	25 ft	12/13/2012	< 0.0055	U		< 0.0022	U		< 0.0022	U	
	VMP-52-25-DUP	25 ft	12/13/2012	< 0.0053	U		< 0.0021	U		< 0.0021	U	
	VMP-52-29	29 ft	12/13/2012	< 0.0052	U		< 0.0021	U		< 0.0021	U	
VMP-54	VMP-53-15	15 ft	12/13/2012	< 0.0054	U		< 0.0021	U		0.00063	J	
	VMP-53-27	27 ft	12/13/2012	< 0.0052	U		< 0.0021	U		0.00046	J	
	VMP-53-31	31 ft	12/13/2012	< 0.0051	U		< 0.002	U		0.00071	J	
VMP-55	VMP-54-15	15 ft	12/14/2012	< 0.0057	U		< 0.0023	U		< 0.0023	U	
	VMP-54-15-DUP	15 ft	12/14/2012	< 0.0055	U		< 0.0022	U		< 0.0022	U	
	VMP-54-25	25 ft	12/14/2012	< 0.0053	U		< 0.0021	U		0.00055	J	
	VMP-54-31	31 ft	12/14/2012	< 0.0053	U		< 0.0021	U		0.00083	J	
VMP-55	VMP-55-13	13 ft	12/17/2012	< 0.0052	U		< 0.0021	U		< 0.0021	U	
	VMP-55-25	25 ft	12/17/2012	< 0.0051	U		< 0.0021	U		< 0.0021	U	
	VMP-55-31	31 ft	12/17/2012	< 0.0053	U		< 0.0021	U		< 0.0021	U	
	VMP-55-31-DUP	31 ft	12/17/2012	< 0.0051	U		< 0.0021	U		0.002	J	

**Notes:****Lab Qualifiers**

J = Estimated value; results between the MDL and RL  
U = Compound analyzed for but not detected above the RL

**URS Qualifiers**

R = Indicates analyte result was rejected  
J = Estimated detection  
UJ = Estimated non-detect  
U = Non-detect, e.g. blank contamination

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*e-Hardcopy 2.0*  
*Automated Report*

### Technical Report for

### Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562735.00015

SGS Accutest Job Number: MC16336

Sampling Dates: 11/26/12 - 11/28/12



### Report to:

AECOM, INC.

Melissa.mansker@aecom.com

ATTN: Melissa Mansker

Total number of pages in report: 107



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

*H. (Brad) Madadian*  
H. (Brad) Madadian  
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

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

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ACCUTEST

October 27, 2016

AECOM  
1001 Highlands Plaza Drive West Suite 300  
St. Louis, MO 63110

RE: SGS Accutest Job # MC16336

Dear Elizabeth Kunkel

As you are aware, SGS Accutest Inc. - Marlborough has been conducting an extensive review of data associated with some historical Gas Chromatography-Mass Spectroscopy volatiles analyses. As a result of this review it was determined that some revisions of the original test report for this job were needed. These corrections have been incorporated into the revised report.

Please be assured that corrective actions have been put in place to address this matter and prevent a recurrence.

We apologize for any inconvenience that this issue may have caused. Please don't hesitate to contact us if we can be of further assistance.

Sincerely,

**H. (Brad) Madadian**

Regional Laboratory Director  
SGS Accutest Inc. - Marlborough

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TESTING AND CERTIFICATION COMPANY.

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## Sample Summary

Shell Oil

Job No: MC16336

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
MC16336-1	11/26/12	11:00 WMP	11/29/12	SO	Soil	MW-17-21
MC16336-2	11/26/12	11:10 WMP	11/29/12	SO	Soil	MW-17-35
MC16336-3	11/26/12	11:20 WMP	11/29/12	SO	Soil	MW-17-14
MC16336-4	11/26/12	00:00 WMP	11/29/12	AQ	Trip Blank Water	TRIP BLANK 8260
MC16336-5	11/26/12	00:00 WMP	11/29/12	AQ	Trip Blank Water	TRIP BLANK 8011
MC16336-6	11/28/12	13:25 WMP	11/29/12	SO	Soil	MW-18-12
MC16336-6D	11/28/12	13:25 WMP	11/29/12	SO	Soil Dup/MSD	MW-18-12
MC16336-6S	11/28/12	13:25 WMP	11/29/12	SO	Soil Matrix Spike	MW-18-12
MC16336-7	11/28/12	13:40 WMP	11/29/12	SO	Soil	MW-18-18
MC16336-8	11/28/12	13:45 WMP	11/29/12	SO	Soil	MW-18-39

---

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

# SAMPLE DELIVERY GROUP CASE NARRATIVE

2

**Client:** She O

**Job No** MC 6336

**Site:** URSMOSTL: Roxana Dr ng, Roxana, IL

**Report Date** 0/27/20 6 9:58:08 A

6 Samp e(s), 2 Tr p B ank(s) and 0 F e d B ank(s) were co ected on between /26/20 2 and /28/20 2 and were rece ved at SGS Accutest New Eng and on /29/20 2 properly preserved, at 0 6 Deg C and ntact These Samp es rece ved a job number of MC 6336 A st ng of the Laboratory Samp e ID, C ent Samp e ID and dates of co ect on are presented n the Resu ts Summary Sect on of th s report -Ch orohexane was searched n the brary search and reported on y f detect ons were found

Except as noted be ow, a method spec f ed ca brat ons and qua ty contro performance cr ter a were met for th s job For more nformat on, please refer to QC summary pages

## Volatiles by GCMS By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** MSV573

- A samp es were ana yzed w th n the recommended method ho d ng t me
- A method b anks for th s batch meet method spec f c cr ter a
- Samp e(s) MC 64 9- MS, MC 64 9- MSD were used as the QC samp es nd cated
- B ank Sp ke/B ank Sp ke Dup Recovery(s) for 2-Ch oroethy v ny ether, Acetone, Acro e n are outs de contro m ts
- Matr x Sp ke /Matr x Sp ke Dup cate Recovery(s) for 2-Ch oroethy v ny ether, Acro e n are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Recovery(s) for 2-Ch oroethy v ny ether, Acro e n are outs de contro m ts Probab e cause due to matr x nte ference
- Acro e n, 2-Ch oroethy v ny ether: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow

**Matrix:** SO

**Batch ID:** MSG487

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6254-4MS, MC 6254-4MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke/B ank Sp ke Dup Recovery(s) for Acro e n, Ch romethane are outs de contro m ts
- Matr x Sp ke /Matr x Sp ke Dup cate Recovery(s) for ,3,5-Tr methy benzene, ,4-D oxane, 4-Methy -2-pentanone (MIBK), Acro e n are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Acro e n: Cont nu ng Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow
- V ny Acetate: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow

**Matrix:** SO

**Batch ID:** MSM 789

- A samp es were ana yzed w th n the recommended method ho d ng t me
- A method b anks for th s batch meet method spec f c cr ter a
- Samp e(s) MC 6366-7MS, MC 6366-7MSD were used as the QC samp es nd cated
- B ank Sp ke Recove y(s) for Acetone, Acro e n are outs de contro m ts B ank Sp ke DUP Recovery(s) for Acetone, Acro e n, V ny Acetate are outs de contro m ts
- Matr x Sp ke Recovery(s) for ,2,3-Tr ch orobenzene, ,2,4-Tr ch orobenzene, ,2-D ch orobenzene, ,3-D ch orobenzene, 2-Hexanone, Acetone, Acro e n, Hexach orobutad ene, n-Buty benzene, n-Propy benzene, Naphtha ene, p-Isopropy to uene, sec-Buty benzene, tert-Buty benzene, V ny Acetate are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for ,2,3-Tr ch orobenzene, ,2,4-Tr ch orobenzene, 2-Butanone (MEK), 2-Hexanone, Acetone, Acro e n, Hexach orobutad ene, n-Buty benzene, p-Isopropy to uene, sec-Buty benzene, V ny Acetate are outs de contro m ts H gh RPD due to poss b e matr x nterference and/or samp e non-homogeneity
- RPD(s) for MSD for 2-Ch oroethy v ny ether, V ny Acetate are outs de contro m ts for samp e MC 6366-7MSD H gh RPD due to poss b e matr x nterference and/or samp e non-homogeneity

**Matrix:** SO

**Batch ID:** MSM 790

- A samp es were ana yzed w th n the recommended method ho d ng t me

Thursday, October 27, 2016

Page 1 of 3

## Volatiles by GCMS By Method SW846 8260B

**Matrix:** SO

**Batch ID:** MSM 790

- Samp e(s) MC 6336-6MS, MC 6336-6MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for Acetone, Acro e n are outs de contro m ts
- Matr x Sp ke Recovery(s) for , , ,2-Tetrach oroethane, , , -Tr ch oroethane, , ,2,2-Tetrach oroethane, , ,2-Tr ch oroethane, , -D ch oroethane, , -D ch oroethene, , -D ch oropropene, ,2,3-Tr ch orobenzene, ,2,3-Tr ch oropropane, ,2,4-Tr ch orobenzene, ,2,4-Tr methy benzene, ,2-D ch orobenzene, ,2-D ch oroethane, ,2-D ch oropropane, ,3,5-Tr methy benzene, ,3-D ch orobenzene, ,3-D ch oropropane, ,4-D ch orobenzene,2,2-D ch oropropane,2-Butanone (MEK),2-Ch oroethy v ny ether,2-Hexanone,4-Methy -2-pentanone (MIBK),Acetone,Acro e n,Acry on tr e,Benzene,Bromobenzene,Bromoch oromethane,Bromod ch oromethane,Bromoform,Bromomethane,Carbon d su f de,Carbon tetrach or de,Ch orobenzene,Ch oroethane,Ch oroform,c s- ,2-D ch oroethene,c s- ,3-D ch oropropene,D bromoch oromethane,D ch orod f uoromethane,Ethy benzene,Hexach orobutad ene,Isopropy benzene,m,p-Xy ene,Methy Tert Buty Ether,Methy ene brom de,Methy ene ch or de,n-Buty benzene,n-Propy benzene,Naphtha ene,o-Ch oroto uene,o-Xy ene,p-Ch oroto uene,p-Isopropy to uene,sec-Buty benzene,Styrene,tert-Buty benzene,Tetrach oroethene,To uene,trans- ,2-D ch oroethene,trans- ,3-D ch oropropene,Tr ch oroethene,Tr ch orof uoromethane,V ny Acetate,V ny ch or de,Xy ene (tota ) are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for ,2,3-Tr ch orobenzene, ,2,4-Tr ch orobenzene,Acetone,Acro e n,V ny Acetate are outs de contro m ts H gh RPD due to poss b e matr x nte ference and/or samp e non-homogene ty
- RPD(s) for MSD for , , ,2-Tetrach oroethane, , , -Tr ch oroethane, , ,2,2-Tetrach oroethane, , ,2-Tr ch oroethane, , -D ch oroethane, , -D ch oroethene, , -D ch oropropene, ,2,3-Tr ch orobenzene, ,2,3-Tr ch oropropane, ,2,4-Tr ch orobenzene, ,2,4-Tr methy benzene, ,2-D ch orobenzene, ,2-D ch oroethane, ,2-D ch oropropane, ,3,5-Tr methy benzene, ,3-D ch orobenzene, ,3-D ch oropropane, ,4-D ch orobenzene, ,4-D oxane,2,2-D ch oropropane,2-Butanone (MEK),2-Ch oroethy v ny ether,2-Hexanone,4-Methy -2-pentanone (MIBK),Acetone,Acro e n,Acry on tr e,Benzene,Bromobenzene,Bromoch oromethane,Bromod ch oromethane,Bromoform,Bromomethane,Carbon d su f de,Carbon tetrach or de,Ch orobenzene,Ch oroethane,Ch oroform,Ch oromethane,c s- ,2-D ch oroethene,c s- ,3-D ch oropropene,D bromoch oromethane,D ch orod f uoromethane,Ethy methacry ate,Ethy benzene,Hexach orobutad ene,Isopropy benzene,m,p-Xy ene,Methy Tert Buty Ether,Methy ene brom de,Methy ene ch or de,n-Buty benzene,n-Propy benzene,Naphtha ene,o-Ch oroto uene,o-Xy ene,p-Ch oroto uene,p-Isopropy to uene,sec-Buty benzene,Styrene,tert-Buty benzene,Tetrach oroethene,To uene,trans- ,2-D ch oroethene,trans- ,3-D ch oropropene,Tr ch oroethene,Tr ch orof uoromethane,V ny Acetate,V ny ch or de,Xy ene (tota ) are outs de contro m ts for samp e MC 6336-6MSD H gh RPD due to poss b e matr x nterference and/or samp e non-homogene ty
- B ank Sp ke Dup for Acetone,Acro e n,V ny Acetate: Outs de contro m ts B ank Sp ke meets program techn ca requirments

## Volatiles by GC By Method SW846 8011

**Matrix:** AQ

**Batch ID:** OP3 226

- A samp es were extracted w th n the recommended method ho d ng t me
- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6 00- MS,MC 6 00- MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- Samp e(s) MC 6336-7 have surrogates outs de contro m ts Probab e cause due to matr x nterference

**Matrix:** SO

**Batch ID:** OP3 352

- A samp es were extracted w th n the recommended method ho d ng t me
- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6336-6MS,MC 6336-6MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- MC 6336-7 for Bromof uorobenzene (S): Outs de contro m ts due to poss b e matr x nterference

## Wet Chemistry By Method SM21 2540 B MOD.

**Matrix:** SO

**Batch ID:** GN4 28

- Sample(s) MC 6336-6DUP were used as the QC samples for Sols, Percent

SGS Accutest New England certifies that all analyses were performed within method specification. It is further recommended that this report be used in its entirety. The Laboratory Director for SGS Accutest New England or assignee as verified by the signature on the cover page has authorized the release of this report (MC 6336).

Thursday, October 27, 2016

Page 3 of 3

# Summary of Hits

Job Number: MC16336  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 11/26/12 thru 11/28/12



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

**MC16336-1 MW-17-21**

Methylene chloride	0.0014 J	0.0021	0.0012	mg/kg	SW846 8260B
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**MC16336-2 MW-17-35**

Benzene	2.91	0.33	0.19	mg/kg	SW846 8260B
n-Butylbenzene	9.56	3.3	0.12	mg/kg	SW846 8260B
sec-Butylbenzene	1.97 J	3.3	0.15	mg/kg	SW846 8260B
Ethylbenzene	11.8	1.3	0.16	mg/kg	SW846 8260B
Isopropylbenzene	8.44	3.3	0.15	mg/kg	SW846 8260B
p-Isopropyltoluene	1.17 J	3.3	0.12	mg/kg	SW846 8260B
Naphthalene	5.30	3.3	0.81	mg/kg	SW846 8260B
n-Propylbenzene	29.1	3.3	0.66	mg/kg	SW846 8260B
Toluene	0.833 J	3.3	0.55	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	120	3.3	0.15	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	30.5	3.3	0.14	mg/kg	SW846 8260B
m,p-Xylene	27.6	1.3	0.51	mg/kg	SW846 8260B
o-Xylene	4.67	1.3	0.16	mg/kg	SW846 8260B
Xylene (total)	32.3	1.3	0.16	mg/kg	SW846 8260B

**MC16336-3 MW-17-14**

Methylene chloride	0.0013 J	0.0021	0.0012	mg/kg	SW846 8260B
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**MC16336-4 TRIP BLANK 8260**

No hits reported in this sample.

**MC16336-5 TRIP BLANK 8011**

No hits reported in this sample.

**MC16336-6 MW-18-12**

Benzene	0.00041 J	0.00056	0.00033	mg/kg	SW846 8260B
Methylene chloride	0.0015 J	0.0022	0.0013	mg/kg	SW846 8260B

**MC16336-7 MW-18-18**

Benzene	3.27	0.75	0.44	mg/kg	SW846 8260B
n-Butylbenzene	33.3	7.5	0.28	mg/kg	SW846 8260B
sec-Butylbenzene	7.92	7.5	0.35	mg/kg	SW846 8260B
Ethylbenzene	290	3.0	0.36	mg/kg	SW846 8260B
Isopropylbenzene	30.7	7.5	0.34	mg/kg	SW846 8260B

## Summary of Hits

Job Number: MC16336  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 11/26/12 thru 11/28/12



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method	
		p-Isopropyltoluene	4.57 J	7.5	0.27	mg/kg	SW846 8260B
		Naphthalene	60.3	7.5	1.9	mg/kg	SW846 8260B
		n-Propylbenzene	91.4	7.5	1.5	mg/kg	SW846 8260B
		Toluene	283	7.5	1.3	mg/kg	SW846 8260B
		1,2,4-Trimethylbenzene	396	7.5	0.34	mg/kg	SW846 8260B
		1,3,5-Trimethylbenzene	90.1	7.5	0.32	mg/kg	SW846 8260B
		m,p-Xylene	690	3.0	1.2	mg/kg	SW846 8260B
		o-Xylene	282	3.0	0.36	mg/kg	SW846 8260B
		Xylene (total)	972	3.0	0.36	mg/kg	SW846 8260B

MC16336-8      MW-18-39

		Benzene	0.0365 J	0.058	0.034	mg/kg	SW846 8260B
		n-Butylbenzene	0.977	0.58	0.021	mg/kg	SW846 8260B
		sec-Butylbenzene	0.328 J	0.58	0.027	mg/kg	SW846 8260B
		Ethylbenzene	9.62	0.23	0.028	mg/kg	SW846 8260B
		Hexachlorobutadiene	0.121 J	0.58	0.054	mg/kg	SW846 8260B
		Isopropylbenzene	1.20	0.58	0.026	mg/kg	SW846 8260B
		p-Isopropyltoluene	0.678	0.58	0.021	mg/kg	SW846 8260B
		Naphthalene	3.97	0.58	0.14	mg/kg	SW846 8260B
		n-Propylbenzene	3.32	0.58	0.12	mg/kg	SW846 8260B
		Toluene	4.10	0.58	0.098	mg/kg	SW846 8260B
		1,2,3-Trichlorobenzene	0.254 J	0.58	0.027	mg/kg	SW846 8260B
		1,2,4-Trichlorobenzene	0.114 J	0.58	0.026	mg/kg	SW846 8260B
		1,2,4-Trimethylbenzene	12.2	0.58	0.026	mg/kg	SW846 8260B
		1,3,5-Trimethylbenzene	3.32	0.58	0.025	mg/kg	SW846 8260B
		m,p-Xylene	26.6	0.23	0.091	mg/kg	SW846 8260B
		o-Xylene	12.7	0.23	0.028	mg/kg	SW846 8260B
		Xylene (total)	39.3	0.23	0.028	mg/kg	SW846 8260B

Sample Results

---

Report of Analysis

---

## Report of Analysis

Client Sample ID:	MW-17-21	Date Sampled:	11/26/12
Lab Sample ID:	MC16336-1	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	91.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M52770.D	1	12/07/12	AMY	n/a	n/a	MSM1789
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.31 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0051	0.0013	mg/kg	
107-02-8	Acrolein	ND	0.026	0.010	mg/kg	
107-13-1	Acrylonitrile	ND	0.026	0.0013	mg/kg	
71-43-2	Benzene	ND	0.00051	0.00030	mg/kg	
108-86-1	Bromobenzene	ND	0.0051	0.00023	mg/kg	
74-97-5	Bromochloromethane	ND	0.0051	0.00038	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0021	0.00022	mg/kg	
75-25-2	Bromoform	ND	0.0021	0.0021	mg/kg	
74-83-9	Bromomethane	ND	0.0021	0.00053	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0051	0.0013	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0051	0.00019	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0051	0.00024	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0051	0.00091	mg/kg	
75-15-0	Carbon disulfide	ND	0.0051	0.00017	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0021	0.00075	mg/kg	
108-90-7	Chlorobenzene	ND	0.0021	0.00028	mg/kg	
75-00-3	Chloroethane	ND	0.0051	0.0013	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0051	0.0021	mg/kg	
67-66-3	Chloroform	ND	0.0021	0.00053	mg/kg	
74-87-3	Chloromethane	ND	0.0051	0.00048	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0051	0.0011	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0051	0.00023	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0021	0.00030	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	0.00022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0021	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0021	0.00028	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0021	0.00030	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0021	0.00038	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0021	0.00031	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0021	0.00029	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:	MW-17-21	Date Sampled:	11/26/12
Lab Sample ID:	MC16336-1	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	91.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0021	0.00038	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0051	0.00024	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0051	0.00089	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0051	0.00027	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0021	0.00018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0021	0.00051	mg/kg	
123-91-1	1,4-Dioxane	ND	0.026	0.026	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0051	0.00070	mg/kg	
100-41-4	Ethylbenzene	ND	0.0021	0.00025	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0051	0.00048	mg/kg	
591-78-6	2-Hexanone	ND	0.0051	0.00051	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0051	0.00023	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0051	0.00018	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0021	0.00030	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0051	0.00051	mg/kg	
74-95-3	Methylene bromide	ND	0.0051	0.00051	mg/kg	
75-09-2	Methylene chloride	0.0014	0.0021	0.0012	mg/kg	J
91-20-3	Naphthalene	ND	0.0051	0.0013	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0051	0.0010	mg/kg	
100-42-5	Styrene	ND	0.0051	0.00024	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0051	0.0010	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0021	0.00044	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0021	0.00024	mg/kg	
108-88-3	Toluene	ND	0.0051	0.00087	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0051	0.00024	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0051	0.00024	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0021	0.00032	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0021	0.00075	mg/kg	
79-01-6	Trichloroethene	ND	0.0021	0.00022	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0021	0.00031	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0051	0.00030	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0051	0.00023	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0051	0.00022	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0051	0.00057	mg/kg	
75-01-4	Vinyl chloride	ND	0.0021	0.00028	mg/kg	
	m,p-Xylene	ND	0.0021	0.00081	mg/kg	
95-47-6	o-Xylene	ND	0.0021	0.00025	mg/kg	
1330-20-7	Xylene (total)	ND	0.0021	0.00025	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

<b>Client Sample ID:</b> MW-17-21	<b>Date Sampled:</b> 11/26/12
<b>Lab Sample ID:</b> MC16336-1	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.6
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		70-130%
2037-26-5	Toluene-D8	110%		70-130%
460-00-4	4-Bromofluorobenzene	96%		70-130%

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

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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

<b>Client Sample ID:</b> MW-17-21	<b>Date Sampled:</b> 11/26/12
<b>Lab Sample ID:</b> MC16336-1	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.6
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19732.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
Run #2							

	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	0.0027	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0027	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	103%		61-167%
460-00-4	Bromofluorobenzene (S)	94%		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

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## Report of Analysis

Client Sample ID:	MW-17-35	Date Sampled:	11/26/12
Lab Sample ID:	MC16336-2	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	77.7
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G122515.D	1	12/03/12	JM	n/a	n/a	MSG4871
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.55 g	10.0 ml	20.0 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	3.3	0.82	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	16	6.5	mg/kg	
107-13-1	Acrylonitrile	ND	16	0.81	mg/kg	
71-43-2	Benzene	2.91	0.33	0.19	mg/kg	
108-86-1	Bromobenzene	ND	3.3	0.15	mg/kg	
74-97-5	Bromochloromethane	ND	3.3	0.24	mg/kg	
75-27-4	Bromodichloromethane	ND	1.3	0.14	mg/kg	
75-25-2	Bromoform	ND	1.3	1.3	mg/kg	
74-83-9	Bromomethane	ND	1.3	0.34	mg/kg	
78-93-3	2-Butanone (MEK)	ND	3.3	0.81	mg/kg	
104-51-8	n-Butylbenzene	9.56	3.3	0.12	mg/kg	
135-98-8	sec-Butylbenzene	1.97	3.3	0.15	mg/kg	J
98-06-6	tert-Butylbenzene	ND	3.3	0.57	mg/kg	
75-15-0	Carbon disulfide	ND	3.3	0.11	mg/kg	
56-23-5	Carbon tetrachloride	ND	1.3	0.47	mg/kg	
108-90-7	Chlorobenzene	ND	1.3	0.18	mg/kg	
75-00-3	Chloroethane	ND	3.3	0.82	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	3.3	1.3	mg/kg	
67-66-3	Chloroform	ND	1.3	0.34	mg/kg	
74-87-3	Chloromethane	ND	3.3	0.30	mg/kg	
95-49-8	o-Chlorotoluene	ND	3.3	0.72	mg/kg	
106-43-4	p-Chlorotoluene	ND	3.3	0.15	mg/kg	
124-48-1	Dibromochloromethane	ND	1.3	0.19	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.3	0.14	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.3	0.15	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.3	0.14	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	1.3	0.74	mg/kg	
75-34-3	1,1-Dichloroethane	ND	1.3	0.18	mg/kg	
107-06-2	1,2-Dichloroethane	ND	1.3	0.19	mg/kg	
75-35-4	1,1-Dichloroethene	ND	1.3	0.24	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	1.3	0.20	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	1.3	0.19	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:	MW-17-35	Date Sampled:	11/26/12
Lab Sample ID:	MC16336-2	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	77.7
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	1.3	0.24	mg/kg	
142-28-9	1,3-Dichloropropane	ND	3.3	0.15	mg/kg	
594-20-7	2,2-Dichloropropane	ND	3.3	0.57	mg/kg	
563-58-6	1,1-Dichloropropene	ND	3.3	0.17	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.3	0.11	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.3	0.32	mg/kg	
123-91-1	1,4-Dioxane	ND	16	16	mg/kg	
97-63-2	Ethyl methacrylate	ND	3.3	0.44	mg/kg	
100-41-4	Ethylbenzene	11.8	1.3	0.16	mg/kg	
87-68-3	Hexachlorobutadiene	ND	3.3	0.30	mg/kg	
591-78-6	2-Hexanone	ND	3.3	0.33	mg/kg	
98-82-8	Isopropylbenzene	8.44	3.3	0.15	mg/kg	
99-87-6	p-Isopropyltoluene	1.17	3.3	0.12	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	1.3	0.19	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	3.3	0.33	mg/kg	
74-95-3	Methylene bromide	ND	3.3	0.32	mg/kg	
75-09-2	Methylene chloride	ND	1.3	0.76	mg/kg	
91-20-3	Naphthalene	5.30	3.3	0.81	mg/kg	
103-65-1	n-Propylbenzene	29.1	3.3	0.66	mg/kg	
100-42-5	Styrene	ND	3.3	0.15	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	3.3	0.65	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.3	0.28	mg/kg	
127-18-4	Tetrachloroethene	ND	1.3	0.15	mg/kg	
108-88-3	Toluene	0.833	3.3	0.55	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	3.3	0.15	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	3.3	0.15	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	1.3	0.21	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.3	0.48	mg/kg	
79-01-6	Trichloroethene	ND	1.3	0.14	mg/kg	
75-69-4	Trichlorofluoromethane	ND	1.3	0.20	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	3.3	0.19	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	120	3.3	0.15	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	30.5	3.3	0.14	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	3.3	0.36	mg/kg	
75-01-4	Vinyl chloride	ND	1.3	0.18	mg/kg	
	m,p-Xylene	27.6	1.3	0.51	mg/kg	
95-47-6	o-Xylene	4.67	1.3	0.16	mg/kg	
1330-20-7	Xylene (total)	32.3	1.3	0.16	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

<b>Client Sample ID:</b> MW-17-35	<b>Date Sampled:</b> 11/26/12
<b>Lab Sample ID:</b> MC16336-2	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 77.7
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		70-130%
2037-26-5	Toluene-D8	92%		70-130%
460-00-4	4-Bromofluorobenzene	96%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-17-35	<b>Date Sampled:</b> 11/26/12
<b>Lab Sample ID:</b> MC16336-2	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 77.7
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19733.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 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	0.0032	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0032	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	90%		61-167%
460-00-4	Bromofluorobenzene (S)	87%		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

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## Report of Analysis

Client Sample ID:	MW-17-14	Date Sampled:	11/26/12
Lab Sample ID:	MC16336-3	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	91.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M52771.D	1	12/07/12	AMY	n/a	n/a	MSM1789
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.28 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0052	0.0013	mg/kg	
107-02-8	Acrolein	ND	0.026	0.010	mg/kg	
107-13-1	Acrylonitrile	ND	0.026	0.0013	mg/kg	
71-43-2	Benzene	ND	0.00052	0.00031	mg/kg	
108-86-1	Bromobenzene	ND	0.0052	0.00023	mg/kg	
74-97-5	Bromochloromethane	ND	0.0052	0.00039	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0021	0.00022	mg/kg	
75-25-2	Bromoform	ND	0.0021	0.0021	mg/kg	
74-83-9	Bromomethane	ND	0.0021	0.00054	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0052	0.0013	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0052	0.00019	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0052	0.00024	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0052	0.00091	mg/kg	
75-15-0	Carbon disulfide	ND	0.0052	0.00017	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0021	0.00075	mg/kg	
108-90-7	Chlorobenzene	ND	0.0021	0.00029	mg/kg	
75-00-3	Chloroethane	ND	0.0052	0.0013	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0052	0.0021	mg/kg	
67-66-3	Chloroform	ND	0.0021	0.00054	mg/kg	
74-87-3	Chloromethane	ND	0.0052	0.00048	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0052	0.0011	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0052	0.00024	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0021	0.00031	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	0.00022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0021	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0021	0.00028	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0021	0.00030	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0021	0.00038	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0021	0.00031	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0021	0.00030	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:	MW-17-14	Date Sampled:	11/26/12
Lab Sample ID:	MC16336-3	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	91.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0021	0.00039	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0052	0.00024	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0052	0.00090	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0052	0.00027	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0021	0.00018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0021	0.00052	mg/kg	
123-91-1	1,4-Dioxane	ND	0.026	0.026	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0052	0.00071	mg/kg	
100-41-4	Ethylbenzene	ND	0.0021	0.00025	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0052	0.00048	mg/kg	
591-78-6	2-Hexanone	ND	0.0052	0.00052	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0052	0.00024	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0052	0.00019	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0021	0.00030	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0052	0.00052	mg/kg	
74-95-3	Methylene bromide	ND	0.0052	0.00051	mg/kg	
75-09-2	Methylene chloride	0.0013	0.0021	0.0012	mg/kg	J
91-20-3	Naphthalene	ND	0.0052	0.0013	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0052	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0052	0.00024	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0052	0.0010	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0021	0.00044	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0021	0.00024	mg/kg	
108-88-3	Toluene	ND	0.0052	0.00088	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0052	0.00025	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0052	0.00024	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0021	0.00033	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0021	0.00076	mg/kg	
79-01-6	Trichloroethene	ND	0.0021	0.00022	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0021	0.00032	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0052	0.00030	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0052	0.00023	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0052	0.00022	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0052	0.00058	mg/kg	
75-01-4	Vinyl chloride	ND	0.0021	0.00028	mg/kg	
	m,p-Xylene	ND	0.0021	0.00082	mg/kg	
95-47-6	o-Xylene	ND	0.0021	0.00025	mg/kg	
1330-20-7	Xylene (total)	ND	0.0021	0.00025	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

<b>Client Sample ID:</b> MW-17-14	<b>Date Sampled:</b> 11/26/12
<b>Lab Sample ID:</b> MC16336-3	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.2
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		70-130%
2037-26-5	Toluene-D8	109%		70-130%
460-00-4	4-Bromofluorobenzene	93%		70-130%

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

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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

<b>Client Sample ID:</b> MW-17-14	
<b>Lab Sample ID:</b> MC16336-3	<b>Date Sampled:</b> 11/26/12
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 11/29/12
<b>Method:</b> SW846 8011 SW846 3550B	<b>Percent Solids:</b> 91.2
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19734.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 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	0.0027	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0027	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	109%		61-167%
460-00-4	Bromofluorobenzene (S)	107%		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

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## Report of Analysis

<b>Client Sample ID:</b> TRIP BLANK 8260	
<b>Lab Sample ID:</b> MC16336-4	<b>Date Sampled:</b> 11/26/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Date Received:</b> 11/29/12
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> n/a
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V14084.D	1	12/07/12	AMY	n/a	n/a	MSV573
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	5.0	3.0	ug/l	
107-02-8	Acrolein <sup>a</sup>	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
110-75-8	2-Chloroethyl vinyl ether <sup>a</sup>	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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:	TRIP BLANK 8260	Date Sampled:	11/26/12
Lab Sample ID:	MC16336-4	Date Received:	11/29/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

<b>Client Sample ID:</b> TRIP BLANK 8260	<b>Date Sampled:</b> 11/26/12
<b>Lab Sample ID:</b> MC16336-4	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	85%		70-130%
2037-26-5	Toluene-D8	91%		70-130%
460-00-4	4-Bromofluorobenzene	96%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> TRIP BLANK 8011	<b>Date Sampled:</b> 11/26/12
<b>Lab Sample ID:</b> MC16336-5	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19444.D	1	11/30/12	AP	11/30/12	OP31226	GBK704
Run #2							

Run #	Initial Volume	Final Volume
Run #1	35.4 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	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	111%		36-173%
460-00-4	Bromofluorobenzene (S)	104%		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

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## Report of Analysis

Client Sample ID:	MW-18-12	Date Sampled:	11/28/12
Lab Sample ID:	MC16336-6	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	92.5
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M52769.D	1	12/07/12	AMY	n/a	n/a	MSM1790
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.86 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0056	0.0014	mg/kg	
107-02-8	Acrolein	ND	0.028	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.028	0.0014	mg/kg	
71-43-2	Benzene	0.00041	0.00056	0.00033	mg/kg	J
108-86-1	Bromobenzene	ND	0.0056	0.00025	mg/kg	
74-97-5	Bromochloromethane	ND	0.0056	0.00042	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0022	0.00024	mg/kg	
75-25-2	Bromoform	ND	0.0022	0.0022	mg/kg	
74-83-9	Bromomethane	ND	0.0022	0.00058	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0056	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0056	0.00020	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0056	0.00026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0056	0.00098	mg/kg	
75-15-0	Carbon disulfide	ND	0.0056	0.00018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0022	0.00081	mg/kg	
108-90-7	Chlorobenzene	ND	0.0022	0.00031	mg/kg	
75-00-3	Chloroethane	ND	0.0056	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0056	0.0022	mg/kg	
67-66-3	Chloroform	ND	0.0022	0.00057	mg/kg	
74-87-3	Chloromethane	ND	0.0056	0.00052	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0056	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0056	0.00025	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0022	0.00033	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0022	0.00024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0022	0.00025	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0022	0.00023	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0022	0.0013	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0022	0.00030	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0022	0.00032	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0022	0.00041	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0022	0.00033	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0022	0.00032	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:	MW-18-12	Date Sampled:	11/28/12
Lab Sample ID:	MC16336-6	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	92.5
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0022	0.00041	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0056	0.00026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0056	0.00096	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0056	0.00029	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0022	0.00019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0022	0.00055	mg/kg	
123-91-1	1,4-Dioxane	ND	0.028	0.028	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0056	0.00076	mg/kg	
100-41-4	Ethylbenzene	ND	0.0022	0.00027	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0056	0.00052	mg/kg	
591-78-6	2-Hexanone	ND	0.0056	0.00056	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0056	0.00025	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0056	0.00020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0022	0.00032	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0056	0.00056	mg/kg	
74-95-3	Methylene bromide	ND	0.0056	0.00055	mg/kg	
75-09-2	Methylene chloride	0.0015	0.0022	0.0013	mg/kg	J
91-20-3	Naphthalene	ND	0.0056	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0056	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0056	0.00026	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0056	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0022	0.00047	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0022	0.00025	mg/kg	
108-88-3	Toluene	ND	0.0056	0.00094	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0056	0.00026	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0056	0.00025	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0022	0.00035	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0022	0.00082	mg/kg	
79-01-6	Trichloroethene	ND	0.0022	0.00024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0022	0.00034	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0056	0.00032	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0056	0.00025	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0056	0.00024	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0056	0.00062	mg/kg	
75-01-4	Vinyl chloride	ND	0.0022	0.00030	mg/kg	
	m,p-Xylene	ND	0.0022	0.00088	mg/kg	
95-47-6	o-Xylene	ND	0.0022	0.00027	mg/kg	
1330-20-7	Xylene (total)	ND	0.0022	0.00027	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

<b>Client Sample ID:</b> MW-18-12	<b>Date Sampled:</b> 11/28/12
<b>Lab Sample ID:</b> MC16336-6	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 92.5
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		70-130%
2037-26-5	Toluene-D8	121%		70-130%
460-00-4	4-Bromofluorobenzene	94%		70-130%

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

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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

<b>Client Sample ID:</b> MW-18-12 <b>Lab Sample ID:</b> MC16336-6 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 3550B <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 11/28/12 <b>Date Received:</b> 11/29/12 <b>Percent Solids:</b> 92.5
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19735.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
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	0.0027	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0027	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	96%		61-167%
460-00-4	Bromofluorobenzene (S)	94%		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

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## Report of Analysis

Client Sample ID:	MW-18-18	Date Sampled:	11/28/12
Lab Sample ID:	MC16336-7	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	73.9
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G122516.D	1	12/03/12	JM	n/a	n/a	MSG4871
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.08 g	10.0 ml	10.0 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	7.5	1.9	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	38	15	mg/kg	
107-13-1	Acrylonitrile	ND	38	1.9	mg/kg	
71-43-2	Benzene	3.27	0.75	0.44	mg/kg	
108-86-1	Bromobenzene	ND	7.5	0.34	mg/kg	
74-97-5	Bromochloromethane	ND	7.5	0.56	mg/kg	
75-27-4	Bromodichloromethane	ND	3.0	0.32	mg/kg	
75-25-2	Bromoform	ND	3.0	3.0	mg/kg	
74-83-9	Bromomethane	ND	3.0	0.78	mg/kg	
78-93-3	2-Butanone (MEK)	ND	7.5	1.9	mg/kg	
104-51-8	n-Butylbenzene	33.3	7.5	0.28	mg/kg	
135-98-8	sec-Butylbenzene	7.92	7.5	0.35	mg/kg	
98-06-6	tert-Butylbenzene	ND	7.5	1.3	mg/kg	
75-15-0	Carbon disulfide	ND	7.5	0.25	mg/kg	
56-23-5	Carbon tetrachloride	ND	3.0	1.1	mg/kg	
108-90-7	Chlorobenzene	ND	3.0	0.41	mg/kg	
75-00-3	Chloroethane	ND	7.5	1.9	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	7.5	3.0	mg/kg	
67-66-3	Chloroform	ND	3.0	0.78	mg/kg	
74-87-3	Chloromethane	ND	7.5	0.70	mg/kg	
95-49-8	o-Chlorotoluene	ND	7.5	1.7	mg/kg	
106-43-4	p-Chlorotoluene	ND	7.5	0.34	mg/kg	
124-48-1	Dibromochloromethane	ND	3.0	0.45	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	3.0	0.33	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	3.0	0.34	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	3.0	0.32	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	3.0	1.7	mg/kg	
75-34-3	1,1-Dichloroethane	ND	3.0	0.41	mg/kg	
107-06-2	1,2-Dichloroethane	ND	3.0	0.43	mg/kg	
75-35-4	1,1-Dichloroethene	ND	3.0	0.55	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	3.0	0.45	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	3.0	0.43	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:	MW-18-18	Date Sampled:	11/28/12
Lab Sample ID:	MC16336-7	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	73.9
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	3.0	0.56	mg/kg	
142-28-9	1,3-Dichloropropane	ND	7.5	0.35	mg/kg	
594-20-7	2,2-Dichloropropane	ND	7.5	1.3	mg/kg	
563-58-6	1,1-Dichloropropene	ND	7.5	0.40	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	3.0	0.26	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	3.0	0.75	mg/kg	
123-91-1	1,4-Dioxane	ND	38	38	mg/kg	
97-63-2	Ethyl methacrylate	ND	7.5	1.0	mg/kg	
100-41-4	Ethylbenzene	290	3.0	0.36	mg/kg	
87-68-3	Hexachlorobutadiene	ND	7.5	0.70	mg/kg	
591-78-6	2-Hexanone	ND	7.5	0.75	mg/kg	
98-82-8	Isopropylbenzene	30.7	7.5	0.34	mg/kg	
99-87-6	p-Isopropyltoluene	4.57	7.5	0.27	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	3.0	0.43	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	7.5	0.75	mg/kg	
74-95-3	Methylene bromide	ND	7.5	0.74	mg/kg	
75-09-2	Methylene chloride	ND	3.0	1.7	mg/kg	
91-20-3	Naphthalene	60.3	7.5	1.9	mg/kg	
103-65-1	n-Propylbenzene	91.4	7.5	1.5	mg/kg	
100-42-5	Styrene	ND	7.5	0.35	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	7.5	1.5	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	3.0	0.64	mg/kg	
127-18-4	Tetrachloroethene	ND	3.0	0.35	mg/kg	
108-88-3	Toluene	283	7.5	1.3	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	7.5	0.36	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	7.5	0.35	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	3.0	0.48	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	3.0	1.1	mg/kg	
79-01-6	Trichloroethene	ND	3.0	0.32	mg/kg	
75-69-4	Trichlorofluoromethane	ND	3.0	0.46	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	7.5	0.44	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	396	7.5	0.34	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	90.1	7.5	0.32	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	7.5	0.84	mg/kg	
75-01-4	Vinyl chloride	ND	3.0	0.41	mg/kg	
	m,p-Xylene	690	3.0	1.2	mg/kg	
95-47-6	o-Xylene	282	3.0	0.36	mg/kg	
1330-20-7	Xylene (total)	972	3.0	0.36	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

<b>Client Sample ID:</b> MW-18-18	<b>Date Sampled:</b> 11/28/12
<b>Lab Sample ID:</b> MC16336-7	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 73.9
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		70-130%
2037-26-5	Toluene-D8	100%		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	mg/kg	

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-18-18 <b>Lab Sample ID:</b> MC16336-7 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 3550B <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 11/28/12 <b>Date Received:</b> 11/29/12 <b>Percent Solids:</b> 73.9
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19736.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 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	0.0033	0.0015	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0033	0.0013	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	96%		61-167%
460-00-4	Bromofluorobenzene (S)	360% <sup>a</sup>		61-167%

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

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

Client Sample ID:	MW-18-39	Date Sampled:	11/28/12
Lab Sample ID:	MC16336-8	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	93.9
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G122514.D	1	12/03/12	JM	n/a	n/a	MSG4871
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.74 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.58	0.15	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	2.9	1.2	mg/kg	
107-13-1	Acrylonitrile	ND	2.9	0.14	mg/kg	
71-43-2	Benzene	0.0365	0.058	0.034	mg/kg	J
108-86-1	Bromobenzene	ND	0.58	0.026	mg/kg	
74-97-5	Bromochloromethane	ND	0.58	0.043	mg/kg	
75-27-4	Bromodichloromethane	ND	0.23	0.024	mg/kg	
75-25-2	Bromoform	ND	0.23	0.23	mg/kg	
74-83-9	Bromomethane	ND	0.23	0.060	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.58	0.14	mg/kg	
104-51-8	n-Butylbenzene	0.977	0.58	0.021	mg/kg	
135-98-8	sec-Butylbenzene	0.328	0.58	0.027	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.58	0.10	mg/kg	
75-15-0	Carbon disulfide	ND	0.58	0.019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.23	0.084	mg/kg	
108-90-7	Chlorobenzene	ND	0.23	0.032	mg/kg	
75-00-3	Chloroethane	ND	0.58	0.15	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.58	0.23	mg/kg	
67-66-3	Chloroform	ND	0.23	0.060	mg/kg	
74-87-3	Chloromethane	ND	0.58	0.054	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.58	0.13	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.58	0.026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.23	0.034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.23	0.025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.23	0.026	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.23	0.024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.23	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.23	0.031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.23	0.033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.23	0.042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.23	0.035	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.23	0.033	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:	MW-18-39	Date Sampled:	11/28/12
Lab Sample ID:	MC16336-8	Date Received:	11/29/12
Matrix:	SO - Soil	Percent Solids:	93.9
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.23	0.043	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.58	0.027	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.58	0.10	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.58	0.030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.23	0.020	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.23	0.057	mg/kg	
123-91-1	1,4-Dioxane	ND	2.9	2.9	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.58	0.079	mg/kg	
100-41-4	Ethylbenzene	9.62	0.23	0.028	mg/kg	
87-68-3	Hexachlorobutadiene	0.121	0.58	0.054	mg/kg	J
591-78-6	2-Hexanone	ND	0.58	0.058	mg/kg	
98-82-8	Isopropylbenzene	1.20	0.58	0.026	mg/kg	
99-87-6	p-Isopropyltoluene	0.678	0.58	0.021	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.23	0.033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.58	0.058	mg/kg	
74-95-3	Methylene bromide	ND	0.58	0.057	mg/kg	
75-09-2	Methylene chloride	ND	0.23	0.13	mg/kg	
91-20-3	Naphthalene	3.97	0.58	0.14	mg/kg	
103-65-1	n-Propylbenzene	3.32	0.58	0.12	mg/kg	
100-42-5	Styrene	ND	0.58	0.027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.58	0.12	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.23	0.049	mg/kg	
127-18-4	Tetrachloroethene	ND	0.23	0.026	mg/kg	
108-88-3	Toluene	4.10	0.58	0.098	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	0.254	0.58	0.027	mg/kg	J
120-82-1	1,2,4-Trichlorobenzene	0.114	0.58	0.026	mg/kg	J
71-55-6	1,1,1-Trichloroethane	ND	0.23	0.036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.23	0.085	mg/kg	
79-01-6	Trichloroethene	ND	0.23	0.024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.23	0.035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.58	0.034	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	12.2	0.58	0.026	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	3.32	0.58	0.025	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.58	0.065	mg/kg	
75-01-4	Vinyl chloride	ND	0.23	0.032	mg/kg	
	m,p-Xylene	26.6	0.23	0.091	mg/kg	
95-47-6	o-Xylene	12.7	0.23	0.028	mg/kg	
1330-20-7	Xylene (total)	39.3	0.23	0.028	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

<b>Client Sample ID:</b> MW-18-39	<b>Date Sampled:</b> 11/28/12
<b>Lab Sample ID:</b> MC16336-8	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 93.9
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		70-130%
2037-26-5	Toluene-D8	91%		70-130%
460-00-4	4-Bromofluorobenzene	95%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-18-39	<b>Date Sampled:</b> 11/28/12
<b>Lab Sample ID:</b> MC16336-8	<b>Date Received:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 93.9
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19737.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.7 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	94%		61-167%
460-00-4	Bromofluorobenzene (S)	92%		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

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## Misc. Forms

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### Custody Documents and Other Forms

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Includes the following where applicable:

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

FED-EX Tracking #	Accutest Order #	Matrix Codes
Accutest Order #	Accutest Job #	DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank
	MC16336	
Client / Reporting Information		Requested Analysis ( see TEST CODE sheet)
Project Information		
Billing Information ( if different from Report to)		
LAB USE ONLY		

Company Name <b>URS</b>		Project Name <b>Roxana Drilling</b>															
Street Address		Street															
City State Zip	City	Company Name															
	<b>Roxana, IL</b>	<b>URS</b>															
Project Contact	E-mail	Project#	Street Address														
<b>E. Kunkel</b>		<b>21562735.00015</b>															
Phone #	Fax #	Client PO#	City State Zip														
Sampler(s) Name(s)	Phone #	Project Manager	Attention: PO#														
<b>W. Pennington</b>	<b>314 452 8929</b>	<b>D. Palmer</b>															
Access Sample #	Field ID / Point of Collection	MECH Dist #	Collection				Number of preserved Bottles										
			Date	Time	Sampled by	Matrix	# of bottles	VOL	NH3	NH4	HNO3	HNO4	MONI	DI W/Inlr	MECH	ENCORE	Blankets
-1	MW-17-21		11/26/12	1100	wmp	SO	4						X	X	X	X	X
-2	MW-17-35		↓	1110	wmp	SO	4						X	X	X	X	X
-3	MW-17-14		↓	1120	wmp	SO	4						X	X	X	X	X
-4	trip blank 8260		↓				2										X
-5	trip blank 8011		↓				2										X
-6	MW-18-12		11/28/12	1325	wmp	SO	4						X	X	X	X	X
-6 <sup>S</sup>	MW-18-12 MS		↓	1325	wmp	SO	4						X	X	X	X	X
-6 <sup>SD</sup>	MW-18-12 MSD		↓	1325	wmp	SO	4						X	X	X	X	X
-7	MW-18-18		↓	1340	wmp	SO	4						X	X	X	X	X
-8	MW-18-39		↓	1345	wmp	SO	4						X	X	X	X	X
																	15A 2DI 1062

Data Deliverable Information Comments / Special Instructions

<p>Turnaround Time ( Business days)</p> <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY	<p>Approved By (Accutest PM): / Date:</p>  	<input type="checkbox"/> Commercial "A" ( Level 1 ) <input type="checkbox"/> Commercial "B" ( Level 2 ) <input checked="" type="checkbox"/> FULLT1 ( Level 3+4 ) <input type="checkbox"/> CT RCP <input type="checkbox"/> MA MCP <input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input checked="" type="checkbox"/> EDD Format <input type="checkbox"/> Other _____ Commercial "A" = Results Only Commercial "B" = Results + QC Summary	<p>Comments / Special Instructions</p>  
--	---	--	--

Emergency & Rush T/A data available VIA Lablink					
Sample Custody must be documented below each time samples change possession, including courier delivery.					
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
<b>W. Pennington</b>	<b>11/28/12 1500</b>	<b>FD EX</b>		<b>11/28/12</b>	
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
Relinquished by:	Date Time:	Received By:	Custody Seal #	<input type="checkbox"/> Intact <input type="checkbox"/> Not Intact	<input type="checkbox"/> Preserved where applicable <input checked="" type="checkbox"/> On Ice Cooler Temp. <b>0.0</b>

MC16336: Chain of Custody  
Page 1 of 3

5.1  
**5**

# Accutest Laboratories Sample Receipt Summary

**Accutest Job Number:** MC16336      **Client:** URS      **Immediate Client Services Action Required:** Yes  
**Date / Time Received:** 11/29/2012 9:30      **Delivery Method:** FedEx  
**Project:** ROXANA DRILLING      **No. Coolers:** 1      **Airbill #'s:**

<u>Cooler Security</u>		<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Cooler Temperature</u>		<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Cooler temp verification:	Infrared gun		
3. Cooler media:	Ice (bag)		

<u>Quality Control Preservation</u>			
	<u>Y</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>		<u>Y or N</u>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

<u>Sample Integrity - Condition</u>		<u>Y or N</u>	
1. Sample rec'd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		

<u>Sample Integrity - Instructions</u>			
	<u>Y</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

-4 and -5 both trip blanks. One of each was received frozen broken, one remains for analysis each.

5.1  
5



## Sample Receipt Summary - Problem Resolution

**Accutest Job Number:** MC16336

**CSR:** Jeremy Vienneau

**Response Date:** 11/30/2012

**Response:** Client was notified of the broken vials. See email in file.

5.1

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Accutest Laboratories  
V:508.481.6200

495 Technology Center West, Bldg One  
F: 508.481.7753

Marlborough, MA  
[www.accutest.com](http://www.accutest.com)

**MC16336: Chain of Custody**  
**Page 3 of 3**



### Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16336

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

5.2  
5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16336-1 Collected: 26-NOV-12 11:00 By: WMP Received: 29-NOV-12 By: AF MW-17-21						
MC16336-1	SM21 2540 B MOD.	03-DEC-12	HS			%SOL
MC16336-1	SW846 8260B	07-DEC-12 15:35	AMY			V8260SL +
MC16336-1	SW846 8011	09-DEC-12 21:52	AP	08-DEC-12	AP	V8011SL
MC16336-2 Collected: 26-NOV-12 11:10 By: WMP Received: 29-NOV-12 By: AF MW-17-35						
MC16336-2	SM21 2540 B MOD.	03-DEC-12	HS			%SOL
MC16336-2	SW846 8260B	03-DEC-12 19:24	JM			V8260SL +
MC16336-2	SW846 8011	09-DEC-12 22:16	AP	08-DEC-12	AP	V8011SL
MC16336-3 Collected: 26-NOV-12 11:20 By: WMP Received: 29-NOV-12 By: AF MW-17-14						
MC16336-3	SM21 2540 B MOD.	03-DEC-12	HS			%SOL
MC16336-3	SW846 8260B	07-DEC-12 16:05	AMY			V8260SL +
MC16336-3	SW846 8011	09-DEC-12 22:41	AP	08-DEC-12	AP	V8011SL
MC16336-4 Collected: 26-NOV-12 00:00 By: WMP Received: 29-NOV-12 By: AF TRIP BLANK 8260						
MC16336-4	SW846 8260B	07-DEC-12 18:58	AMY			V8260SL +
MC16336-5 Collected: 26-NOV-12 00:00 By: WMP Received: 29-NOV-12 By: AF TRIP BLANK 8011						
MC16336-5	SW846 8011	30-NOV-12 13:23	AP	30-NOV-12	NK	V8011SL
MC16336-6 Collected: 28-NOV-12 13:25 By: WMP Received: 29-NOV-12 By: AF MW-18-12						
MC16336-6	SM21 2540 B MOD.	03-DEC-12	HS			%SOL
MC16336-6	SW846 8260B	07-DEC-12 15:05	AMY			V8260SL +
MC16336-6	SW846 8011	09-DEC-12 23:05	AP	08-DEC-12	AP	V8011SL

### Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16336

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

5.2  
5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
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MC16336-7 Collected: 28-NOV-12 13:40 By: WMP Received: 29-NOV-12 By: AF  
 MW-18-18

MC16336-7 SM21 2540 B MOD.	03-DEC-12	HS				%SOL
MC16336-7 SW846 8260B	03-DEC-12 19:53	JM				V8260SL +
MC16336-7 SW846 8011	09-DEC-12 23:30	AP	08-DEC-12	AP		V8011SL

MC16336-8 Collected: 28-NOV-12 13:45 By: WMP Received: 29-NOV-12 By: AF  
 MW-18-39

MC16336-8 SM21 2540 B MOD.	03-DEC-12	HS				%SOL
MC16336-8 SW846 8260B	03-DEC-12 18:55	JM				V8260SL +
MC16336-8 SW846 8011	09-DEC-12 23:55	AP	08-DEC-12	AP		V8011SL

# SGS Accutest Internal Chain of Custody

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 11/29/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16336-1.1	Walk In Ref #9	Hamid Siamak	12/03/12 08:10	Retrieve from Storage
MC16336-1.1	Hamid Siamak	Walk In Ref #9	12/03/12 11:04	Return to Storage
MC16336-1.1	Walk In Ref #9	Michael Rolo	12/06/12 09:27	Retrieve from Storage
MC16336-1.1	Michael Rolo	Walk In Ref #9	12/06/12 09:28	Return to Storage
MC16336-1.1	Walk In Ref #9	Chris Cataldo	12/08/12 10:33	Retrieve from Storage
MC16336-1.1	Chris Cataldo	Walk In Ref #9	12/08/12 21:09	Return to Storage
MC16336-1.1	Scott Parsick		02/13/13 11:50	Disposed
MC16336-1.3	VOC Ref #10	Amy Min Yang	12/07/12 14:05	Retrieve from Storage
MC16336-1.3	Amy Min Yang	GCMSM	12/07/12 14:05	Load on Instrument
MC16336-1.3	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16336-1.3	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16336-1.3	Scott Parsick		02/13/13 11:50	Disposed
MC16336-1.4	VOC Ref #10	Gary Krasinski	11/30/12 11:40	Retrieve from Storage
MC16336-1.4	Gary Krasinski	VOC Ref #10	12/03/12 08:14	Return to Storage
MC16336-1.4	Scott Parsick		02/13/13 11:50	Disposed
MC16336-2.1	Walk In Ref #9	Hamid Siamak	12/03/12 08:10	Retrieve from Storage
MC16336-2.1	Hamid Siamak	Walk In Ref #9	12/03/12 11:04	Return to Storage
MC16336-2.1	Walk In Ref #9	Michael Rolo	12/06/12 09:27	Retrieve from Storage
MC16336-2.1	Michael Rolo	Walk In Ref #9	12/06/12 09:28	Return to Storage
MC16336-2.1	Walk In Ref #9	Chris Cataldo	12/08/12 10:33	Retrieve from Storage
MC16336-2.1	Chris Cataldo	Walk In Ref #9	12/08/12 21:09	Return to Storage
MC16336-2.1	Scott Parsick		02/13/13 11:50	Disposed
MC16336-2.4	VOC Ref #10	Gary Krasinski	11/30/12 11:40	Retrieve from Storage
MC16336-2.4	Gary Krasinski	VOC Ref #10	12/03/12 10:10	Return to Storage
MC16336-2.4	VOC Ref #10	Jaime Maslowski	12/03/12 10:16	Retrieve from Storage
MC16336-2.4	Jaime Maslowski	VOC Ref #10	12/04/12 09:49	Return to Storage
MC16336-2.4	Scott Parsick		02/13/13 11:50	Disposed
MC16336-3.1	Walk In Ref #9	Hamid Siamak	12/03/12 08:10	Retrieve from Storage
MC16336-3.1	Hamid Siamak	Walk In Ref #9	12/03/12 11:04	Return to Storage
MC16336-3.1	Walk In Ref #9	Michael Rolo	12/06/12 09:27	Retrieve from Storage
MC16336-3.1	Michael Rolo	Walk In Ref #9	12/06/12 09:28	Return to Storage
MC16336-3.1	Walk In Ref #9	Chris Cataldo	12/08/12 10:33	Retrieve from Storage
MC16336-3.1	Chris Cataldo	Walk In Ref #9	12/08/12 21:09	Return to Storage
MC16336-3.1	Scott Parsick		02/13/13 11:50	Disposed
MC16336-3.2	VOC Ref #10	Amy Min Yang	12/07/12 14:05	Retrieve from Storage
MC16336-3.2	Amy Min Yang	GCMSM	12/07/12 14:05	Load on Instrument
MC16336-3.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16336-3.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage

# SGS Accutest Internal Chain of Custody

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 11/29/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16336-3.2	Scott Parsick		02/13/13 11:50	Disposed
MC16336-3.4	VOC Ref #10	Gary Krasinski	11/30/12 11:40	Retrieve from Storage
MC16336-3.4	Gary Krasinski	VOC Ref #10	12/03/12 08:14	Return to Storage
MC16336-3.4	Scott Parsick		02/13/13 11:50	Disposed
MC16336-4.1	VOC Ref #2	Amy Min Yang	12/07/12 15:21	Retrieve from Storage
MC16336-4.1	Amy Min Yang	GCMSV	12/07/12 15:21	Load on Instrument
MC16336-4.1	GCMSV	Amy Min Yang	12/10/12 17:18	Unload from Instrument
MC16336-4.1	Amy Min Yang	VOC Ref #2	12/10/12 17:18	Return to Storage
MC16336-4.1	Scott Parsick		02/13/13 11:50	Disposed
MC16336-6.1	Walk In Ref #9	Hamid Siamak	12/03/12 08:10	Retrieve from Storage
MC16336-6.1	Hamid Siamak	Walk In Ref #9	12/03/12 11:04	Return to Storage
MC16336-6.1	Walk In Ref #9	Michael Rolo	12/06/12 09:27	Retrieve from Storage
MC16336-6.1	Michael Rolo	Walk In Ref #9	12/06/12 09:28	Return to Storage
MC16336-6.1	Walk In Ref #9	Chris Cataldo	12/08/12 10:33	Retrieve from Storage
MC16336-6.1	Chris Cataldo	Walk In Ref #9	12/08/12 21:09	Return to Storage
MC16336-6.1	Scott Parsick		02/13/13 11:50	Disposed
MC16336-6.4	VOC Ref #10	Amy Min Yang	12/07/12 14:05	Retrieve from Storage
MC16336-6.4	Amy Min Yang	GCMSM	12/07/12 14:05	Load on Instrument
MC16336-6.4	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16336-6.4	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16336-6.4	Scott Parsick		02/13/13 11:50	Disposed
MC16336-6.5	VOC Ref #10	Amy Min Yang	12/10/12 16:25	Retrieve from Storage
MC16336-6.5	Amy Min Yang	GCMSM	12/10/12 16:25	Load on Instrument
MC16336-6.5	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16336-6.5	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16336-6.5	Scott Parsick		02/13/13 11:50	Disposed
MC16336-6.6	VOC Ref #10	Amy Min Yang	12/10/12 16:25	Retrieve from Storage
MC16336-6.6	Amy Min Yang	GCMSM	12/10/12 16:25	Load on Instrument
MC16336-6.6	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16336-6.6	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16336-6.6	Scott Parsick		02/13/13 11:50	Disposed
MC16336-6.8	VOC Ref #10	Amy Min Yang	12/07/12 14:05	Retrieve from Storage
MC16336-6.8	Amy Min Yang	GCMSM	12/07/12 14:05	Load on Instrument
MC16336-6.8	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16336-6.8	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16336-6.8	Scott Parsick		02/13/13 11:50	Disposed

5.3  
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# SGS Accutest Internal Chain of Custody

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 11/29/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16336-6.9	VOC Ref #10	Amy Min Yang	12/07/12 14:05	Retrieve from Storage
MC16336-6.9	Amy Min Yang	GCMSM	12/07/12 14:05	Load on Instrument
MC16336-6.9	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16336-6.9	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16336-6.9	Scott Parsick		02/13/13 11:50	Disposed
MC16336-6.12	VOC Ref #10	Gary Krasinski	11/30/12 11:40	Retrieve from Storage
MC16336-6.12	Gary Krasinski	VOC Ref #10	12/03/12 08:14	Return to Storage
MC16336-6.12	Scott Parsick		02/13/13 11:50	Disposed
MC16336-7.1	Walk In Ref #9	Hamid Siamak	12/03/12 08:10	Retrieve from Storage
MC16336-7.1	Hamid Siamak	Walk In Ref #9	12/03/12 11:04	Return to Storage
MC16336-7.1	Walk In Ref #9	Michael Rolo	12/06/12 09:27	Retrieve from Storage
MC16336-7.1	Michael Rolo	Walk In Ref #9	12/06/12 09:28	Return to Storage
MC16336-7.1	Scott Parsick		02/13/13 11:50	Disposed
MC16336-7.4	VOC Ref #10	Gary Krasinski	11/30/12 11:40	Retrieve from Storage
MC16336-7.4	Gary Krasinski	VOC Ref #10	12/03/12 10:10	Return to Storage
MC16336-7.4	VOC Ref #10	Jaime Maslowski	12/03/12 10:16	Retrieve from Storage
MC16336-7.4	Jaime Maslowski	VOC Ref #10	12/04/12 09:49	Return to Storage
MC16336-7.4	Scott Parsick		02/13/13 11:50	Disposed
MC16336-8.1	Walk In Ref #9	Hamid Siamak	12/03/12 08:10	Retrieve from Storage
MC16336-8.1	Hamid Siamak	Walk In Ref #9	12/03/12 11:04	Return to Storage
MC16336-8.1	Walk In Ref #9	Michael Rolo	12/06/12 09:27	Retrieve from Storage
MC16336-8.1	Michael Rolo	Walk In Ref #9	12/06/12 09:28	Return to Storage
MC16336-8.1	Walk In Ref #9	Chris Cataldo	12/08/12 10:33	Retrieve from Storage
MC16336-8.1	Chris Cataldo	Walk In Ref #9	12/08/12 21:09	Return to Storage
MC16336-8.1	Scott Parsick		02/13/13 11:50	Disposed
MC16336-8.4	VOC Ref #10	Gary Krasinski	11/30/12 11:40	Retrieve from Storage
MC16336-8.4	Gary Krasinski	VOC Ref #10	12/03/12 10:10	Return to Storage
MC16336-8.4	VOC Ref #10	Jaime Maslowski	12/03/12 10:16	Retrieve from Storage
MC16336-8.4	Jaime Maslowski	VOC Ref #10	12/04/12 09:49	Return to Storage
MC16336-8.4	Scott Parsick		02/13/13 11:50	Disposed

5.3  
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## GC/MS Volatiles

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## QC Data Summaries

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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: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4871-MB	G122498.D	1	12/03/12	JM	n/a	n/a	MSG4871

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-2, MC16336-7, MC16336-8

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

6.1.1  
6

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4871-MB	G122498.D	1	12/03/12	JM	n/a	n/a	MSG4871

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-2, MC16336-7, MC16336-8

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.1  
6

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4871-MB	G122498.D	1	12/03/12	JM	n/a	n/a	MSG4871

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-2, MC16336-7, MC16336-8

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 70-130%
2037-26-5	Toluene-D8	99% 70-130%
460-00-4	4-Bromofluorobenzene	99% 70-130%

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

6.1.1  
6

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1790-MB1	M52763.D	1	12/07/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

6.1.2  
6

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1790-MB1	M52763.D	1	12/07/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1790-MB1	M52763.D	1	12/07/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	94% 70-130%
2037-26-5	Toluene-D8	111% 70-130%
460-00-4	4-Bromofluorobenzene	93% 70-130%

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

6.1.2  
6

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1789-MB	M52763.D	1	12/07/12	AMY	n/a	n/a	MSM1789

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-1, MC16336-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1789-MB	M52763.D	1	12/07/12	AMY	n/a	n/a	MSM1789

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-1, MC16336-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

# Method Blank Summary

Job Number: MC16336  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1789-MB	M52763.D	1	12/07/12	AMY	n/a	n/a	MSM1789

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-1, MC16336-3

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	94% 70-130%
2037-26-5	Toluene-D8	111% 70-130%
460-00-4	4-Bromofluorobenzene	93% 70-130%

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

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV573-MB	V14074.D	1	12/07/12	AMY	n/a	n/a	MSV573

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-4

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	

6.1.4  
6

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV573-MB	V14074.D	1	12/07/12	AMY	n/a	n/a	MSV573

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-4

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	ug/l	

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV573-MB	V14074.D	1	12/07/12	AMY	n/a	n/a	MSV573

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-4

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	85% 70-130%
2037-26-5	Toluene-D8	91% 70-130%
460-00-4	4-Bromofluorobenzene	97% 70-130%

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

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1790-MB	M52787.D	1	12/10/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6MS, MC16336-6MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

6.1.5  
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# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1790-MB	M52787.D	1	12/10/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6MS, MC16336-6MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

6.1.5  
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# Method Blank Summary

Job Number: MC16336  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1790-MB	M52787.D	1	12/10/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6MS, MC16336-6MSD

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	94%	70-130%
2037-26-5	Toluene-D8	114%	70-130%
460-00-4	4-Bromofluorobenzene	89%	70-130%

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4871-BS	G122495.D	1	12/03/12	JM	n/a	n/a	MSG4871
MSG4871-BSD	G122496.D	1	12/03/12	JM	n/a	n/a	MSG4871

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-2, MC16336-7, MC16336-8

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	2500	3140	126	2870	115	9	70-130/25
107-02-8	Acrolein	12500	4510	36* a	4510	36* a	0	70-130/25
107-13-1	Acrylonitrile	2500	2550	102	2570	103	1	70-130/25
71-43-2	Benzene	2500	2640	106	2690	108	2	70-130/25
108-86-1	Bromobenzene	2500	2490	100	2500	100	0	70-130/25
74-97-5	Bromochloromethane	2500	2720	109	2780	111	2	70-130/25
75-27-4	Bromodichloromethane	2500	2430	97	2470	99	2	70-130/25
75-25-2	Bromoform	2500	2110	84	2140	86	1	70-130/25
74-83-9	Bromomethane	2500	2650	106	2710	108	2	70-130/25
78-93-3	2-Butanone (MEK)	2500	2850	114	2730	109	4	70-130/25
104-51-8	n-Butylbenzene	2500	2620	105	2630	105	0	70-130/25
135-98-8	sec-Butylbenzene	2500	2800	112	2820	113	1	70-130/25
98-06-6	tert-Butylbenzene	2500	2460	98	2930	117	17	70-130/25
75-15-0	Carbon disulfide	2500	3070	123	3160	126	3	70-130/25
56-23-5	Carbon tetrachloride	2500	2290	92	2350	94	3	70-130/25
108-90-7	Chlorobenzene	2500	2710	108	2760	110	2	70-130/25
75-00-3	Chloroethane	2500	2870	115	2910	116	1	70-130/25
110-75-8	2-Chloroethyl vinyl ether	2500	1500	60	1550	62	3	10-160/25
67-66-3	Chloroform	2500	2730	109	2780	111	2	70-130/25
74-87-3	Chloromethane	2500	3320	133* a	3460	138* a	4	70-130/25
95-49-8	o-Chlorotoluene	2500	2790	112	2770	111	1	70-130/25
106-43-4	p-Chlorotoluene	2500	2850	114	2960	118	4	70-130/25
124-48-1	Dibromochloromethane	2500	2320	93	2350	94	1	70-130/25
95-50-1	1,2-Dichlorobenzene	2500	2760	110	2750	110	0	70-130/25
541-73-1	1,3-Dichlorobenzene	2500	2740	110	2770	111	1	70-130/25
106-46-7	1,4-Dichlorobenzene	2500	2580	103	2590	104	0	70-130/25
75-71-8	Dichlorodifluoromethane	2500	2170	87	2240	90	3	70-130/25
75-34-3	1,1-Dichloroethane	2500	2940	118	2990	120	2	70-130/25
107-06-2	1,2-Dichloroethane	2500	2380	95	2430	97	2	70-130/25
75-35-4	1,1-Dichloroethene	2500	2840	114	2930	117	3	70-130/25
156-59-2	cis-1,2-Dichloroethene	2500	2870	115	2920	117	2	70-130/25
156-60-5	trans-1,2-Dichloroethene	2500	2750	110	2830	113	3	70-130/25
78-87-5	1,2-Dichloropropane	2500	2640	106	2690	108	2	70-130/25
142-28-9	1,3-Dichloropropane	2500	2490	100	2510	100	1	70-130/25
594-20-7	2,2-Dichloropropane	2500	2930	117	3040	122	4	70-130/25
563-58-6	1,1-Dichloropropene	2500	2620	105	2700	108	3	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4871-BS	G122495.D	1	12/03/12	JM	n/a	n/a	MSG4871
MSG4871-BSD	G122496.D	1	12/03/12	JM	n/a	n/a	MSG4871

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-2, MC16336-7, MC16336-8

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	2500	2500	100	2540	102	2	70-130/25
10061-02-6	trans-1,3-Dichloropropene	2500	2580	103	2590	104	0	70-130/25
123-91-1	1,4-Dioxane	12500	9930	79	9110	73	9	70-130/25
97-63-2	Ethyl methacrylate	2500	2460	98	2420	97	2	76-141/25
100-41-4	Ethylbenzene	2500	2570	103	2620	105	2	70-130/25
87-68-3	Hexachlorobutadiene	2500	2380	95	2420	97	2	70-130/25
591-78-6	2-Hexanone	2500	2400	96	2290	92	5	70-130/25
98-82-8	Isopropylbenzene	2500	2830	113	2860	114	1	70-130/25
99-87-6	p-Isopropyltoluene	2500	2670	107	2680	107	0	70-130/25
1634-04-4	Methyl Tert Butyl Ether	2500	2760	110	2780	111	1	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	1940	78	1930	77	1	70-130/25
74-95-3	Methylene bromide	2500	2470	99	2480	99	0	70-130/25
75-09-2	Methylene chloride	2500	2880	115	2930	117	2	70-130/25
91-20-3	Naphthalene	2500	3170	127	3170	127	0	70-130/25
103-65-1	n-Propylbenzene	2500	2830	113	2870	115	1	70-130/25
100-42-5	Styrene	2500	2460	98	2480	99	1	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	2500	2330	93	2370	95	2	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	2500	2680	107	2680	107	0	70-130/25
127-18-4	Tetrachloroethene	2500	2430	97	2480	99	2	70-130/25
108-88-3	Toluene	2500	2670	107	2700	108	1	70-130/25
87-61-6	1,2,3-Trichlorobenzene	2500	3160	126	3150	126	0	70-130/25
120-82-1	1,2,4-Trichlorobenzene	2500	2730	109	2700	108	1	70-130/25
71-55-6	1,1,1-Trichloroethane	2500	2640	106	2730	109	3	70-130/25
79-00-5	1,1,2-Trichloroethane	2500	2490	100	2520	101	1	70-130/25
79-01-6	Trichloroethene	2500	2530	101	2570	103	2	70-130/25
75-69-4	Trichlorofluoromethane	2500	2630	105	2610	104	1	70-130/25
96-18-4	1,2,3-Trichloropropane	2500	2600	104	2620	105	1	70-130/25
95-63-6	1,2,4-Trimethylbenzene	2500	2530	101	2550	102	1	70-130/25
108-67-8	1,3,5-Trimethylbenzene	2500	2510	100	2530	101	1	70-130/25
108-05-4	Vinyl Acetate	2500	2910	116	2950	118	1	70-130/25
75-01-4	Vinyl chloride	2500	2830	113	2880	115	2	70-130/25
	m,p-Xylene	5000	5300	106	5410	108	2	70-130/25
95-47-6	o-Xylene	2500	2710	108	2780	111	3	70-130/25
1330-20-7	Xylene (total)	7500	8010	107	8190	109	2	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4871-BS	G122495.D	1	12/03/12	JM	n/a	n/a	MSG4871
MSG4871-BSD	G122496.D	1	12/03/12	JM	n/a	n/a	MSG4871

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-2, MC16336-7, MC16336-8

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	104%	106%	70-130%
2037-26-5	Toluene-D8	98%	99%	70-130%
460-00-4	4-Bromofluorobenzene	98%	99%	70-130%

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

\* = Outside of Control Limits.

6.2.1  
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# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1790-BS1	M52760.D	1	12/07/12	AMY	n/a	n/a	MSM1790
MSM1790-BSD1	M52761.D	1	12/07/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	31.0	62* a	25.7	51* a	19	70-130/25
107-02-8	Acrolein	250	132	53* a	102	41* a	26* a	70-130/25
107-13-1	Acrylonitrile	50	44.7	89	45.4	91	2	70-130/25
71-43-2	Benzene	50	50.4	101	49.6	99	2	70-130/25
108-86-1	Bromobenzene	50	46.1	92	43.4	87	6	70-130/25
74-97-5	Bromochloromethane	50	46.6	93	43.9	88	6	70-130/25
75-27-4	Bromodichloromethane	50	48.4	97	45.2	90	7	70-130/25
75-25-2	Bromoform	50	45.6	91	41.9	84	8	70-130/25
74-83-9	Bromomethane	50	50.5	101	49.6	99	2	70-130/25
78-93-3	2-Butanone (MEK)	50	41.8	84	36.0	72	15	70-130/25
104-51-8	n-Butylbenzene	50	51.3	103	51.0	102	1	70-130/25
135-98-8	sec-Butylbenzene	50	49.7	99	49.3	99	1	70-130/25
98-06-6	tert-Butylbenzene	50	49.3	99	48.2	96	2	70-130/25
75-15-0	Carbon disulfide	50	55.9	112	55.7	111	0	70-130/25
56-23-5	Carbon tetrachloride	50	55.5	111	55.4	111	0	70-130/25
108-90-7	Chlorobenzene	50	46.3	93	44.7	89	4	70-130/25
75-00-3	Chloroethane	50	52.4	105	52.9	106	1	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	48.8	98	43.5	87	11	10-160/25
67-66-3	Chloroform	50	48.3	97	47.1	94	3	70-130/25
74-87-3	Chloromethane	50	56.9	114	56.5	113	1	70-130/25
95-49-8	o-Chlorotoluene	50	45.5	91	43.8	88	4	70-130/25
106-43-4	p-Chlorotoluene	50	46.6	93	43.5	87	7	70-130/25
124-48-1	Dibromochloromethane	50	45.6	91	43.3	87	5	70-130/25
95-50-1	1,2-Dichlorobenzene	50	43.3	87	41.1	82	5	70-130/25
541-73-1	1,3-Dichlorobenzene	50	45.3	91	42.2	84	7	70-130/25
106-46-7	1,4-Dichlorobenzene	50	44.8	90	42.3	85	6	70-130/25
75-71-8	Dichlorodifluoromethane	50	53.3	107	56.3	113	5	70-130/25
75-34-3	1,1-Dichloroethane	50	49.8	100	48.4	97	3	70-130/25
107-06-2	1,2-Dichloroethane	50	45.1	90	41.4	83	9	70-130/25
75-35-4	1,1-Dichloroethene	50	57.0	114	58.0	116	2	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	48.2	96	46.7	93	3	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	51.4	103	50.6	101	2	70-130/25
78-87-5	1,2-Dichloropropane	50	48.1	96	45.8	92	5	70-130/25
142-28-9	1,3-Dichloropropane	50	45.4	91	41.1	82	10	70-130/25
594-20-7	2,2-Dichloropropane	50	54.1	108	52.9	106	2	70-130/25
563-58-6	1,1-Dichloropropene	50	55.3	111	55.7	111	1	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1790-BS1	M52760.D	1	12/07/12	AMY	n/a	n/a	MSM1790
MSM1790-BSD1	M52761.D	1	12/07/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	50	45.6	91	43.2	86	5	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	47.9	96	44.2	88	8	70-130/25
123-91-1	1,4-Dioxane	250	261	104	238	95	9	70-130/25
97-63-2	Ethyl methacrylate	50	52.1	104	46.6	93	11	76-141/25
100-41-4	Ethylbenzene	50	51.1	102	50.7	101	1	70-130/25
87-68-3	Hexachlorobutadiene	50	52.7	105	53.1	106	1	70-130/25
591-78-6	2-Hexanone	50	56.1	112	47.7	95	16	70-130/25
98-82-8	Isopropylbenzene	50	49.3	99	48.2	96	2	70-130/25
99-87-6	p-Isopropyltoluene	50	52.4	105	52.2	104	0	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	42.5	85	38.1	76	11	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	54.3	109	46.0	92	17	70-130/25
74-95-3	Methylene bromide	50	47.0	94	43.4	87	8	70-130/25
75-09-2	Methylene chloride	50	44.7	89	43.4	87	3	70-130/25
91-20-3	Naphthalene	50	55.3	111	48.8	98	12	70-130/25
103-65-1	n-Propylbenzene	50	48.4	97	47.0	94	3	70-130/25
100-42-5	Styrene	50	49.3	99	46.8	94	5	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	47.6	95	46.0	92	3	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	45.7	91	39.2	78	15	70-130/25
127-18-4	Tetrachloroethene	50	54.2	108	55.5	111	2	70-130/25
108-88-3	Toluene	50	53.5	107	52.3	105	2	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	45.8	92	41.8	84	9	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	46.3	93	43.0	86	7	70-130/25
71-55-6	1,1,1-Trichloroethane	50	54.5	109	52.9	106	3	70-130/25
79-00-5	1,1,2-Trichloroethane	50	46.1	92	42.5	85	8	70-130/25
79-01-6	Trichloroethene	50	53.1	106	53.0	106	0	70-130/25
75-69-4	Trichlorofluoromethane	50	56.8	114	58.2	116	2	70-130/25
96-18-4	1,2,3-Trichloropropane	50	47.6	95	41.8	84	13	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	48.9	98	47.5	95	3	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	49.5	99	47.7	95	4	70-130/25
108-05-4	Vinyl Acetate	50	36.4	73	30.1	60* a	19	70-130/25
75-01-4	Vinyl chloride	50	52.1	104	52.4	105	1	70-130/25
	m,p-Xylene	100	101	101	101	101	0	70-130/25
95-47-6	o-Xylene	50	49.6	99	47.3	95	5	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: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1790-BS1	M52760.D	1	12/07/12	AMY	n/a	n/a	MSM1790
MSM1790-BSD1	M52761.D	1	12/07/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	101%	100%	70-130%
2037-26-5	Toluene-D8	113%	115%	70-130%
460-00-4	4-Bromofluorobenzene	92%	91%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1789-BS	M52760.D	1	12/07/12	AMY	n/a	n/a	MSM1789
MSM1789-BSD	M52761.D	1	12/07/12	AMY	n/a	n/a	MSM1789

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-1, MC16336-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	31.0	62* a	25.7	51* a	19	70-130/25
107-02-8	Acrolein	250	132	53* a	102	41* a	26* a	70-130/25
107-13-1	Acrylonitrile	50	44.7	89	45.4	91	2	70-130/25
71-43-2	Benzene	50	50.4	101	49.6	99	2	70-130/25
108-86-1	Bromobenzene	50	46.1	92	43.4	87	6	70-130/25
74-97-5	Bromochloromethane	50	46.6	93	43.9	88	6	70-130/25
75-27-4	Bromodichloromethane	50	48.4	97	45.2	90	7	70-130/25
75-25-2	Bromoform	50	45.6	91	41.9	84	8	70-130/25
74-83-9	Bromomethane	50	50.5	101	49.6	99	2	70-130/25
78-93-3	2-Butanone (MEK)	50	41.8	84	36.0	72	15	70-130/25
104-51-8	n-Butylbenzene	50	51.3	103	51.0	102	1	70-130/25
135-98-8	sec-Butylbenzene	50	49.7	99	49.3	99	1	70-130/25
98-06-6	tert-Butylbenzene	50	49.3	99	48.2	96	2	70-130/25
75-15-0	Carbon disulfide	50	55.9	112	55.7	111	0	70-130/25
56-23-5	Carbon tetrachloride	50	55.5	111	55.4	111	0	70-130/25
108-90-7	Chlorobenzene	50	46.3	93	44.7	89	4	70-130/25
75-00-3	Chloroethane	50	52.4	105	52.9	106	1	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	48.8	98	43.5	87	11	10-160/25
67-66-3	Chloroform	50	48.3	97	47.1	94	3	70-130/25
74-87-3	Chloromethane	50	56.9	114	56.5	113	1	70-130/25
95-49-8	o-Chlorotoluene	50	45.5	91	43.8	88	4	70-130/25
106-43-4	p-Chlorotoluene	50	46.6	93	43.5	87	7	70-130/25
124-48-1	Dibromochloromethane	50	45.6	91	43.3	87	5	70-130/25
95-50-1	1,2-Dichlorobenzene	50	43.3	87	41.1	82	5	70-130/25
541-73-1	1,3-Dichlorobenzene	50	45.3	91	42.2	84	7	70-130/25
106-46-7	1,4-Dichlorobenzene	50	44.8	90	42.3	85	6	70-130/25
75-71-8	Dichlorodifluoromethane	50	53.3	107	56.3	113	5	70-130/25
75-34-3	1,1-Dichloroethane	50	49.8	100	48.4	97	3	70-130/25
107-06-2	1,2-Dichloroethane	50	45.1	90	41.4	83	9	70-130/25
75-35-4	1,1-Dichloroethene	50	57.0	114	58.0	116	2	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	48.2	96	46.7	93	3	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	51.4	103	50.6	101	2	70-130/25
78-87-5	1,2-Dichloropropane	50	48.1	96	45.8	92	5	70-130/25
142-28-9	1,3-Dichloropropane	50	45.4	91	41.1	82	10	70-130/25
594-20-7	2,2-Dichloropropane	50	54.1	108	52.9	106	2	70-130/25
563-58-6	1,1-Dichloropropene	50	55.3	111	55.7	111	1	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1789-BS	M52760.D	1	12/07/12	AMY	n/a	n/a	MSM1789
MSM1789-BSD	M52761.D	1	12/07/12	AMY	n/a	n/a	MSM1789

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-1, MC16336-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	50	45.6	91	43.2	86	5	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	47.9	96	44.2	88	8	70-130/25
123-91-1	1,4-Dioxane	250	261	104	238	95	9	70-130/25
97-63-2	Ethyl methacrylate	50	52.1	104	46.6	93	11	76-141/25
100-41-4	Ethylbenzene	50	51.1	102	50.7	101	1	70-130/25
87-68-3	Hexachlorobutadiene	50	52.7	105	53.1	106	1	70-130/25
591-78-6	2-Hexanone	50	56.1	112	47.7	95	16	70-130/25
98-82-8	Isopropylbenzene	50	49.3	99	48.2	96	2	70-130/25
99-87-6	p-Isopropyltoluene	50	52.4	105	52.2	104	0	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	42.5	85	38.1	76	11	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	54.3	109	46.0	92	17	70-130/25
74-95-3	Methylene bromide	50	47.0	94	43.4	87	8	70-130/25
75-09-2	Methylene chloride	50	44.7	89	43.4	87	3	70-130/25
91-20-3	Naphthalene	50	55.3	111	48.8	98	12	70-130/25
103-65-1	n-Propylbenzene	50	48.4	97	47.0	94	3	70-130/25
100-42-5	Styrene	50	49.3	99	46.8	94	5	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	47.6	95	46.0	92	3	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	45.7	91	39.2	78	15	70-130/25
127-18-4	Tetrachloroethene	50	54.2	108	55.5	111	2	70-130/25
108-88-3	Toluene	50	53.5	107	52.3	105	2	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	45.8	92	41.8	84	9	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	46.3	93	43.0	86	7	70-130/25
71-55-6	1,1,1-Trichloroethane	50	54.5	109	52.9	106	3	70-130/25
79-00-5	1,1,2-Trichloroethane	50	46.1	92	42.5	85	8	70-130/25
79-01-6	Trichloroethene	50	53.1	106	53.0	106	0	70-130/25
75-69-4	Trichlorofluoromethane	50	56.8	114	58.2	116	2	70-130/25
96-18-4	1,2,3-Trichloropropane	50	47.6	95	41.8	84	13	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	48.9	98	47.5	95	3	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	49.5	99	47.7	95	4	70-130/25
108-05-4	Vinyl Acetate	50	36.4	73	30.1	60* a	19	70-130/25
75-01-4	Vinyl chloride	50	52.1	104	52.4	105	1	70-130/25
	m,p-Xylene	100	101	101	101	101	0	70-130/25
95-47-6	o-Xylene	50	49.6	99	47.3	95	5	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: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1789-BS	M52760.D	1	12/07/12	AMY	n/a	n/a	MSM1789
MSM1789-BSD	M52761.D	1	12/07/12	AMY	n/a	n/a	MSM1789

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-1, MC16336-3

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	101%	100%	70-130%
2037-26-5	Toluene-D8	113%	115%	70-130%
460-00-4	4-Bromofluorobenzene	92%	91%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV573-BS	V14071.D	1	12/07/12	AMY	n/a	n/a	MSV573
MSV573-BSD	V14072.D	1	12/07/12	AMY	n/a	n/a	MSV573

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	73.0	146* a	69.2	138* a	5	70-130/25
107-02-8	Acrolein	250	132	53* a	136	54* a	3	70-130/25
107-13-1	Acrylonitrile	50	47.5	95	50.0	100	5	70-130/25
71-43-2	Benzene	50	51.1	102	53.3	107	4	70-130/25
108-86-1	Bromobenzene	50	53.4	107	55.3	111	3	70-130/25
74-97-5	Bromochloromethane	50	52.1	104	54.1	108	4	70-130/25
75-27-4	Bromodichloromethane	50	44.0	88	45.7	91	4	70-130/25
75-25-2	Bromoform	50	42.3	85	43.6	87	3	70-130/25
74-83-9	Bromomethane	50	44.6	89	46.5	93	4	70-130/25
78-93-3	2-Butanone (MEK)	50	62.6	125	61.2	122	2	70-130/25
104-51-8	n-Butylbenzene	50	53.0	106	55.2	110	4	70-130/25
135-98-8	sec-Butylbenzene	50	49.7	99	52.0	104	5	70-130/25
98-06-6	tert-Butylbenzene	50	48.5	97	50.4	101	4	70-130/25
75-15-0	Carbon disulfide	50	46.4	93	48.9	98	5	70-130/25
56-23-5	Carbon tetrachloride	50	44.4	89	46.3	93	4	70-130/25
108-90-7	Chlorobenzene	50	48.6	97	50.6	101	4	70-130/25
75-00-3	Chloroethane	50	48.3	97	50.1	100	4	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	15.8	32* a	17.9	36* a	12	70-130/25
67-66-3	Chloroform	50	49.4	99	51.8	104	5	70-130/25
74-87-3	Chloromethane	50	46.9	94	49.1	98	5	70-130/25
95-49-8	o-Chlorotoluene	50	48.4	97	50.3	101	4	70-130/25
106-43-4	p-Chlorotoluene	50	49.9	100	51.8	104	4	70-130/25
124-48-1	Dibromochloromethane	50	43.6	87	45.0	90	3	70-130/25
95-50-1	1,2-Dichlorobenzene	50	49.4	99	51.2	102	4	70-130/25
541-73-1	1,3-Dichlorobenzene	50	49.9	100	51.6	103	3	70-130/25
106-46-7	1,4-Dichlorobenzene	50	51.0	102	52.9	106	4	70-130/25
75-71-8	Dichlorodifluoromethane	50	39.7	79	41.4	83	4	70-130/25
75-34-3	1,1-Dichloroethane	50	51.8	104	54.3	109	5	70-130/25
107-06-2	1,2-Dichloroethane	50	50.0	100	50.7	101	1	70-130/25
75-35-4	1,1-Dichloroethene	50	51.6	103	54.1	108	5	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	50.2	100	52.1	104	4	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	49.1	98	51.8	104	5	70-130/25
78-87-5	1,2-Dichloropropane	50	50.4	101	52.0	104	3	70-130/25
142-28-9	1,3-Dichloropropane	50	50.8	102	52.3	105	3	70-130/25
594-20-7	2,2-Dichloropropane	50	58.2	116	60.8	122	4	70-130/25
563-58-6	1,1-Dichloropropene	50	50.0	100	52.7	105	5	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV573-BS	V14071.D	1	12/07/12	AMY	n/a	n/a	MSV573
MSV573-BSD	V14072.D	1	12/07/12	AMY	n/a	n/a	MSV573

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-4

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	43.2	86	44.7	89	3	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	44.8	90	46.2	92	3	70-130/25
123-91-1	1,4-Dioxane	250	243	97	250	100	3	70-130/25
97-63-2	Ethyl methacrylate	50	46.4	93	47.4	95	2	77-137/25
100-41-4	Ethylbenzene	50	52.9	106	55.4	111	5	70-130/25
87-68-3	Hexachlorobutadiene	50	51.8	104	55.0	110	6	70-130/25
591-78-6	2-Hexanone	50	59.1	118	57.3	115	3	70-130/25
98-82-8	Isopropylbenzene	50	49.9	100	52.1	104	4	70-130/25
99-87-6	p-Isopropyltoluene	50	55.3	111	57.5	115	4	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	50.7	101	52.9	106	4	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	48.1	96	49.2	98	2	70-130/25
74-95-3	Methylene bromide	50	49.8	100	50.9	102	2	70-130/25
75-09-2	Methylene chloride	50	49.1	98	50.8	102	3	70-130/25
91-20-3	Naphthalene	50	50.8	102	54.3	109	7	70-130/25
103-65-1	n-Propylbenzene	50	50.1	100	52.1	104	4	70-130/25
100-42-5	Styrene	50	55.1	110	57.3	115	4	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	46.8	94	48.0	96	3	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	52.3	105	53.4	107	2	70-130/25
127-18-4	Tetrachloroethene	50	49.8	100	52.7	105	6	70-130/25
108-88-3	Toluene	50	50.7	101	52.7	105	4	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	52.7	105	57.0	114	8	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	53.9	108	56.4	113	5	70-130/25
71-55-6	1,1,1-Trichloroethane	50	45.8	92	48.1	96	5	70-130/25
79-00-5	1,1,2-Trichloroethane	50	47.7	95	48.8	98	2	70-130/25
79-01-6	Trichloroethene	50	48.6	97	50.8	102	4	70-130/25
75-69-4	Trichlorofluoromethane	50	44.6	89	45.9	92	3	70-130/25
96-18-4	1,2,3-Trichloropropane	50	54.9	110	56.5	113	3	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	52.2	104	54.1	108	4	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	51.2	102	53.3	107	4	70-130/25
108-05-4	Vinyl Acetate	50	47.5	95	49.1	98	3	70-130/25
75-01-4	Vinyl chloride	50	40.4	81	42.3	85	5	70-130/25
	m,p-Xylene	100	105	105	110	110	5	70-130/25
95-47-6	o-Xylene	50	53.0	106	55.5	111	5	70-130/25
1330-20-7	Xylene (total)	150	158	105	165	110	4	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV573-BS	V14071.D	1	12/07/12	AMY	n/a	n/a	MSV573
MSV573-BSD	V14072.D	1	12/07/12	AMY	n/a	n/a	MSV573

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-4

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	91%	91%	70-130%
2037-26-5	Toluene-D8	92%	91%	70-130%
460-00-4	4-Bromofluorobenzene	98%	97%	70-130%

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

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16254-4MS	G122512.D	1	12/03/12	JM	n/a	n/a	MSG4871
MC16254-4MSD	G122513.D	1	12/03/12	JM	n/a	n/a	MSG4871
MC16254-4	G122500.D	1	12/03/12	JM	n/a	n/a	MSG4871

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-2, MC16336-7, MC16336-8

CAS No.	Compound	MC16254-4 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
67-64-1	Acetone	ND		2680	1990	74	2680	1900	71	5	70-130/30
107-02-8	Acrolein	ND		13400	4330	32* a	13400	4260	32* a	2	70-130/30
107-13-1	Acrylonitrile	ND		2680	2430	91	2680	2410	90	1	70-130/30
71-43-2	Benzene	2820		2680	5090	85	2680	5100	85	0	70-130/30
108-86-1	Bromobenzene	ND		2680	2500	93	2680	2510	94	0	70-130/30
74-97-5	Bromochloromethane	ND		2680	2690	100	2680	2760	103	3	70-130/30
75-27-4	Bromodichloromethane	ND		2680	2400	90	2680	2430	91	1	70-130/30
75-25-2	Bromoform	ND		2680	2000	75	2680	2030	76	1	70-130/30
74-83-9	Bromomethane	ND		2680	2630	98	2680	2530	94	4	70-130/30
78-93-3	2-Butanone (MEK)	ND		2680	2260	84	2680	2130	79	6	70-130/30
104-51-8	n-Butylbenzene	107		2680	2680	96	2680	2710	97	1	70-130/30
135-98-8	sec-Butylbenzene	59.2		2680	2860	105	2680	2870	105	0	70-130/30
98-06-6	tert-Butylbenzene	ND		2680	3060	114	2680	3090	115	1	70-130/30
75-15-0	Carbon disulfide	ND		2680	3010	112	2680	2970	111	1	70-130/30
56-23-5	Carbon tetrachloride	ND		2680	2290	85	2680	2350	88	3	70-130/30
108-90-7	Chlorobenzene	ND		2680	2660	99	2680	2720	101	2	70-130/30
75-00-3	Chloroethane	ND		2680	2840	106	2680	2740	102	4	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND		2680	1430	53	2680	1430	53	0	10-160/30
67-66-3	Chloroform	ND		2680	2720	101	2680	2730	102	0	70-130/30
74-87-3	Chloromethane	ND		2680	3370	126	2680	3220	120	5	70-130/30
95-49-8	o-Chlorotoluene	ND		2680	2730	102	2680	2850	106	4	70-130/30
106-43-4	p-Chlorotoluene	ND		2680	2930	109	2680	2890	108	1	70-130/30
124-48-1	Dibromochloromethane	ND		2680	2200	82	2680	2270	85	3	70-130/30
95-50-1	1,2-Dichlorobenzene	ND		2680	2720	101	2680	2710	101	0	70-130/30
541-73-1	1,3-Dichlorobenzene	ND		2680	2710	101	2680	2750	103	1	70-130/30
106-46-7	1,4-Dichlorobenzene	ND		2680	2560	96	2680	2570	96	0	70-130/30
75-71-8	Dichlorodifluoromethane	ND		2680	2040	76	2680	1980	74	3	70-130/30
75-34-3	1,1-Dichloroethane	ND		2680	2930	109	2680	2950	110	1	70-130/30
107-06-2	1,2-Dichloroethane	ND		2680	2410	90	2680	2400	90	0	70-130/30
75-35-4	1,1-Dichloroethene	ND		2680	2830	106	2680	2740	102	3	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND		2680	2860	107	2680	2860	107	0	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND		2680	2770	103	2680	2780	104	0	70-130/30
78-87-5	1,2-Dichloropropane	ND		2680	2640	99	2680	2620	98	1	70-130/30
142-28-9	1,3-Dichloropropane	ND		2680	2380	89	2680	2400	90	1	70-130/30
594-20-7	2,2-Dichloropropane	ND		2680	2750	103	2680	2790	104	1	70-130/30
563-58-6	1,1-Dichloropropene	ND		2680	2600	97	2680	2590	97	0	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16254-4MS	G122512.D	1	12/03/12	JM	n/a	n/a	MSG4871
MC16254-4MSD	G122513.D	1	12/03/12	JM	n/a	n/a	MSG4871
MC16254-4	G122500.D	1	12/03/12	JM	n/a	n/a	MSG4871

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-2, MC16336-7, MC16336-8

CAS No.	Compound	MC16254-4 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	2680	2430	91	2680	2440	91	0	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	2680	2470	92	2680	2470	92	0	70-130/30
123-91-1	1,4-Dioxane	ND	13400	7600	57* a	13400	8740	65* a	14	70-130/30
97-63-2	Ethyl methacrylate	ND	2680	2360	88	2680	2360	88	0	41-160/30
100-41-4	Ethylbenzene	1690	2680	4180	93	2680	4280	97	2	70-130/30
87-68-3	Hexachlorobutadiene	ND	2680	2270	85	2680	2300	86	1	70-130/30
591-78-6	2-Hexanone	ND	2680	2030	76	2680	2010	75	1	70-130/30
98-82-8	Isopropylbenzene	210	2680	3100	108	2680	3090	107	0	70-130/30
99-87-6	p-Isopropyltoluene	49.7	2680	2720	100	2680	2710	99	0	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	2680	2670	100	2680	2670	100	0	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	2680	1860	69* a	2680	1830	68* a	2	70-130/30
74-95-3	Methylene bromide	ND	2680	2440	91	2680	2420	90	1	70-130/30
75-09-2	Methylene chloride	ND	2680	2850	106	2680	2840	106	0	70-130/30
91-20-3	Naphthalene	215	2680	3230	113	2680	3240	113	0	70-130/30
103-65-1	n-Propylbenzene	344	2680	3230	108	2680	3250	108	1	70-130/30
100-42-5	Styrene	ND	2680	2390	89	2680	2460	92	3	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	2680	2240	84	2680	2340	87	4	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	2680	2620	98	2680	2600	97	1	70-130/30
127-18-4	Tetrachloroethene	ND	2680	2380	89	2680	2410	90	1	70-130/30
108-88-3	Toluene	303	2680	2950	99	2680	2950	99	0	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	2680	2920	109	2680	2970	111	2	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	2680	2580	96	2680	2610	97	1	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	2680	2690	100	2680	2780	104	3	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	2680	2430	91	2680	2430	91	0	70-130/30
79-01-6	Trichloroethene	ND	2680	2540	95	2680	2530	94	0	70-130/30
75-69-4	Trichlorofluoromethane	ND	2680	2480	93	2680	2530	94	2	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	2680	2540	95	2680	2510	94	1	70-130/30
95-63-6	1,2,4-Trimethylbenzene	745	2680	3310	96	2680	3370	98	2	70-130/30
108-67-8	1,3,5-Trimethylbenzene	1400	2680	2800	52* a	2680	2770	51* a	1	70-130/30
108-05-4	Vinyl Acetate	ND	2680	2710	101	2680	2690	100	1	70-130/30
75-01-4	Vinyl chloride	ND	2680	2400	90	2680	2090	78	14	70-130/30
	m,p-Xylene	4070	5360	9170	95	5360	9450	100	3	70-130/30
95-47-6	o-Xylene	422	2680	3050	98	2680	3120	101	2	70-130/30
1330-20-7	Xylene (total)	4490	8040	12200	96	8040	12600	101	3	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16254-4MS	G122512.D	1	12/03/12	JM	n/a	n/a	MSG4871
MC16254-4MSD	G122513.D	1	12/03/12	JM	n/a	n/a	MSG4871
MC16254-4	G122500.D	1	12/03/12	JM	n/a	n/a	MSG4871

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-2, MC16336-7, MC16336-8

CAS No.	Surrogate Recoveries	MS	MSD	MC16254-4	Limits
1868-53-7	Dibromofluoromethane	102%	102%	98%	70-130%
2037-26-5	Toluene-D8	95%	95%	92%	70-130%
460-00-4	4-Bromofluorobenzene	96%	97%	90%	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: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16419-1MS	V14078.D	5	12/07/12	AMY	n/a	n/a	MSV573
MC16419-1MSD	V14079.D	5	12/07/12	AMY	n/a	n/a	MSV573
MC16419-1	V14075.D	1	12/07/12	AMY	n/a	n/a	MSV573

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-4

CAS No.	Compound	MC16419-1 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	250	237	95	250	205	82	14	70-130/30
107-02-8	Acrolein	ND	1250	622	50* a	1250	600	48* a	4	70-130/30
107-13-1	Acrylonitrile	ND	250	265	106	250	250	100	6	70-130/30
71-43-2	Benzene	ND	250	268	107	250	260	104	3	70-130/30
108-86-1	Bromobenzene	ND	250	274	110	250	267	107	3	70-130/30
74-97-5	Bromochloromethane	ND	250	271	108	250	262	105	3	70-130/30
75-27-4	Bromodichloromethane	ND	250	226	90	250	222	89	2	70-130/30
75-25-2	Bromoform	ND	250	215	86	250	213	85	1	70-130/30
74-83-9	Bromomethane	ND	250	244	98	250	234	94	4	70-130/30
78-93-3	2-Butanone (MEK)	ND	250	254	102	250	248	99	2	70-130/30
104-51-8	n-Butylbenzene	ND	250	279	112	250	270	108	3	70-130/30
135-98-8	sec-Butylbenzene	ND	250	265	106	250	255	102	4	70-130/30
98-06-6	tert-Butylbenzene	ND	250	256	102	250	246	98	4	70-130/30
75-15-0	Carbon disulfide	ND	250	253	101	250	244	98	4	70-130/30
56-23-5	Carbon tetrachloride	ND	250	245	98	250	241	96	2	70-130/30
108-90-7	Chlorobenzene	ND	250	254	102	250	246	98	3	70-130/30
75-00-3	Chloroethane	ND	250	271	108	250	256	102	6	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	250	ND	0* a	250	ND	0* a	nc	70-130/30
67-66-3	Chloroform	0.88	250	261	104	250	248	99	5	70-130/30
74-87-3	Chloromethane	ND	250	253	101	250	244	98	4	70-130/30
95-49-8	o-Chlorotoluene	ND	250	252	101	250	242	97	4	70-130/30
106-43-4	p-Chlorotoluene	ND	250	260	104	250	251	100	4	70-130/30
124-48-1	Dibromochloromethane	ND	250	226	90	250	222	89	2	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	250	252	101	250	249	100	1	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	250	256	102	250	248	99	3	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	250	264	106	250	257	103	3	70-130/30
75-71-8	Dichlorodifluoromethane	ND	250	242	97	250	236	94	3	70-130/30
75-34-3	1,1-Dichloroethane	ND	250	272	109	250	262	105	4	70-130/30
107-06-2	1,2-Dichloroethane	ND	250	261	104	250	254	102	3	70-130/30
75-35-4	1,1-Dichloroethene	ND	250	290	116	250	276	110	5	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	250	263	105	250	253	101	4	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	250	264	106	250	250	100	5	70-130/30
78-87-5	1,2-Dichloropropane	ND	250	261	104	250	255	102	2	70-130/30
142-28-9	1,3-Dichloropropane	ND	250	262	105	250	254	102	3	70-130/30
594-20-7	2,2-Dichloropropane	ND	250	304	122	250	297	119	2	70-130/30
563-58-6	1,1-Dichloropropene	ND	250	279	112	250	268	107	4	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16419-1MS	V14078.D	5	12/07/12	AMY	n/a	n/a	MSV573
MC16419-1MSD	V14079.D	5	12/07/12	AMY	n/a	n/a	MSV573
MC16419-1	V14075.D	1	12/07/12	AMY	n/a	n/a	MSV573

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-4

CAS No.	Compound	MC16419-1 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	250	219	88	250	215	86	2	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	250	228	91	250	226	90	1	70-130/30
123-91-1	1,4-Dioxane	ND	1250	1220	98	1250	1230	98	1	70-130/30
97-63-2	Ethyl methacrylate	ND	250	235	94	250	230	92	2	72-139/30
100-41-4	Ethylbenzene	ND	250	280	112	250	270	108	4	70-130/30
87-68-3	Hexachlorobutadiene	ND	250	266	106	250	270	108	1	70-130/30
591-78-6	2-Hexanone	ND	250	245	98	250	237	95	3	70-130/30
98-82-8	Isopropylbenzene	ND	250	266	106	250	254	102	5	70-130/30
99-87-6	p-Isopropyltoluene	ND	250	290	116	250	280	112	4	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	250	259	104	250	254	102	2	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	244	98	250	236	94	3	70-130/30
74-95-3	Methylene bromide	ND	250	258	103	250	254	102	2	70-130/30
75-09-2	Methylene chloride	ND	250	257	103	250	247	99	4	70-130/30
91-20-3	Naphthalene	ND	250	222	89	250	256	102	14	70-130/30
103-65-1	n-Propylbenzene	ND	250	264	106	250	255	102	3	70-130/30
100-42-5	Styrene	ND	250	284	114	250	276	110	3	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	243	97	250	236	94	3	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	271	108	250	262	105	3	70-130/30
127-18-4	Tetrachloroethene	0.49	250	275	110	250	266	106	3	70-130/30
108-88-3	Toluene	ND	250	265	106	250	258	103	3	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	250	226	90	250	266	106	16	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	250	251	100	250	269	108	7	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	250	246	98	250	239	96	3	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	250	249	100	250	242	97	3	70-130/30
79-01-6	Trichloroethene	ND	250	259	104	250	251	100	3	70-130/30
75-69-4	Trichlorofluoromethane	ND	250	267	107	250	255	102	5	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	250	261	104	250	271	108	4	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	250	268	107	250	259	104	3	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	250	267	107	250	257	103	4	70-130/30
108-05-4	Vinyl Acetate	ND	250	245	98	250	236	94	4	70-130/30
75-01-4	Vinyl chloride	ND	250	228	91	250	220	88	4	70-130/30
	m,p-Xylene	ND	500	548	110	500	527	105	4	70-130/30
95-47-6	o-Xylene	ND	250	276	110	250	267	107	3	70-130/30
1330-20-7	Xylene (total)	ND	750	824	110	750	794	106	4	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16419-1MS	V14078.D	5	12/07/12	AMY	n/a	n/a	MSV573
MC16419-1MSD	V14079.D	5	12/07/12	AMY	n/a	n/a	MSV573
MC16419-1	V14075.D	1	12/07/12	AMY	n/a	n/a	MSV573

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-4

CAS No.	Surrogate Recoveries	MS	MSD	MC16419-1	Limits
1868-53-7	Dibromofluoromethane	92%	92%	85%	70-130%
2037-26-5	Toluene-D8	92%	93%	90%	70-130%
460-00-4	4-Bromofluorobenzene	97%	98%	96%	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: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16366-7MS	M52775.D	1	12/07/12	AMY	n/a	n/a	MSM1789
MC16366-7MSD	M52776.D	1	12/07/12	AMY	n/a	n/a	MSM1789
MC16366-7	M52774.D	1	12/07/12	AMY	n/a	n/a	MSM1789

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-1, MC16336-3

CAS No.	Compound	MC16366-7 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	44.1	66.9	152* a	40	68.3	171* a	2	70-130/30
107-02-8	Acrolein	ND	221	108	49* a	200	113	57* a	5	70-130/30
107-13-1	Acrylonitrile	ND	44.1	39.2	89	40	40.2	101	3	70-130/30
71-43-2	Benzene	ND	44.1	43.2	98	40	39.9	100	8	70-130/30
108-86-1	Bromobenzene	ND	44.1	35.8	81	40	35.4	89	1	70-130/30
74-97-5	Bromochloromethane	ND	44.1	46.0	104	40	41.3	103	11	70-130/30
75-27-4	Bromodichloromethane	ND	44.1	42.2	96	40	41.1	103	3	70-130/30
75-25-2	Bromoform	ND	44.1	42.2	96	40	39.0	98	8	70-130/30
74-83-9	Bromomethane	ND	44.1	44.0	100	40	37.8	95	15	70-130/30
78-93-3	2-Butanone (MEK)	ND	44.1	49.6	112	40	59.5	149* a	18	70-130/30
104-51-8	n-Butylbenzene	ND	44.1	22.0	50* a	40	21.2	53* a	4	70-130/30
135-98-8	sec-Butylbenzene	ND	44.1	25.1	57* a	40	25.0	63* a	0	70-130/30
98-06-6	tert-Butylbenzene	ND	44.1	27.6	63* a	40	28.5	71	3	70-130/30
75-15-0	Carbon disulfide	ND	44.1	41.1	93	40	37.6	94	9	70-130/30
56-23-5	Carbon tetrachloride	ND	44.1	42.9	97	40	39.8	100	7	70-130/30
108-90-7	Chlorobenzene	ND	44.1	36.8	83	40	35.3	88	4	70-130/30
75-00-3	Chloroethane	ND	44.1	42.9	97	40	36.6	92	16	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	44.1	33.5	76	40	23.5	59	35* b	10-160/30
67-66-3	Chloroform	ND	44.1	44.9	102	40	40.4	101	11	70-130/30
74-87-3	Chloromethane	ND	44.1	48.7	110	40	42.5	106	14	70-130/30
95-49-8	o-Chlorotoluene	ND	44.1	31.1	70	40	30.3	76	3	70-130/30
106-43-4	p-Chlorotoluene	ND	44.1	32.1	73	40	30.7	77	4	70-130/30
124-48-1	Dibromochloromethane	ND	44.1	43.2	98	40	40.9	102	5	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	44.1	29.9	68* a	40	29.2	73	2	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	44.1	29.9	68* a	40	29.0	73	3	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	44.1	31.0	70	40	29.6	74	5	70-130/30
75-71-8	Dichlorodifluoromethane	ND	44.1	46.0	104	40	38.9	97	17	70-130/30
75-34-3	1,1-Dichloroethane	ND	44.1	44.8	101	40	39.3	98	13	70-130/30
107-06-2	1,2-Dichloroethane	ND	44.1	42.5	96	40	39.9	100	6	70-130/30
75-35-4	1,1-Dichloroethene	ND	44.1	44.9	102	40	40.0	100	12	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	44.1	42.8	97	40	39.8	100	7	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	44.1	41.7	94	40	38.1	95	9	70-130/30
78-87-5	1,2-Dichloropropane	ND	44.1	41.9	95	40	39.9	100	5	70-130/30
142-28-9	1,3-Dichloropropane	ND	44.1	42.3	96	40	40.0	100	6	70-130/30
594-20-7	2,2-Dichloropropane	ND	44.1	44.0	100	40	39.0	98	12	70-130/30
563-58-6	1,1-Dichloropropene	ND	44.1	41.3	94	40	40.6	102	2	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16366-7MS	M52775.D	1	12/07/12	AMY	n/a	n/a	MSM1789
MC16366-7MSD	M52776.D	1	12/07/12	AMY	n/a	n/a	MSM1789
MC16366-7	M52774.D	1	12/07/12	AMY	n/a	n/a	MSM1789

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-1, MC16336-3

CAS No.	Compound	MC16366-7 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	44.1	39.8	90	40	38.6	97	3	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	44.1	42.8	97	40	40.5	101	6	70-130/30
123-91-1	1,4-Dioxane	ND	221	251	114	200	229	115	9	70-130/30
97-63-2	Ethyl methacrylate	ND	44.1	44.8	101	40	38.7	97	15	41-160/30
100-41-4	Ethylbenzene	ND	44.1	37.4	85	40	37.7	94	1	70-130/30
87-68-3	Hexachlorobutadiene	ND	44.1	13.5	31* a	40	12.1	30* a	11	70-130/30
591-78-6	2-Hexanone	ND	44.1	60.6	137* a	40	60.7	152* a	0	70-130/30
98-82-8	Isopropylbenzene	ND	44.1	32.0	72	40	33.1	83	3	70-130/30
99-87-6	p-Isopropyltoluene	ND	44.1	27.7	63* a	40	27.2	68* a	2	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	44.1	32.0	72	40	37.6	94	16	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	44.1	45.0	102	40	42.0	105	7	70-130/30
74-95-3	Methylene bromide	ND	44.1	43.6	99	40	40.9	102	6	70-130/30
75-09-2	Methylene chloride	ND	44.1	42.1	95	40	37.7	94	11	70-130/30
91-20-3	Naphthalene	ND	44.1	26.2	59* a	40	28.9	72	10	70-130/30
103-65-1	n-Propylbenzene	ND	44.1	29.3	66* a	40	29.7	74	1	70-130/30
100-42-5	Styrene	ND	44.1	38.4	87	40	36.6	92	5	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	44.1	40.0	91	40	39.9	100	0	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	44.1	42.2	96	40	37.8	95	11	70-130/30
127-18-4	Tetrachloroethene	ND	44.1	38.2	87	40	38.6	97	1	70-130/30
108-88-3	Toluene	ND	44.1	43.2	98	40	40.1	100	7	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	44.1	21.4	48* a	40	20.0	50* a	7	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	44.1	21.9	50* a	40	20.5	51* a	7	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	44.1	42.5	96	40	40.2	101	6	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	44.1	44.2	100	40	39.8	100	10	70-130/30
79-01-6	Trichloroethene	ND	44.1	42.2	96	40	39.9	100	6	70-130/30
75-69-4	Trichlorofluoromethane	ND	44.1	43.0	97	40	39.0	98	10	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	44.1	42.6	96	40	38.7	97	10	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	44.1	31.0	70	40	31.4	79	1	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	44.1	30.7	70	40	31.2	78	2	70-130/30
108-05-4	Vinyl Acetate	ND	44.1	24.9	56* a	40	17.5	44* a	35* b	70-130/30
75-01-4	Vinyl chloride	ND	44.1	42.6	96	40	36.7	92	15	70-130/30
	m,p-Xylene	ND	88.3	74.3	84	79.9	73.7	92	1	70-130/30
95-47-6	o-Xylene	ND	44.1	37.9	86	40	36.4	91	4	70-130/30
1330-20-7	Xylene (total)	ND	132	112	85	120	110	92	2	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16366-7MS	M52775.D	1	12/07/12	AMY	n/a	n/a	MSM1789
MC16366-7MSD	M52776.D	1	12/07/12	AMY	n/a	n/a	MSM1789
MC16366-7	M52774.D	1	12/07/12	AMY	n/a	n/a	MSM1789

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-1, MC16336-3

CAS No.	Surrogate Recoveries	MS	MSD	MC16366-7	Limits
1868-53-7	Dibromofluoromethane	98%	96%	97%	70-130%
2037-26-5	Toluene-D8	116%	112%	111%	70-130%
460-00-4	4-Bromofluorobenzene	95%	96%	91%	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.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16336-6MS	M52805.D	1	12/10/12	AMY	n/a	n/a	MSM1790
MC16336-6MSD	M52806.D	1	12/10/12	AMY	n/a	n/a	MSM1790
MC16336-6	M52769.D	1	12/07/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6

CAS No.	Compound	MC16336-6 ug/kg	Spike Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND		65.6	33.9	52* a	85.3	56.4	66* a	50* b	70-130/30
107-02-8	Acrolein	ND		328	85.8	26* a	426	165	39* a	63* b	70-130/30
107-13-1	Acrylonitrile	ND		65.6	35.7	54* a	85.3	72.4	85	68* b	70-130/30
71-43-2	Benzene	0.41	J	65.6	37.8	57* a	85.3	73.6	86	64* b	70-130/30
108-86-1	Bromobenzene	ND		65.6	25.5	39* a	85.3	71.2	84	95* b	70-130/30
74-97-5	Bromochloromethane	ND		65.6	42.7	65* a	85.3	74.9	88	55* b	70-130/30
75-27-4	Bromodichloromethane	ND		65.6	38.2	58* a	85.3	73.9	87	64* b	70-130/30
75-25-2	Bromoform	ND		65.6	40.4	62* a	85.3	79.7	93	65* b	70-130/30
74-83-9	Bromomethane	ND		65.6	45.2	69* a	85.3	71.1	83	45* b	70-130/30
78-93-3	2-Butanone (MEK)	ND		65.6	24.3	37* a	85.3	72.1	85	99* b	70-130/30
104-51-8	n-Butylbenzene	ND		65.6	18.6	28* a	85.3	61.8	72	107* b	70-130/30
135-98-8	sec-Butylbenzene	ND		65.6	19.0	29* a	85.3	65.8	77	110* b	70-130/30
98-06-6	tert-Butylbenzene	ND		65.6	18.5	28* a	85.3	66.1	78	113* b	70-130/30
75-15-0	Carbon disulfide	ND		65.6	41.9	64* a	85.3	78.0	91	60* b	70-130/30
56-23-5	Carbon tetrachloride	ND		65.6	32.8	50* a	85.3	78.1	92	82* b	70-130/30
108-90-7	Chlorobenzene	ND		65.6	28.5	43* a	85.3	71.5	84	86* b	70-130/30
75-00-3	Chloroethane	ND		65.6	40.2	61* a	85.3	69.6	82	54* b	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND		65.6	ND	0* a	85.3	64.2	75	200* b	10-160/30
67-66-3	Chloroform	ND		65.6	38.1	58* a	85.3	71.9	84	61* b	70-130/30
74-87-3	Chloromethane	ND		65.6	49.4	75	85.3	78.3	92	45* b	70-130/30
95-49-8	o-Chlorotoluene	ND		65.6	20.5	31* a	85.3	65.1	76	104* b	70-130/30
106-43-4	p-Chlorotoluene	ND		65.6	20.9	32* a	85.3	64.7	76	102* b	70-130/30
124-48-1	Dibromochloromethane	ND		65.6	39.2	60* a	85.3	79.3	93	68* b	70-130/30
95-50-1	1,2-Dichlorobenzene	ND		65.6	20.6	31* a	85.3	62.5	73	101* b	70-130/30
541-73-1	1,3-Dichlorobenzene	ND		65.6	20.3	31* a	85.3	63.9	75	104* b	70-130/30
106-46-7	1,4-Dichlorobenzene	ND		65.6	21.0	32* a	85.3	64.1	75	101* b	70-130/30
75-71-8	Dichlorodifluoromethane	ND		65.6	34.7	53* a	85.3	70.8	83	68* b	70-130/30
75-34-3	1,1-Dichloroethane	ND		65.6	37.7	57* a	85.3	71.9	84	62* b	70-130/30
107-06-2	1,2-Dichloroethane	ND		65.6	38.7	59* a	85.3	71.5	84	60* b	70-130/30
75-35-4	1,1-Dichloroethene	ND		65.6	42.4	65* a	85.3	82.0	96	64* b	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND		65.6	39.7	61* a	85.3	71.5	84	57* b	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND		65.6	41.5	63* a	85.3	74.9	88	57* b	70-130/30
78-87-5	1,2-Dichloropropane	ND		65.6	34.0	52* a	85.3	68.7	81	68* b	70-130/30
142-28-9	1,3-Dichloropropane	ND		65.6	38.1	58* a	85.3	74.4	87	65* b	70-130/30
594-20-7	2,2-Dichloropropane	ND		65.6	33.9	52* a	85.3	71.8	84	72* b	70-130/30
563-58-6	1,1-Dichloropropene	ND		65.6	32.8	50* a	85.3	78.9	93	83* b	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16336-6MS	M52805.D	1	12/10/12	AMY	n/a	n/a	MSM1790
MC16336-6MSD	M52806.D	1	12/10/12	AMY	n/a	n/a	MSM1790
MC16336-6	M52769.D	1	12/07/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6

CAS No.	Compound	MC16336-6 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND		65.6	34.7	53* a	85.3	68.7	81	66* b 70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		65.6	38.9	59* a	85.3	76.2	89	65* b 70-130/30
123-91-1	1,4-Dioxane	ND		328	282	86	426	531	125	61* b 70-130/30
97-63-2	Ethyl methacrylate	ND		65.6	33.6	51	85.3	81.5	96	83* b 41-160/30
100-41-4	Ethylbenzene	ND		65.6	25.5	39* a	85.3	75.6	89	99* b 70-130/30
87-68-3	Hexachlorobutadiene	ND		65.6	18.2	28* a	85.3	62.8	74	110* b 70-130/30
591-78-6	2-Hexanone	ND		65.6	41.6	63* a	85.3	83.6	98	67* b 70-130/30
98-82-8	Isopropylbenzene	ND		65.6	20.1	31* a	85.3	70.6	83	111* b 70-130/30
99-87-6	p-Isopropyltoluene	ND		65.6	20.4	31* a	85.3	70.1	82	110* b 70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		65.6	17.0	26* a	85.3	65.2	76	117* b 70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		65.6	43.0	66* a	85.3	79.9	94	60* b 70-130/30
74-95-3	Methylene bromide	ND		65.6	42.9	65* a	85.3	76.6	90	56* b 70-130/30
75-09-2	Methylene chloride	1.5	J	65.6	39.2	57* a	85.3	69.1	79	55* b 70-130/30
91-20-3	Naphthalene	ND		65.6	16.2	25* a	85.3	74.3	87	128* b 70-130/30
103-65-1	n-Propylbenzene	ND		65.6	19.7	30* a	85.3	65.9	77	108* b 70-130/30
100-42-5	Styrene	ND		65.6	26.8	41* a	85.3	71.9	84	91* b 70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		65.6	31.2	48* a	85.3	74.7	88	82* b 70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		65.6	37.8	58* a	85.3	79.2	93	71* b 70-130/30
127-18-4	Tetrachloroethene	ND		65.6	28.7	44* a	85.3	82.8	97	97* b 70-130/30
108-88-3	Toluene	ND		65.6	31.7	48* a	85.3	83.1	97	90* b 70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		65.6	15.8	24* a	85.3	55.1	65* a	111* b 70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		65.6	15.1	23* a	85.3	53.7	63* a	112* b 70-130/30
71-55-6	1,1,1-Trichloroethane	ND		65.6	32.7	50* a	85.3	74.3	87	78* b 70-130/30
79-00-5	1,1,2-Trichloroethane	ND		65.6	39.5	60* a	85.3	76.8	90	64* b 70-130/30
79-01-6	Trichloroethene	ND		65.6	35.6	54* a	85.3	76.6	90	73* b 70-130/30
75-69-4	Trichlorofluoromethane	ND		65.6	35.3	54* a	85.3	78.4	92	76* b 70-130/30
96-18-4	1,2,3-Trichloropropane	ND		65.6	36.6	56* a	85.3	82.0	96	77* b 70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND		65.6	19.9	30* a	85.3	67.2	79	109* b 70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		65.6	20.0	30* a	85.3	67.5	79	109* b 70-130/30
108-05-4	Vinyl Acetate	ND		65.6	19.3	29* a	85.3	41.1	48* a	72* b 70-130/30
75-01-4	Vinyl chloride	ND		65.6	45.1	69* a	85.3	70.6	83	44* b 70-130/30
	m,p-Xylene	ND		131	49.7	38* a	171	150	88	100* b 70-130/30
95-47-6	o-Xylene	ND		65.6	23.9	36* a	85.3	72.4	85	101* b 70-130/30
1330-20-7	Xylene (total)	ND		197	73.5	37* a	256	223	87	101* b 70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16336-6MS	M52805.D	1	12/10/12	AMY	n/a	n/a	MSM1790
MC16336-6MSD	M52806.D	1	12/10/12	AMY	n/a	n/a	MSM1790
MC16336-6	M52769.D	1	12/07/12	AMY	n/a	n/a	MSM1790

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16336-6

CAS No.	Surrogate Recoveries	MS	MSD	MC16336-6	Limits
1868-53-7	Dibromofluoromethane	97%	96%	98%	70-130%
2037-26-5	Toluene-D8	115%	116%	121%	70-130%
460-00-4	4-Bromofluorobenzene	91%	93%	94%	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: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSG4871-CC4851	Injection Date:	12/03/12
Lab File ID:	G122495.D	Injection Time:	09:15
Instrument ID:	GCMSG	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	308671	5.13	407327	6.27	193100	9.62	241063	12.25	56399	3.10
Upper Limit <sup>a</sup>	617342	5.63	814654	6.77	386200	10.12	482126	12.75	112798	3.60
Lower Limit <sup>b</sup>	154336	4.63	203664	5.77	96550	9.12	120532	11.75	28200	2.60

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSG4871-BS	308671	5.13	407327	6.27	193100	9.62	241063	12.25	56399	3.10
MSG4871-BSD	307124	5.13	406417	6.27	191786	9.62	242604	12.25	55986	3.10
MSG4871-MB	314091	5.13	414409	6.27	193830	9.62	243336	12.25	55020	3.10
ZZZZZZ	313760	5.13	414526	6.27	191762	9.62	240316	12.25	54583	3.10
MC16254-4	315126	5.13	414313	6.27	194803	9.62	243801	12.25	53307	3.09
ZZZZZZ	313903	5.13	414188	6.27	193242	9.62	241080	12.25	54644	3.10
ZZZZZZ	312873	5.13	413193	6.27	235288	9.62	247584	12.25	64334	3.09
ZZZZZZ	293684	5.13	394490	6.27	195244	9.62	253591	12.26	64831	3.10
ZZZZZZ	306434	5.13	411965	6.27	195461	9.62	246409	12.25	59624	3.10
ZZZZZZ	309956	5.13	410617	6.27	196186	9.62	244349	12.25	59514	3.10
ZZZZZZ	308723	5.13	408350	6.27	193830	9.62	243085	12.25	57300	3.10
ZZZZZZ	309534	5.13	409785	6.27	192976	9.62	244034	12.25	57206	3.10
ZZZZZZ	310220	5.13	407933	6.27	190929	9.62	244727	12.25	56966	3.10
ZZZZZZ	309233	5.13	406464	6.27	191976	9.62	244800	12.25	58061	3.10
ZZZZZZ	312717	5.13	412045	6.27	193033	9.62	241889	12.25	54087	3.10
ZZZZZZ	312429	5.13	407092	6.27	194688	9.62	241747	12.25	61040	3.10
MC16254-4MS	318825	5.13	421346	6.27	204051	9.62	245248	12.25	48937	3.09
MC16254-4MSD	312707	5.13	416412	6.27	197267	9.62	241675	12.25	41514	3.09
MC16336-8	315479	5.13	415187	6.27	204249	9.62	243853	12.25	46008	3.09
MC16336-2	316298	5.13	417645	6.27	199609	9.62	240850	12.25	41872	3.09
MC16336-7	317824	5.13	421093	6.27	206545	9.62	242767	12.25	40407	3.09

- 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.

6.4.1  
6

# Volatile Internal Standard Area Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1789-CC1784	Injection Date:	12/07/12
Lab File ID:	M52759.D	Injection Time:	10:00
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1	IS 2	IS 3	IS 4	IS 5					
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	224361	9.36	333914	10.24	180727	13.52	186240	16.08	53372	6.85
Upper Limit <sup>a</sup>	448722	9.86	667828	10.74	361454	14.02	372480	16.58	106744	7.35
Lower Limit <sup>b</sup>	112181	8.86	166957	9.74	90364	13.02	93120	15.58	26686	6.35

Lab	IS 1	IS 2	IS 3	IS 4	IS 5					
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSM1789-BS	197602	9.36	297597	10.24	164760	13.52	173090	16.08	115690 <sup>c</sup>	6.86
MSM1790-BS1	197602	9.36	297597	10.24	164760	13.52	173090	16.08	115690 <sup>c</sup>	6.86
MSM1789-BSD	197943	9.36	290654	10.24	163027	13.52	173324	16.09	113884 <sup>c</sup>	6.86
MSM1790-BSD1	197943	9.36	290654	10.24	163027	13.52	173324	16.09	113884 <sup>c</sup>	6.86
MSM1789-MB	218855	9.36	318582	10.24	164232	13.52	178475	16.08	53571	6.86
MSM1790-MB1	218855	9.36	318582	10.24	164232	13.52	178475	16.08	53571	6.86
ZZZZZZ	215596	9.36	318716	10.24	169416	13.52	178065	16.08	99113	6.86
ZZZZZZ	187518	9.36	278518	10.24	136525	13.52	108254	16.09	110765 <sup>c</sup>	6.86
ZZZZZZ	222360	9.36	333153	10.24	174525	13.52	188656	16.08	107675 <sup>c</sup>	6.86
ZZZZZZ	222549	9.36	324145	10.24	173399	13.52	185495	16.09	97147	6.85
ZZZZZZ	216455	9.36	309863	10.24	165881	13.52	178747	16.08	100563	6.86
MC16336-6	147640	9.36	215463	10.24	116079	13.52	124690	16.09	53641	6.86
MC16336-1	212230	9.36	314176	10.24	167456	13.52	184621	16.08	94743	6.86
MC16336-3	211731	9.36	328875	10.24	170785	13.52	182730	16.08	92737	6.86
MC16366-7	222265	9.36	324509	10.24	170505	13.52	181932	16.08	55970	6.86
MC16366-7MS	127437	9.36	185592	10.24	103069	13.52	107042	16.08	28963	6.86
MC16366-7MSD	228887	9.36	337534	10.24	180891	13.52	182992	16.08	49036	6.86
ZZZZZZ	216372	9.36	309196	10.24	164627	13.52	180201	16.08	50256	6.85
ZZZZZZ	218331	9.36	314140	10.24	169810	13.52	184840	16.08	57971	6.85
ZZZZZZ	210103	9.36	307525	10.24	166143	13.52	179079	16.08	54715	6.86
ZZZZZZ	176062	9.36	255202	10.24	98414	13.52	46863 <sup>d</sup>	16.09	89292	6.86

- 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.
- (c) Outside control limits. Target analytes not associated with this internal standard.
- (d) Outside control limits due to possible matrix interference. Confirmed by reanalysis.

6.4.2  
6

# Volatile Internal Standard Area Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1790-CC1784	Injection Date:	12/10/12
Lab File ID:	M52783.D	Injection Time:	09:07
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	238203	9.36	351350	10.24	188304	13.52	201447	16.08	56158	6.86
Upper Limit <sup>a</sup>	476406	9.86	702700	10.74	376608	14.02	402894	16.58	112316	7.36
Lower Limit <sup>b</sup>	119102	8.86	175675	9.74	94152	13.02	100724	15.58	28079	6.36

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSM1790-BS	202143	9.36	305671	10.24	165223	13.52	177306	16.08	103866	6.86
MSM1790-BSD	196850	9.36	287275	10.24	153964	13.52	167848	16.08	114618 <sup>c</sup>	6.85
MSM1790-MB	219186	9.36	311017	10.24	161757	13.52	173222	16.08	44199	6.86
ZZZZZZ	225987	9.36	335180	10.24	171886	13.52	189019	16.08	83166	6.86
ZZZZZZ	221749	9.36	327625	10.24	167586	13.52	178279	16.08	97539	6.85
ZZZZZZ	213367	9.36	314946	10.24	159561	13.52	175775	16.08	82434	6.86
ZZZZZZ	227090	9.36	331981	10.24	175636	13.52	189112	16.09	59127	6.86
ZZZZZZ	217927	9.36	320614	10.24	161801	13.52	173162	16.08	99202	6.86
ZZZZZZ	224804	9.36	333999	10.24	170390	13.52	179149	16.09	79353	6.86
ZZZZZZ	216886	9.36	315905	10.24	162910	13.52	176918	16.08	81007	6.86
ZZZZZZ	224572	9.36	323616	10.24	164639	13.52	173919	16.08	45320	6.86
ZZZZZZ	161566	9.36	235652	10.24	120474	13.52	130862	16.09	42342	6.86
ZZZZZZ	217416	9.36	317648	10.24	161134	13.52	164975	16.09	43717	6.86
ZZZZZZ	224973	9.36	334350	10.24	169522	13.52	177963	16.08	44753	6.86
ZZZZZZ	215310	9.36	314528	10.25	164269	13.52	172606	16.08	34653	6.86
ZZZZZZ	196014	9.36	280258	10.24	109420	13.52	56092 <sup>d</sup>	16.09	92154	6.86
ZZZZZZ	223151	9.36	331919	10.24	167176	13.52	177902	16.09	45228	6.86
ZZZZZZ	220904	9.36	316861	10.24	162345	13.52	172525	16.08	51268	6.86
ZZZZZZ	221135	9.36	318991	10.24	162579	13.52	168336	16.08	51471	6.86
ZZZZZZ	216521	9.36	314546	10.24	160701	13.52	163838	16.09	41020	6.86
MC16336-6MS	62655 <sup>e</sup>	9.36	90748 <sup>e</sup>	10.24	48977 <sup>e</sup>	13.53	52679 <sup>e</sup>	16.08	15350 <sup>c</sup>	6.87
MC16336-6MSD	217890	9.36	311182	10.24	175626	13.52	182168	16.08	97433	6.86

- 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.
- (c) Outside control limits. Target analytes not associated with this internal standard.
- (d) Outside control limits due to possible matrix interference. Confirmed by reanalysis.
- (e) Outside control limits due to possible matrix interference. Confirmed by MS/MSD.

6.4.3  
6

# Volatile Internal Standard Area Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSV573-CC568	Injection Date:	12/07/12
Lab File ID:	V14070.D	Injection Time:	12:07
Instrument ID:	GCMSV	Method:	SW846 8260B

	IS 1	IS 2	IS 3	IS 4	IS 5
	AREA	RT	AREA	RT	AREA
Check Std	369670	6.51	660479	7.71	364202
Upper Limit <sup>a</sup>	739340	7.01	1320958	8.21	728404
Lower Limit <sup>b</sup>	184835	6.01	330240	7.21	182101

Lab	IS 1	IS 2	IS 3	IS 4	IS 5
Sample ID	AREA	RT	AREA	RT	AREA
MSV573-BS	371768	6.51	663505	7.71	372259
MSV573-BSD	372081	6.52	670244	7.71	374338
MSV573-MB	361879	6.52	649544	7.71	355614
MC16419-1	356622	6.52	640015	7.71	351578
ZZZZZZ	351776	6.52	634120	7.71	346940
ZZZZZZ	347637	6.52	626260	7.71	343812
MC16419-1MS	351171	6.52	628036	7.71	351880
MC16419-1MSD	355615	6.52	629896	7.71	355817
ZZZZZZ	349750	6.52	629453	7.71	344943
ZZZZZZ	347191	6.52	625444	7.71	343000
ZZZZZZ	344260	6.52	619570	7.71	340476
ZZZZZZ	334267	6.52	607417	7.71	333166
MC16336-4	337270	6.52	605668	7.71	331199
ZZZZZZ	332338	6.51	600466	7.71	329076
ZZZZZZ	329706	6.52	593578	7.71	324155
ZZZZZZ	326953	6.52	591718	7.71	320303
ZZZZZZ	322164	6.52	585802	7.71	319190
ZZZZZZ	321086	6.52	579647	7.71	317967
ZZZZZZ	321169	6.52	583341	7.71	316518
ZZZZZZ	315630	6.52	576534	7.71	314811
ZZZZZZ	326225	6.52	589356	7.71	322378
ZZZZZZ	330532	6.52	598017	7.72	325581
ZZZZZZ	326999	6.53	593018	7.72	321545

- 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.

6.4.4  
6

# Volatile Surrogate Recovery Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16336-4	V14084.D	85	91	96
MC16419-1MS	V14078.D	92	92	97
MC16419-1MSD	V14079.D	92	93	98
MSV573-BS	V14071.D	91	92	98
MSV573-BSD	V14072.D	91	91	97
MSV573-MB	V14074.D	85	91	97

**Surrogate Compounds**                      **Recovery Limits**

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

6.5.1  
6

# Volatile Surrogate Recovery Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16336-1	M52770.D	104	110	96
MC16336-2	G122515.D	98	92	96
MC16336-3	M52771.D	103	109	93
MC16336-6	M52769.D	98	121	94
MC16336-7	G122516.D	106	100	104
MC16336-8	G122514.D	97	91	95
MC16254-4MS	G122512.D	102	95	96
MC16254-4MSD	G122513.D	102	95	97
MC16336-6MS	M52805.D	97	115	91
MC16336-6MSD	M52806.D	96	116	93
MC16366-7MS	M52775.D	98	116	95
MC16366-7MSD	M52776.D	96	112	96
MSG4871-BS	G122495.D	104	98	98
MSG4871-BSD	G122496.D	106	99	99
MSG4871-MB	G122498.D	105	99	99
MSM1789-BS	M52760.D	101	113	92
MSM1789-BSD	M52761.D	100	115	91
MSM1789-MB	M52763.D	94	111	93
MSM1790-BS1	M52760.D	101	113	92
MSM1790-BSD1	M52761.D	100	115	91
MSM1790-MB1	M52763.D	94	111	93
MSM1790-MB	M52787.D	94	114	89

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

6.5.2  
6

## GC Volatiles

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## QC Data Summaries

**7**

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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: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31226-MB	BK19433.D	1	11/30/12	AP	11/29/12	OP31226	GBK704

The QC reported here applies to the following samples:

Method: SW846 8011

MC16336-5

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	114% 36-173%
460-00-4	Bromofluorobenzene (S)	97% 36-173%

7.1.1

7

# Method Blank Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-MB	BK19728.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples: Method: SW846 8011

MC16336-1, MC16336-2, MC16336-3, MC16336-6, MC16336-7, MC16336-8

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.5	0.96	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	108% 61-167%
460-00-4	Bromofluorobenzene (S)	98% 61-167%

7.1.2  
7

# Blank Spike Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31226-BS	BK19434.D	1	11/30/12	AP	11/29/12	OP31226	GBK704

The QC reported here applies to the following samples:

Method: SW846 8011

MC16336-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.065	92	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)	114%	36-173%
460-00-4	Bromofluorobenzene (S)	97%	36-173%

7.2.1  
7

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-BS	BK19729.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16336-1, MC16336-2, MC16336-3, MC16336-6, MC16336-7, MC16336-8

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	65	66.5	102	59-142
106-93-4	1,2-Dibromoethane	65	60.3	93	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	107%	61-167%
460-00-4	Bromofluorobenzene (S)	97%	61-167%

7.2.2  
7

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31226-MS	BK19435.D	1	11/30/12	AP	11/29/12	OP31226	GBK704
OP31226-MSD	BK19436.D	1	11/30/12	AP	11/29/12	OP31226	GBK704
MC16100-11	BK19437.D	1	11/30/12	AP	11/29/12	OP31226	GBK704

The QC reported here applies to the following samples:

Method: SW846 8011

MC16336-5

CAS No.	Compound	MC16100-11 Spike		MS	MS	Spike	MSD	MSD	RPD	Limits
		ug/l	Q ug/l	ug/l	%	ug/l	ug/l	%		Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.071	0.065	92	0.071	0.059	83	10	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.071	0.074	104	0.071	0.074	104	0	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16100-11 Limits	
460-00-4	Bromofluorobenzene (S)	113%	113%	114%	36-173%
460-00-4	Bromofluorobenzene (S)	96%	98%	94%	36-173%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-MS	BK19730.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
OP31352-MSD	BK19731.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
MC16336-6	BK19735.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16336-1, MC16336-2, MC16336-3, MC16336-6, MC16336-7, MC16336-8

7.3.2  
7

CAS No.	Compound	MC16336-6 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	367	337	92	419	382	91	13	40-156/27
106-93-4	1,2-Dibromoethane	ND	367	304	83	419	342	82	12	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16336-6	Limits
460-00-4	Bromofluorobenzene (S)	99%	91%	96%	61-167%
460-00-4	Bromofluorobenzene (S)	91%	85%	94%	61-167%

\* = Outside of Control Limits.

# Volatile Surrogate Recovery Summary

Job Number: MC16336  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: AQ
--------------------	------------

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16336-5	BK19444.D	111	104
OP31226-BS	BK19434.D	114	97
OP31226-MB	BK19433.D	114	97
OP31226-MS	BK19435.D	113	96
OP31226-MSD	BK19436.D	113	98

Surrogate Compounds	Recovery Limits
---------------------	-----------------

S1 = Bromofluorobenzene (S)	36-173%
-----------------------------	---------

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

# Volatile Surrogate Recovery Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: SO
--------------------	------------

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16336-1	BK19732.D	103	94
MC16336-2	BK19733.D	90	87
MC16336-3	BK19734.D	109	107
MC16336-6	BK19735.D	96	94
MC16336-7	BK19736.D	96	360* <sup>c</sup>
MC16336-8	BK19737.D	94	92
OP31352-BS	BK19729.D	107	97
OP31352-MB	BK19728.D	108	98
OP31352-MS	BK19730.D	99	91
OP31352-MSD	BK19731.D	91	85

Surrogate Compounds	Recovery Limits
---------------------	-----------------

S1 = Bromofluorobenzene (S)	61-167%
-----------------------------	---------

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1
- (c) Outside control limits due to possible matrix interference.

7.4.2  
7

# GC Surrogate Retention Time Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK704-CC703	Injection Date:	11/30/12
Lab File ID:	BK19432.D	Injection Time:	08:35
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.61	4.93
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP31227-MB	BK19433A.D	11/30/12	08:58	4.60	4.93
OP31226-MB	BK19433.D	11/30/12	08:58	4.60	4.93
OP31227-BS	BK19434A.D	11/30/12	09:22	4.60	4.93
OP31226-BS	BK19434.D	11/30/12	09:22	4.60	4.93
OP31226-MS	BK19435.D	11/30/12	09:46	4.61	4.93
OP31226-MSD	BK19436.D	11/30/12	10:10	4.61	4.93
MC16100-11	BK19437.D	11/30/12	10:34	4.61	4.93
ZZZZZZ	BK19438.D	11/30/12	10:58	4.60	4.93
ZZZZZZ	BK19439.D	11/30/12	11:23	4.60	4.93
ZZZZZZ	BK19440.D	11/30/12	11:47	4.60	4.93
ZZZZZZ	BK19441.D	11/30/12	12:11	4.60	4.93
ZZZZZZ	BK19442.D	11/30/12	12:35	4.61	4.93

**Surrogate Compounds**

S1 = Bromofluorobenzene (S)

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

7.5.1  
7

# GC Surrogate Retention Time Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK704-CC703	Injection Date:	11/30/12
Lab File ID:	BK19443.D	Injection Time:	12:59
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.62	4.93
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
MC16336-5	BK19444.D	11/30/12	13:23	4.62	4.93
GBK704-ECC703	BK19445.D	11/30/12	13:47	4.62	4.93

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

# GC Surrogate Retention Time Summary

Job Number: MC16336  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK712-ICC712	Injection Date:	12/09/12
Lab File ID:	BK19722.D	Injection Time:	17:47
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.56	4.90
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP31352-MB	BK19728.D	12/09/12	20:14	4.57	4.90
OP31352-BS	BK19729.D	12/09/12	20:38	4.56	4.90
OP31352-MS	BK19730.D	12/09/12	21:03	4.57	4.90
OP31352-MSD	BK19731.D	12/09/12	21:27	4.57	4.90
MC16336-1	BK19732.D	12/09/12	21:52	4.56	4.90
MC16336-2	BK19733.D	12/09/12	22:16	4.56	4.90
MC16336-3	BK19734.D	12/09/12	22:41	4.56	4.90
MC16336-6	BK19735.D	12/09/12	23:05	4.57	4.90
MC16336-7	BK19736.D	12/09/12	23:30	4.56	4.90
MC16336-8	BK19737.D	12/09/12	23:55	4.56	4.90

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

## General Chemistry

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### QC Data Summaries



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Includes the following where applicable:

- Percent Solids Raw Data Summary

# Percent Solids Raw Data Summary

Job Number: MC16336  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

---

Sample: MC16336-1      Analyzed: 03-DEC-12 by HS      Method: SM21 2540 B MOD.  
ClientID: MW-17-21

Wet Weight (Total)	28.563	g
Tare Weight	20.614	g
Dry Weight (Total)	27.899	g
Solids, Percent	91.6	%

---

Sample: MC16336-2      Analyzed: 03-DEC-12 by HS      Method: SM21 2540 B MOD.  
ClientID: MW-17-35

Wet Weight (Total)	36.77	g
Tare Weight	27.99	g
Dry Weight (Total)	34.816	g
Solids, Percent	77.7	%

---

Sample: MC16336-3      Analyzed: 03-DEC-12 by HS      Method: SM21 2540 B MOD.  
ClientID: MW-17-14

Wet Weight (Total)	28.042	g
Tare Weight	18.839	g
Dry Weight (Total)	27.233	g
Solids, Percent	91.2	%

---

Sample: MC16336-6      Analyzed: 03-DEC-12 by HS      Method: SM21 2540 B MOD.  
ClientID: MW-18-12

Wet Weight (Total)	24.26	g
Tare Weight	18.349	g
Dry Weight (Total)	23.818	g
Solids, Percent	92.5	%

---

Sample: MC16336-7      Analyzed: 03-DEC-12 by HS      Method: SM21 2540 B MOD.  
ClientID: MW-18-18

Wet Weight (Total)	29.327	g
Tare Weight	18.872	g
Dry Weight (Total)	26.598	g
Solids, Percent	73.9	%

---

Sample: MC16336-8      Analyzed: 03-DEC-12 by HS      Method: SM21 2540 B MOD.  
ClientID: MW-18-39

Wet Weight (Total)	30.096	g
Tare Weight	23.904	g
Dry Weight (Total)	29.721	g
Solids, Percent	93.9	%

---

8.1  
8

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*Automated Report*

### Technical Report for

#### Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562735.00015

SGS Accutest Job Number: MC16445

Sampling Date: 11/29/12

#### Report to:

AECOM, INC.

Melissa.mansker@aecom.com

ATTN: Melissa Mansker

Total number of pages in report: 86



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

H. (Brad) Madadian  
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

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

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Test results relate only to samples analyzed.



ACCUTEST

October 27, 2016

AECOM  
1001 Highlands Plaza Drive West Suite 300  
St. Louis, MO 63110

RE: SGS Accutest Job # MC16445

Dear Elizabeth Kunkel

As you are aware, SGS Accutest Inc. - Marlborough has been conducting an extensive review of data associated with some historical Gas Chromatography-Mass Spectroscopy volatiles analyses. As a result of this review it was determined that some revisions of the original test report for this job were needed. These corrections have been incorporated into the revised report.

Please be assured that corrective actions have been put in place to address this matter and prevent a recurrence.

We apologize for any inconvenience that this issue may have caused. Please don't hesitate to contact us if we can be of further assistance.

Sincerely,

**H. (Brad) Madadian**

Regional Laboratory Director  
SGS Accutest Inc. - Marlborough

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TESTING AND CERTIFICATION COMPANY.

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## Sample Summary

Shell Oil

Job No: MC16445

URSMOSTL: Roxana Drilling, Roxana, IL  
Project No: 21562735.00015

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
MC16445-1	11/29/12	13:45 MMSJ	12/03/12	SO	Soil	MW-22-12
MC16445-2	11/29/12	13:45 MMSJ	12/03/12	SO	Soil	MW-22-12-DUP
MC16445-3	11/29/12	14:40 MMSJ	12/03/12	SO	Soil	MW-22-23
MC16445-4	11/29/12	14:40 MMSJ	12/03/12	SO	Soil	MW-22-23-DUP
MC16445-5	11/29/12	14:50 MMSJ	12/03/12	SO	Soil	MW-22-39
MC16445-6	11/29/12	00:00 MMSJ	12/03/12	AQ	Trip Blank Water	TRIP BLANK

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

# SAMPLE DELIVERY GROUP CASE NARRATIVE



**Client:** She O

**Job No** MC 6445

**Site:** URSMOSTL: Roxana Dr ing, Roxana, IL

**Report Date** 10/27/2016 10:09:42 A

5 Sample(s), Trip Blank(s) and 0 Field Blank(s) were collected on 10/29/2016 and were received at SGS Accutest New England on 11/03/2016 properly preserved, at 0-3 Deg C and intact. These Samples received a job number of MC 6445. Assigning of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report. Dichlorohexane was searched in the library search and reported on if detections were found.

Except as noted below, all method specified calibration 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:** MSH 953

- All samples were analyzed within the recommended method hold time.
- Samples MC 6569-2MS, MC 6569-2MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specification criteria.
- Blank Spike Recovery(s) for 2,2-Dichloropropane, 2-Chloroethyl vinyl ether, Acroene are out of control limits.
- Matrix Spike Recovery(s) for Acetone, 2-Chloroethyl vinyl ether, Acroene are out of control limits. Out of control limits due to possible matrix interference.
- Matrix Spike Duplicate Recovery(s) for 2-Chloroethyl vinyl ether, Acetone, Acroene are out of control limits. Probable cause due to matrix interference.

**Matrix:** SO **Batch ID:** MSK2 53

- All samples were analyzed within the recommended method hold time.
- All method blanks for this batch meet method specification criteria.
- Samples JB20375-3MS, JB20375-3MSD were used as the QC samples indicated.
- Blank Spike / Blank Spike Duplicate Recovery(s) for Acroene are out of control limits.
- Matrix Spike Recovery(s) for Acroene, 2-Butanone (MEK), Acetone are out of control limits. Out of control limits due to possible matrix interference.
- Matrix Spike Duplicate Recovery(s) for 2-Butanone (MEK), Acetone, Acroene are out of control limits. Probable cause due to matrix interference.
- 2-Butanone (MEK), 2-Hexanone, Acetone: In this Calibration Verification cat on out of acceptance criteria. Spike Blank (second source standard) was used to verify calibration standard accuracy.
- Acroene: Continuing Calibration Verification cat on out of acceptance criteria. Sample result may be biased.

**Matrix:** SO **Batch ID:** MSM 788

- All samples were analyzed within the recommended method hold time.
- All method blanks for this batch meet method specification criteria.
- Samples MC 6395-2MS, MC 6395-2MSD were used as the QC samples indicated.
- Blank Spike Recovery(s) for Acetone, Acroene, Vinyl Acetate are out of control limits.
- Matrix Spike Recovery(s) for 1,4-Dioxane, 2-Hexanone, 4-Methyl-2-pentanone (MIBK), Acroene, Acrylonitrile are out of control limits. Out of control limits due to possible matrix interference.
- Matrix Spike Duplicate Recovery(s) for 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,4-Dioxane, 2-Butanone (MEK), 2-Hexanone, 4-Methyl-2-pentanone (MIBK), Acroene, Acrylonitrile, Hexachlorobutadiene are out of control limits. High RPD due to possible matrix interference and/or sample non-homogeneity.
- RPD(s) for MSD for Hexachlorobutadiene are out of control limits for sample MC 6395-2MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.

**Volatiles by GC By Method SW846 8011**

<b>Matrix:</b> AQ	<b>Batch ID:</b> OP3 406
-------------------	--------------------------

- All samples were analyzed within the recommended method holding time
- Sample(s) MC 6600-6MS, MC 6600-6MSD were used as the QC samples indicated
- All methods blanks for this batch meet method specifications

<b>Matrix:</b> SO	<b>Batch ID:</b> OP3 352
-------------------	--------------------------

- All samples were extracted within the recommended method holding time
- All samples were analyzed within the recommended method holding time
- Sample(s) MC 6336-6MS, MC 6336-6MSD were used as the QC samples indicated
- All methods blanks for this batch meet method specifications

**Wet Chemistry By Method SM21 2540 B MOD.**

<b>Matrix:</b> SO	<b>Batch ID:</b> GN4 52
-------------------	-------------------------

- Sample(s) MC 6373-8DUP were used as the QC samples for Sulfides, Percent

SGS Accutest New England certifies that all analyses were performed within method specifications. It is further recommended that this report be used in its entirety. The Laboratory Director for SGS Accutest New England or assignee as verified by the signature on the cover page has authorized the release of this report (MC 6445)

## Summary of Hits

Job Number: MC16445  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 11/29/12



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

**MC16445-1 MW-22-12**

Benzene	0.0023	0.00064	0.00038	mg/kg	SW846 8260B
Ethylbenzene	0.0105	0.0026	0.00031	mg/kg	SW846 8260B
Toluene	0.0096	0.0064	0.0011	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	0.00075 J	0.0064	0.00029	mg/kg	SW846 8260B
m,p-Xylene	0.0017 J	0.0026	0.0010	mg/kg	SW846 8260B
o-Xylene	0.00069 J	0.0026	0.00031	mg/kg	SW846 8260B
Xylene (total)	0.0024 J	0.0026	0.00031	mg/kg	SW846 8260B

**MC16445-2 MW-22-12-DUP**

Benzene	0.0024	0.00076	0.00045	mg/kg	SW846 8260B
Carbon disulfide	0.0021 J	0.0076	0.00025	mg/kg	SW846 8260B
Ethylbenzene	0.0107	0.0030	0.00036	mg/kg	SW846 8260B
Toluene	0.0099	0.0076	0.0013	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	0.00084 J	0.0076	0.00034	mg/kg	SW846 8260B
m,p-Xylene	0.0018 J	0.0030	0.0012	mg/kg	SW846 8260B
o-Xylene	0.00078 J	0.0030	0.00036	mg/kg	SW846 8260B
Xylene (total)	0.0026 J	0.0030	0.00036	mg/kg	SW846 8260B

**MC16445-3 MW-22-23**

n-Butylbenzene	40.6	12	0.42	mg/kg	SW846 8260B
sec-Butylbenzene	12.4	12	0.53	mg/kg	SW846 8260B
tert-Butylbenzene	11.8 J	12	2.0	mg/kg	SW846 8260B
Ethylbenzene	354	4.6	0.56	mg/kg	SW846 8260B
Isopropylbenzene	32.4	12	0.53	mg/kg	SW846 8260B
p-Isopropyltoluene	7.17 J	12	0.41	mg/kg	SW846 8260B
Naphthalene	43.2	12	2.9	mg/kg	SW846 8260B
n-Propylbenzene	98.7	12	2.3	mg/kg	SW846 8260B
Toluene	358	12	2.0	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	381	12	0.52	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	111	12	0.49	mg/kg	SW846 8260B
m,p-Xylene	787	4.6	1.8	mg/kg	SW846 8260B
o-Xylene	361	4.6	0.55	mg/kg	SW846 8260B
Xylene (total)	1150	4.6	0.55	mg/kg	SW846 8260B

**MC16445-4 MW-22-23-DUP**

n-Butylbenzene	37.7	13	0.47	mg/kg	SW846 8260B
sec-Butylbenzene	10.9 J	13	0.59	mg/kg	SW846 8260B
tert-Butylbenzene	10.0 J	13	2.2	mg/kg	SW846 8260B
Ethylbenzene	329	5.1	0.62	mg/kg	SW846 8260B
Isopropylbenzene	28.8	13	0.58	mg/kg	SW846 8260B

## Summary of Hits

Job Number: MC16445  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 11/29/12



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
		p-Isopropyltoluene	6.55 J	13	0.45	mg/kg SW846 8260B
		Naphthalene	39.8	13	3.2	mg/kg SW846 8260B
		n-Propylbenzene	88.7	13	2.6	mg/kg SW846 8260B
		Toluene	318	13	2.2	mg/kg SW846 8260B
		1,2,4-Trimethylbenzene	348	13	0.57	mg/kg SW846 8260B
		1,3,5-Trimethylbenzene	99.2	13	0.54	mg/kg SW846 8260B
		m,p-Xylene	742	5.1	2.0	mg/kg SW846 8260B
		o-Xylene	339	5.1	0.61	mg/kg SW846 8260B
		Xylene (total)	1080	5.1	0.61	mg/kg SW846 8260B

**MC16445-5 MW-22-39**

n-Butylbenzene	1.32	0.77	0.028	mg/kg	SW846 8260B
sec-Butylbenzene	0.166 J	0.77	0.035	mg/kg	SW846 8260B
tert-Butylbenzene	0.558 J	0.77	0.14	mg/kg	SW846 8260B
Ethylbenzene	0.521	0.31	0.037	mg/kg	SW846 8260B
Isopropylbenzene	0.130 J	0.77	0.035	mg/kg	SW846 8260B
p-Isopropyltoluene	0.613 J	0.77	0.027	mg/kg	SW846 8260B
n-Propylbenzene	0.309 J	0.77	0.16	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	5.33	0.77	0.034	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	3.07	0.77	0.033	mg/kg	SW846 8260B
m,p-Xylene	1.40	0.31	0.12	mg/kg	SW846 8260B
o-Xylene	0.941	0.31	0.037	mg/kg	SW846 8260B
Xylene (total)	2.34	0.31	0.037	mg/kg	SW846 8260B

**MC16445-6 TRIP BLANK**

No hits reported in this sample.

**Sample Results**

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**Report of Analysis**

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## Report of Analysis

Client Sample ID:	MW-22-12	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-1	Date Received:	12/03/12
Matrix:	SO - Soil	Percent Solids:	78.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M52756.D	1	12/06/12	AMY	n/a	n/a	MSM1788
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.96 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0064	0.0016	mg/kg	
107-02-8	Acrolein	ND	0.032	0.013	mg/kg	
107-13-1	Acrylonitrile	ND	0.032	0.0016	mg/kg	
71-43-2	Benzene	0.0023	0.00064	0.00038	mg/kg	
108-86-1	Bromobenzene	ND	0.0064	0.00029	mg/kg	
74-97-5	Bromochloromethane	ND	0.0064	0.00048	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0026	0.00027	mg/kg	
75-25-2	Bromoform	ND	0.0026	0.0026	mg/kg	
74-83-9	Bromomethane	ND	0.0026	0.00067	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0064	0.0016	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0064	0.00024	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0064	0.00030	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0064	0.0011	mg/kg	
75-15-0	Carbon disulfide	ND	0.0064	0.00021	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0026	0.00093	mg/kg	
108-90-7	Chlorobenzene	ND	0.0026	0.00035	mg/kg	
75-00-3	Chloroethane	ND	0.0064	0.0016	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0064	0.0026	mg/kg	
67-66-3	Chloroform	ND	0.0026	0.00066	mg/kg	
74-87-3	Chloromethane	ND	0.0064	0.00060	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0064	0.0014	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0064	0.00029	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0026	0.00038	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0026	0.00028	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0026	0.00029	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0026	0.00027	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0026	0.0015	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0026	0.00035	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0026	0.00037	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0026	0.00047	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0026	0.00039	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0026	0.00037	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:	MW-22-12	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-1	Date Received:	12/03/12
Matrix:	SO - Soil	Percent Solids:	78.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0026	0.00048	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0064	0.00030	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0064	0.0011	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0064	0.00034	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0026	0.00022	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0026	0.00064	mg/kg	
123-91-1	1,4-Dioxane	ND	0.032	0.032	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0064	0.00088	mg/kg	
100-41-4	Ethylbenzene	0.0105	0.0026	0.00031	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0064	0.00060	mg/kg	
591-78-6	2-Hexanone	ND	0.0064	0.00064	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0064	0.00029	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0064	0.00023	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0026	0.00037	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0064	0.00064	mg/kg	
74-95-3	Methylene bromide	ND	0.0064	0.00063	mg/kg	
75-09-2	Methylene chloride	ND	0.0026	0.0015	mg/kg	
91-20-3	Naphthalene	ND	0.0064	0.0016	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0064	0.0013	mg/kg	
100-42-5	Styrene	ND	0.0064	0.00030	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0064	0.0013	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0026	0.00055	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0026	0.00029	mg/kg	
108-88-3	Toluene	0.0096	0.0064	0.0011	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0064	0.00030	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0064	0.00029	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0026	0.00040	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0026	0.00094	mg/kg	
79-01-6	Trichloroethene	ND	0.0026	0.00027	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0026	0.00039	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0064	0.00038	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.00075	0.0064	0.00029	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	ND	0.0064	0.00027	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0064	0.00072	mg/kg	
75-01-4	Vinyl chloride	ND	0.0026	0.00035	mg/kg	
	m,p-Xylene	0.0017	0.0026	0.0010	mg/kg	J
95-47-6	o-Xylene	0.00069	0.0026	0.00031	mg/kg	J
1330-20-7	Xylene (total)	0.0024	0.0026	0.00031	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

<b>Client Sample ID:</b> MW-22-12	<b>Date Sampled:</b> 11/29/12
<b>Lab Sample ID:</b> MC16445-1	<b>Date Received:</b> 12/03/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 78.4
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		70-130%
2037-26-5	Toluene-D8	117%		70-130%
460-00-4	4-Bromofluorobenzene	98%		70-130%

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

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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

<b>Client Sample ID:</b> MW-22-12	
<b>Lab Sample ID:</b> MC16445-1	<b>Date Sampled:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 12/03/12
<b>Method:</b> SW846 8011 SW846 3550B	<b>Percent Solids:</b> 78.4
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19739.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

	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	0.0032	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0032	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	94%		61-167%
460-00-4	Bromofluorobenzene (S)	92%		61-167%

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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

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## Report of Analysis

Client Sample ID:	MW-22-12-DUP	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-2	Date Received:	12/03/12
Matrix:	SO - Soil	Percent Solids:	76.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M52757.D	1	12/06/12	AMY	n/a	n/a	MSM1788
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.32 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0076	0.0019	mg/kg	
107-02-8	Acrolein	ND	0.038	0.015	mg/kg	
107-13-1	Acrylonitrile	ND	0.038	0.0019	mg/kg	
71-43-2	Benzene	0.0024	0.00076	0.00045	mg/kg	
108-86-1	Bromobenzene	ND	0.0076	0.00034	mg/kg	
74-97-5	Bromochloromethane	ND	0.0076	0.00056	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0030	0.00032	mg/kg	
75-25-2	Bromoform	ND	0.0030	0.0030	mg/kg	
74-83-9	Bromomethane	ND	0.0030	0.00078	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0076	0.0019	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0076	0.00028	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0076	0.00035	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0076	0.0013	mg/kg	
75-15-0	Carbon disulfide	0.0021	0.0076	0.00025	mg/kg	J
56-23-5	Carbon tetrachloride	ND	0.0030	0.0011	mg/kg	
108-90-7	Chlorobenzene	ND	0.0030	0.00042	mg/kg	
75-00-3	Chloroethane	ND	0.0076	0.0019	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0076	0.0030	mg/kg	
67-66-3	Chloroform	ND	0.0030	0.00078	mg/kg	
74-87-3	Chloromethane	ND	0.0076	0.00070	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0076	0.0017	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0076	0.00034	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0030	0.00045	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0030	0.00033	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0030	0.00034	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0030	0.00032	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0030	0.0017	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0030	0.00041	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0030	0.00043	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0030	0.00056	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0030	0.00045	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0030	0.00043	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:	MW-22-12-DUP	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-2	Date Received:	12/03/12
Matrix:	SO - Soil	Percent Solids:	76.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0030	0.00056	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0076	0.00035	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0076	0.0013	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0076	0.00040	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0030	0.00026	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0030	0.00075	mg/kg	
123-91-1	1,4-Dioxane	ND	0.038	0.038	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0076	0.0010	mg/kg	
100-41-4	Ethylbenzene	0.0107	0.0030	0.00036	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0076	0.00070	mg/kg	
591-78-6	2-Hexanone	ND	0.0076	0.00076	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0076	0.00035	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0076	0.00027	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0030	0.00044	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0076	0.00076	mg/kg	
74-95-3	Methylene bromide	ND	0.0076	0.00075	mg/kg	
75-09-2	Methylene chloride	ND	0.0030	0.0018	mg/kg	
91-20-3	Naphthalene	ND	0.0076	0.0019	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0076	0.0015	mg/kg	
100-42-5	Styrene	ND	0.0076	0.00035	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0076	0.0015	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0030	0.00064	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0030	0.00035	mg/kg	
108-88-3	Toluene	0.0099	0.0076	0.0013	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0076	0.00036	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0076	0.00035	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0030	0.00048	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0030	0.0011	mg/kg	
79-01-6	Trichloroethene	ND	0.0030	0.00032	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0030	0.00046	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0076	0.00044	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.00084	0.0076	0.00034	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	ND	0.0076	0.00032	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0076	0.00084	mg/kg	
75-01-4	Vinyl chloride	ND	0.0030	0.00041	mg/kg	
	m,p-Xylene	0.0018	0.0030	0.0012	mg/kg	J
95-47-6	o-Xylene	0.00078	0.0030	0.00036	mg/kg	J
1330-20-7	Xylene (total)	0.0026	0.0030	0.00036	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

<b>Client Sample ID:</b> MW-22-12-DUP	<b>Date Sampled:</b> 11/29/12
<b>Lab Sample ID:</b> MC16445-2	<b>Date Received:</b> 12/03/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 76.6
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%		70-130%
2037-26-5	Toluene-D8	116%		70-130%
460-00-4	4-Bromofluorobenzene	95%		70-130%

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

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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

<b>Client Sample ID:</b> MW-22-12-DUP	<b>Date Sampled:</b> 11/29/12
<b>Lab Sample ID:</b> MC16445-2	<b>Date Received:</b> 12/03/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 76.6
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19740.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

	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	0.0032	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0032	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	96%		61-167%
460-00-4	Bromofluorobenzene (S)	93%		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

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## Report of Analysis

Client Sample ID:	MW-22-23	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-3	Date Received:	12/03/12
Matrix:	SO - Soil	Percent Solids:	81.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65375.D	1	12/05/12	GK	n/a	n/a	MSK2153
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.95 g	10.0 ml	5.0 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone <sup>a</sup>	ND	12	2.9	mg/kg	
107-02-8	Acrolein <sup>b</sup>	ND	58	23	mg/kg	
107-13-1	Acrylonitrile	ND	58	2.9	mg/kg	
71-43-2	Benzene	ND	1.2	0.68	mg/kg	
108-86-1	Bromobenzene	ND	12	0.51	mg/kg	
74-97-5	Bromochloromethane	ND	12	0.86	mg/kg	
75-27-4	Bromodichloromethane	ND	4.6	0.49	mg/kg	
75-25-2	Bromoform	ND	4.6	4.6	mg/kg	
74-83-9	Bromomethane	ND	4.6	1.2	mg/kg	
78-93-3	2-Butanone (MEK) <sup>a</sup>	ND	12	2.9	mg/kg	
104-51-8	n-Butylbenzene	40.6	12	0.42	mg/kg	
135-98-8	sec-Butylbenzene	12.4	12	0.53	mg/kg	
98-06-6	tert-Butylbenzene	11.8	12	2.0	mg/kg	J
75-15-0	Carbon disulfide	ND	12	0.38	mg/kg	
56-23-5	Carbon tetrachloride	ND	4.6	1.7	mg/kg	
108-90-7	Chlorobenzene	ND	4.6	0.63	mg/kg	
75-00-3	Chloroethane	ND	12	2.9	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	12	4.6	mg/kg	
67-66-3	Chloroform	ND	4.6	1.2	mg/kg	
74-87-3	Chloromethane	ND	12	1.1	mg/kg	
95-49-8	o-Chlorotoluene	ND	12	2.5	mg/kg	
106-43-4	p-Chlorotoluene	ND	12	0.52	mg/kg	
124-48-1	Dibromochloromethane	ND	4.6	0.68	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	4.6	0.50	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	4.6	0.52	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	4.6	0.49	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	4.6	2.6	mg/kg	
75-34-3	1,1-Dichloroethane	ND	4.6	0.62	mg/kg	
107-06-2	1,2-Dichloroethane	ND	4.6	0.66	mg/kg	
75-35-4	1,1-Dichloroethene	ND	4.6	0.85	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	4.6	0.69	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	4.6	0.66	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:	MW-22-23	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-3	Date Received:	12/03/12
Matrix:	SO - Soil	Percent Solids:	81.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	4.6	0.86	mg/kg	
142-28-9	1,3-Dichloropropane	ND	12	0.53	mg/kg	
594-20-7	2,2-Dichloropropane	ND	12	2.0	mg/kg	
563-58-6	1,1-Dichloropropene	ND	12	0.61	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.6	0.39	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.6	1.1	mg/kg	
123-91-1	1,4-Dioxane	ND	58	58	mg/kg	
97-63-2	Ethyl methacrylate	ND	12	1.6	mg/kg	
100-41-4	Ethylbenzene	354	4.6	0.56	mg/kg	
87-68-3	Hexachlorobutadiene	ND	12	1.1	mg/kg	
591-78-6	2-Hexanone <sup>a</sup>	ND	12	1.2	mg/kg	
98-82-8	Isopropylbenzene	32.4	12	0.53	mg/kg	
99-87-6	p-Isopropyltoluene	7.17	12	0.41	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	4.6	0.66	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	12	1.2	mg/kg	
74-95-3	Methylene bromide	ND	12	1.1	mg/kg	
75-09-2	Methylene chloride	ND	4.6	2.7	mg/kg	
91-20-3	Naphthalene	43.2	12	2.9	mg/kg	
103-65-1	n-Propylbenzene	98.7	12	2.3	mg/kg	
100-42-5	Styrene	ND	12	0.54	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	12	2.3	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.6	0.98	mg/kg	
127-18-4	Tetrachloroethene	ND	4.6	0.53	mg/kg	
108-88-3	Toluene	358	12	2.0	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	12	0.55	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	12	0.53	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.6	0.73	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.6	1.7	mg/kg	
79-01-6	Trichloroethene	ND	4.6	0.49	mg/kg	
75-69-4	Trichlorofluoromethane	ND	4.6	0.70	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	12	0.67	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	381	12	0.52	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	111	12	0.49	mg/kg	
108-05-4	Vinyl Acetate	ND	12	1.3	mg/kg	
75-01-4	Vinyl chloride	ND	4.6	0.63	mg/kg	
	m,p-Xylene	787	4.6	1.8	mg/kg	
95-47-6	o-Xylene	361	4.6	0.55	mg/kg	
1330-20-7	Xylene (total)	1150	4.6	0.55	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

<b>Client Sample ID:</b> MW-22-23	<b>Date Sampled:</b> 11/29/12
<b>Lab Sample ID:</b> MC16445-3	<b>Date Received:</b> 12/03/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
2037-26-5	Toluene-D8	103%		70-130%
460-00-4	4-Bromofluorobenzene	112%		70-130%

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

- (a) Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.
- (b) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-22-23	
<b>Lab Sample ID:</b> MC16445-3	<b>Date Sampled:</b> 11/29/12
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 12/03/12
<b>Method:</b> SW846 8011 SW846 3550B	<b>Percent Solids:</b> 81.1
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19741.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

	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	0.0031	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0031	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	72%		61-167%
460-00-4	Bromofluorobenzene (S)	83%		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

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## Report of Analysis

Client Sample ID:	MW-22-23-DUP	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-4	Date Received:	12/03/12
Matrix:	SO - Soil	Percent Solids:	80.7
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65376.D	1	12/05/12	GK	n/a	n/a	MSK2153
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	12.0 g	10.0 ml	2.5 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone <sup>a</sup>	ND	13	3.2	mg/kg	
107-02-8	Acrolein <sup>b</sup>	ND	64	25	mg/kg	
107-13-1	Acrylonitrile	ND	64	3.2	mg/kg	
71-43-2	Benzene	ND	1.3	0.75	mg/kg	
108-86-1	Bromobenzene	ND	13	0.57	mg/kg	
74-97-5	Bromochloromethane	ND	13	0.95	mg/kg	
75-27-4	Bromodichloromethane	ND	5.1	0.54	mg/kg	
75-25-2	Bromoform	ND	5.1	5.1	mg/kg	
74-83-9	Bromomethane	ND	5.1	1.3	mg/kg	
78-93-3	2-Butanone (MEK) <sup>a</sup>	ND	13	3.2	mg/kg	
104-51-8	n-Butylbenzene	37.7	13	0.47	mg/kg	
135-98-8	sec-Butylbenzene	10.9	13	0.59	mg/kg	J
98-06-6	tert-Butylbenzene	10.0	13	2.2	mg/kg	J
75-15-0	Carbon disulfide	ND	13	0.42	mg/kg	
56-23-5	Carbon tetrachloride	ND	5.1	1.9	mg/kg	
108-90-7	Chlorobenzene	ND	5.1	0.70	mg/kg	
75-00-3	Chloroethane	ND	13	3.2	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	13	5.1	mg/kg	
67-66-3	Chloroform	ND	5.1	1.3	mg/kg	
74-87-3	Chloromethane	ND	13	1.2	mg/kg	
95-49-8	o-Chlorotoluene	ND	13	2.8	mg/kg	
106-43-4	p-Chlorotoluene	ND	13	0.58	mg/kg	
124-48-1	Dibromochloromethane	ND	5.1	0.75	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	5.1	0.55	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	5.1	0.58	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	5.1	0.54	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	5.1	2.9	mg/kg	
75-34-3	1,1-Dichloroethane	ND	5.1	0.69	mg/kg	
107-06-2	1,2-Dichloroethane	ND	5.1	0.73	mg/kg	
75-35-4	1,1-Dichloroethene	ND	5.1	0.94	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	5.1	0.77	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	5.1	0.73	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:	MW-22-23-DUP	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-4	Date Received:	12/03/12
Matrix:	SO - Soil	Percent Solids:	80.7
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	5.1	0.95	mg/kg	
142-28-9	1,3-Dichloropropane	ND	13	0.59	mg/kg	
594-20-7	2,2-Dichloropropane	ND	13	2.2	mg/kg	
563-58-6	1,1-Dichloropropene	ND	13	0.67	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.1	0.43	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.1	1.3	mg/kg	
123-91-1	1,4-Dioxane	ND	64	64	mg/kg	
97-63-2	Ethyl methacrylate	ND	13	1.7	mg/kg	
100-41-4	Ethylbenzene	329	5.1	0.62	mg/kg	
87-68-3	Hexachlorobutadiene	ND	13	1.2	mg/kg	
591-78-6	2-Hexanone <sup>a</sup>	ND	13	1.3	mg/kg	
98-82-8	Isopropylbenzene	28.8	13	0.58	mg/kg	
99-87-6	p-Isopropyltoluene	6.55	13	0.45	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	5.1	0.73	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	13	1.3	mg/kg	
74-95-3	Methylene bromide	ND	13	1.3	mg/kg	
75-09-2	Methylene chloride	ND	5.1	3.0	mg/kg	
91-20-3	Naphthalene	39.8	13	3.2	mg/kg	
103-65-1	n-Propylbenzene	88.7	13	2.6	mg/kg	
100-42-5	Styrene	ND	13	0.60	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	13	2.5	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.1	1.1	mg/kg	
127-18-4	Tetrachloroethene	ND	5.1	0.58	mg/kg	
108-88-3	Toluene	318	13	2.2	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	13	0.60	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	13	0.58	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.1	0.80	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.1	1.9	mg/kg	
79-01-6	Trichloroethene	ND	5.1	0.54	mg/kg	
75-69-4	Trichlorofluoromethane	ND	5.1	0.77	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	13	0.74	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	348	13	0.57	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	99.2	13	0.54	mg/kg	
108-05-4	Vinyl Acetate	ND	13	1.4	mg/kg	
75-01-4	Vinyl chloride	ND	5.1	0.69	mg/kg	
	m,p-Xylene	742	5.1	2.0	mg/kg	
95-47-6	o-Xylene	339	5.1	0.61	mg/kg	
1330-20-7	Xylene (total)	1080	5.1	0.61	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

<b>Client Sample ID:</b> MW-22-23-DUP	<b>Date Sampled:</b> 11/29/12
<b>Lab Sample ID:</b> MC16445-4	<b>Date Received:</b> 12/03/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.7
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		70-130%
2037-26-5	Toluene-D8	101%		70-130%
460-00-4	4-Bromofluorobenzene	108%		70-130%

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

- (a) Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.
- (b) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-22-23-DUP	<b>Date Sampled:</b> 11/29/12
<b>Lab Sample ID:</b> MC16445-4	<b>Date Received:</b> 12/03/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.7
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19742.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 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	0.0031	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0031	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	72%		61-167%
460-00-4	Bromofluorobenzene (S)	82%		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

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## Report of Analysis

Client Sample ID:	MW-22-39	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-5	Date Received:	12/03/12
Matrix:	SO - Soil	Percent Solids:	77.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65377.D	1	12/05/12	GK	n/a	n/a	MSK2153
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.63 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone <sup>a</sup>	ND	0.77	0.19	mg/kg	
107-02-8	Acrolein <sup>b</sup>	ND	3.8	1.5	mg/kg	
107-13-1	Acrylonitrile	ND	3.8	0.19	mg/kg	
71-43-2	Benzene	ND	0.077	0.045	mg/kg	
108-86-1	Bromobenzene	ND	0.77	0.034	mg/kg	
74-97-5	Bromochloromethane	ND	0.77	0.057	mg/kg	
75-27-4	Bromodichloromethane	ND	0.31	0.032	mg/kg	
75-25-2	Bromoform	ND	0.31	0.31	mg/kg	
74-83-9	Bromomethane	ND	0.31	0.080	mg/kg	
78-93-3	2-Butanone (MEK) <sup>a</sup>	ND	0.77	0.19	mg/kg	
104-51-8	n-Butylbenzene	1.32	0.77	0.028	mg/kg	
135-98-8	sec-Butylbenzene	0.166	0.77	0.035	mg/kg	J
98-06-6	tert-Butylbenzene	0.558	0.77	0.14	mg/kg	J
75-15-0	Carbon disulfide	ND	0.77	0.025	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.31	0.11	mg/kg	
108-90-7	Chlorobenzene	ND	0.31	0.042	mg/kg	
75-00-3	Chloroethane	ND	0.77	0.19	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.77	0.31	mg/kg	
67-66-3	Chloroform	ND	0.31	0.079	mg/kg	
74-87-3	Chloromethane	ND	0.77	0.071	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.77	0.17	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.77	0.035	mg/kg	
124-48-1	Dibromochloromethane	ND	0.31	0.045	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.31	0.033	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.31	0.035	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.31	0.032	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.31	0.17	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.31	0.041	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.31	0.044	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.31	0.056	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.31	0.046	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.31	0.044	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:	MW-22-39	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-5	Date Received:	12/03/12
Matrix:	SO - Soil	Percent Solids:	77.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.31	0.057	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.77	0.035	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.77	0.13	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.77	0.040	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.31	0.026	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.31	0.076	mg/kg	
123-91-1	1,4-Dioxane	ND	3.8	3.8	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.77	0.10	mg/kg	
100-41-4	Ethylbenzene	0.521	0.31	0.037	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.77	0.071	mg/kg	
591-78-6	2-Hexanone <sup>a</sup>	ND	0.77	0.077	mg/kg	
98-82-8	Isopropylbenzene	0.130	0.77	0.035	mg/kg	J
99-87-6	p-Isopropyltoluene	0.613	0.77	0.027	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.31	0.044	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.77	0.077	mg/kg	
74-95-3	Methylene bromide	ND	0.77	0.076	mg/kg	
75-09-2	Methylene chloride	ND	0.31	0.18	mg/kg	
91-20-3	Naphthalene	ND	0.77	0.19	mg/kg	
103-65-1	n-Propylbenzene	0.309	0.77	0.16	mg/kg	J
100-42-5	Styrene	ND	0.77	0.036	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.77	0.15	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.31	0.065	mg/kg	
127-18-4	Tetrachloroethene	ND	0.31	0.035	mg/kg	
108-88-3	Toluene	ND	0.77	0.13	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.77	0.036	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.77	0.035	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.31	0.048	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.31	0.11	mg/kg	
79-01-6	Trichloroethene	ND	0.31	0.032	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.31	0.047	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.77	0.045	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	5.33	0.77	0.034	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	3.07	0.77	0.033	mg/kg	
108-05-4	Vinyl Acetate	ND	0.77	0.086	mg/kg	
75-01-4	Vinyl chloride	ND	0.31	0.042	mg/kg	
	m,p-Xylene	1.40	0.31	0.12	mg/kg	
95-47-6	o-Xylene	0.941	0.31	0.037	mg/kg	
1330-20-7	Xylene (total)	2.34	0.31	0.037	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

<b>Client Sample ID:</b> MW-22-39		<b>Date Sampled:</b> 11/29/12
<b>Lab Sample ID:</b> MC16445-5		<b>Date Received:</b> 12/03/12
<b>Matrix:</b> SO - Soil		<b>Percent Solids:</b> 77.6
<b>Method:</b> SW846 8260B		
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL		

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-130%
2037-26-5	Toluene-D8	105%		70-130%
460-00-4	4-Bromofluorobenzene	120%		70-130%

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

- (a) Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.
- (b) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-22-39	<b>Date Sampled:</b> 11/29/12
<b>Lab Sample ID:</b> MC16445-5	<b>Date Received:</b> 12/03/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 77.6
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19743.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 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	0.0032	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0032	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	79%		61-167%
460-00-4	Bromofluorobenzene (S)	83%		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

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## Report of Analysis

<b>Client Sample ID:</b>	TRIP BLANK	<b>Date Sampled:</b>	11/29/12
<b>Lab Sample ID:</b>	MC16445-6	<b>Date Received:</b>	12/03/12
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H59219.D	1	12/13/12	DFT	n/a	n/a	MSH1953
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	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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:	TRIP BLANK	Date Sampled:	11/29/12
Lab Sample ID:	MC16445-6	Date Received:	12/03/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 11/29/12
<b>Lab Sample ID:</b> MC16445-6	<b>Date Received:</b> 12/03/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
2037-26-5	Toluene-D8	101%		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	

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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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 11/29/12
<b>Lab Sample ID:</b> MC16445-6	<b>Date Received:</b> 12/03/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19940.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
Run #2							

Run #	Initial Volume	Final Volume
Run #1	32.9 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	0.016	0.014	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.016	0.011	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	117%		36-173%		
460-00-4	Bromofluorobenzene (S)	106%		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

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Misc. Forms

Custody Documents and Other Forms

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Includes the following where applicable:

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

FED-EX Tracking #	Bottle Order Control #
Accutest Quote #	Accutest Job # <b>MC16445</b>

Client / Reporting Information		Project Information		Requested Analysis ( see TEST CODE sheet)													Matrix Codes	
Company Name <b>URS</b>		Project Name <b>Roxana Drilling</b>		<div style="display: flex; justify-content: space-between;"> <span>VOC 8011</span> <span>VOC 8260</span> </div>													DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIO - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank	
Street Address		Street																
City State Zip		City State Zip																
Project Contact <b>E. Kunkel</b>		Project # <b>2562735.00015</b>																
Phone #		Client PO#																
Sampler(s) Name(s) <b>M. Miller S. Jansen</b>		Project Manager <b>D. Palmer</b>																
Accutest Sample #	Field ID / Point of Collection	MECH/DTI Viol #	Collection Date	Time	Sampled by	Matrix	# of bottles	HCL	NH4I	NH4B	H2SO4	NO3	NO2	DI Water	MEQ	ENCORE	Beutler	LAB USE ONLY
-1	MW-22-12		11/29/12	1345	MJM	SO	4							X	X	X	X	
-2	MW-22-12-Dup			1345										X	X	X	X	
-3	MW-22-23			1440										X	X	X	X	
-4	MW-22-23-Dup			1440										X	X	X	X	
-5	MW-22-39			1450										X	X	X	X	
-6	Trip Blank						4							X	X	X	X	

Data Deliverable Information			Comments / Special Instructions	
Turnaround Time ( Business days ) <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush T/A data available VIA Lablink	Approved By (Accutest PM): / Date: _____ _____	<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input checked="" type="checkbox"/> FULL T1 (Level 3+4) <input type="checkbox"/> CT RCP <input type="checkbox"/> MA MCP Commercial "A" = Results Only Commercial "B" = Results + QC Summary	<input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input checked="" type="checkbox"/> EDD Format _____ <input type="checkbox"/> Other _____	2K2, 2E, 10H1

**Sample Custody must be documented below each time samples change possession, including courier delivery.**

Relinquished By Sampler: 1 <b>Susan E. Jansen</b>	Date Time: 11/30/12	Received By: 1 <b>Index</b>	Relinquished By: 2 <b>FEDX</b>	Date Time: 12-3-12	Received By: 2 <b>Way Mon...</b>		
Relinquished by: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4		
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	<input type="checkbox"/> Intact <input type="checkbox"/> Not Intact	Preserved where applicable <input type="checkbox"/>	On Ice <input checked="" type="checkbox"/>	Cooler Temp. <b>0.3</b>

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## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC16445      Client: URS      Immediate Client Services Action Required: No  
 Date / Time Received: 12/3/2012      Delivery Method: \_\_\_\_\_      Client Service Action Required at Login: No  
 Project: ROXANA DRILLING      No. Coolers: 1      Airbill #'s: \_\_\_\_\_

**Cooler Security**

	<u>Y</u>	<u>or</u>	<u>N</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

**Cooler Temperature**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:	<u>Infrared gun</u>		
3. Cooler media:	<u>Ice (bag)</u>		

**Quality Control Preservation**

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Sample Integrity - Documentation**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

**Sample Integrity - Condition**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	<u>Intact</u>		

**Sample Integrity - Instructions**

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

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### Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16445

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

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Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16445-1 Collected: 29-NOV-12 13:45 By: MMSJ Received: 03-DEC-12 By: MW-22-12						
MC16445-1	SM21 2540 B MOD.	04-DEC-12	MC			%SOL
MC16445-1	SW846 8260B	06-DEC-12 21:30	AMY			V8260SL +
MC16445-1	SW846 8011	10-DEC-12 00:44	AP	10-DEC-12	NK	V8011SL
MC16445-2 Collected: 29-NOV-12 13:45 By: MMSJ Received: 03-DEC-12 By: MW-22-12-DUP						
MC16445-2	SM21 2540 B MOD.	04-DEC-12	MC			%SOL
MC16445-2	SW846 8260B	06-DEC-12 22:00	AMY			V8260SL +
MC16445-2	SW846 8011	10-DEC-12 01:09	AP	10-DEC-12	NK	V8011SL
MC16445-3 Collected: 29-NOV-12 14:40 By: MMSJ Received: 03-DEC-12 By: MW-22-23						
MC16445-3	SM21 2540 B MOD.	04-DEC-12	MC			%SOL
MC16445-3	SW846 8260B	05-DEC-12 14:07	GK			V8260SL +
MC16445-3	SW846 8011	10-DEC-12 01:33	AP	10-DEC-12	NK	V8011SL
MC16445-4 Collected: 29-NOV-12 14:40 By: MMSJ Received: 03-DEC-12 By: MW-22-23-DUP						
MC16445-4	SM21 2540 B MOD.	04-DEC-12	MC			%SOL
MC16445-4	SW846 8260B	05-DEC-12 14:35	GK			V8260SL +
MC16445-4	SW846 8011	10-DEC-12 01:58	AP	10-DEC-12	NK	V8011SL
MC16445-5 Collected: 29-NOV-12 14:50 By: MMSJ Received: 03-DEC-12 By: MW-22-39						
MC16445-5	SM21 2540 B MOD.	04-DEC-12	MC			%SOL
MC16445-5	SW846 8260B	05-DEC-12 15:02	GK			V8260SL +
MC16445-5	SW846 8011	10-DEC-12 02:23	AP	10-DEC-12	NK	V8011SL
MC16445-6 Collected: 29-NOV-12 00:00 By: MMSJ Received: 03-DEC-12 By: TRIP BLANK						
MC16445-6	SW846 8260B	13-DEC-12 19:02	DFT			V8260SL +
MC16445-6	SW846 8011	13-DEC-12 21:17	AP	13-DEC-12	BJ	V8011SL

# SGS Accutest Internal Chain of Custody

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/03/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16445-1.1	Walk In Ref #5	Miranda Cardullo	12/04/12 16:11	Retrieve from Storage
MC16445-1.1	Miranda Cardullo	Walk In Ref #5	12/04/12 16:47	Return to Storage
MC16445-1.1	Walk In Ref #5	Michael Rolo	12/07/12 09:01	Retrieve from Storage
MC16445-1.1	Michael Rolo	Walk In Ref #5	12/07/12 09:01	Return to Storage
MC16445-1.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16445-1.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16445-1.1	Scott Parsick		02/13/13 11:50	Disposed
MC16445-1.3	VOC Ref #10	Amy Min Yang	12/06/12 16:01	Retrieve from Storage
MC16445-1.3	Amy Min Yang	GCMSM	12/06/12 16:01	Load on Instrument
MC16445-1.3	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16445-1.3	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16445-1.3	Scott Parsick		02/13/13 11:50	Disposed
MC16445-1.4	VOC Ref #10	Gary Krasinski	12/04/12 12:35	Retrieve from Storage
MC16445-1.4	Gary Krasinski	VOC Ref #10	12/05/12 08:45	Return to Storage
MC16445-1.4	Scott Parsick		02/13/13 11:50	Disposed
MC16445-2.1	Walk In Ref #5	Miranda Cardullo	12/04/12 16:11	Retrieve from Storage
MC16445-2.1	Miranda Cardullo	Walk In Ref #5	12/04/12 16:47	Return to Storage
MC16445-2.1	Walk In Ref #5	Michael Rolo	12/07/12 09:01	Retrieve from Storage
MC16445-2.1	Michael Rolo	Walk In Ref #5	12/07/12 09:01	Return to Storage
MC16445-2.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16445-2.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16445-2.1	Scott Parsick		02/13/13 11:50	Disposed
MC16445-2.2	VOC Ref #10	Amy Min Yang	12/06/12 16:01	Retrieve from Storage
MC16445-2.2	Amy Min Yang	GCMSM	12/06/12 16:01	Load on Instrument
MC16445-2.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16445-2.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16445-2.2	Scott Parsick		02/13/13 11:50	Disposed
MC16445-2.4	VOC Ref #10	Gary Krasinski	12/04/12 12:35	Retrieve from Storage
MC16445-2.4	Gary Krasinski	VOC Ref #10	12/05/12 08:45	Return to Storage
MC16445-2.4	Scott Parsick		02/13/13 11:50	Disposed
MC16445-3.1	Walk In Ref #5	Miranda Cardullo	12/04/12 16:11	Retrieve from Storage
MC16445-3.1	Miranda Cardullo	Walk In Ref #5	12/04/12 16:47	Return to Storage
MC16445-3.1	Walk In Ref #5	Michael Rolo	12/07/12 09:01	Retrieve from Storage
MC16445-3.1	Michael Rolo	Walk In Ref #5	12/07/12 09:01	Return to Storage
MC16445-3.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16445-3.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16445-3.1	Scott Parsick		02/13/13 11:50	Disposed

5.3  
5

# SGS Accutest Internal Chain of Custody

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/03/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16445-3.4	VOC Ref #10	Gary Krasinski	12/04/12 12:35	Retrieve from Storage
MC16445-3.4	Gary Krasinski	VOC Ref #10	12/06/12 08:47	Return to Storage
MC16445-3.4	Scott Parsick		02/13/13 11:50	Disposed
MC16445-4.1	Walk In Ref #5	Miranda Cardullo	12/04/12 16:11	Retrieve from Storage
MC16445-4.1	Miranda Cardullo	Walk In Ref #5	12/04/12 16:47	Return to Storage
MC16445-4.1	Walk In Ref #5	Michael Rolo	12/07/12 09:01	Retrieve from Storage
MC16445-4.1	Michael Rolo	Walk In Ref #5	12/07/12 09:01	Return to Storage
MC16445-4.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16445-4.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16445-4.1	Scott Parsick		02/13/13 11:50	Disposed
MC16445-4.4	VOC Ref #10	Gary Krasinski	12/04/12 12:35	Retrieve from Storage
MC16445-4.4	Gary Krasinski	VOC Ref #10	12/06/12 08:47	Return to Storage
MC16445-4.4	Scott Parsick		02/13/13 11:50	Disposed
MC16445-5.1	Walk In Ref #5	Miranda Cardullo	12/04/12 16:11	Retrieve from Storage
MC16445-5.1	Miranda Cardullo	Walk In Ref #5	12/04/12 16:47	Return to Storage
MC16445-5.1	Walk In Ref #5	Michael Rolo	12/07/12 09:01	Retrieve from Storage
MC16445-5.1	Michael Rolo	Walk In Ref #5	12/07/12 09:01	Return to Storage
MC16445-5.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16445-5.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16445-5.1	Scott Parsick		02/13/13 11:50	Disposed
MC16445-5.4	VOC Ref #10	Gary Krasinski	12/04/12 12:35	Retrieve from Storage
MC16445-5.4	Gary Krasinski	VOC Ref #10	12/06/12 08:47	Return to Storage
MC16445-5.4	Scott Parsick		02/13/13 11:50	Disposed
MC16445-6.2	VOC Ref #2	Amy Min Yang	12/13/12 15:11	Retrieve from Storage
MC16445-6.2	Amy Min Yang	GCMSH	12/13/12 15:11	Load on Instrument
MC16445-6.2	GCMSH	Jugal Patel	12/14/12 16:54	Unload from Instrument
MC16445-6.2	Jugal Patel	VOC Ref #2	12/14/12 16:54	Return to Storage
MC16445-6.2	Scott Parsick		02/13/13 11:50	Disposed
MC16445-6.3	VOC Ref #2	Bijan Jafari	12/13/12 04:39	Retrieve from Storage
MC16445-6.3	Bijan Jafari		12/14/12 17:43	Depleted

5.3  
5

**GC/MS Volatiles**

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**QC Data Summaries**

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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: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2153-MB	K65367.D	1	12/05/12	GK	n/a	n/a	MSK2153

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-3, MC16445-4, MC16445-5

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

6.1.1  
6

# Method Blank Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2153-MB	K65367.D	1	12/05/12	GK	n/a	n/a	MSK2153

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-3, MC16445-4, MC16445-5

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.1  
6

# Method Blank Summary

Job Number: MC16445  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2153-MB	K65367.D	1	12/05/12	GK	n/a	n/a	MSK2153

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-3, MC16445-4, MC16445-5

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	97% 70-130%
2037-26-5	Toluene-D8	96% 70-130%
460-00-4	4-Bromofluorobenzene	101% 70-130%

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

6.1.1  
6

# Method Blank Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1788-MB	M52739.D	1	12/06/12	AMY	n/a	n/a	MSM1788

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-1, MC16445-2

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

6.1.2  
6

# Method Blank Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1788-MB	M52739.D	1	12/06/12	AMY	n/a	n/a	MSM1788

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-1, MC16445-2

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

# Method Blank Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1788-MB	M52739.D	1	12/06/12	AMY	n/a	n/a	MSM1788

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-1, MC16445-2

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	97% 70-130%
2037-26-5	Toluene-D8	113% 70-130%
460-00-4	4-Bromofluorobenzene	94% 70-130%

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

6.1.2  
6

# Method Blank Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1953-MB	H59206.D	1	12/13/12	DFT	n/a	n/a	MSH1953

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-6

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	

6.1.3  
6

# Method Blank Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1953-MB	H59206.D	1	12/13/12	DFT	n/a	n/a	MSH1953

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-6

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	ug/l	

## Method Blank Summary

Job Number: MC16445  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1953-MB	H59206.D	1	12/13/12	DFT	n/a	n/a	MSH1953

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-6

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	103%	70-130%
2037-26-5	Toluene-D8	101%	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	

# Blank Spike Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1953-BS	H59204.D	1	12/13/12	DFT	n/a	n/a	MSH1953

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	50	63.4	127	70-130
107-02-8	Acrolein	250	133	53* a	70-130
107-13-1	Acrylonitrile	50	43.1	86	70-130
71-43-2	Benzene	50	48.6	97	70-130
108-86-1	Bromobenzene	50	50.7	101	70-130
74-97-5	Bromochloromethane	50	51.3	103	70-130
75-27-4	Bromodichloromethane	50	57.4	115	70-130
75-25-2	Bromoform	50	56.0	112	70-130
74-83-9	Bromomethane	50	48.9	98	70-130
78-93-3	2-Butanone (MEK)	50	52.5	105	70-130
104-51-8	n-Butylbenzene	50	53.1	106	70-130
135-98-8	sec-Butylbenzene	50	54.8	110	70-130
98-06-6	tert-Butylbenzene	50	56.5	113	70-130
75-15-0	Carbon disulfide	50	51.9	104	70-130
56-23-5	Carbon tetrachloride	50	63.0	126	70-130
108-90-7	Chlorobenzene	50	50.8	102	70-130
75-00-3	Chloroethane	50	48.9	98	70-130
110-75-8	2-Chloroethyl vinyl ether	50	32.5	65* a	70-130
67-66-3	Chloroform	50	55.1	110	70-130
74-87-3	Chloromethane	50	53.6	107	70-130
95-49-8	o-Chlorotoluene	50	55.4	111	70-130
106-43-4	p-Chlorotoluene	50	57.1	114	70-130
124-48-1	Dibromochloromethane	50	51.0	102	70-130
95-50-1	1,2-Dichlorobenzene	50	53.3	107	70-130
541-73-1	1,3-Dichlorobenzene	50	54.2	108	70-130
106-46-7	1,4-Dichlorobenzene	50	49.8	100	70-130
75-71-8	Dichlorodifluoromethane	50	37.7	75	70-130
75-34-3	1,1-Dichloroethane	50	53.9	108	70-130
107-06-2	1,2-Dichloroethane	50	54.1	108	70-130
75-35-4	1,1-Dichloroethene	50	53.0	106	70-130
156-59-2	cis-1,2-Dichloroethene	50	50.7	101	70-130
156-60-5	trans-1,2-Dichloroethene	50	50.1	100	70-130
78-87-5	1,2-Dichloropropane	50	48.3	97	70-130
142-28-9	1,3-Dichloropropane	50	46.4	93	70-130
594-20-7	2,2-Dichloropropane	50	68.3	137* a	70-130
563-58-6	1,1-Dichloropropene	50	51.0	102	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1953-BS	H59204.D	1	12/13/12	DFT	n/a	n/a	MSH1953

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	49.7	99	70-130
10061-02-6	trans-1,3-Dichloropropene	50	54.1	108	70-130
123-91-1	1,4-Dioxane	250	213	85	70-130
97-63-2	Ethyl methacrylate	50	49.4	99	77-137
100-41-4	Ethylbenzene	50	49.2	98	70-130
87-68-3	Hexachlorobutadiene	50	49.6	99	70-130
591-78-6	2-Hexanone	50	53.2	106	70-130
98-82-8	Isopropylbenzene	50	55.5	111	70-130
99-87-6	p-Isopropyltoluene	50	51.7	103	70-130
1634-04-4	Methyl Tert Butyl Ether	50	51.3	103	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	45.5	91	70-130
74-95-3	Methylene bromide	50	49.3	99	70-130
75-09-2	Methylene chloride	50	52.2	104	70-130
91-20-3	Naphthalene	50	43.6	87	70-130
103-65-1	n-Propylbenzene	50	55.8	112	70-130
100-42-5	Styrene	50	51.5	103	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	61.1	122	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	50.7	101	70-130
127-18-4	Tetrachloroethene	50	46.9	94	70-130
108-88-3	Toluene	50	48.8	98	70-130
87-61-6	1,2,3-Trichlorobenzene	50	44.2	88	70-130
120-82-1	1,2,4-Trichlorobenzene	50	46.8	94	70-130
71-55-6	1,1,1-Trichloroethane	50	58.2	116	70-130
79-00-5	1,1,2-Trichloroethane	50	49.0	98	70-130
79-01-6	Trichloroethene	50	49.9	100	70-130
75-69-4	Trichlorofluoromethane	50	52.6	105	70-130
96-18-4	1,2,3-Trichloropropane	50	51.7	103	70-130
95-63-6	1,2,4-Trimethylbenzene	50	50.1	100	70-130
108-67-8	1,3,5-Trimethylbenzene	50	50.4	101	70-130
108-05-4	Vinyl Acetate	50	48.8	98	70-130
75-01-4	Vinyl chloride	50	50.9	102	70-130
	m,p-Xylene	100	102	102	70-130
95-47-6	o-Xylene	50	52.7	105	70-130
1330-20-7	Xylene (total)	150	155	103	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16445  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1953-BS	H59204.D	1	12/13/12	DFT	n/a	n/a	MSH1953

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-6

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	109%	70-130%
2037-26-5	Toluene-D8	100%	70-130%
460-00-4	4-Bromofluorobenzene	104%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2153-BS	K65364.D	1	12/05/12	GK	n/a	n/a	MSK2153
MSK2153-BSD	K65365.D	1	12/05/12	GK	n/a	n/a	MSK2153

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-3, MC16445-4, MC16445-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	2500	1780	71	1660	66* a	7	70-130/25
107-02-8	Acrolein	12500	ND	0* b	ND	0* b	nc	70-130/25
107-13-1	Acrylonitrile	2500	2360	94	2270	91	4	70-130/25
71-43-2	Benzene	2500	2490	100	2550	102	2	70-130/25
108-86-1	Bromobenzene	2500	2540	102	2600	104	2	70-130/25
74-97-5	Bromochloromethane	2500	2310	92	2300	92	0	70-130/25
75-27-4	Bromodichloromethane	2500	2570	103	2580	103	0	70-130/25
75-25-2	Bromoform	2500	2390	96	2840	114	17	70-130/25
74-83-9	Bromomethane	2500	2510	100	2340	94	7	70-130/25
78-93-3	2-Butanone (MEK)	2500	1980	79	2020	81	2	70-130/25
104-51-8	n-Butylbenzene	2500	2640	106	2630	105	0	70-130/25
135-98-8	sec-Butylbenzene	2500	2990	120	2840	114	5	70-130/25
98-06-6	tert-Butylbenzene	2500	3000	120	2830	113	6	70-130/25
75-15-0	Carbon disulfide	2500	2570	103	2620	105	2	70-130/25
56-23-5	Carbon tetrachloride	2500	2460	98	2500	100	2	70-130/25
108-90-7	Chlorobenzene	2500	2590	104	2880	115	11	70-130/25
75-00-3	Chloroethane	2500	2410	96	2400	96	0	70-130/25
110-75-8	2-Chloroethyl vinyl ether	2500	1260	50	1250	50	1	10-160/25
67-66-3	Chloroform	2500	2490	100	2510	100	1	70-130/25
74-87-3	Chloromethane	2500	3160	126	2750	110	14	70-130/25
95-49-8	o-Chlorotoluene	2500	2940	118	2690	108	9	70-130/25
106-43-4	p-Chlorotoluene	2500	3030	121	2800	112	8	70-130/25
124-48-1	Dibromochloromethane	2500	2500	100	2800	112	11	70-130/25
95-50-1	1,2-Dichlorobenzene	2500	2770	111	2710	108	2	70-130/25
541-73-1	1,3-Dichlorobenzene	2500	2740	110	2800	112	2	70-130/25
106-46-7	1,4-Dichlorobenzene	2500	2570	103	2550	102	1	70-130/25
75-71-8	Dichlorodifluoromethane	2500	2070	83	1890	76	9	70-130/25
75-34-3	1,1-Dichloroethane	2500	2520	101	2550	102	1	70-130/25
107-06-2	1,2-Dichloroethane	2500	2560	102	2510	100	2	70-130/25
75-35-4	1,1-Dichloroethene	2500	2530	101	2590	104	2	70-130/25
156-59-2	cis-1,2-Dichloroethene	2500	2360	94	2380	95	1	70-130/25
156-60-5	trans-1,2-Dichloroethene	2500	2350	94	2370	95	1	70-130/25
78-87-5	1,2-Dichloropropane	2500	2510	100	2550	102	2	70-130/25
142-28-9	1,3-Dichloropropane	2500	2570	103	2660	106	3	70-130/25
594-20-7	2,2-Dichloropropane	2500	2530	101	2560	102	1	70-130/25
563-58-6	1,1-Dichloropropene	2500	2560	102	2610	104	2	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2153-BS	K65364.D	1	12/05/12	GK	n/a	n/a	MSK2153
MSK2153-BSD	K65365.D	1	12/05/12	GK	n/a	n/a	MSK2153

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-3, MC16445-4, MC16445-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	2500	2530	101	2510	100	1	70-130/25
10061-02-6	trans-1,3-Dichloropropene	2500	2710	108	2620	105	3	70-130/25
123-91-1	1,4-Dioxane	12500	13100	105	14100	113	7	70-130/25
97-63-2	Ethyl methacrylate	2500	2560	102	2290	92	11	76-141/25
100-41-4	Ethylbenzene	2500	2560	102	2670	107	4	70-130/25
87-68-3	Hexachlorobutadiene	2500	2840	114	2830	113	0	70-130/25
591-78-6	2-Hexanone	2500	2170	87	2090	84	4	70-130/25
98-82-8	Isopropylbenzene	2500	2960	118	2880	115	3	70-130/25
99-87-6	p-Isopropyltoluene	2500	2850	114	2770	111	3	70-130/25
1634-04-4	Methyl Tert Butyl Ether	2500	2530	101	2520	101	0	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	2360	94	2270	91	4	70-130/25
74-95-3	Methylene bromide	2500	2530	101	2490	100	2	70-130/25
75-09-2	Methylene chloride	2500	2510	100	2560	102	2	70-130/25
91-20-3	Naphthalene	2500	2320	93	2160	86	7	70-130/25
103-65-1	n-Propylbenzene	2500	3010	120	2760	110	9	70-130/25
100-42-5	Styrene	2500	2460	98	2610	104	6	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	2500	2470	99	2840	114	14	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	2500	2780	111	2350	94	17	70-130/25
127-18-4	Tetrachloroethene	2500	2280	91	2750	110	19	70-130/25
108-88-3	Toluene	2500	2510	100	2430	97	3	70-130/25
87-61-6	1,2,3-Trichlorobenzene	2500	2340	94	2230	89	5	70-130/25
120-82-1	1,2,4-Trichlorobenzene	2500	2530	101	2430	97	4	70-130/25
71-55-6	1,1,1-Trichloroethane	2500	2520	101	2520	101	0	70-130/25
79-00-5	1,1,2-Trichloroethane	2500	2500	100	2350	94	6	70-130/25
79-01-6	Trichloroethene	2500	2460	98	2490	100	1	70-130/25
75-69-4	Trichlorofluoromethane	2500	2440	98	2470	99	1	70-130/25
96-18-4	1,2,3-Trichloropropane	2500	2780	111	2350	94	17	70-130/25
95-63-6	1,2,4-Trimethylbenzene	2500	2760	110	2610	104	6	70-130/25
108-67-8	1,3,5-Trimethylbenzene	2500	2700	108	2590	104	4	70-130/25
108-05-4	Vinyl Acetate	2500	2310	92	2260	90	2	70-130/25
75-01-4	Vinyl chloride	2500	2650	106	2440	98	8	70-130/25
	m,p-Xylene	5000	5270	105	5730	115	8	70-130/25
95-47-6	o-Xylene	2500	2770	111	2950	118	6	70-130/25
1330-20-7	Xylene (total)	7500	8050	107	8680	116	8	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2153-BS	K65364.D	1	12/05/12	GK	n/a	n/a	MSK2153
MSK2153-BSD	K65365.D	1	12/05/12	GK	n/a	n/a	MSK2153

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-3, MC16445-4, MC16445-5

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	98%	98%	70-130%
2037-26-5	Toluene-D8	101%	100%	70-130%
460-00-4	4-Bromofluorobenzene	112%	104%	70-130%

- (a) Outside control limits. Blank Spike meets program technical requirements.
- (b) Outside control limits due standard degradation. Refer to Continuing Calibration.

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1788-BS	M52736.D	1	12/06/12	AMY	n/a	n/a	MSM1788
MSM1788-BSD	M52737.D	1	12/06/12	AMY	n/a	n/a	MSM1788

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-1, MC16445-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	29.2	58* a	30.4	61* a	4	70-130/25
107-02-8	Acrolein	250	109	44* a	114	46* a	4	70-130/25
107-13-1	Acrylonitrile	50	46.5	93	48.3	97	4	70-130/25
71-43-2	Benzene	50	46.1	92	47.7	95	3	70-130/25
108-86-1	Bromobenzene	50	42.1	84	44.1	88	5	70-130/25
74-97-5	Bromochloromethane	50	42.1	84	43.4	87	3	70-130/25
75-27-4	Bromodichloromethane	50	43.9	88	45.2	90	3	70-130/25
75-25-2	Bromoform	50	39.9	80	41.1	82	3	70-130/25
74-83-9	Bromomethane	50	46.2	92	47.7	95	3	70-130/25
78-93-3	2-Butanone (MEK)	50	37.6	75	40.6	81	8	70-130/25
104-51-8	n-Butylbenzene	50	48.4	97	49.6	99	2	70-130/25
135-98-8	sec-Butylbenzene	50	47.2	94	49.3	99	4	70-130/25
98-06-6	tert-Butylbenzene	50	47.3	95	49.7	99	5	70-130/25
75-15-0	Carbon disulfide	50	51.5	103	53.7	107	4	70-130/25
56-23-5	Carbon tetrachloride	50	50.9	102	52.7	105	3	70-130/25
108-90-7	Chlorobenzene	50	41.9	84	43.7	87	4	70-130/25
75-00-3	Chloroethane	50	48.7	97	50.1	100	3	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	44.2	88	43.6	87	1	10-160/25
67-66-3	Chloroform	50	45.6	91	47.5	95	4	70-130/25
74-87-3	Chloromethane	50	51.0	102	53.1	106	4	70-130/25
95-49-8	o-Chlorotoluene	50	42.9	86	44.4	89	3	70-130/25
106-43-4	p-Chlorotoluene	50	42.9	86	44.4	89	3	70-130/25
124-48-1	Dibromochloromethane	50	41.1	82	43.5	87	6	70-130/25
95-50-1	1,2-Dichlorobenzene	50	39.8	80	40.5	81	2	70-130/25
541-73-1	1,3-Dichlorobenzene	50	40.4	81	41.6	83	3	70-130/25
106-46-7	1,4-Dichlorobenzene	50	40.5	81	41.7	83	3	70-130/25
75-71-8	Dichlorodifluoromethane	50	48.4	97	51.5	103	6	70-130/25
75-34-3	1,1-Dichloroethane	50	46.9	94	49.3	99	5	70-130/25
107-06-2	1,2-Dichloroethane	50	40.8	82	42.7	85	5	70-130/25
75-35-4	1,1-Dichloroethene	50	51.9	104	55.3	111	6	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	44.5	89	46.6	93	5	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	46.9	94	50.2	100	7	70-130/25
78-87-5	1,2-Dichloropropane	50	43.3	87	45.3	91	5	70-130/25
142-28-9	1,3-Dichloropropane	50	40.7	81	43.2	86	6	70-130/25
594-20-7	2,2-Dichloropropane	50	49.9	100	51.5	103	3	70-130/25
563-58-6	1,1-Dichloropropene	50	50.9	102	53.4	107	5	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1788-BS	M52736.D	1	12/06/12	AMY	n/a	n/a	MSM1788
MSM1788-BSD	M52737.D	1	12/06/12	AMY	n/a	n/a	MSM1788

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-1, MC16445-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	50	41.5	83	44.1	88	6	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	43.3	87	46.2	92	6	70-130/25
123-91-1	1,4-Dioxane	250	260	104	266	106	2	70-130/25
97-63-2	Ethyl methacrylate	50	47.0	94	49.2	98	5	76-141/25
100-41-4	Ethylbenzene	50	47.1	94	49.7	99	5	70-130/25
87-68-3	Hexachlorobutadiene	50	48.9	98	49.8	100	2	70-130/25
591-78-6	2-Hexanone	50	54.0	108	54.9	110	2	70-130/25
98-82-8	Isopropylbenzene	50	47.0	94	49.2	98	5	70-130/25
99-87-6	p-Isopropyltoluene	50	49.6	99	51.1	102	3	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	38.7	77	40.5	81	5	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	50.5	101	52.1	104	3	70-130/25
74-95-3	Methylene bromide	50	41.6	83	42.9	86	3	70-130/25
75-09-2	Methylene chloride	50	41.8	84	43.0	86	3	70-130/25
91-20-3	Naphthalene	50	48.8	98	48.1	96	1	70-130/25
103-65-1	n-Propylbenzene	50	46.2	92	47.7	95	3	70-130/25
100-42-5	Styrene	50	43.4	87	45.8	92	5	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	43.4	87	44.4	89	2	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	42.3	85	42.9	86	1	70-130/25
127-18-4	Tetrachloroethene	50	48.5	97	51.9	104	7	70-130/25
108-88-3	Toluene	50	48.3	97	51.2	102	6	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	40.2	80	39.9	80	1	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	40.0	80	40.1	80	0	70-130/25
71-55-6	1,1,1-Trichloroethane	50	50.2	100	52.7	105	5	70-130/25
79-00-5	1,1,2-Trichloroethane	50	41.3	83	43.4	87	5	70-130/25
79-01-6	Trichloroethene	50	47.8	96	50.8	102	6	70-130/25
75-69-4	Trichlorofluoromethane	50	52.0	104	54.5	109	5	70-130/25
96-18-4	1,2,3-Trichloropropane	50	44.3	89	45.2	90	2	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	45.7	91	47.5	95	4	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	46.6	93	48.4	97	4	70-130/25
108-05-4	Vinyl Acetate	50	29.0	58* a	27.9	56* a	4	70-130/25
75-01-4	Vinyl chloride	50	47.8	96	49.7	99	4	70-130/25
	m,p-Xylene	100	92.2	92	97.7	98	6	70-130/25
95-47-6	o-Xylene	50	45.1	90	47.1	94	4	70-130/25
1330-20-7	Xylene (total)	150	137	91	145	97	6	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1788-BS	M52736.D	1	12/06/12	AMY	n/a	n/a	MSM1788
MSM1788-BSD	M52737.D	1	12/06/12	AMY	n/a	n/a	MSM1788

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-1, MC16445-2

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	101%	101%	70-130%
2037-26-5	Toluene-D8	113%	115%	70-130%
460-00-4	4-Bromofluorobenzene	97%	96%	70-130%

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

\* = Outside of Control Limits.

6.3.2  
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# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB20375-3MS	K65378.D	1	12/05/12	GK	n/a	n/a	MSK2153
JB20375-3MSD	K65379.D	1	12/05/12	GK	n/a	n/a	MSK2153
JB20375-3 <sup>a</sup>	K65373.D	1	12/05/12	GK	n/a	n/a	MSK2153

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-3, MC16445-4, MC16445-5

CAS No.	Compound	JB20375-3 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
67-64-1	Acetone	ND		3110	1730	56* <sup>b</sup>	3110	1910	61* <sup>b</sup>	10	70-130/30
107-02-8	Acrolein	ND		15500	ND	0* <sup>c</sup>	15500	ND	0* <sup>c</sup>	nc	70-130/30
107-13-1	Acrylonitrile	ND		3110	2450	79	3110	2360	76	4	70-130/30
71-43-2	Benzene	ND		3110	2860	92	3110	2940	95	3	70-130/30
108-86-1	Bromobenzene	ND		3110	3260	105	3110	3340	107	2	70-130/30
74-97-5	Bromochloromethane	ND		3110	2790	90	3110	2830	91	1	70-130/30
75-27-4	Bromodichloromethane	ND		3110	3040	98	3110	3090	99	2	70-130/30
75-25-2	Bromoform	ND		3110	3570	115	3110	3590	116	1	70-130/30
74-83-9	Bromomethane	ND		3110	2850	92	3110	2960	95	4	70-130/30
78-93-3	2-Butanone (MEK)	ND		3110	1960	63* <sup>b</sup>	3110	2040	66* <sup>b</sup>	4	70-130/30
104-51-8	n-Butylbenzene	88.2	J	3110	3290	103	3110	3440	108	4	70-130/30
135-98-8	sec-Butylbenzene	43.6	J	3110	3560	113	3110	3720	118	4	70-130/30
98-06-6	tert-Butylbenzene	ND		3110	3580	115	3110	3720	120	4	70-130/30
75-15-0	Carbon disulfide	ND		3110	2850	92	3110	2900	93	2	70-130/30
56-23-5	Carbon tetrachloride	ND		3110	3210	103	3110	3280	106	2	70-130/30
108-90-7	Chlorobenzene	ND		3110	3540	114	3110	3630	117	3	70-130/30
75-00-3	Chloroethane	ND		3110	2650	85	3110	2640	85	0	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND		3110	1350	43	3110	1410	45	4	10-160/30
67-66-3	Chloroform	ND		3110	2770	89	3110	2840	91	2	70-130/30
74-87-3	Chloromethane	ND		3110	3410	110	3110	3450	111	1	70-130/30
95-49-8	o-Chlorotoluene	ND		3110	3410	110	3110	3480	112	2	70-130/30
106-43-4	p-Chlorotoluene	ND		3110	3520	113	3110	3630	117	3	70-130/30
124-48-1	Dibromochloromethane	ND		3110	3550	114	3110	3560	115	0	70-130/30
95-50-1	1,2-Dichlorobenzene	ND		3110	3400	109	3110	3460	111	2	70-130/30
541-73-1	1,3-Dichlorobenzene	ND		3110	3470	112	3110	3600	116	4	70-130/30
106-46-7	1,4-Dichlorobenzene	ND		3110	3180	102	3110	3290	106	3	70-130/30
75-71-8	Dichlorodifluoromethane	ND		3110	2430	78	3110	2490	80	2	70-130/30
75-34-3	1,1-Dichloroethane	ND		3110	2690	87	3110	2710	87	1	70-130/30
107-06-2	1,2-Dichloroethane	ND		3110	2850	92	3110	2960	95	4	70-130/30
75-35-4	1,1-Dichloroethene	ND		3110	2970	96	3110	3080	99	4	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND		3110	2720	88	3110	2790	90	3	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND		3110	2670	86	3110	2800	90	5	70-130/30
78-87-5	1,2-Dichloropropane	ND		3110	2770	89	3110	2910	94	5	70-130/30
142-28-9	1,3-Dichloropropane	ND		3110	3140	101	3110	3160	102	1	70-130/30
594-20-7	2,2-Dichloropropane	ND		3110	2810	90	3110	2870	92	2	70-130/30
563-58-6	1,1-Dichloropropene	ND		3110	2910	94	3110	3030	98	4	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB20375-3MS	K65378.D	1	12/05/12	GK	n/a	n/a	MSK2153
JB20375-3MSD	K65379.D	1	12/05/12	GK	n/a	n/a	MSK2153
JB20375-3 <sup>a</sup>	K65373.D	1	12/05/12	GK	n/a	n/a	MSK2153

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-3, MC16445-4, MC16445-5

CAS No.	Compound	JB20375-3 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
10061-01-5	cis-1,3-Dichloropropene	ND		3110	2890	93	3110	2890	93	0	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		3110	3070	99	3110	3110	100	1	70-130/30
123-91-1	1,4-Dioxane	ND		15500	12700	82	15500	15900	102	22	70-130/30
97-63-2	Ethyl methacrylate	ND		3110	2810	90	3110	2870	92	2	41-160/30
100-41-4	Ethylbenzene	ND		3110	3360	108	3110	3460	111	3	70-130/30
87-68-3	Hexachlorobutadiene	ND		3110	3500	113	3110	3620	117	3	70-130/30
591-78-6	2-Hexanone	ND		3110	2440	79	3110	2540	82	4	70-130/30
98-82-8	Isopropylbenzene	ND		3110	3550	114	3110	3690	119	4	70-130/30
99-87-6	p-Isopropyltoluene	51.9	J	3110	3460	110	3110	3550	113	3	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		3110	2800	90	3110	2760	89	1	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		3110	2450	79	3110	2540	82	4	70-130/30
74-95-3	Methylene bromide	ND		3110	2960	95	3110	2970	96	0	70-130/30
75-09-2	Methylene chloride	ND		3110	2820	91	3110	2840	91	1	70-130/30
91-20-3	Naphthalene	88.5	J	3110	2840	89	3110	2890	90	2	70-130/30
103-65-1	n-Propylbenzene	ND		3110	3480	112	3110	3590	116	3	70-130/30
100-42-5	Styrene	ND		3110	3270	105	3110	3360	108	3	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		3110	3560	115	3110	3640	117	2	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		3110	3110	100	3110	3140	101	1	70-130/30
127-18-4	Tetrachloroethene	ND		3110	3380	109	3110	3510	113	4	70-130/30
108-88-3	Toluene	ND		3110	3010	97	3110	3080	99	2	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		3110	2700	87	3110	2790	90	3	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		3110	2940	95	3110	3030	98	3	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		3110	2920	94	3110	2960	95	1	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		3110	2810	90	3110	2860	92	2	70-130/30
79-01-6	Trichloroethene	ND		3110	2970	96	3110	3010	97	1	70-130/30
75-69-4	Trichlorofluoromethane	ND		3110	2880	93	3110	2980	96	3	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		3110	2990	96	3110	3000	97	0	70-130/30
95-63-6	1,2,4-Trimethylbenzene	58.0	J	3110	3270	103	3110	3420	108	4	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		3110	3210	103	3110	3350	108	4	70-130/30
108-05-4	Vinyl Acetate	ND		3110	2280	73	3110	2300	74	1	70-130/30
75-01-4	Vinyl chloride	ND		3110	3500	113	3110	3320	107	5	70-130/30
	m,p-Xylene	ND		6210	7130	115	6210	7310	118	2	70-130/30
95-47-6	o-Xylene	ND		3110	3670	118	3110	3750	121	2	70-130/30
1330-20-7	Xylene (total)	ND		9320	10800	116	9320	11100	119	3	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB20375-3MS	K65378.D	1	12/05/12	GK	n/a	n/a	MSK2153
JB20375-3MSD	K65379.D	1	12/05/12	GK	n/a	n/a	MSK2153
JB20375-3 <sup>a</sup>	K65373.D	1	12/05/12	GK	n/a	n/a	MSK2153

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-3, MC16445-4, MC16445-5

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CAS No.	Surrogate Recoveries	MS	MSD	JB20375-3	Limits
1868-53-7	Dibromofluoromethane	95%	97%	101%	70-130%
2037-26-5	Toluene-D8	100%	101%	104%	70-130%
460-00-4	4-Bromofluorobenzene	104%	105%	108%	70-130%

- (a) Sample analyzed past recommended hold time.
- (b) Outside control limits due to possible matrix interference. Refer to Blank Spike.
- (c) Outside control limits due standard degradation. Refer to Continuing Calibration.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16395-2MS	M52748.D	1	12/06/12	AMY	n/a	n/a	MSM1788
MC16395-2MSD	M52749.D	1	12/06/12	AMY	n/a	n/a	MSM1788
MC16395-2	M52747.D	1	12/06/12	AMY	n/a	n/a	MSM1788

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-1, MC16445-2

CAS No.	Compound	MC16395-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	53	60.2	114	50.7	64.4	127	7	70-130/30
107-02-8	Acrolein	ND	265	124	47* a	253	126	50* a	2	70-130/30
107-13-1	Acrylonitrile	ND	53	69.3	131* b	50.7	69.4	137* b	0	70-130/30
71-43-2	Benzene	ND	53	52.4	99	50.7	48.2	95	8	70-130/30
108-86-1	Bromobenzene	ND	53	47.3	89	50.7	42.1	83	12	70-130/30
74-97-5	Bromochloromethane	ND	53	55.8	105	50.7	52.5	104	6	70-130/30
75-27-4	Bromodichloromethane	ND	53	53.8	101	50.7	52.0	103	3	70-130/30
75-25-2	Bromoform	ND	53	56.6	107	50.7	55.2	109	3	70-130/30
74-83-9	Bromomethane	ND	53	53.3	101	50.7	49.3	97	8	70-130/30
78-93-3	2-Butanone (MEK)	ND	53	64.6	122	50.7	67.7	134* a	5	70-130/30
104-51-8	n-Butylbenzene	ND	53	45.0	85	50.7	35.3	70	24	70-130/30
135-98-8	sec-Butylbenzene	ND	53	43.7	82	50.7	35.8	71	20	70-130/30
98-06-6	tert-Butylbenzene	ND	53	42.8	81	50.7	37.5	74	13	70-130/30
75-15-0	Carbon disulfide	ND	53	55.7	105	50.7	49.6	98	12	70-130/30
56-23-5	Carbon tetrachloride	ND	53	52.9	100	50.7	48.0	95	10	70-130/30
108-90-7	Chlorobenzene	ND	53	47.2	89	50.7	41.8	83	12	70-130/30
75-00-3	Chloroethane	ND	53	54.1	102	50.7	50.0	99	8	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	53	39.9	75	50.7	38.5	76	4	10-160/30
67-66-3	Chloroform	ND	53	52.8	100	50.7	49.3	97	7	70-130/30
74-87-3	Chloromethane	ND	53	60.0	113	50.7	55.1	109	9	70-130/30
95-49-8	o-Chlorotoluene	ND	53	43.0	81	50.7	37.0	73	15	70-130/30
106-43-4	p-Chlorotoluene	ND	53	43.6	82	50.7	37.5	74	15	70-130/30
124-48-1	Dibromochloromethane	ND	53	55.7	105	50.7	52.6	104	6	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	53	41.0	77	50.7	35.7	70	14	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	53	41.6	78	50.7	35.3	70	16	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	53	42.0	79	50.7	36.6	72	14	70-130/30
75-71-8	Dichlorodifluoromethane	ND	53	55.8	105	50.7	50.3	99	10	70-130/30
75-34-3	1,1-Dichloroethane	ND	53	53.2	100	50.7	48.3	95	10	70-130/30
107-06-2	1,2-Dichloroethane	ND	53	54.2	102	50.7	51.6	102	5	70-130/30
75-35-4	1,1-Dichloroethene	ND	53	57.5	108	50.7	52.1	103	10	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	53	51.9	98	50.7	48.8	96	6	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	53	52.8	100	50.7	48.0	95	10	70-130/30
78-87-5	1,2-Dichloropropane	ND	53	52.3	99	50.7	50.5	100	4	70-130/30
142-28-9	1,3-Dichloropropane	ND	53	54.9	104	50.7	52.9	104	4	70-130/30
594-20-7	2,2-Dichloropropane	ND	53	53.0	100	50.7	48.3	95	9	70-130/30
563-58-6	1,1-Dichloropropene	ND	53	54.3	102	50.7	48.4	96	11	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16395-2MS	M52748.D	1	12/06/12	AMY	n/a	n/a	MSM1788
MC16395-2MSD	M52749.D	1	12/06/12	AMY	n/a	n/a	MSM1788
MC16395-2	M52747.D	1	12/06/12	AMY	n/a	n/a	MSM1788

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-1, MC16445-2

CAS No.	Compound	MC16395-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	53	51.0	96	50.7	48.7	96	5	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	53	56.2	106	50.7	54.0	107	4	70-130/30
123-91-1	1,4-Dioxane	ND	265	406	153* a	253	393	155* a	3	70-130/30
97-63-2	Ethyl methacrylate	ND	53	64.7	122	50.7	64.0	126	1	41-160/30
100-41-4	Ethylbenzene	ND	53	49.5	93	50.7	43.6	86	13	70-130/30
87-68-3	Hexachlorobutadiene	ND	53	45.6	86	50.7	32.9	65* a	32* c	70-130/30
591-78-6	2-Hexanone	ND	53	74.0	140* a	50.7	78.4	155* a	6	70-130/30
98-82-8	Isopropylbenzene	ND	53	45.6	86	50.7	39.4	78	15	70-130/30
99-87-6	p-Isopropyltoluene	ND	53	46.7	88	50.7	38.5	76	19	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	53	51.1	96	50.7	50.4	99	1	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	53	71.0	134* a	50.7	75.5	149* a	6	70-130/30
74-95-3	Methylene bromide	ND	53	57.3	108	50.7	55.9	110	2	70-130/30
75-09-2	Methylene chloride	ND	53	49.9	94	50.7	47.4	94	5	70-130/30
91-20-3	Naphthalene	ND	53	46.6	88	50.7	42.5	84	9	70-130/30
103-65-1	n-Propylbenzene	ND	53	43.9	83	50.7	37.2	73	17	70-130/30
100-42-5	Styrene	ND	53	48.0	91	50.7	42.2	83	13	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	53	50.7	96	50.7	47.0	93	8	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	53	58.2	110	50.7	58.0	114	0	70-130/30
127-18-4	Tetrachloroethene	ND	53	52.2	98	50.7	45.1	89	15	70-130/30
108-88-3	Toluene	ND	53	52.9	100	50.7	48.3	95	9	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	53	39.2	74	50.7	31.9	63* a	21	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	53	40.3	76	50.7	31.7	63* a	24	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	53	53.8	101	50.7	48.6	96	10	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	53	56.1	106	50.7	55.8	110	1	70-130/30
79-01-6	Trichloroethene	ND	53	53.5	101	50.7	48.4	96	10	70-130/30
75-69-4	Trichlorofluoromethane	ND	53	55.5	105	50.7	50.9	100	9	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	53	61.7	116	50.7	61.2	121	1	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	53	44.6	84	50.7	38.4	76	15	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	53	45.1	85	50.7	37.9	75	17	70-130/30
108-05-4	Vinyl Acetate	ND	53	44.8	85	50.7	41.0	81	9	70-130/30
75-01-4	Vinyl chloride	ND	53	51.7	98	50.7	47.3	93	9	70-130/30
	m,p-Xylene	ND	106	96.6	91	101	84.9	84	13	70-130/30
95-47-6	o-Xylene	ND	53	47.0	89	50.7	42.3	84	11	70-130/30
1330-20-7	Xylene (total)	ND	159	144	91	152	127	84	13	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16395-2MS	M52748.D	1	12/06/12	AMY	n/a	n/a	MSM1788
MC16395-2MSD	M52749.D	1	12/06/12	AMY	n/a	n/a	MSM1788
MC16395-2	M52747.D	1	12/06/12	AMY	n/a	n/a	MSM1788

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-1, MC16445-2

CAS No.	Surrogate Recoveries	MS	MSD	MC16395-2	Limits
1868-53-7	Dibromofluoromethane	99%	99%	100%	70-130%
2037-26-5	Toluene-D8	112%	114%	113%	70-130%
460-00-4	4-Bromofluorobenzene	96%	96%	95%	70-130%

- (a) Outside control limits due to possible matrix interference. Refer to Blank Spike.
- (b) Outside control limits. Associated samples are non-detect for this compound.
- (c) High RPD due to possible matrix interference and/or sample non-homogeneity.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16569-2MS	H59213.D	5	12/13/12	DFT	n/a	n/a	MSH1953
MC16569-2MSD	H59214.D	5	12/13/12	DFT	n/a	n/a	MSH1953
MC16569-2	H59212.D	1	12/13/12	DFT	n/a	n/a	MSH1953

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-6

CAS No.	Compound	MC16569-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	7.4	250	173	66* a	250	172	66* a	1	70-130/30
107-02-8	Acrolein	ND	1250	428	34* b	1250	426	34* b	0	70-130/30
107-13-1	Acrylonitrile	ND	250	189	76	250	177	71	7	70-130/30
71-43-2	Benzene	ND	250	225	90	250	217	87	4	70-130/30
108-86-1	Bromobenzene	ND	250	235	94	250	225	90	4	70-130/30
74-97-5	Bromochloromethane	ND	250	237	95	250	230	92	3	70-130/30
75-27-4	Bromodichloromethane	ND	250	245	98	250	238	95	3	70-130/30
75-25-2	Bromoform	ND	250	205	82	250	210	84	2	70-130/30
74-83-9	Bromomethane	ND	250	234	94	250	224	90	4	70-130/30
78-93-3	2-Butanone (MEK)	ND	250	219	88	250	200	80	9	70-130/30
104-51-8	n-Butylbenzene	ND	250	239	96	250	227	91	5	70-130/30
135-98-8	sec-Butylbenzene	ND	250	250	100	250	238	95	5	70-130/30
98-06-6	tert-Butylbenzene	ND	250	258	103	250	244	98	6	70-130/30
75-15-0	Carbon disulfide	ND	250	215	86	250	208	83	3	70-130/30
56-23-5	Carbon tetrachloride	ND	250	277	111	250	274	110	1	70-130/30
108-90-7	Chlorobenzene	ND	250	236	94	250	230	92	3	70-130/30
75-00-3	Chloroethane	ND	250	238	95	250	229	92	4	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	250	74.4	30* b	250	71.6	29* b	4	70-130/30
67-66-3	Chloroform	ND	250	246	98	250	237	95	4	70-130/30
74-87-3	Chloromethane	ND	250	264	106	250	248	99	6	70-130/30
95-49-8	o-Chlorotoluene	ND	250	250	100	250	240	96	4	70-130/30
106-43-4	p-Chlorotoluene	ND	250	260	104	250	246	98	6	70-130/30
124-48-1	Dibromochloromethane	ND	250	214	86	250	213	85	0	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	250	241	96	250	233	93	3	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	250	249	100	250	234	94	6	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	250	224	90	250	214	86	5	70-130/30
75-71-8	Dichlorodifluoromethane	ND	250	187	75	250	177	71	5	70-130/30
75-34-3	1,1-Dichloroethane	ND	250	249	100	250	239	96	4	70-130/30
107-06-2	1,2-Dichloroethane	ND	250	236	94	250	232	93	2	70-130/30
75-35-4	1,1-Dichloroethene	ND	250	254	102	250	243	97	4	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	250	232	93	250	228	91	2	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	250	236	94	250	224	90	5	70-130/30
78-87-5	1,2-Dichloropropane	ND	250	224	90	250	219	88	2	70-130/30
142-28-9	1,3-Dichloropropane	ND	250	218	87	250	216	86	1	70-130/30
594-20-7	2,2-Dichloropropane	ND	250	304	122	250	292	117	4	70-130/30
563-58-6	1,1-Dichloropropene	ND	250	243	97	250	235	94	3	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16569-2MS	H59213.D	5	12/13/12	DFT	n/a	n/a	MSH1953
MC16569-2MSD	H59214.D	5	12/13/12	DFT	n/a	n/a	MSH1953
MC16569-2	H59212.D	1	12/13/12	DFT	n/a	n/a	MSH1953

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-6

CAS No.	Compound	MC16569-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	250	226	90	250	223	89	1	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	250	244	98	250	239	96	2	70-130/30
123-91-1	1,4-Dioxane	ND	1250	1080	86	1250	989	79	9	70-130/30
97-63-2	Ethyl methacrylate	ND	250	219	88	250	211	84	4	72-139/30
100-41-4	Ethylbenzene	ND	250	233	93	250	226	90	3	70-130/30
87-68-3	Hexachlorobutadiene	ND	250	214	86	250	206	82	4	70-130/30
591-78-6	2-Hexanone	ND	250	216	86	250	205	82	5	70-130/30
98-82-8	Isopropylbenzene	ND	250	259	104	250	242	97	7	70-130/30
99-87-6	p-Isopropyltoluene	ND	250	235	94	250	221	88	6	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	250	228	91	250	225	90	1	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	209	84	250	202	81	3	70-130/30
74-95-3	Methylene bromide	ND	250	225	90	250	218	87	3	70-130/30
75-09-2	Methylene chloride	ND	250	236	94	250	235	94	0	70-130/30
91-20-3	Naphthalene	ND	250	185	74	250	187	75	1	70-130/30
103-65-1	n-Propylbenzene	ND	250	260	104	250	244	98	6	70-130/30
100-42-5	Styrene	ND	250	214	86	250	211	84	1	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	274	110	250	274	110	0	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	237	95	250	229	92	3	70-130/30
127-18-4	Tetrachloroethene	ND	250	225	90	250	216	86	4	70-130/30
108-88-3	Toluene	ND	250	224	90	250	218	87	3	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	250	180	72	250	185	74	3	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	250	196	78	250	196	78	0	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	250	260	104	250	254	102	2	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	250	227	91	250	220	88	3	70-130/30
79-01-6	Trichloroethene	ND	250	226	90	250	221	88	2	70-130/30
75-69-4	Trichlorofluoromethane	ND	250	247	99	250	236	94	5	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	250	229	92	250	223	89	3	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	250	228	91	250	218	87	4	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	250	227	91	250	217	87	5	70-130/30
108-05-4	Vinyl Acetate	ND	250	214	86	250	207	83	3	70-130/30
75-01-4	Vinyl chloride	ND	250	255	102	250	230	92	10	70-130/30
	m,p-Xylene	ND	500	470	94	500	457	91	3	70-130/30
95-47-6	o-Xylene	ND	250	245	98	250	240	96	2	70-130/30
1330-20-7	Xylene (total)	ND	750	715	95	750	697	93	3	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16569-2MS	H59213.D	5	12/13/12	DFT	n/a	n/a	MSH1953
MC16569-2MSD	H59214.D	5	12/13/12	DFT	n/a	n/a	MSH1953
MC16569-2	H59212.D	1	12/13/12	DFT	n/a	n/a	MSH1953

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16445-6

CAS No.	Surrogate Recoveries	MS	MSD	MC16569-2	Limits
1868-53-7	Dibromofluoromethane	105%	105%	100%	70-130%
2037-26-5	Toluene-D8	98%	100%	100%	70-130%
460-00-4	4-Bromofluorobenzene	105%	104%	104%	70-130%

- (a) Outside control limits due to possible matrix interference. Refer to Blank Spike.
- (b) Outside control limits. Blank Spike meets program technical requirements.

\* = Outside of Control Limits.

# Volatile Internal Standard Area Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSH1953-CC1910	Injection Date:	12/13/12
Lab File ID:	H59203.D	Injection Time:	11:52
Instrument ID:	GCMSH	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	224682	8.70	332183	9.57	150248	12.83	172667	15.40	45837	6.28
Upper Limit <sup>a</sup>	449364	9.20	664366	10.07	300496	13.33	345334	15.90	91674	6.78
Lower Limit <sup>b</sup>	112341	8.20	166092	9.07	75124	12.33	86334	14.90	22919	5.78

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSH1953-BS	222524	8.70	327495	9.57	151033	12.83	170912	15.40	47356	6.27
MSH1953-MB	207079	8.71	298050	9.57	129633	12.83	148786	15.40	45719	6.29
ZZZZZZ	194018	8.71	279846	9.57	119400	12.83	136486	15.40	36918	6.28
ZZZZZZ	203303	8.70	285246	9.57	126532	12.83	142714	15.40	40816	6.28
ZZZZZZ	196015	8.71	278630	9.57	120529	12.83	139831	15.40	38593	6.28
ZZZZZZ	229931	8.70	328951	9.57	148901	12.83	188496	15.40	76048	6.28
MC16569-2	228680	8.70	332076	9.57	145327	12.83	166675	15.40	49182	6.28
MC16569-2MS	248836	8.70	368613	9.57	166743	12.83	186150	15.40	52559	6.28
MC16569-2MSD	247308	8.70	362659	9.57	162987	12.83	188783	15.40	51131	6.27
ZZZZZZ	223993	8.70	318160	9.57	137701	12.83	155844	15.40	48952	6.28
ZZZZZZ	212287	8.71	296514	9.57	128966	12.83	146781	15.40	43890	6.28
ZZZZZZ	208428	8.71	298995	9.57	129271	12.83	144661	15.40	42588	6.28
MC16445-6	208113	8.70	290423	9.57	126590	12.83	146448	15.40	42428	6.28
ZZZZZZ	203453	8.71	286230	9.57	122893	12.83	138541	15.40	41791	6.28
ZZZZZZ	194450	8.70	273711	9.57	120449	12.83	133966	15.40	39516	6.28
ZZZZZZ	220137	8.71	308469	9.57	140224	12.83	162501	15.40	47238	6.27
ZZZZZZ	228068	8.70	331661	9.57	141919	12.83	156927	15.40	41594	6.28
ZZZZZZ	208725	8.70	291735	9.57	126591	12.83	145235	15.40	42151	6.28
ZZZZZZ	208661	8.70	295957	9.57	132345	12.83	168300	15.40	50912	6.28
ZZZZZZ	207090	8.71	295799	9.57	127835	12.83	144525	15.40	50773	6.27
ZZZZZZ	210203	8.70	299923	9.57	131570	12.83	171763	15.40	44164	6.27

- 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: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSK2153-CC2132	Injection Date:	12/05/12
Lab File ID:	K65363A.D	Injection Time:	08:40
Instrument ID:	GCMSK	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	123640	8.82	200301	9.67	98664	12.93	98233	15.49	34525	6.42
Upper Limit <sup>a</sup>	247280	9.32	400602	10.17	197328	13.43	196466	15.99	69050	6.92
Lower Limit <sup>b</sup>	61820	8.32	100151	9.17	49332	12.43	49117	14.99	17263	5.92

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSK2154-BS	120087	8.82	191498	9.67	94663	12.93	95702	15.49	29153	6.42
MSK2153-BS	120087	8.82	191498	9.67	94663	12.93	95702	15.49	29153	6.42

- 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 Internal Standard Area Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1788-CC1784	Injection Date:	12/06/12
Lab File ID:	M52735.D	Injection Time:	10:54
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	232644	9.36	346270	10.24	188801	13.52	186280	16.08	58853	6.86
Upper Limit <sup>a</sup>	465288	9.86	692540	10.74	377602	14.02	372560	16.58	117706	7.36
Lower Limit <sup>b</sup>	116322	8.86	173135	9.74	94401	13.02	93140	15.58	29427	6.36

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSM1788-BS	208568	9.36	312001	10.24	172544	13.52	173377	16.08	118203 <sup>c</sup>	6.86
MSM1788-BSD	213285	9.36	320005	10.24	176131	13.52	178931	16.08	125465 <sup>c</sup>	6.86
MSM1788-MB	226358	9.36	329355	10.24	177171	13.52	182523	16.08	55837	6.87
ZZZZZZ	229297	9.36	339019	10.24	185345	13.52	197952	16.08	100176	6.86
ZZZZZZ	187982	9.36	272284	10.24	114529	13.52	69938 <sup>d</sup>	16.09	105737	6.86
ZZZZZZ	168855	9.36	249701	10.24	121138	13.52	90978 <sup>d</sup>	16.09	96384	6.85
ZZZZZZ	177656	9.36	262339	10.24	135890	13.52	127244	16.08	84550	6.86
ZZZZZZ	224290	9.36	329971	10.24	177919	13.52	182579	16.09	107587	6.86
ZZZZZZ	229625	9.36	340025	10.24	182525	13.52	193284	16.08	105660	6.86
ZZZZZZ	196568	9.36	290697	10.24	138333	13.52	95143	16.08	95402	6.86
MC16395-2	213800	9.36	312309	10.24	167075	13.52	177124	16.08	90790	6.86
MC16395-2MS	215391	9.36	324318	10.24	176667	13.52	180338	16.08	101447	6.86
MC16395-2MSD	215680	9.36	323604	10.24	179626	13.52	183464	16.08	98188	6.86
ZZZZZZ	195673	9.36	289996	10.24	149401	13.52	131442	16.08	89823	6.86
ZZZZZZ	190536	9.36	280968	10.24	140161	13.52	123176	16.09	83472	6.85
ZZZZZZ	190351	9.36	278721	10.24	144447	13.52	139646	16.09	95550	6.85
ZZZZZZ	212833	9.36	317165	10.24	152875	13.52	157036	16.08	104841	6.86
MC16445-1	199519	9.36	292725	10.24	157330	13.52	159431	16.08	79279	6.86
MC16445-2	198683	9.36	292834	10.24	158026	13.52	163901	16.08	85293	6.86

- 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.
- (c) Outside control limits. Target analytes not associated with this internal standard.
- (d) Outside control limits due to possible matrix interference. Confirmed by reanalysis.

6.5.3  
6

# Volatile Surrogate Recovery Summary

Job Number: MC16445  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16445-6	H59219.D	100	101	104
MC16569-2MS	H59213.D	105	98	105
MC16569-2MSD	H59214.D	105	100	104
MSH1953-BS	H59204.D	109	100	104
MSH1953-MB	H59206.D	103	101	104

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: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16445-1	M52756.D	98	117	98
MC16445-2	M52757.D	96	116	95
MC16445-3	K65375.D	100	103	112
MC16445-4	K65376.D	99	101	108
MC16445-5	K65377.D	101	105	120
JB20375-3MS	K65378.D	95	100	104
JB20375-3MSD	K65379.D	97	101	105
MC16395-2MS	M52748.D	99	112	96
MC16395-2MSD	M52749.D	99	114	96
MSK2153-BS	K65364.D	98	101	112
MSK2153-BSD	K65365.D	98	100	104
MSK2153-MB	K65367.D	97	96	101
MSM1788-BS	M52736.D	101	113	97
MSM1788-BSD	M52737.D	101	115	96
MSM1788-MB	M52739.D	97	113	94

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 Volatiles**

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**QC Data Summaries****7**

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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: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-MB	BK19728.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16445-1, MC16445-2, MC16445-3, MC16445-4, MC16445-5

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.5	0.96	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	108% 61-167%
460-00-4	Bromofluorobenzene (S)	98% 61-167%

7.1.1  
7

# Method Blank Summary

Job Number: MC16445  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-MB	BK19937.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16445-6

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	100% 36-173%
460-00-4	Bromofluorobenzene (S)	95% 36-173%

# Blank Spike Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-BS	BK19729.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16445-1, MC16445-2, MC16445-3, MC16445-4, MC16445-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	65	66.5	102	59-142
106-93-4	1,2-Dibromoethane	65	60.3	93	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	107%	61-167%
460-00-4	Bromofluorobenzene (S)	97%	61-167%

7.2.1  
7

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-BS	BK19938.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16445-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.067	94	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)	104%	36-173%
460-00-4	Bromofluorobenzene (S)	96%	36-173%

7.2.2  
7

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-MS	BK19730.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
OP31352-MSD	BK19731.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
MC16336-6	BK19735.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16445-1, MC16445-2, MC16445-3, MC16445-4, MC16445-5

CAS No.	Compound	MC16336-6 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	367	337	92	419	382	91	13	40-156/27
106-93-4	1,2-Dibromoethane	ND	367	304	83	419	342	82	12	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16336-6	Limits
460-00-4	Bromofluorobenzene (S)	99%	91%	96%	61-167%
460-00-4	Bromofluorobenzene (S)	91%	85%	94%	61-167%

\* = Outside of Control Limits.

7.3.1  
 7

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-MS	BK19941.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
OP31406-MSD	BK19942.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
MC16600-6	BK19943.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16445-6

CAS No.	Compound	MC16600-6 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.071	0.066	93	0.071	0.064	90	3	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.071	0.072	101	0.071	0.067	94	7	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16600-6	Limits
460-00-4	Bromofluorobenzene (S)	110%	108%	107%	36-173%
460-00-4	Bromofluorobenzene (S)	100%	100%	99%	36-173%

\* = Outside of Control Limits.

7.3.2  
7

# Volatile Surrogate Recovery Summary

Job Number: MC16445  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16445-6	BK19940.D	117	106
OP31406-BS	BK19938.D	104	96
OP31406-MB	BK19937.D	100	95
OP31406-MS	BK19941.D	110	100
OP31406-MSD	BK19942.D	108	100

Surrogate Compounds	Recovery Limits
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S1 = Bromofluorobenzene (S)	36-173%
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- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

# Volatile Surrogate Recovery Summary

Job Number: MC16445  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011 Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16445-1	BK19739.D	94	92
MC16445-2	BK19740.D	96	93
MC16445-3	BK19741.D	72	83
MC16445-4	BK19742.D	72	82
MC16445-5	BK19743.D	79	83
OP31352-BS	BK19729.D	107	97
OP31352-MB	BK19728.D	108	98
OP31352-MS	BK19730.D	99	91
OP31352-MSD	BK19731.D	91	85

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 61-167%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

# GC Surrogate Retention Time Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK712-ICC712	Injection Date:	12/09/12
Lab File ID:	BK19722.D	Injection Time:	17:47
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.56	4.90
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP31352-MB	BK19728.D	12/09/12	20:14	4.57	4.90
OP31352-BS	BK19729.D	12/09/12	20:38	4.56	4.90
OP31352-MS	BK19730.D	12/09/12	21:03	4.57	4.90
OP31352-MSD	BK19731.D	12/09/12	21:27	4.57	4.90
ZZZZZZ	BK19732.D	12/09/12	21:52	4.56	4.90
ZZZZZZ	BK19733.D	12/09/12	22:16	4.56	4.90
ZZZZZZ	BK19734.D	12/09/12	22:41	4.56	4.90
MC16336-6	BK19735.D	12/09/12	23:05	4.57	4.90
ZZZZZZ	BK19736.D	12/09/12	23:30	4.56	4.90
ZZZZZZ	BK19737.D	12/09/12	23:55	4.56	4.90

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.1  
7

# GC Surrogate Retention Time Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK712-CC712	Injection Date:	12/10/12
Lab File ID:	BK19738.D	Injection Time:	00:20
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.56	4.90
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
MC16445-1	BK19739.D	12/10/12	00:44	4.57	4.90
MC16445-2	BK19740.D	12/10/12	01:09	4.57	4.90
MC16445-3	BK19741.D	12/10/12	01:33	4.56	4.90
MC16445-4	BK19742.D	12/10/12	01:58	4.56	4.90
MC16445-5	BK19743.D	12/10/12	02:23	4.56	4.90
ZZZZZZ	BK19744.D	12/10/12	02:47	4.56	4.90
ZZZZZZ	BK19745.D	12/10/12	03:12	4.56	4.90
ZZZZZZ	BK19746.D	12/10/12	03:36	4.56	4.90
ZZZZZZ	BK19747.D	12/10/12	04:01	4.56	4.90
ZZZZZZ	BK19748.D	12/10/12	04:25	4.56	4.90

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.2  
7

# GC Surrogate Retention Time Summary

Job Number: MC16445  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK716-ICC716	Injection Date:	12/13/12
Lab File ID:	BK19932.D	Injection Time:	18:03
Instrument ID:	GCBK	Method:	SW846 8011

	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
Check Std	4.52	4.85

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
ZZZZZZ	BK19935A.D	12/13/12	19:16	4.52	4.85
ZZZZZZ	BK19935B.D	12/13/12	19:16	4.52	4.85
OP31405-MB	BK19937A.D	12/13/12	20:04	4.52	4.85
OP31406-MB	BK19937.D	12/13/12	20:04	4.52	4.85
OP31406-BS	BK19938.D	12/13/12	20:28	4.52	4.85
OP31405-BS	BK19938A.D	12/13/12	20:28	4.52	4.85
OP31405-BSD	BK19939.D	12/13/12	20:52	4.52	4.85
MC16445-6	BK19940.D	12/13/12	21:17	4.52	4.85
OP31406-MS	BK19941.D	12/13/12	21:41	4.52	4.85
OP31406-MSD	BK19942.D	12/13/12	22:06	4.52	4.85
MC16600-6	BK19943.D	12/13/12	22:30	4.52	4.85
ZZZZZZ	BK19944.D	12/13/12	22:55	4.52	4.85
ZZZZZZ	BK19945.D	12/13/12	23:19	4.52	4.85
ZZZZZZ	BK19946.D	12/13/12	23:43	4.52	4.85

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

## General Chemistry

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### QC Data Summaries



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Includes the following where applicable:

- Percent Solids Raw Data Summary

# Percent Solids Raw Data Summary

Job Number: MC16445  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

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Sample: MC16445-1      Analyzed: 04-DEC-12 by MC      Method: SM21 2540 B MOD.  
ClientID: MW-22-12

Wet Weight (Total)	33.233	g
Tare Weight	21.223	g
Dry Weight (Total)	30.633	g
Solids, Percent	78.4	%

---

Sample: MC16445-2      Analyzed: 04-DEC-12 by MC      Method: SM21 2540 B MOD.  
ClientID: MW-22-12-DUP

Wet Weight (Total)	30.968	g
Tare Weight	18.653	g
Dry Weight (Total)	28.092	g
Solids, Percent	76.6	%

---

Sample: MC16445-3      Analyzed: 04-DEC-12 by MC      Method: SM21 2540 B MOD.  
ClientID: MW-22-23

Wet Weight (Total)	30.817	g
Tare Weight	19.811	g
Dry Weight (Total)	28.735	g
Solids, Percent	81.1	%

---

Sample: MC16445-4      Analyzed: 04-DEC-12 by MC      Method: SM21 2540 B MOD.  
ClientID: MW-22-23-DUP

Wet Weight (Total)	42.604	g
Tare Weight	30.762	g
Dry Weight (Total)	40.32	g
Solids, Percent	80.7	%

---

Sample: MC16445-5      Analyzed: 04-DEC-12 by MC      Method: SM21 2540 B MOD.  
ClientID: MW-22-39

Wet Weight (Total)	34.937	g
Tare Weight	21.078	g
Dry Weight (Total)	31.829	g
Solids, Percent	77.6	%

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8.1  
8

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VERIFICATION, TESTING AND CERTIFICATION COMPANY.



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*Automated Report*

### Technical Report for

#### Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562735.00015

SGS Accutest Job Number: MC16475

Sampling Date: 12/03/12

#### Report to:

AECOM, INC.

Melissa.mansker@aecom.com

ATTN: Melissa Mansker

Total number of pages in report: 67



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

H. (Brad) Madadian  
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

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

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Test results relate only to samples analyzed.



ACCUTEST

October 27, 2016

AECOM  
1001 Highlands Plaza Drive West Suite 300  
St. Louis, MO 63110

RE: SGS Accutest Job # MC16475

Dear Elizabeth Kunkel

As you are aware, SGS Accutest Inc. - Marlborough has been conducting an extensive review of data associated with some historical Gas Chromatography-Mass Spectroscopy volatiles analyses. As a result of this review it was determined that some revisions of the original test report for this job were needed. These corrections have been incorporated into the revised report.

Please be assured that corrective actions have been put in place to address this matter and prevent a recurrence.

We apologize for any inconvenience that this issue may have caused. Please don't hesitate to contact us if we can be of further assistance.

Sincerely,

**H. (Brad) Madadian**

Regional Laboratory Director  
SGS Accutest Inc. - Marlborough

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TESTING AND CERTIFICATION COMPANY.

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## Sample Summary

Shell Oil

Job No: MC16475

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
MC16475-1	12/03/12	13:20 WPJS	12/04/12	SO	Soil	MW-19-13
MC16475-2	12/03/12	13:25 WPJS	12/04/12	SO	Soil	MW-19-20
MC16475-3	12/03/12	13:35 WPJS	12/04/12	SO	Soil	MW-19-32
MC16475-4	12/03/12	00:00 WPJS	12/04/12	AQ	Trip Blank Water	TRIP BLANK

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

# SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** She O

**Job No** MC 6475

**Site:** URSMOSTL: Roxana Dr ing, Roxana, IL

**Report Date** 0/27/20 6 0: 6:25 A

3 Samp e(s), Tr p B ank(s) and 0 F e d B ank(s) were co ected on 2/03/20 2 and were rece ved at SGS Accutest New Eng and on 2/04/20 2 proper y preserved, at 2 2 Deg C and n tact These Samp es rece ved a job number of MC 6475 A st ng of the Laboratory Samp e ID, C ent Samp e ID and dates of co ect on are presented n the Resu ts Summary Sect on of th s repo t - Ch orohexane was searched n the brary search and reported on y f detect ons were found

Except as noted be ow, a method spec f ed ca brat ons and qua ty contro performance cr ter a were met for th s job For more nformat on, p ease refer to QC summary pages

## Volatiles by GCMS By Method SW846 8260B

**Matrix:** AQ **Batch ID:** MSH 955

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6456-3MS, MC 6456-3MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke/ B ank Sp ke Dup Recovery(s) for 2,2-D ch oropropane, 2-Ch oroethy v ny ether, Acro e n, D ch orod f uoromethane are outs de contro m ts
- Matr x Sp ke Recovery(s) for , -Tr ch oroethane, 2,2-D ch oropropane, 2-Ch oroethy v ny ether, Acro e n, Carbon tetrach or de, Ch oromethane, D ch orod f uoromethane, Tr ch orof uoromethane are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for 2,2-D ch oropropane, 2-Ch oroethy v ny ether, Acro e n, Carbon tetrach or de, Ch oromethane, D ch orod f uoromethane are outs de contro m ts Probab e cause due to matr x nterference

**Matrix:** SO **Batch ID:** MSG4880

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6587-5MS, MC 6587-5MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for 4-Methy -2-pentanone (MIBK), Acro e n are outs de contro m ts
- Matr x Sp ke Recovery(s) for 4-Methy -2-pentanone (MIBK), Acro e n, Ch oromethane are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for 4-Methy -2-pentanone (MIBK), Acro e n, Ch oromethane are outs de contro m ts Probab e cause due to matr x nterference
- V ny Acetate: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow
- Acro e n: Cont nu ng Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow

## Volatiles by GC By Method SW846 8011

**Matrix:** AQ **Batch ID:** OP3 406

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6600-6MS, MC 6600-6MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a

**Matrix:** SO **Batch ID:** OP3 352

- A samp es were extracted w th n the recommended method ho d ng t me
- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6336-6MS, MC 6336-6MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a

## Wet Chemistry By Method SM21 2540 B MOD.

**Matrix:** SO

**Batch ID:** GN4 20

- Sample(s) MC 6587- DUP were used as the QC samples for Solids, Percent

SGS Accutest New England certifies that all analyses were performed within method specification. It is further recommended that this report be used in its entirety. The Laboratory Director for SGS Accutest New England or assignee as verified by the signature on the cover page has authorized the release of this report (MC 6475)

Thursday, October 27, 2016

Page 2 of 2

## Summary of Hits

Job Number: MC16475  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 12/03/12



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
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**MC16475-1 MW-19-13**

Benzene	73.3	1.3	0.76	mg/kg	SW846 8260B
n-Butylbenzene	27.3	13	0.48	mg/kg	SW846 8260B
sec-Butylbenzene	15.7	13	0.60	mg/kg	SW846 8260B
Ethylbenzene	198	5.2	0.63	mg/kg	SW846 8260B
Isopropylbenzene	31.6	13	0.59	mg/kg	SW846 8260B
p-Isopropyltoluene	14.7	13	0.46	mg/kg	SW846 8260B
Naphthalene	34.8	13	3.2	mg/kg	SW846 8260B
n-Propylbenzene	58.2	13	2.6	mg/kg	SW846 8260B
Toluene	656	13	2.2	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	219	13	0.58	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	60.4	13	0.55	mg/kg	SW846 8260B
m,p-Xylene	441	5.2	2.0	mg/kg	SW846 8260B
o-Xylene	172	5.2	0.62	mg/kg	SW846 8260B
Xylene (total)	613	5.2	0.62	mg/kg	SW846 8260B
1,2-Dibromoethane	0.0537	0.0033	0.0013	mg/kg	SW846 8011

**MC16475-2 MW-19-20**

Acrolein <sup>a</sup>	1.94 J	3.7	1.5	mg/kg	SW846 8260B
Benzene	3.59	0.074	0.043	mg/kg	SW846 8260B
n-Butylbenzene	0.459 J	0.74	0.027	mg/kg	SW846 8260B
sec-Butylbenzene	0.458 J	0.74	0.034	mg/kg	SW846 8260B
Ethylbenzene	3.50	0.29	0.036	mg/kg	SW846 8260B
Isopropylbenzene	1.54	0.74	0.034	mg/kg	SW846 8260B
p-Isopropyltoluene	0.441 J	0.74	0.026	mg/kg	SW846 8260B
Naphthalene	4.44	0.74	0.18	mg/kg	SW846 8260B
n-Propylbenzene	1.67	0.74	0.15	mg/kg	SW846 8260B
Toluene	0.501 J	0.74	0.12	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	9.21	0.74	0.033	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	2.45	0.74	0.031	mg/kg	SW846 8260B
m,p-Xylene	3.11	0.29	0.12	mg/kg	SW846 8260B
o-Xylene	0.234 J	0.29	0.035	mg/kg	SW846 8260B
Xylene (total)	3.34	0.29	0.035	mg/kg	SW846 8260B

**MC16475-3 MW-19-32**

Benzene	0.562	0.067	0.039	mg/kg	SW846 8260B
n-Butylbenzene	0.290 J	0.67	0.025	mg/kg	SW846 8260B
sec-Butylbenzene	0.116 J	0.67	0.031	mg/kg	SW846 8260B
Ethylbenzene	1.95	0.27	0.032	mg/kg	SW846 8260B
Isopropylbenzene	0.239 J	0.67	0.030	mg/kg	SW846 8260B
p-Isopropyltoluene	0.0998 J	0.67	0.024	mg/kg	SW846 8260B
Naphthalene	0.694	0.67	0.17	mg/kg	SW846 8260B

## Summary of Hits

Job Number: MC16475  
Account: Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL  
Collected: 12/03/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
n-Propylbenzene		0.600 J	0.67	0.14	mg/kg	SW846 8260B
Toluene		0.506 J	0.67	0.11	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		2.21	0.67	0.030	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		0.644 J	0.67	0.029	mg/kg	SW846 8260B
m,p-Xylene		3.36	0.27	0.11	mg/kg	SW846 8260B
o-Xylene		1.34	0.27	0.032	mg/kg	SW846 8260B
Xylene (total)		4.70	0.27	0.032	mg/kg	SW846 8260B

MC16475-4 TRIP BLANK

No hits reported in this sample.

(a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.

Sample Results

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Report of Analysis

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## Report of Analysis

Client Sample ID:	MW-19-13	Date Sampled:	12/03/12
Lab Sample ID:	MC16475-1	Date Received:	12/04/12
Matrix:	SO - Soil	Percent Solids:	75.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G122784.D	1	12/11/12	JM	n/a	n/a	MSG4880
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.88 g	10.0 ml	5.0 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	13	3.3	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	65	26	mg/kg	
107-13-1	Acrylonitrile	ND	65	3.2	mg/kg	
71-43-2	Benzene	73.3	1.3	0.76	mg/kg	
108-86-1	Bromobenzene	ND	13	0.58	mg/kg	
74-97-5	Bromochloromethane	ND	13	0.97	mg/kg	
75-27-4	Bromodichloromethane	ND	5.2	0.55	mg/kg	
75-25-2	Bromoform	ND	5.2	5.2	mg/kg	
74-83-9	Bromomethane	ND	5.2	1.3	mg/kg	
78-93-3	2-Butanone (MEK)	ND	13	3.2	mg/kg	
104-51-8	n-Butylbenzene	27.3	13	0.48	mg/kg	
135-98-8	sec-Butylbenzene	15.7	13	0.60	mg/kg	
98-06-6	tert-Butylbenzene	ND	13	2.3	mg/kg	
75-15-0	Carbon disulfide	ND	13	0.43	mg/kg	
56-23-5	Carbon tetrachloride	ND	5.2	1.9	mg/kg	
108-90-7	Chlorobenzene	ND	5.2	0.71	mg/kg	
75-00-3	Chloroethane	ND	13	3.3	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	13	5.2	mg/kg	
67-66-3	Chloroform	ND	5.2	1.3	mg/kg	
74-87-3	Chloromethane	ND	13	1.2	mg/kg	
95-49-8	o-Chlorotoluene	ND	13	2.9	mg/kg	
106-43-4	p-Chlorotoluene	ND	13	0.59	mg/kg	
124-48-1	Dibromochloromethane	ND	5.2	0.77	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	5.2	0.56	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	5.2	0.59	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	5.2	0.55	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	5.2	3.0	mg/kg	
75-34-3	1,1-Dichloroethane	ND	5.2	0.70	mg/kg	
107-06-2	1,2-Dichloroethane	ND	5.2	0.75	mg/kg	
75-35-4	1,1-Dichloroethene	ND	5.2	0.95	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	5.2	0.78	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	5.2	0.74	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:	MW-19-13	Date Sampled:	12/03/12
Lab Sample ID:	MC16475-1	Date Received:	12/04/12
Matrix:	SO - Soil	Percent Solids:	75.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	5.2	0.97	mg/kg	
142-28-9	1,3-Dichloropropane	ND	13	0.60	mg/kg	
594-20-7	2,2-Dichloropropane	ND	13	2.3	mg/kg	
563-58-6	1,1-Dichloropropene	ND	13	0.68	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.2	0.44	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.2	1.3	mg/kg	
123-91-1	1,4-Dioxane	ND	65	65	mg/kg	
97-63-2	Ethyl methacrylate	ND	13	1.8	mg/kg	
100-41-4	Ethylbenzene	198	5.2	0.63	mg/kg	
87-68-3	Hexachlorobutadiene	ND	13	1.2	mg/kg	
591-78-6	2-Hexanone	ND	13	1.3	mg/kg	
98-82-8	Isopropylbenzene	31.6	13	0.59	mg/kg	
99-87-6	p-Isopropyltoluene	14.7	13	0.46	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	5.2	0.75	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	13	1.3	mg/kg	
74-95-3	Methylene bromide	ND	13	1.3	mg/kg	
75-09-2	Methylene chloride	ND	5.2	3.0	mg/kg	
91-20-3	Naphthalene	34.8	13	3.2	mg/kg	
103-65-1	n-Propylbenzene	58.2	13	2.6	mg/kg	
100-42-5	Styrene	ND	13	0.61	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	13	2.6	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.2	1.1	mg/kg	
127-18-4	Tetrachloroethene	ND	5.2	0.59	mg/kg	
108-88-3	Toluene	656	13	2.2	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	13	0.62	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	13	0.60	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.2	0.82	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.2	1.9	mg/kg	
79-01-6	Trichloroethene	ND	5.2	0.55	mg/kg	
75-69-4	Trichlorofluoromethane	ND	5.2	0.79	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	13	0.76	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	219	13	0.58	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	60.4	13	0.55	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	13	1.5	mg/kg	
75-01-4	Vinyl chloride	ND	5.2	0.71	mg/kg	
	m,p-Xylene	441	5.2	2.0	mg/kg	
95-47-6	o-Xylene	172	5.2	0.62	mg/kg	
1330-20-7	Xylene (total)	613	5.2	0.62	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

<b>Client Sample ID:</b> MW-19-13	<b>Date Sampled:</b> 12/03/12
<b>Lab Sample ID:</b> MC16475-1	<b>Date Received:</b> 12/04/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 75.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

4.1  
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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		70-130%
2037-26-5	Toluene-D8	91%		70-130%
460-00-4	4-Bromofluorobenzene	103%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

---

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

<b>Client Sample ID:</b> MW-19-13	<b>Date Sampled:</b> 12/03/12
<b>Lab Sample ID:</b> MC16475-1	<b>Date Received:</b> 12/04/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 75.1
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19744.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 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	0.0033	0.0015	mg/kg	
106-93-4	1,2-Dibromoethane	0.0537	0.0033	0.0013	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	69%		61-167%
460-00-4	Bromofluorobenzene (S)	74%		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

4.1  
4

## Report of Analysis

Client Sample ID:	MW-19-20	Date Sampled:	12/03/12
Lab Sample ID:	MC16475-2	Date Received:	12/04/12
Matrix:	SO - Soil	Percent Solids:	72.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G122782.D	1	12/11/12	JM	n/a	n/a	MSG4880
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.43 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.74	0.19	mg/kg	
107-02-8	Acrolein <sup>a</sup>	1.94	3.7	1.5	mg/kg	J
107-13-1	Acrylonitrile	ND	3.7	0.18	mg/kg	
71-43-2	Benzene	3.59	0.074	0.043	mg/kg	
108-86-1	Bromobenzene	ND	0.74	0.033	mg/kg	
74-97-5	Bromochloromethane	ND	0.74	0.055	mg/kg	
75-27-4	Bromodichloromethane	ND	0.29	0.031	mg/kg	
75-25-2	Bromoform	ND	0.29	0.29	mg/kg	
74-83-9	Bromomethane	ND	0.29	0.076	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.74	0.18	mg/kg	
104-51-8	n-Butylbenzene	0.459	0.74	0.027	mg/kg	J
135-98-8	sec-Butylbenzene	0.458	0.74	0.034	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.74	0.13	mg/kg	
75-15-0	Carbon disulfide	ND	0.74	0.024	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.29	0.11	mg/kg	
108-90-7	Chlorobenzene	ND	0.29	0.040	mg/kg	
75-00-3	Chloroethane	ND	0.74	0.18	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.74	0.29	mg/kg	
67-66-3	Chloroform	ND	0.29	0.076	mg/kg	
74-87-3	Chloromethane	ND	0.74	0.068	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.74	0.16	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.74	0.033	mg/kg	
124-48-1	Dibromochloromethane	ND	0.29	0.043	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.29	0.032	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.29	0.033	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.29	0.031	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.29	0.17	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.29	0.040	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.29	0.042	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.29	0.054	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.29	0.044	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.29	0.042	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:	MW-19-20	Date Sampled:	12/03/12
Lab Sample ID:	MC16475-2	Date Received:	12/04/12
Matrix:	SO - Soil	Percent Solids:	72.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.29	0.055	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.74	0.034	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.74	0.13	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.74	0.039	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.29	0.025	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.29	0.073	mg/kg	
123-91-1	1,4-Dioxane	ND	3.7	3.7	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.74	0.10	mg/kg	
100-41-4	Ethylbenzene	3.50	0.29	0.036	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.74	0.068	mg/kg	
591-78-6	2-Hexanone	ND	0.74	0.074	mg/kg	
98-82-8	Isopropylbenzene	1.54	0.74	0.034	mg/kg	
99-87-6	p-Isopropyltoluene	0.441	0.74	0.026	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.29	0.042	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.74	0.074	mg/kg	
74-95-3	Methylene bromide	ND	0.74	0.073	mg/kg	
75-09-2	Methylene chloride	ND	0.29	0.17	mg/kg	
91-20-3	Naphthalene	4.44	0.74	0.18	mg/kg	
103-65-1	n-Propylbenzene	1.67	0.74	0.15	mg/kg	
100-42-5	Styrene	ND	0.74	0.034	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.74	0.15	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.29	0.063	mg/kg	
127-18-4	Tetrachloroethene	ND	0.29	0.034	mg/kg	
108-88-3	Toluene	0.501	0.74	0.12	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.74	0.035	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.74	0.034	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.29	0.046	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.29	0.11	mg/kg	
79-01-6	Trichloroethene	ND	0.29	0.031	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.29	0.045	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.74	0.043	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	9.21	0.74	0.033	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	2.45	0.74	0.031	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.74	0.082	mg/kg	
75-01-4	Vinyl chloride	ND	0.29	0.040	mg/kg	
	m,p-Xylene	3.11	0.29	0.12	mg/kg	
95-47-6	o-Xylene	0.234	0.29	0.035	mg/kg	J
1330-20-7	Xylene (total)	3.34	0.29	0.035	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

<b>Client Sample ID:</b> MW-19-20	<b>Date Sampled:</b> 12/03/12
<b>Lab Sample ID:</b> MC16475-2	<b>Date Received:</b> 12/04/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 72.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		70-130%
2037-26-5	Toluene-D8	97%		70-130%
460-00-4	4-Bromofluorobenzene	98%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-19-20	<b>Date Sampled:</b> 12/03/12
<b>Lab Sample ID:</b> MC16475-2	<b>Date Received:</b> 12/04/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 72.1
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19745.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 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	0.0035	0.0015	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0035	0.0013	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	75%		61-167%
460-00-4	Bromofluorobenzene (S)	71%		61-167%

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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

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## Report of Analysis

Client Sample ID:	MW-19-32	Date Sampled:	12/03/12
Lab Sample ID:	MC16475-3	Date Received:	12/04/12
Matrix:	SO - Soil	Percent Solids:	74.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G122783.D	1	12/11/12	JM	n/a	n/a	MSG4880
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.79 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.67	0.17	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	3.3	1.3	mg/kg	
107-13-1	Acrylonitrile	ND	3.3	0.17	mg/kg	
71-43-2	Benzene	0.562	0.067	0.039	mg/kg	
108-86-1	Bromobenzene	ND	0.67	0.030	mg/kg	
74-97-5	Bromochloromethane	ND	0.67	0.050	mg/kg	
75-27-4	Bromodichloromethane	ND	0.27	0.028	mg/kg	
75-25-2	Bromoform	ND	0.27	0.27	mg/kg	
74-83-9	Bromomethane	ND	0.27	0.069	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.67	0.17	mg/kg	
104-51-8	n-Butylbenzene	0.290	0.67	0.025	mg/kg	J
135-98-8	sec-Butylbenzene	0.116	0.67	0.031	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.67	0.12	mg/kg	
75-15-0	Carbon disulfide	ND	0.67	0.022	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.27	0.097	mg/kg	
108-90-7	Chlorobenzene	ND	0.27	0.037	mg/kg	
75-00-3	Chloroethane	ND	0.67	0.17	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.67	0.27	mg/kg	
67-66-3	Chloroform	ND	0.27	0.069	mg/kg	
74-87-3	Chloromethane	ND	0.67	0.062	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.67	0.15	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.67	0.030	mg/kg	
124-48-1	Dibromochloromethane	ND	0.27	0.039	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.27	0.029	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.27	0.030	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.27	0.028	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.27	0.15	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.27	0.036	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.27	0.038	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.27	0.049	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.27	0.040	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.27	0.038	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:	MW-19-32	Date Sampled:	12/03/12
Lab Sample ID:	MC16475-3	Date Received:	12/04/12
Matrix:	SO - Soil	Percent Solids:	74.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.27	0.050	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.67	0.031	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.67	0.12	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.67	0.035	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.27	0.023	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.27	0.066	mg/kg	
123-91-1	1,4-Dioxane	ND	3.3	3.3	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.67	0.091	mg/kg	
100-41-4	Ethylbenzene	1.95	0.27	0.032	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.67	0.062	mg/kg	
591-78-6	2-Hexanone	ND	0.67	0.067	mg/kg	
98-82-8	Isopropylbenzene	0.239	0.67	0.030	mg/kg	J
99-87-6	p-Isopropyltoluene	0.0998	0.67	0.024	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.27	0.038	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.67	0.067	mg/kg	
74-95-3	Methylene bromide	ND	0.67	0.066	mg/kg	
75-09-2	Methylene chloride	ND	0.27	0.15	mg/kg	
91-20-3	Naphthalene	0.694	0.67	0.17	mg/kg	
103-65-1	n-Propylbenzene	0.600	0.67	0.14	mg/kg	J
100-42-5	Styrene	ND	0.67	0.031	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.67	0.13	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.27	0.057	mg/kg	
127-18-4	Tetrachloroethene	ND	0.27	0.031	mg/kg	
108-88-3	Toluene	0.506	0.67	0.11	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.67	0.032	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.67	0.031	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.27	0.042	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.27	0.098	mg/kg	
79-01-6	Trichloroethene	ND	0.27	0.028	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.27	0.041	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.67	0.039	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	2.21	0.67	0.030	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	0.644	0.67	0.029	mg/kg	J
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.67	0.075	mg/kg	
75-01-4	Vinyl chloride	ND	0.27	0.036	mg/kg	
	m,p-Xylene	3.36	0.27	0.11	mg/kg	
95-47-6	o-Xylene	1.34	0.27	0.032	mg/kg	
1330-20-7	Xylene (total)	4.70	0.27	0.032	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

<b>Client Sample ID:</b> MW-19-32	<b>Date Sampled:</b> 12/03/12
<b>Lab Sample ID:</b> MC16475-3	<b>Date Received:</b> 12/04/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 74.3
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-130%
2037-26-5	Toluene-D8	94%		70-130%
460-00-4	4-Bromofluorobenzene	94%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-19-32	
<b>Lab Sample ID:</b> MC16475-3	<b>Date Sampled:</b> 12/03/12
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 12/04/12
<b>Method:</b> SW846 8011 SW846 3550B	<b>Percent Solids:</b> 74.3
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19746.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 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	0.0033	0.0015	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0033	0.0013	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	75%		61-167%
460-00-4	Bromofluorobenzene (S)	79%		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

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## Report of Analysis

Client Sample ID:	TRIP BLANK	Date Sampled:	12/03/12
Lab Sample ID:	MC16475-4	Date Received:	12/04/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H59258.D	1	12/14/12	JP	n/a	n/a	MSH1955
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	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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:	TRIP BLANK	Date Sampled:	12/03/12
Lab Sample ID:	MC16475-4	Date Received:	12/04/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 12/03/12
<b>Lab Sample ID:</b> MC16475-4	<b>Date Received:</b> 12/04/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

4.4  
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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
2037-26-5	Toluene-D8	100%		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	

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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

<b>Client Sample ID:</b> TRIP BLANK	
<b>Lab Sample ID:</b> MC16475-4	<b>Date Sampled:</b> 12/03/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Date Received:</b> 12/04/12
<b>Method:</b> SW846 8011 SW846 8011	<b>Percent Solids:</b> n/a
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19944.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
Run #2							

	Initial Volume	Final Volume
Run #1	35.8 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	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

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

4.4  
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**Misc. Forms**

**Custody Documents and Other Forms**

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**Includes the following where applicable:**

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

FED-EX Tracking #	Bottle Order Convoy #
Accutest Quote #	Accutest Job # <b>MC16475</b>

Client / Reporting Information		Project Information				Requested Analysis ( see TEST CODE sheet)												Matrix Codes
Company Name: <b>URS</b>		Project Name: <b>Roxana Drilling</b>																DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank
Street Address:		Street: <b>Roxana, IL</b>																
City State Zip:		Billing Information ( If different from Report to ) Company Name: <b>URS</b>																
Project Contact: <b>E. Kunkel</b>		Project#: <b>21562735.00015</b>																
Phone #:		Street Address:				VOC 8260 VOC 801												LAB USE ONLY
E-mail:		City State Zip:																
Fax #:		Client PO#: <b>D. Palmer</b>																
Attention: <b>D. Palmer</b>		PO#:																
Sampler(s) Name(s): <b>W. Pennington</b>		Collection:																
Phone #:		MECH DI / Val #																
Field ID / Point of Collection		Date																
Sample #		Time																
-		12/3/12 1320																
-1 MW-19-13		↓																
-2 MW-19-20		↓																
-3 MW-19-32		↓																
-4 Trip Blank		↓																

2F, 10H2  
2L1

Turnaround Time ( Business days )		Approved By (Accutest PM) / Date:		Data Deliverable Information				Comments / Special Instructions			
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY		_____ _____ _____		<input type="checkbox"/> Commercial "A" ( Level 1 ) <input type="checkbox"/> Commercial "B" ( Level 2 ) <input checked="" type="checkbox"/> FULLT1 ( Level 3+4 ) <input type="checkbox"/> CT RCP <input type="checkbox"/> MA MCP Commercial "A" = Results Only Commercial "B" = Results + QC Summary				<input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input checked="" type="checkbox"/> EDD Format <input type="checkbox"/> Other _____			

Sample Custody must be documented below each time samples change possession, including courier delivery.							
Relinquished by: <b>W. Pennington</b>	Date Time: <b>12/3/12 1000</b>	Received By: <b>Fed EX</b>	Relinquished By: <b>Fed EX</b>	Date Time: <b>4:30</b>	Received By: <b>[Signature]</b>		
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:		
Relinquished by:	Date Time:	Received By:	Custody Seal #	<input type="checkbox"/> Intact <input type="checkbox"/> Not intact	Preserved where applicable <input type="checkbox"/>	On Ice <input checked="" type="checkbox"/>	Cooler Temp. <b>2.2°</b>

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## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC16475      Client: URS      Immediate Client Services Action Required: No  
 Date / Time Received: 12/4/2012      Delivery Method: \_\_\_\_\_      Client Service Action Required at Login: No  
 Project: ROXANA DRILLING      No. Coolers: 1      Airbill #'s: \_\_\_\_\_

**Cooler Security**

	<u>Y</u>	<u>or</u>	<u>N</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

**Cooler Temperature**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:	<u>Infrared gun</u>		
3. Cooler media:	<u>Ice (bag)</u>		

**Quality Control Preservation**

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

**Sample Integrity - Documentation**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

**Sample Integrity - Condition**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	<u>Intact</u>		

**Sample Integrity - Instructions**

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

### Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16475

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

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Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16475-1 Collected: 03-DEC-12 13:20 By: WPJS Received: 04-DEC-12 By: MW-19-13						
MC16475-1	SM21 2540 B MOD.	07-DEC-12	CF			%SOL
MC16475-1	SW846 8011	10-DEC-12 02:47	AP	10-DEC-12	NK	V8011SL
MC16475-1	SW846 8260B	11-DEC-12 18:14	JM			V8260SL+
MC16475-2 Collected: 03-DEC-12 13:25 By: WPJS Received: 04-DEC-12 By: MW-19-20						
MC16475-2	SM21 2540 B MOD.	07-DEC-12	CF			%SOL
MC16475-2	SW846 8011	10-DEC-12 03:12	AP	10-DEC-12	NK	V8011SL
MC16475-2	SW846 8260B	11-DEC-12 17:16	JM			V8260SL+
MC16475-3 Collected: 03-DEC-12 13:35 By: WPJS Received: 04-DEC-12 By: MW-19-32						
MC16475-3	SM21 2540 B MOD.	07-DEC-12	CF			%SOL
MC16475-3	SW846 8011	10-DEC-12 03:36	AP	10-DEC-12	NK	V8011SL
MC16475-3	SW846 8260B	11-DEC-12 17:46	JM			V8260SL+
MC16475-4 Collected: 03-DEC-12 00:00 By: WPJS Received: 04-DEC-12 By: TRIP BLANK						
MC16475-4	SW846 8011	13-DEC-12 22:55	AP	13-DEC-12	BJ	V8011SL
MC16475-4	SW846 8260B	14-DEC-12 12:41	JP			V8260SL+

# SGS Accutest Internal Chain of Custody

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/04/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16475-1.1	Walk In Ref #5	Crystall Woodruff	12/07/12 16:36	Retrieve from Storage
MC16475-1.1	Crystall Woodruff	Walk In Ref #5	12/07/12 18:14	Return to Storage
MC16475-1.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16475-1.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16475-1.1	Scott Parsick		02/13/13 11:50	Disposed
MC16475-1.4	VOC Ref #10	Gary Krasinski	12/05/12 15:08	Retrieve from Storage
MC16475-1.4	Gary Krasinski	VOC Ref #10	12/10/12 08:16	Return to Storage
MC16475-1.4	VOC Ref #10	Jaime Maslowski	12/11/12 12:04	Retrieve from Storage
MC16475-1.4	Jaime Maslowski	VOC Ref #10	12/12/12 10:08	Return to Storage
MC16475-1.4	Scott Parsick		02/13/13 11:50	Disposed
MC16475-2.1	Walk In Ref #5	Crystall Woodruff	12/07/12 16:36	Retrieve from Storage
MC16475-2.1	Crystall Woodruff	Walk In Ref #5	12/07/12 18:14	Return to Storage
MC16475-2.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16475-2.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16475-2.1	Scott Parsick		02/13/13 11:50	Disposed
MC16475-2.4	VOC Ref #10	Gary Krasinski	12/05/12 15:08	Retrieve from Storage
MC16475-2.4	Gary Krasinski	VOC Ref #10	12/10/12 08:16	Return to Storage
MC16475-2.4	VOC Ref #10	Jaime Maslowski	12/11/12 12:04	Retrieve from Storage
MC16475-2.4	Jaime Maslowski	VOC Ref #10	12/12/12 10:08	Return to Storage
MC16475-2.4	Scott Parsick		02/13/13 11:50	Disposed
MC16475-3.1	Walk In Ref #5	Crystall Woodruff	12/07/12 16:36	Retrieve from Storage
MC16475-3.1	Crystall Woodruff	Walk In Ref #5	12/07/12 18:14	Return to Storage
MC16475-3.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16475-3.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16475-3.1	Scott Parsick		02/13/13 11:50	Disposed
MC16475-3.4	VOC Ref #10	Gary Krasinski	12/05/12 15:08	Retrieve from Storage
MC16475-3.4	Gary Krasinski	VOC Ref #10	12/10/12 08:16	Return to Storage
MC16475-3.4	VOC Ref #10	Jaime Maslowski	12/11/12 12:04	Retrieve from Storage
MC16475-3.4	Jaime Maslowski	VOC Ref #10	12/12/12 10:08	Return to Storage
MC16475-3.4	Scott Parsick		02/13/13 11:50	Disposed
MC16475-4.1	VOC Ref #2	Jugal Patel	12/14/12 12:14	Retrieve from Storage
MC16475-4.1	Jugal Patel	GCMSh	12/14/12 12:15	Load on Instrument
MC16475-4.1	GCMSh	Jugal Patel	12/14/12 16:54	Unload from Instrument
MC16475-4.1	Jugal Patel	VOC Ref #2	12/14/12 16:58	Return to Storage
MC16475-4.1	Scott Parsick		02/13/13 11:50	Disposed
MC16475-4.4	VOC Ref #2	Bijan Jafari	12/13/12 04:39	Retrieve from Storage
MC16475-4.4	Bijan Jafari		12/14/12 17:43	Depleted

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## GC/MS Volatiles

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## QC Data Summaries

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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: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-MB	G122775.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-1, MC16475-2, MC16475-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

6.1.1  
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# Method Blank Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-MB	G122775.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-1, MC16475-2, MC16475-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.1  
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# Method Blank Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-MB	G122775.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-1, MC16475-2, MC16475-3

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	111%	70-130%
2037-26-5	Toluene-D8	103%	70-130%
460-00-4	4-Bromofluorobenzene	101%	70-130%

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

6.1.1  
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# Method Blank Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1955-MB	H59257.D	1	12/14/12	JP	n/a	n/a	MSH1955

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-4

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	

# Method Blank Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1955-MB	H59257.D	1	12/14/12	JP	n/a	n/a	MSH1955

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-4

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	ug/l	

# Method Blank Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1955-MB	H59257.D	1	12/14/12	JP	n/a	n/a	MSH1955

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-4

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	101% 70-130%
2037-26-5	Toluene-D8	99% 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	

# Blank Spike Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-BS	G122773.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-1, MC16475-2, MC16475-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	2500	2390	96	70-130
107-02-8	Acrolein	12500	5000	40* a	70-130
107-13-1	Acrylonitrile	2500	2510	100	70-130
71-43-2	Benzene	2500	2620	105	70-130
108-86-1	Bromobenzene	2500	2350	94	70-130
74-97-5	Bromochloromethane	2500	2620	105	70-130
75-27-4	Bromodichloromethane	2500	2310	92	70-130
75-25-2	Bromoform	2500	1840	74	70-130
74-83-9	Bromomethane	2500	2590	104	70-130
78-93-3	2-Butanone (MEK)	2500	2610	104	70-130
104-51-8	n-Butylbenzene	2500	2490	100	70-130
135-98-8	sec-Butylbenzene	2500	2690	108	70-130
98-06-6	tert-Butylbenzene	2500	2820	113	70-130
75-15-0	Carbon disulfide	2500	3120	125	70-130
56-23-5	Carbon tetrachloride	2500	2240	90	70-130
108-90-7	Chlorobenzene	2500	2550	102	70-130
75-00-3	Chloroethane	2500	2830	113	70-130
110-75-8	2-Chloroethyl vinyl ether	2500	890	36	10-160
67-66-3	Chloroform	2500	2700	108	70-130
74-87-3	Chloromethane	2500	3260	130	70-130
95-49-8	o-Chlorotoluene	2500	2670	107	70-130
106-43-4	p-Chlorotoluene	2500	2780	111	70-130
124-48-1	Dibromochloromethane	2500	2060	82	70-130
95-50-1	1,2-Dichlorobenzene	2500	2580	103	70-130
541-73-1	1,3-Dichlorobenzene	2500	2570	103	70-130
106-46-7	1,4-Dichlorobenzene	2500	2410	96	70-130
75-71-8	Dichlorodifluoromethane	2500	2050	82	70-130
75-34-3	1,1-Dichloroethane	2500	2990	120	70-130
107-06-2	1,2-Dichloroethane	2500	2290	92	70-130
75-35-4	1,1-Dichloroethene	2500	2820	113	70-130
156-59-2	cis-1,2-Dichloroethene	2500	2840	114	70-130
156-60-5	trans-1,2-Dichloroethene	2500	2740	110	70-130
78-87-5	1,2-Dichloropropane	2500	2590	104	70-130
142-28-9	1,3-Dichloropropane	2500	2320	93	70-130
594-20-7	2,2-Dichloropropane	2500	2940	118	70-130
563-58-6	1,1-Dichloropropene	2500	2570	103	70-130

\* = Outside of Control Limits.

6.2.1  
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# Blank Spike Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-BS	G122773.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-1, MC16475-2, MC16475-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	2500	2400	96	70-130
10061-02-6	trans-1,3-Dichloropropene	2500	2400	96	70-130
123-91-1	1,4-Dioxane	12500	11300	90	70-130
97-63-2	Ethyl methacrylate	2500	2290	92	76-141
100-41-4	Ethylbenzene	2500	2430	97	70-130
87-68-3	Hexachlorobutadiene	2500	2320	93	70-130
591-78-6	2-Hexanone	2500	2010	80	70-130
98-82-8	Isopropylbenzene	2500	2730	109	70-130
99-87-6	p-Isopropyltoluene	2500	2550	102	70-130
1634-04-4	Methyl Tert Butyl Ether	2500	2660	106	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	1640	66* a	70-130
74-95-3	Methylene bromide	2500	2330	93	70-130
75-09-2	Methylene chloride	2500	2880	115	70-130
91-20-3	Naphthalene	2500	2870	115	70-130
103-65-1	n-Propylbenzene	2500	2730	109	70-130
100-42-5	Styrene	2500	2280	91	70-130
630-20-6	1,1,1,2-Tetrachloroethane	2500	2140	86	70-130
79-34-5	1,1,2,2-Tetrachloroethane	2500	2530	101	70-130
127-18-4	Tetrachloroethene	2500	2250	90	70-130
108-88-3	Toluene	2500	2560	102	70-130
87-61-6	1,2,3-Trichlorobenzene	2500	2960	118	70-130
120-82-1	1,2,4-Trichlorobenzene	2500	2530	101	70-130
71-55-6	1,1,1-Trichloroethane	2500	2740	110	70-130
79-00-5	1,1,2-Trichloroethane	2500	2360	94	70-130
79-01-6	Trichloroethene	2500	2450	98	70-130
75-69-4	Trichlorofluoromethane	2500	2670	107	70-130
96-18-4	1,2,3-Trichloropropane	2500	2480	99	70-130
95-63-6	1,2,4-Trimethylbenzene	2500	2430	97	70-130
108-67-8	1,3,5-Trimethylbenzene	2500	2420	97	70-130
108-05-4	Vinyl Acetate	2500	2790	112	70-130
75-01-4	Vinyl chloride	2500	2850	114	70-130
	m,p-Xylene	5000	4980	100	70-130
95-47-6	o-Xylene	2500	2540	102	70-130
1330-20-7	Xylene (total)	7500	7530	100	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16475  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-BS	G122773.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-1, MC16475-2, MC16475-3

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	109%	70-130%
2037-26-5	Toluene-D8	100%	70-130%
460-00-4	4-Bromofluorobenzene	101%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1955-BS	H59255.D	1	12/14/12	JP	n/a	n/a	MSH1955
MSH1955-BSD	H59256.D	1	12/14/12	JP	n/a	n/a	MSH1955

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	61.9	124	58.0	116	7	70-130/25
107-02-8	Acrolein	250	121	48* a	120	48* a	1	70-130/25
107-13-1	Acrylonitrile	50	40.8	82	41.4	83	1	70-130/25
71-43-2	Benzene	50	46.7	93	46.4	93	1	70-130/25
108-86-1	Bromobenzene	50	50.0	100	50.3	101	1	70-130/25
74-97-5	Bromochloromethane	50	49.4	99	49.3	99	0	70-130/25
75-27-4	Bromodichloromethane	50	55.9	112	55.5	111	1	70-130/25
75-25-2	Bromoform	50	55.1	110	55.6	111	1	70-130/25
74-83-9	Bromomethane	50	45.8	92	44.4	89	3	70-130/25
78-93-3	2-Butanone (MEK)	50	51.0	102	50.5	101	1	70-130/25
104-51-8	n-Butylbenzene	50	52.3	105	52.1	104	0	70-130/25
135-98-8	sec-Butylbenzene	50	54.3	109	54.4	109	0	70-130/25
98-06-6	tert-Butylbenzene	50	55.2	110	55.8	112	1	70-130/25
75-15-0	Carbon disulfide	50	49.6	99	47.7	95	4	70-130/25
56-23-5	Carbon tetrachloride	50	64.4	129	63.4	127	2	70-130/25
108-90-7	Chlorobenzene	50	49.5	99	49.9	100	1	70-130/25
75-00-3	Chloroethane	50	45.8	92	44.4	89	3	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	27.9	56* a	29.5	59* a	6	70-130/25
67-66-3	Chloroform	50	54.0	108	53.0	106	2	70-130/25
74-87-3	Chloromethane	50	46.2	92	45.2	90	2	70-130/25
95-49-8	o-Chlorotoluene	50	53.6	107	53.8	108	0	70-130/25
106-43-4	p-Chlorotoluene	50	55.5	111	55.5	111	0	70-130/25
124-48-1	Dibromochloromethane	50	49.6	99	50.4	101	2	70-130/25
95-50-1	1,2-Dichlorobenzene	50	51.9	104	52.6	105	1	70-130/25
541-73-1	1,3-Dichlorobenzene	50	53.6	107	53.4	107	0	70-130/25
106-46-7	1,4-Dichlorobenzene	50	48.9	98	48.8	98	0	70-130/25
75-71-8	Dichlorodifluoromethane	50	31.7	63* a	31.0	62* a	2	70-130/25
75-34-3	1,1-Dichloroethane	50	51.6	103	51.0	102	1	70-130/25
107-06-2	1,2-Dichloroethane	50	54.5	109	53.3	107	2	70-130/25
75-35-4	1,1-Dichloroethene	50	51.6	103	50.5	101	2	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	48.5	97	47.5	95	2	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	48.8	98	47.6	95	2	70-130/25
78-87-5	1,2-Dichloropropane	50	46.5	93	46.1	92	1	70-130/25
142-28-9	1,3-Dichloropropane	50	45.2	90	46.9	94	4	70-130/25
594-20-7	2,2-Dichloropropane	50	68.1	136* a	65.7	131* a	4	70-130/25
563-58-6	1,1-Dichloropropene	50	52.3	105	51.1	102	2	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1955-BS	H59255.D	1	12/14/12	JP	n/a	n/a	MSH1955
MSH1955-BSD	H59256.D	1	12/14/12	JP	n/a	n/a	MSH1955

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-4

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	48.9	98	48.7	97	0	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	53.6	107	53.7	107	0	70-130/25
123-91-1	1,4-Dioxane	250	206	82	217	87	5	70-130/25
97-63-2	Ethyl methacrylate	50	48.3	97	48.9	98	1	77-137/25
100-41-4	Ethylbenzene	50	48.5	97	49.1	98	1	70-130/25
87-68-3	Hexachlorobutadiene	50	50.0	100	49.6	99	1	70-130/25
591-78-6	2-Hexanone	50	50.4	101	51.2	102	2	70-130/25
98-82-8	Isopropylbenzene	50	54.0	108	54.7	109	1	70-130/25
99-87-6	p-Isopropyltoluene	50	51.3	103	51.3	103	0	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	49.1	98	49.3	99	0	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	43.1	86	43.8	88	2	70-130/25
74-95-3	Methylene bromide	50	48.6	97	48.9	98	1	70-130/25
75-09-2	Methylene chloride	50	49.2	98	48.4	97	2	70-130/25
91-20-3	Naphthalene	50	41.5	83	41.6	83	0	70-130/25
103-65-1	n-Propylbenzene	50	54.8	110	54.6	109	0	70-130/25
100-42-5	Styrene	50	48.0	96	49.0	98	2	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	59.1	118	59.4	119	1	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	47.9	96	49.3	99	3	70-130/25
127-18-4	Tetrachloroethene	50	46.9	94	47.3	95	1	70-130/25
108-88-3	Toluene	50	48.2	96	47.6	95	1	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	43.3	87	43.7	87	1	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	44.6	89	45.3	91	2	70-130/25
71-55-6	1,1,1-Trichloroethane	50	58.3	117	57.0	114	2	70-130/25
79-00-5	1,1,2-Trichloroethane	50	46.8	94	47.5	95	1	70-130/25
79-01-6	Trichloroethene	50	49.5	99	48.3	97	2	70-130/25
75-69-4	Trichlorofluoromethane	50	54.0	108	52.2	104	3	70-130/25
96-18-4	1,2,3-Trichloropropane	50	49.0	98	50.5	101	3	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	50.0	100	49.9	100	0	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	49.7	99	50.0	100	1	70-130/25
108-05-4	Vinyl Acetate	50	44.5	89	44.4	89	0	70-130/25
75-01-4	Vinyl chloride	50	46.8	94	46.2	92	1	70-130/25
	m,p-Xylene	100	99.4	99	101	101	2	70-130/25
95-47-6	o-Xylene	50	52.2	104	52.5	105	1	70-130/25
1330-20-7	Xylene (total)	150	152	101	153	102	1	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1955-BS	H59255.D	1	12/14/12	JP	n/a	n/a	MSH1955
MSH1955-BSD	H59256.D	1	12/14/12	JP	n/a	n/a	MSH1955

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-4

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	110%	107%	70-130%
2037-26-5	Toluene-D8	100%	99%	70-130%
460-00-4	4-Bromofluorobenzene	103%	103%	70-130%

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

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16587-5MS	G122788.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5MSD	G122789.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5	G122785.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-1, MC16475-2, MC16475-3

CAS No.	Compound	MC16587-5 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND		5730	103	5730	6180	108	5	70-130/30
107-02-8	Acrolein	ND		28700	32* a	28700	9690	34* a	6	70-130/30
107-13-1	Acrylonitrile	ND		5730	100	5730	6040	105	5	70-130/30
71-43-2	Benzene	ND		5730	107	5730	6110	107	1	70-130/30
108-86-1	Bromobenzene	ND		5730	94	5730	5420	95	1	70-130/30
74-97-5	Bromochloromethane	ND		5730	108	5730	6220	108	0	70-130/30
75-27-4	Bromodichloromethane	ND		5730	94	5730	5430	95	1	70-130/30
75-25-2	Bromoform	ND		5730	73	5730	4280	75	2	70-130/30
74-83-9	Bromomethane	ND		5730	105	5730	6080	106	1	70-130/30
78-93-3	2-Butanone (MEK)	ND		5730	110	5730	6210	108	2	70-130/30
104-51-8	n-Butylbenzene	ND		5730	101	5730	5760	100	1	70-130/30
135-98-8	sec-Butylbenzene	ND		5730	108	5730	6190	108	0	70-130/30
98-06-6	tert-Butylbenzene	ND		5730	114	5730	6530	114	0	70-130/30
75-15-0	Carbon disulfide	ND		5730	128	5730	7250	126	2	70-130/30
56-23-5	Carbon tetrachloride	ND		5730	91	5730	5170	90	1	70-130/30
108-90-7	Chlorobenzene	ND		5730	104	5730	5950	104	1	70-130/30
75-00-3	Chloroethane	ND		5730	118	5730	6740	118	1	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND		5730	36	5730	2190	38	5	10-160/30
67-66-3	Chloroform	ND		5730	112	5730	6420	112	0	70-130/30
74-87-3	Chloromethane	ND		5730	135* a	5730	7800	136* a	1	70-130/30
95-49-8	o-Chlorotoluene	ND		5730	107	5730	6110	107	0	70-130/30
106-43-4	p-Chlorotoluene	ND		5730	112	5730	6550	114	2	70-130/30
124-48-1	Dibromochloromethane	ND		5730	84	5730	4910	86	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND		5730	103	5730	5970	104	1	70-130/30
541-73-1	1,3-Dichlorobenzene	ND		5730	103	5730	5980	104	1	70-130/30
106-46-7	1,4-Dichlorobenzene	ND		5730	97	5730	5590	97	1	70-130/30
75-71-8	Dichlorodifluoromethane	ND		5730	87	5730	5000	87	1	70-130/30
75-34-3	1,1-Dichloroethane	ND		5730	123	5730	7000	122	1	70-130/30
107-06-2	1,2-Dichloroethane	ND		5730	93	5730	5390	94	1	70-130/30
75-35-4	1,1-Dichloroethene	ND		5730	116	5730	6680	116	0	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND		5730	118	5730	6780	118	0	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND		5730	114	5730	6550	114	0	70-130/30
78-87-5	1,2-Dichloropropane	ND		5730	107	5730	6130	107	0	70-130/30
142-28-9	1,3-Dichloropropane	ND		5730	94	5730	5470	95	1	70-130/30
594-20-7	2,2-Dichloropropane	ND		5730	115	5730	6460	113	2	70-130/30
563-58-6	1,1-Dichloropropene	ND		5730	107	5730	6010	105	2	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16587-5MS	G122788.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5MSD	G122789.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5	G122785.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-1, MC16475-2, MC16475-3

CAS No.	Compound	MC16587-5 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND		5730	98	5730	5550	97	1	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		5730	97	5730	5630	98	1	70-130/30
123-91-1	1,4-Dioxane	ND		28700	95	28700	27000	94	1	70-130/30
97-63-2	Ethyl methacrylate	ND		5730	94	5730	5410	94	1	41-160/30
100-41-4	Ethylbenzene	36.7	J	5730	98	5730	5670	98	0	70-130/30
87-68-3	Hexachlorobutadiene	ND		5730	91	5730	5260	92	1	70-130/30
591-78-6	2-Hexanone	ND		5730	83	5730	4740	83	0	70-130/30
98-82-8	Isopropylbenzene	ND		5730	109	5730	6310	110	1	70-130/30
99-87-6	p-Isopropyltoluene	ND		5730	102	5730	5830	102	1	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		5730	109	5730	6340	111	1	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5730	68* a	5730	3910	68* a	0	70-130/30
74-95-3	Methylene bromide	ND		5730	96	5730	5520	96	0	70-130/30
75-09-2	Methylene chloride	ND		5730	120	5730	6880	120	0	70-130/30
91-20-3	Naphthalene	ND		5730	117	5730	6890	120	3	70-130/30
103-65-1	n-Propylbenzene	ND		5730	110	5730	6340	111	0	70-130/30
100-42-5	Styrene	ND		5730	93	5730	5340	93	0	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		5730	87	5730	5030	88	1	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		5730	99	5730	5810	101	2	70-130/30
127-18-4	Tetrachloroethene	ND		5730	90	5730	5200	91	0	70-130/30
108-88-3	Toluene	ND		5730	106	5730	6070	106	0	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		5730	117	5730	6970	122	4	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		5730	101	5730	5870	102	1	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		5730	111	5730	6340	111	1	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		5730	96	5730	5620	98	2	70-130/30
79-01-6	Trichloroethene	ND		5730	101	5730	5740	100	1	70-130/30
75-69-4	Trichlorofluoromethane	ND		5730	108	5730	6120	107	1	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		5730	98	5730	5680	99	1	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND		5730	98	5730	5620	98	0	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		5730	97	5730	5590	97	0	70-130/30
108-05-4	Vinyl Acetate	ND		5730	114	5730	6580	115	1	70-130/30
75-01-4	Vinyl chloride	ND		5730	119	5730	6650	116	2	70-130/30
	m,p-Xylene	ND		11500	101	11500	11600	101	0	70-130/30
95-47-6	o-Xylene	ND		5730	105	5730	5990	104	0	70-130/30
1330-20-7	Xylene (total)	80.3	J	17200	102	17200	17600	102	0	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16587-5MS	G122788.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5MSD	G122789.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5	G122785.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-1, MC16475-2, MC16475-3

CAS No.	Surrogate Recoveries	MS	MSD	MC16587-5	Limits
1868-53-7	Dibromofluoromethane	106%	106%	100%	70-130%
2037-26-5	Toluene-D8	97%	97%	90%	70-130%
460-00-4	4-Bromofluorobenzene	97%	98%	90%	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: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16456-3MS	H59277.D	5	12/14/12	JP	n/a	n/a	MSH1955
MC16456-3MSD	H59278.D	5	12/14/12	JP	n/a	n/a	MSH1955
MC16456-3	H59265.D	1	12/14/12	JP	n/a	n/a	MSH1955

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-4

CAS No.	Compound	MC16456-3 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	250	208	83	250	203	81	2	70-130/30
107-02-8	Acrolein	ND	1250	541	43* a	1250	514	41* a	5	70-130/30
107-13-1	Acrylonitrile	ND	250	216	86	250	196	78	10	70-130/30
71-43-2	Benzene	ND	250	252	101	250	238	95	6	70-130/30
108-86-1	Bromobenzene	ND	250	260	104	250	252	101	3	70-130/30
74-97-5	Bromochloromethane	ND	250	271	108	250	250	100	8	70-130/30
75-27-4	Bromodichloromethane	ND	250	315	126	250	294	118	7	70-130/30
75-25-2	Bromoform	ND	250	289	116	250	276	110	5	70-130/30
74-83-9	Bromomethane	ND	250	275	110	250	254	102	8	70-130/30
78-93-3	2-Butanone (MEK)	ND	250	232	93	250	216	86	7	70-130/30
104-51-8	n-Butylbenzene	ND	250	268	107	250	254	102	5	70-130/30
135-98-8	sec-Butylbenzene	ND	250	278	111	250	266	106	4	70-130/30
98-06-6	tert-Butylbenzene	ND	250	292	117	250	279	112	5	70-130/30
75-15-0	Carbon disulfide	ND	250	224	90	250	221	88	1	70-130/30
56-23-5	Carbon tetrachloride	ND	250	368	147* a	250	341	136* a	8	70-130/30
108-90-7	Chlorobenzene	ND	250	261	104	250	247	99	6	70-130/30
75-00-3	Chloroethane	ND	250	261	104	250	245	98	6	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	250	77.4	31* a	250	76.2	30* a	2	70-130/30
67-66-3	Chloroform	ND	250	303	121	250	276	110	9	70-130/30
74-87-3	Chloromethane	ND	250	353	141* a	250	335	134* a	5	70-130/30
95-49-8	o-Chlorotoluene	ND	250	279	112	250	266	106	5	70-130/30
106-43-4	p-Chlorotoluene	ND	250	288	115	250	276	110	4	70-130/30
124-48-1	Dibromochloromethane	ND	250	265	106	250	254	102	4	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	250	271	108	250	258	103	5	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	250	278	111	250	267	107	4	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	250	253	101	250	244	98	4	70-130/30
75-71-8	Dichlorodifluoromethane	ND	250	448	179* a	250	428	171* a	5	70-130/30
75-34-3	1,1-Dichloroethane	2.7	250	287	114	250	264	105	8	70-130/30
107-06-2	1,2-Dichloroethane	ND	250	309	124	250	292	117	6	70-130/30
75-35-4	1,1-Dichloroethene	2.0	250	285	113	250	268	106	6	70-130/30
156-59-2	cis-1,2-Dichloroethene	1.8	250	268	106	250	247	98	8	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	250	264	106	250	243	97	8	70-130/30
78-87-5	1,2-Dichloropropane	ND	250	245	98	250	231	92	6	70-130/30
142-28-9	1,3-Dichloropropane	ND	250	241	96	250	232	93	4	70-130/30
594-20-7	2,2-Dichloropropane	ND	250	369	148* a	250	342	137* a	8	70-130/30
563-58-6	1,1-Dichloropropene	ND	250	282	113	250	270	108	4	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16456-3MS	H59277.D	5	12/14/12	JP	n/a	n/a	MSH1955
MC16456-3MSD	H59278.D	5	12/14/12	JP	n/a	n/a	MSH1955
MC16456-3	H59265.D	1	12/14/12	JP	n/a	n/a	MSH1955

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-4

CAS No.	Compound	MC16456-3 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	250	258	103	250	248	99	4	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	250	290	116	250	278	111	4	70-130/30
123-91-1	1,4-Dioxane	ND	1250	1080	86	1250	1060	85	2	70-130/30
97-63-2	Ethyl methacrylate	ND	250	251	100	250	238	95	5	72-139/30
100-41-4	Ethylbenzene	ND	250	260	104	250	244	98	6	70-130/30
87-68-3	Hexachlorobutadiene	ND	250	254	102	250	248	99	2	70-130/30
591-78-6	2-Hexanone	ND	250	220	88	250	213	85	3	70-130/30
98-82-8	Isopropylbenzene	ND	250	281	112	250	269	108	4	70-130/30
99-87-6	p-Isopropyltoluene	ND	250	264	106	250	254	102	4	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	250	268	107	250	250	100	7	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	222	89	250	211	84	5	70-130/30
74-95-3	Methylene bromide	ND	250	265	106	250	253	101	5	70-130/30
75-09-2	Methylene chloride	ND	250	266	106	250	245	98	8	70-130/30
91-20-3	Naphthalene	ND	250	195	78	250	196	78	1	70-130/30
103-65-1	n-Propylbenzene	ND	250	283	113	250	271	108	4	70-130/30
100-42-5	Styrene	ND	250	252	101	250	237	95	6	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	319	128	250	301	120	6	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	248	99	250	240	96	3	70-130/30
127-18-4	Tetrachloroethene	ND	250	255	102	250	241	96	6	70-130/30
108-88-3	Toluene	ND	250	259	104	250	246	98	5	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	250	204	82	250	204	82	0	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	250	218	87	250	214	86	2	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	250	337	135* a	250	308	123	9	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	250	251	100	250	238	95	5	70-130/30
79-01-6	Trichloroethene	ND	250	273	109	250	254	102	7	70-130/30
75-69-4	Trichlorofluoromethane	ND	250	336	134* a	250	309	124	8	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	250	258	103	250	246	98	5	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	250	259	104	250	249	100	4	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	250	258	103	250	249	100	4	70-130/30
108-05-4	Vinyl Acetate	ND	250	240	96	250	232	93	3	70-130/30
75-01-4	Vinyl chloride	ND	250	315	126	250	298	119	6	70-130/30
	m,p-Xylene	ND	500	537	107	500	501	100	7	70-130/30
95-47-6	o-Xylene	ND	250	279	112	250	262	105	6	70-130/30
1330-20-7	Xylene (total)	ND	750	816	109	750	763	102	7	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16456-3MS	H59277.D	5	12/14/12	JP	n/a	n/a	MSH1955
MC16456-3MSD	H59278.D	5	12/14/12	JP	n/a	n/a	MSH1955
MC16456-3	H59265.D	1	12/14/12	JP	n/a	n/a	MSH1955

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16475-4

CAS No.	Surrogate Recoveries	MS	MSD	MC16456-3	Limits
1868-53-7	Dibromofluoromethane	112%	108%	102%	70-130%
2037-26-5	Toluene-D8	98%	98%	100%	70-130%
460-00-4	4-Bromofluorobenzene	102%	102%	105%	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: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSG4880-CC4851	Injection Date:	12/11/12
Lab File ID:	G122772.D	Injection Time:	12:27
Instrument ID:	GCMSG	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	282854	5.13	386682	6.27	185876	9.62	224758	12.25	55938	3.10
Upper Limit <sup>a</sup>	565708	5.63	773364	6.77	371752	10.12	449516	12.75	111876	3.60
Lower Limit <sup>b</sup>	141427	4.63	193341	5.77	92938	9.12	112379	11.75	27969	2.60

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSG4880-BS	279361	5.13	378357	6.27	182624	9.62	221524	12.25	56696	3.10
MSG4880-MB	277809	5.13	374897	6.27	182434	9.62	223449	12.25	56868	3.10
ZZZZZZ	280559	5.13	380568	6.27	185584	9.62	225884	12.25	57852	3.10
MC16475-2	279090	5.13	377463	6.27	191881	9.62	222529	12.25	55692	3.10
MC16475-3	282810	5.13	378518	6.27	187896	9.62	225464	12.25	52941	3.10
MC16475-1	287554	5.13	399703	6.27	222422	9.63	223337	12.25	58402	3.09
MC16587-5	273233	5.13	377003	6.27	182140	9.62	225333	12.25	56555	3.10
ZZZZZZ	282645	5.13	383059	6.27	188745	9.62	230746	12.25	55493	3.10
ZZZZZZ	269959	5.13	368584	6.27	180494	9.62	220361	12.25	55539	3.10
MC16587-5MS	274869	5.13	372600	6.27	181935	9.62	224033	12.25	56514	3.10
MC16587-5MSD	272912	5.13	371776	6.27	180464	9.62	221659	12.25	58561	3.10
ZZZZZZ	276540	5.13	376992	6.27	182311	9.62	221396	12.25	58586	3.14
ZZZZZZ	274965	5.13	371930	6.27	181572	9.62	218163	12.25	56459	3.13
ZZZZZZ	271327	5.13	365963	6.27	178291	9.62	215271	12.25	62280	3.14
ZZZZZZ	272406	5.13	366878	6.27	177996	9.62	216973	12.25	54588	3.13
ZZZZZZ	276682	5.13	370068	6.27	179261	9.62	218768	12.25	57430	3.13
ZZZZZZ	282570	5.13	381461	6.27	181918	9.62	183642	12.25	53900	3.10

- 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: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSH1955-CC1910	Injection Date:	12/14/12
Lab File ID:	H59254.D	Injection Time:	10:53
Instrument ID:	GCMSH	Method:	SW846 8260B

	IS 1	IS 2	IS 3	IS 4	IS 5
	AREA	RT	AREA	RT	AREA
Check Std	205111	8.70	298820	9.57	138594
Upper Limit <sup>a</sup>	410222	9.20	597640	10.07	277188
Lower Limit <sup>b</sup>	102556	8.20	149410	9.07	69297

Lab	IS 1	IS 2	IS 3	IS 4	IS 5
Sample ID	AREA	RT	AREA	RT	AREA
MSH1955-BS	208338	8.71	304398	9.57	142745
MSH1955-BSD	210143	8.70	305504	9.57	140110
MSH1955-MB	199776	8.70	280720	9.57	124047
MC16475-4	186079	8.71	259481	9.57	114612
ZZZZZZ	177675	8.71	248541	9.58	109129
ZZZZZZ	187804	8.71	265102	9.57	116020
ZZZZZZ	186845	8.71	263040	9.57	113872
ZZZZZZ	183918	8.71	256640	9.57	111601
ZZZZZZ	184064	8.71	257870	9.57	111359
ZZZZZZ	176071	8.70	246479	9.57	107189
MC16456-3	177621	8.70	245817	9.57	108089
ZZZZZZ	173041	8.71	238873	9.57	104448
ZZZZZZ	175526	8.70	241850	9.57	107840
ZZZZZZ	181901	8.70	268972	9.57	108016
ZZZZZZ	183492	8.71	255192	9.57	107637
ZZZZZZ	178452	8.70	244687	9.57	106922
ZZZZZZ	175485	8.71	241537	9.57	105707
ZZZZZZ	171606	8.71	236835	9.57	104015
ZZZZZZ	167049	8.71	253558	9.57	104226
MC16456-3MS	179632	8.70	264470	9.57	125272
MC16456-3MSD	198315	8.70	286384	9.57	135779

- 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: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16475-4	H59258.D	100	100	107
MC16456-3MS	H59277.D	112	98	102
MC16456-3MSD	H59278.D	108	98	102
MSH1955-BS	H59255.D	110	100	103
MSH1955-BSD	H59256.D	107	99	103
MSH1955-MB	H59257.D	101	99	106

**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: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16475-1	G122784.D	99	91	103
MC16475-2	G122782.D	105	97	98
MC16475-3	G122783.D	101	94	94
MC16587-5MS	G122788.D	106	97	97
MC16587-5MSD	G122789.D	106	97	98
MSG4880-BS	G122773.D	109	100	101
MSG4880-MB	G122775.D	111	103	101

**Surrogate Compounds**                      **Recovery Limits**

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

6.6.2  
6

**GC Volatiles**

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**QC Data Summaries****7**

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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: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-MB	BK19728.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16475-1, MC16475-2, MC16475-3

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.5	0.96	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	108% 61-167%
460-00-4	Bromofluorobenzene (S)	98% 61-167%

7.1.1

7

# Method Blank Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-MB	BK19937.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16475-4

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	100% 36-173%
460-00-4	Bromofluorobenzene (S)	95% 36-173%

7.1.2

7

# Blank Spike Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-BS	BK19729.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16475-1, MC16475-2, MC16475-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	65	66.5	102	59-142
106-93-4	1,2-Dibromoethane	65	60.3	93	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	107%	61-167%
460-00-4	Bromofluorobenzene (S)	97%	61-167%

7.2.1  
7

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-BS	BK19938.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16475-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.067	94	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)	104%	36-173%
460-00-4	Bromofluorobenzene (S)	96%	36-173%

7.2.2  
7

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-MS	BK19730.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
OP31352-MSD	BK19731.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
MC16336-6	BK19735.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16475-1, MC16475-2, MC16475-3

CAS No.	Compound	MC16336-6 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	367	337	92	419	382	91	13	40-156/27
106-93-4	1,2-Dibromoethane	ND	367	304	83	419	342	82	12	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16336-6	Limits
460-00-4	Bromofluorobenzene (S)	99%	91%	96%	61-167%
460-00-4	Bromofluorobenzene (S)	91%	85%	94%	61-167%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-MS	BK19941.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
OP31406-MSD	BK19942.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
MC16600-6	BK19943.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16475-4

CAS No.	Compound	MC16600-6 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.071	0.066	93	0.071	0.064	90	3	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.071	0.072	101	0.071	0.067	94	7	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16600-6	Limits
460-00-4	Bromofluorobenzene (S)	110%	108%	107%	36-173%
460-00-4	Bromofluorobenzene (S)	100%	100%	99%	36-173%

\* = Outside of Control Limits.

# Volatile Surrogate Recovery Summary

Job Number: MC16475  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16475-4	BK19944.D	100	89
OP31406-BS	BK19938.D	104	96
OP31406-MB	BK19937.D	100	95
OP31406-MS	BK19941.D	110	100
OP31406-MSD	BK19942.D	108	100

Surrogate Compounds	Recovery Limits
---------------------	-----------------

S1 = Bromofluorobenzene (S)	36-173%
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- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

# Volatile Surrogate Recovery Summary

Job Number: MC16475  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011 Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16475-1	BK19744.D	69	74
MC16475-2	BK19745.D	75	71
MC16475-3	BK19746.D	75	79
OP31352-BS	BK19729.D	107	97
OP31352-MB	BK19728.D	108	98
OP31352-MS	BK19730.D	99	91
OP31352-MSD	BK19731.D	91	85

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 61-167%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

# GC Surrogate Retention Time Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK712-ICC712	Injection Date:	12/09/12
Lab File ID:	BK19722.D	Injection Time:	17:47
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.56	4.90
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP31352-MB	BK19728.D	12/09/12	20:14	4.57	4.90
OP31352-BS	BK19729.D	12/09/12	20:38	4.56	4.90
OP31352-MS	BK19730.D	12/09/12	21:03	4.57	4.90
OP31352-MSD	BK19731.D	12/09/12	21:27	4.57	4.90
ZZZZZZ	BK19732.D	12/09/12	21:52	4.56	4.90
ZZZZZZ	BK19733.D	12/09/12	22:16	4.56	4.90
ZZZZZZ	BK19734.D	12/09/12	22:41	4.56	4.90
MC16336-6	BK19735.D	12/09/12	23:05	4.57	4.90
ZZZZZZ	BK19736.D	12/09/12	23:30	4.56	4.90
ZZZZZZ	BK19737.D	12/09/12	23:55	4.56	4.90

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.1  
7

# GC Surrogate Retention Time Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK712-CC712	Injection Date:	12/10/12
Lab File ID:	BK19738.D	Injection Time:	00:20
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.56	4.90
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
ZZZZZZ	BK19739.D	12/10/12	00:44	4.57	4.90
ZZZZZZ	BK19740.D	12/10/12	01:09	4.57	4.90
ZZZZZZ	BK19741.D	12/10/12	01:33	4.56	4.90
ZZZZZZ	BK19742.D	12/10/12	01:58	4.56	4.90
ZZZZZZ	BK19743.D	12/10/12	02:23	4.56	4.90
MC16475-1	BK19744.D	12/10/12	02:47	4.56	4.90
MC16475-2	BK19745.D	12/10/12	03:12	4.56	4.90
MC16475-3	BK19746.D	12/10/12	03:36	4.56	4.90
ZZZZZZ	BK19747.D	12/10/12	04:01	4.56	4.90
ZZZZZZ	BK19748.D	12/10/12	04:25	4.56	4.90

**Surrogate Compounds**

S1 = Bromofluorobenzene (S)

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

7.5.2  
7

# GC Surrogate Retention Time Summary

Job Number: MC16475  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK716-ICC716	Injection Date:	12/13/12
Lab File ID:	BK19932.D	Injection Time:	18:03
Instrument ID:	GCBK	Method:	SW846 8011

	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
Check Std	4.52	4.85

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
ZZZZZZ	BK19935A.D	12/13/12	19:16	4.52	4.85
ZZZZZZ	BK19935B.D	12/13/12	19:16	4.52	4.85
OP31405-MB	BK19937A.D	12/13/12	20:04	4.52	4.85
OP31406-MB	BK19937.D	12/13/12	20:04	4.52	4.85
OP31406-BS	BK19938.D	12/13/12	20:28	4.52	4.85
OP31405-BS	BK19938A.D	12/13/12	20:28	4.52	4.85
OP31405-BSD	BK19939.D	12/13/12	20:52	4.52	4.85
ZZZZZZ	BK19940.D	12/13/12	21:17	4.52	4.85
OP31406-MS	BK19941.D	12/13/12	21:41	4.52	4.85
OP31406-MSD	BK19942.D	12/13/12	22:06	4.52	4.85
MC16600-6	BK19943.D	12/13/12	22:30	4.52	4.85
MC16475-4	BK19944.D	12/13/12	22:55	4.52	4.85
ZZZZZZ	BK19945.D	12/13/12	23:19	4.52	4.85
ZZZZZZ	BK19946.D	12/13/12	23:43	4.52	4.85

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

## General Chemistry

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### QC Data Summaries



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Includes the following where applicable:

- Percent Solids Raw Data Summary

# Percent Solids Raw Data Summary

Job Number: MC16475  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

---

Sample: MC16475-1      Analyzed: 07-DEC-12 by CF      Method: SM21 2540 B MOD.  
ClientID: MW-19-13

Wet Weight (Total)	37.396	g
Tare Weight	27.986	g
Dry Weight (Total)	35.057	g
Solids, Percent	75.1	%

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Sample: MC16475-2      Analyzed: 07-DEC-12 by CF      Method: SM21 2540 B MOD.  
ClientID: MW-19-20

Wet Weight (Total)	31.154	g
Tare Weight	21.029	g
Dry Weight (Total)	28.331	g
Solids, Percent	72.1	%

---

Sample: MC16475-3      Analyzed: 07-DEC-12 by CF      Method: SM21 2540 B MOD.  
ClientID: MW-19-32

Wet Weight (Total)	29.674	g
Tare Weight	19.003	g
Dry Weight (Total)	26.935	g
Solids, Percent	74.3	%

---

8.1  
8

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VERIFICATION, TESTING AND CERTIFICATION COMPANY.



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### Technical Report for

## Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562735.00015

SGS Accutest Job Number: MC16587

Sampling Dates: 12/04/12 - 12/05/12



### Report to:

AECOM, INC.

Melissa.mansker@aecom.com

ATTN: Melissa Mansker

Total number of pages in report: **93**



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

H. (Brad) Madadian  
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

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

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Test results relate only to samples analyzed.



ACCUTEST

October 27, 2016

AECOM  
1001 Highlands Plaza Drive West Suite 300  
St. Louis, MO 63110

RE: SGS Accutest Job # MC16587

Dear Elizabeth Kunkel

As you are aware, SGS Accutest Inc. - Marlborough has been conducting an extensive review of data associated with some historical Gas Chromatography-Mass Spectroscopy volatiles analyses. As a result of this review it was determined that some revisions of the original test report for this job were needed. These corrections have been incorporated into the revised report.

Please be assured that corrective actions have been put in place to address this matter and prevent a recurrence.

We apologize for any inconvenience that this issue may have caused. Please don't hesitate to contact us if we can be of further assistance.

Sincerely,

**H. (Brad) Madadian**

Regional Laboratory Director  
SGS Accutest Inc. - Marlborough

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TESTING AND CERTIFICATION COMPANY.

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## Sample Summary

Shell Oil

Job No: MC16587

URSMOSTL: Roxana Drilling, Roxana, IL  
Project No: 21562735.00015

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
MC16587-1	12/04/12	14:40 WPJS	12/06/12	SO	Soil	MW-16-14
MC16587-2	12/04/12	14:50 WPJS	12/06/12	SO	Soil	MW-16-27
MC16587-3	12/04/12	14:55 WPJS	12/06/12	SO	Soil	MW-16-37
MC16587-4	12/04/12	00:00 WPJS	12/06/12	AQ	Trip Blank Water	TRIP BLANK
MC16587-5	12/05/12	13:25 WPJS	12/06/12	SO	Soil	MW-20-11
MC16587-6	12/05/12	13:35 WPJS	12/06/12	SO	Soil	MW-20-21
MC16587-7	12/05/12	13:40 WPJS	12/06/12	SO	Soil	MW-20-41

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

## SAMPLE DELIVERY GROUP CASE NARRATIVE

2

**Client:** She O

**Job No** MC 6587

**Site:** URSMOSTL: Roxana Dr ing, Roxana, IL

**Report Date** 0/27/20 6 0:3 : 3 A

6 Samp e(s), Tr p B ank(s) and 0 F e d B ank(s) were co ected on between 2/04/20 2 and 2/05/20 2 and were rece ved at SGS Accutest New Eng and on 2/06/20 2 properly preserved, at 0 6 Deg C and ntact These Samp es rece ved a job number of MC 6587 A st ng of the Laboratory Samp e ID, C ent Samp e ID and dates of co ect on are presented n the Resu ts Summary Sect on of th s report -Ch orohexane was searched n the brary search and reported on y f detect ons were found

Except as noted be ow, a method spec f ed ca brat ons and qua ty contro performance cr ter a were met for th s job For more nformat on, p ease refer to QC summary pages

### Volatiles by GCMS By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** MSN2676

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6648- 2MS, MC 6648- 2MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for Acry on tr e, 2,2-D ch oropropane, Acro e n, D ch orod fuoromethane are outs de contro m ts
- Matr x Sp ke Recovery(s) for D ch orod fuoromethane, Acro e n, Acry on tr e are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for Acro e n, D ch orod fuoromethane are outs de contro m ts Probab e cause due to matr x nterference
- Acro e n: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow

**Matrix:** SO

**Batch ID:** MSG4879

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6503-2MS, MC 6503-2MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for , -D ch oroethane, , 2,3-Tr ch orobenzene, 2,2-D ch oropropane, Acro e n, Carbon d su f de, Ch oromethane, Methy ene ch or de are outs de contro m ts
- Matr x Sp ke Recovery(s) for 2-Hexanone, Acro e n, Bromoform, Carbon d su f de, Ch oromethane, tert-Buty benzene are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for 2-Hexanone, Acro e n, Bromoform, Ch oromethane, tert-Buty benzene are outs de contro m ts Probab e cause due to matr x nte ference
- V ny ch or de(CCC's)potent a y do not meet the reference method acceptance cr ter a n nst ument QC and resu ts may be b ased h gh
- V ny Acetate: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow
- MSG4879-MB for D bromo fuoromethane: Outs de contro m ts Assoc ated target ana ytes are non-detect

**Matrix:** SO

**Batch ID:** MSG4880

- A samp es were ana yzed w th n the recommended method ho d ng t me
- A method b anks for th s batch meet method spec f c cr ter a
- Samp e(s) MC 6587-5MS, MC 6587-5MSD were used as the QC samp es nd cated
- B ank Sp ke Recove y(s) for 4-Methy -2-pentanone (MIBK), Acro e n are outs de contro m ts
- Matr x Sp ke/Matr x Sp ke Dup cate Recovery(s) for 4-Methy -2-pentanone (MIBK), Acro e n, Ch oromethane are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Acro e n: Cont nu ng Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow
- V ny Acetate: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow

Thursday, October 27, 2016

Page 1 of 2

**Volatiles by GC By Method SW846 8011**

**Matrix:** AQ **Batch ID:** OP3 406

- All samples were analyzed with the recommended method holding time
- Sample(s) MC 6600-6MS, MC 6600-6MSD were used as the QC samples indicated
- All method blanks for this batch meet method specification

**Matrix:** SO **Batch ID:** OP3 352

- All samples were extracted with the recommended method holding time
- All samples were analyzed with the recommended method holding time
- All method blanks for this batch meet method specification
- Sample(s) MC 6336-6MS, MC 6336-6MSD were used as the QC samples indicated

**Wet Chemistry By Method SM21 2540 B MOD.**

**Matrix:** SO **Batch ID:** GN4 20

- Sample(s) MC 6587- DUP were used as the QC samples for Sulfide, Percent

SGS Accutest New England certifies that all analyses were performed with the method specification. It is further recommended that this report be used in its entirety. The Laboratory Director for SGS Accutest New England or assignee as verified by the signature on the cover page has authorized the release of this report(MC 6587)

## Summary of Hits

Job Number: MC16587  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 12/04/12 thru 12/05/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
<b>MC16587-1 MW-16-14</b>						
n-Butylbenzene <sup>a</sup>		0.0323 J	0.56	0.021	mg/kg	SW846 8260B
Ethylbenzene <sup>a</sup>		0.0320 J	0.23	0.027	mg/kg	SW846 8260B
Naphthalene <sup>a</sup>		0.201 J	0.56	0.14	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene <sup>a</sup>		0.0894 J	0.56	0.025	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene <sup>a</sup>		0.0408 J	0.56	0.024	mg/kg	SW846 8260B
o-Xylene <sup>a</sup>		0.0400 J	0.23	0.027	mg/kg	SW846 8260B
Xylene (total) <sup>a</sup>		0.128 J	0.23	0.027	mg/kg	SW846 8260B
<b>MC16587-2 MW-16-27</b>						
n-Butylbenzene <sup>a</sup>		0.0233 J	0.56	0.021	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene <sup>a</sup>		0.0467 J	0.56	0.025	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene <sup>a</sup>		0.0286 J	0.56	0.024	mg/kg	SW846 8260B
o-Xylene <sup>a</sup>		0.0281 J	0.22	0.027	mg/kg	SW846 8260B
Xylene (total) <sup>a</sup>		0.0852 J	0.22	0.027	mg/kg	SW846 8260B
<b>MC16587-3 MW-16-37</b>						
1,2,4-Trimethylbenzene <sup>a</sup>		0.0197 J	0.27	0.012	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene <sup>a</sup>		0.0131 J	0.27	0.012	mg/kg	SW846 8260B
o-Xylene <sup>a</sup>		0.0157 J	0.11	0.013	mg/kg	SW846 8260B
Xylene (total) <sup>a</sup>		0.0454 J	0.11	0.013	mg/kg	SW846 8260B
<b>MC16587-4 TRIP BLANK</b>						
No hits reported in this sample.						
<b>MC16587-5 MW-20-11</b>						
Ethylbenzene		0.0367 J	0.23	0.028	mg/kg	SW846 8260B
Xylene (total)		0.0803 J	0.23	0.027	mg/kg	SW846 8260B
<b>MC16587-6 MW-20-21</b>						
Benzene		0.0585 J	0.062	0.036	mg/kg	SW846 8260B
sec-Butylbenzene		0.365 J	0.62	0.028	mg/kg	SW846 8260B
Chlorobenzene		0.0401 J	0.25	0.034	mg/kg	SW846 8260B
Isopropylbenzene		0.110 J	0.62	0.028	mg/kg	SW846 8260B
p-Isopropyltoluene		0.0854 J	0.62	0.022	mg/kg	SW846 8260B
n-Propylbenzene		0.178 J	0.62	0.13	mg/kg	SW846 8260B

## Summary of Hits

Job Number: MC16587  
Account: Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL  
Collected: 12/04/12 thru 12/05/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
MC16587-7	MW-20-41					
Ethylbenzene		0.0345 J	0.23	0.028	mg/kg	SW846 8260B
Isopropylbenzene		0.0314 J	0.57	0.026	mg/kg	SW846 8260B
o-Xylene		0.0398 J	0.23	0.027	mg/kg	SW846 8260B
Xylene (total)		0.0398 J	0.23	0.027	mg/kg	SW846 8260B

(a) Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.

Sample Results

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Report of Analysis

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## Report of Analysis

Client Sample ID:	MW-16-14	Date Sampled:	12/04/12
Lab Sample ID:	MC16587-1	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	96.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	G122738.D	1	12/10/12	JM	n/a	n/a	MSG4879
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.68 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.56	0.14	mg/kg	
107-02-8	Acrolein	ND	2.8	1.1	mg/kg	
107-13-1	Acrylonitrile	ND	2.8	0.14	mg/kg	
71-43-2	Benzene	ND	0.056	0.033	mg/kg	
108-86-1	Bromobenzene	ND	0.56	0.025	mg/kg	
74-97-5	Bromochloromethane	ND	0.56	0.042	mg/kg	
75-27-4	Bromodichloromethane	ND	0.23	0.024	mg/kg	
75-25-2	Bromoform	ND	0.23	0.23	mg/kg	
74-83-9	Bromomethane	ND	0.23	0.059	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.56	0.14	mg/kg	
104-51-8	n-Butylbenzene	0.0323	0.56	0.021	mg/kg	J
135-98-8	sec-Butylbenzene	ND	0.56	0.026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.56	0.099	mg/kg	
75-15-0	Carbon disulfide	ND	0.56	0.019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.23	0.082	mg/kg	
108-90-7	Chlorobenzene	ND	0.23	0.031	mg/kg	
75-00-3	Chloroethane	ND	0.56	0.14	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.56	0.23	mg/kg	
67-66-3	Chloroform	ND	0.23	0.058	mg/kg	
74-87-3	Chloromethane	ND	0.56	0.052	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.56	0.12	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.56	0.026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.23	0.033	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.23	0.024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.23	0.025	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.23	0.024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.23	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.23	0.030	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.23	0.032	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.23	0.041	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.23	0.034	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.23	0.032	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:	MW-16-14	Date Sampled:	12/04/12
Lab Sample ID:	MC16587-1	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	96.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.23	0.042	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.56	0.026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.56	0.098	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.56	0.030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.23	0.019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.23	0.056	mg/kg	
123-91-1	1,4-Dioxane	ND	2.8	2.8	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.56	0.077	mg/kg	
100-41-4	Ethylbenzene	0.0320	0.23	0.027	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.56	0.052	mg/kg	
591-78-6	2-Hexanone	ND	0.56	0.056	mg/kg	
98-82-8	Isopropylbenzene	ND	0.56	0.026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.56	0.020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.23	0.032	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.56	0.056	mg/kg	
74-95-3	Methylene bromide	ND	0.56	0.056	mg/kg	
75-09-2	Methylene chloride	ND	0.23	0.13	mg/kg	
91-20-3	Naphthalene	0.201	0.56	0.14	mg/kg	J
103-65-1	n-Propylbenzene	ND	0.56	0.11	mg/kg	
100-42-5	Styrene	ND	0.56	0.026	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.56	0.11	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.23	0.048	mg/kg	
127-18-4	Tetrachloroethene	ND	0.23	0.026	mg/kg	
108-88-3	Toluene	ND	0.56	0.096	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.56	0.027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.56	0.026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.23	0.035	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.23	0.083	mg/kg	
79-01-6	Trichloroethene	ND	0.23	0.024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.23	0.034	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.56	0.033	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.0894	0.56	0.025	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.0408	0.56	0.024	mg/kg	J
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.56	0.063	mg/kg	
75-01-4	Vinyl chloride	ND	0.23	0.031	mg/kg	
	m,p-Xylene	ND	0.23	0.089	mg/kg	
95-47-6	o-Xylene	0.0400	0.23	0.027	mg/kg	J
1330-20-7	Xylene (total)	0.128	0.23	0.027	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

<b>Client Sample ID:</b> MW-16-14	<b>Date Sampled:</b> 12/04/12
<b>Lab Sample ID:</b> MC16587-1	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.4
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

4.1  
4

**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		70-130%
2037-26-5	Toluene-D8	94%		70-130%
460-00-4	4-Bromofluorobenzene	95%		70-130%

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

- (a) Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

---

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

<b>Client Sample ID:</b> MW-16-14	<b>Date Sampled:</b> 12/04/12
<b>Lab Sample ID:</b> MC16587-1	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.4
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19747.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

	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	0.0026	0.0011	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.00099	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	72%		61-167%
460-00-4	Bromofluorobenzene (S)	76%		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

4.1  
4

## Report of Analysis

Client Sample ID:	MW-16-27	Date Sampled:	12/04/12
Lab Sample ID:	MC16587-2	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	96.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	G122739.D	1	12/10/12	JM	n/a	n/a	MSG4879
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.68 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.56	0.14	mg/kg	
107-02-8	Acrolein	ND	2.8	1.1	mg/kg	
107-13-1	Acrylonitrile	ND	2.8	0.14	mg/kg	
71-43-2	Benzene	ND	0.056	0.033	mg/kg	
108-86-1	Bromobenzene	ND	0.56	0.025	mg/kg	
74-97-5	Bromochloromethane	ND	0.56	0.042	mg/kg	
75-27-4	Bromodichloromethane	ND	0.22	0.024	mg/kg	
75-25-2	Bromoform	ND	0.22	0.22	mg/kg	
74-83-9	Bromomethane	ND	0.22	0.058	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.56	0.14	mg/kg	
104-51-8	n-Butylbenzene	0.0233	0.56	0.021	mg/kg	J
135-98-8	sec-Butylbenzene	ND	0.56	0.026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.56	0.099	mg/kg	
75-15-0	Carbon disulfide	ND	0.56	0.018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.22	0.081	mg/kg	
108-90-7	Chlorobenzene	ND	0.22	0.031	mg/kg	
75-00-3	Chloroethane	ND	0.56	0.14	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.56	0.22	mg/kg	
67-66-3	Chloroform	ND	0.22	0.058	mg/kg	
74-87-3	Chloromethane	ND	0.56	0.052	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.56	0.12	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.56	0.025	mg/kg	
124-48-1	Dibromochloromethane	ND	0.22	0.033	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.22	0.024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.22	0.025	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.22	0.024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.22	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.22	0.030	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.22	0.032	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.22	0.041	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.22	0.034	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.22	0.032	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:	MW-16-27	Date Sampled:	12/04/12
Lab Sample ID:	MC16587-2	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	96.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.22	0.042	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.56	0.026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.56	0.097	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.56	0.029	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.22	0.019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.22	0.056	mg/kg	
123-91-1	1,4-Dioxane	ND	2.8	2.8	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.56	0.076	mg/kg	
100-41-4	Ethylbenzene	ND	0.22	0.027	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.56	0.052	mg/kg	
591-78-6	2-Hexanone	ND	0.56	0.056	mg/kg	
98-82-8	Isopropylbenzene	ND	0.56	0.026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.56	0.020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.22	0.032	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.56	0.056	mg/kg	
74-95-3	Methylene bromide	ND	0.56	0.055	mg/kg	
75-09-2	Methylene chloride	ND	0.22	0.13	mg/kg	
91-20-3	Naphthalene	ND	0.56	0.14	mg/kg	
103-65-1	n-Propylbenzene	ND	0.56	0.11	mg/kg	
100-42-5	Styrene	ND	0.56	0.026	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.56	0.11	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.22	0.048	mg/kg	
127-18-4	Tetrachloroethene	ND	0.22	0.026	mg/kg	
108-88-3	Toluene	ND	0.56	0.095	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.56	0.027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.56	0.026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.22	0.035	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.22	0.082	mg/kg	
79-01-6	Trichloroethene	ND	0.22	0.024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.22	0.034	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.56	0.033	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.0467	0.56	0.025	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.0286	0.56	0.024	mg/kg	J
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.56	0.063	mg/kg	
75-01-4	Vinyl chloride	ND	0.22	0.031	mg/kg	
	m,p-Xylene	ND	0.22	0.088	mg/kg	
95-47-6	o-Xylene	0.0281	0.22	0.027	mg/kg	J
1330-20-7	Xylene (total)	0.0852	0.22	0.027	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

<b>Client Sample ID:</b> MW-16-27	<b>Date Sampled:</b> 12/04/12
<b>Lab Sample ID:</b> MC16587-2	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.8
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-130%
2037-26-5	Toluene-D8	92%		70-130%
460-00-4	4-Bromofluorobenzene	94%		70-130%

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

- (a) Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-16-27	
<b>Lab Sample ID:</b> MC16587-2	<b>Date Sampled:</b> 12/04/12
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 12/06/12
<b>Method:</b> SW846 8011 SW846 3550B	<b>Percent Solids:</b> 96.8
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19748.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 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	0.0025	0.0011	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0025	0.00098	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	72%		61-167%
460-00-4	Bromofluorobenzene (S)	73%		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

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## Report of Analysis

Client Sample ID:	MW-16-37	Date Sampled:	12/04/12
Lab Sample ID:	MC16587-3	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	96.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	G122740.D	1	12/10/12	JM	n/a	n/a	MSG4879
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	9.89 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.27	0.069	mg/kg	
107-02-8	Acrolein	ND	1.4	0.54	mg/kg	
107-13-1	Acrylonitrile	ND	1.4	0.068	mg/kg	
71-43-2	Benzene	ND	0.027	0.016	mg/kg	
108-86-1	Bromobenzene	ND	0.27	0.012	mg/kg	
74-97-5	Bromochloromethane	ND	0.27	0.020	mg/kg	
75-27-4	Bromodichloromethane	ND	0.11	0.011	mg/kg	
75-25-2	Bromoform	ND	0.11	0.11	mg/kg	
74-83-9	Bromomethane	ND	0.11	0.028	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.27	0.068	mg/kg	
104-51-8	n-Butylbenzene	ND	0.27	0.010	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.27	0.013	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.27	0.048	mg/kg	
75-15-0	Carbon disulfide	ND	0.27	0.0089	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.11	0.040	mg/kg	
108-90-7	Chlorobenzene	ND	0.11	0.015	mg/kg	
75-00-3	Chloroethane	ND	0.27	0.068	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.27	0.11	mg/kg	
67-66-3	Chloroform	ND	0.11	0.028	mg/kg	
74-87-3	Chloromethane	ND	0.27	0.025	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.27	0.060	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.27	0.012	mg/kg	
124-48-1	Dibromochloromethane	ND	0.11	0.016	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.11	0.012	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.11	0.012	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.11	0.011	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.11	0.062	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.11	0.015	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.11	0.016	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.11	0.020	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.11	0.016	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.11	0.016	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:	MW-16-37	Date Sampled:	12/04/12
Lab Sample ID:	MC16587-3	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	96.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.11	0.020	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.27	0.013	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.27	0.047	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.27	0.014	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.11	0.0093	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.11	0.027	mg/kg	
123-91-1	1,4-Dioxane	ND	1.4	1.4	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.27	0.037	mg/kg	
100-41-4	Ethylbenzene	ND	0.11	0.013	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.27	0.025	mg/kg	
591-78-6	2-Hexanone	ND	0.27	0.027	mg/kg	
98-82-8	Isopropylbenzene	ND	0.27	0.012	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.27	0.0097	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.11	0.016	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.27	0.027	mg/kg	
74-95-3	Methylene bromide	ND	0.27	0.027	mg/kg	
75-09-2	Methylene chloride	ND	0.11	0.063	mg/kg	
91-20-3	Naphthalene	ND	0.27	0.068	mg/kg	
103-65-1	n-Propylbenzene	ND	0.27	0.055	mg/kg	
100-42-5	Styrene	ND	0.27	0.013	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.27	0.054	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.11	0.023	mg/kg	
127-18-4	Tetrachloroethene	ND	0.11	0.012	mg/kg	
108-88-3	Toluene	ND	0.27	0.046	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.27	0.013	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.27	0.012	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.11	0.017	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.11	0.040	mg/kg	
79-01-6	Trichloroethene	ND	0.11	0.012	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.11	0.017	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.27	0.016	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.0197	0.27	0.012	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.0131	0.27	0.012	mg/kg	J
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.27	0.030	mg/kg	
75-01-4	Vinyl chloride	ND	0.11	0.015	mg/kg	
	m,p-Xylene	ND	0.11	0.043	mg/kg	
95-47-6	o-Xylene	0.0157	0.11	0.013	mg/kg	J
1330-20-7	Xylene (total)	0.0454	0.11	0.013	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

<b>Client Sample ID:</b> MW-16-37	<b>Date Sampled:</b> 12/04/12
<b>Lab Sample ID:</b> MC16587-3	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.3
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-130%
2037-26-5	Toluene-D8	93%		70-130%
460-00-4	4-Bromofluorobenzene	93%		70-130%

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

- (a) Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-16-37	<b>Date Sampled:</b> 12/04/12
<b>Lab Sample ID:</b> MC16587-3	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.3
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19751.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	112%		61-167%
460-00-4	Bromofluorobenzene (S)	124%		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

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## Report of Analysis

<b>Client Sample ID:</b> TRIP BLANK	
<b>Lab Sample ID:</b> MC16587-4	<b>Date Sampled:</b> 12/04/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Date Received:</b> 12/06/12
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> n/a
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N71222.D	1	12/18/12	JP	n/a	n/a	MSN2676
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	5.0	3.0	ug/l	
107-02-8	Acrolein <sup>a</sup>	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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:	TRIP BLANK	Date Sampled:	12/04/12
Lab Sample ID:	MC16587-4	Date Received:	12/06/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 12/04/12
<b>Lab Sample ID:</b> MC16587-4	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		70-130%
2037-26-5	Toluene-D8	102%		70-130%
460-00-4	4-Bromofluorobenzene	120%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 12/04/12
<b>Lab Sample ID:</b> MC16587-4	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19945.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
Run #2							

	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	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	111%		36-173%
460-00-4	Bromofluorobenzene (S)	95%		36-173%

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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

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## Report of Analysis

Client Sample ID:	MW-20-11	Date Sampled:	12/05/12
Lab Sample ID:	MC16587-5	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	88.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G122785.D	1	12/11/12	JM	n/a	n/a	MSG4880
Run #2							

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

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.57	0.14	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	2.9	1.1	mg/kg	
107-13-1	Acrylonitrile	ND	2.9	0.14	mg/kg	
71-43-2	Benzene	ND	0.057	0.034	mg/kg	
108-86-1	Bromobenzene	ND	0.57	0.026	mg/kg	
74-97-5	Bromochloromethane	ND	0.57	0.043	mg/kg	
75-27-4	Bromodichloromethane	ND	0.23	0.024	mg/kg	
75-25-2	Bromoform	ND	0.23	0.23	mg/kg	
74-83-9	Bromomethane	ND	0.23	0.060	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.57	0.14	mg/kg	
104-51-8	n-Butylbenzene	ND	0.57	0.021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.57	0.026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.57	0.10	mg/kg	
75-15-0	Carbon disulfide	ND	0.57	0.019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.23	0.083	mg/kg	
108-90-7	Chlorobenzene	ND	0.23	0.032	mg/kg	
75-00-3	Chloroethane	ND	0.57	0.14	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.57	0.23	mg/kg	
67-66-3	Chloroform	ND	0.23	0.059	mg/kg	
74-87-3	Chloromethane	ND	0.57	0.053	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.57	0.13	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.57	0.026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.23	0.034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.23	0.025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.23	0.026	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.23	0.024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.23	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.23	0.031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.23	0.033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.23	0.042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.23	0.035	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.23	0.033	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:	MW-20-11	Date Sampled:	12/05/12
Lab Sample ID:	MC16587-5	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	88.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.23	0.043	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.57	0.027	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.57	0.099	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.57	0.030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.23	0.020	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.23	0.057	mg/kg	
123-91-1	1,4-Dioxane	ND	2.9	2.9	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.57	0.078	mg/kg	
100-41-4	Ethylbenzene	0.0367	0.23	0.028	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.57	0.053	mg/kg	
591-78-6	2-Hexanone	ND	0.57	0.057	mg/kg	
98-82-8	Isopropylbenzene	ND	0.57	0.026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.57	0.020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.23	0.033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.57	0.057	mg/kg	
74-95-3	Methylene bromide	ND	0.57	0.057	mg/kg	
75-09-2	Methylene chloride	ND	0.23	0.13	mg/kg	
91-20-3	Naphthalene	ND	0.57	0.14	mg/kg	
103-65-1	n-Propylbenzene	ND	0.57	0.12	mg/kg	
100-42-5	Styrene	ND	0.57	0.027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.57	0.11	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.23	0.049	mg/kg	
127-18-4	Tetrachloroethene	ND	0.23	0.026	mg/kg	
108-88-3	Toluene	ND	0.57	0.097	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.57	0.027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.57	0.026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.23	0.036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.23	0.084	mg/kg	
79-01-6	Trichloroethene	ND	0.23	0.024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.23	0.035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.57	0.034	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.57	0.026	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.57	0.025	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.57	0.064	mg/kg	
75-01-4	Vinyl chloride	ND	0.23	0.031	mg/kg	
	m,p-Xylene	ND	0.23	0.090	mg/kg	
95-47-6	o-Xylene	ND	0.23	0.027	mg/kg	
1330-20-7	Xylene (total)	0.0803	0.23	0.027	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

<b>Client Sample ID:</b> MW-20-11	<b>Date Sampled:</b> 12/05/12
<b>Lab Sample ID:</b> MC16587-5	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.3
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
2037-26-5	Toluene-D8	90%		70-130%
460-00-4	4-Bromofluorobenzene	90%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-20-11	<b>Date Sampled:</b> 12/05/12
<b>Lab Sample ID:</b> MC16587-5	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.3
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19752.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.7 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	0.0028	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	96%		61-167%
460-00-4	Bromofluorobenzene (S)	104%		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

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## Report of Analysis

Client Sample ID:	MW-20-21	Date Sampled:	12/05/12
Lab Sample ID:	MC16587-6	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	81.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G122786.D	1	12/11/12	JM	n/a	n/a	MSG4880
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.50 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.62	0.16	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	3.1	1.2	mg/kg	
107-13-1	Acrylonitrile	ND	3.1	0.15	mg/kg	
71-43-2	Benzene	0.0585	0.062	0.036	mg/kg	J
108-86-1	Bromobenzene	ND	0.62	0.028	mg/kg	
74-97-5	Bromochloromethane	ND	0.62	0.046	mg/kg	
75-27-4	Bromodichloromethane	ND	0.25	0.026	mg/kg	
75-25-2	Bromoform	ND	0.25	0.25	mg/kg	
74-83-9	Bromomethane	ND	0.25	0.064	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.62	0.15	mg/kg	
104-51-8	n-Butylbenzene	ND	0.62	0.023	mg/kg	
135-98-8	sec-Butylbenzene	0.365	0.62	0.028	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.62	0.11	mg/kg	
75-15-0	Carbon disulfide	ND	0.62	0.020	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.25	0.090	mg/kg	
108-90-7	Chlorobenzene	0.0401	0.25	0.034	mg/kg	J
75-00-3	Chloroethane	ND	0.62	0.16	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.62	0.25	mg/kg	
67-66-3	Chloroform	ND	0.25	0.064	mg/kg	
74-87-3	Chloromethane	ND	0.62	0.057	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.62	0.14	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.62	0.028	mg/kg	
124-48-1	Dibromochloromethane	ND	0.25	0.037	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.25	0.027	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.25	0.028	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.25	0.026	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.25	0.14	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.25	0.033	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.25	0.036	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.25	0.045	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.25	0.037	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.25	0.035	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:	MW-20-21	Date Sampled:	12/05/12
Lab Sample ID:	MC16587-6	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	81.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.25	0.046	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.62	0.029	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.62	0.11	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.62	0.033	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.25	0.021	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.25	0.061	mg/kg	
123-91-1	1,4-Dioxane	ND	3.1	3.1	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.62	0.084	mg/kg	
100-41-4	Ethylbenzene	ND	0.25	0.030	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.62	0.058	mg/kg	
591-78-6	2-Hexanone	ND	0.62	0.062	mg/kg	
98-82-8	Isopropylbenzene	0.110	0.62	0.028	mg/kg	J
99-87-6	p-Isopropyltoluene	0.0854	0.62	0.022	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.25	0.036	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.62	0.062	mg/kg	
74-95-3	Methylene bromide	ND	0.62	0.061	mg/kg	
75-09-2	Methylene chloride	ND	0.25	0.14	mg/kg	
91-20-3	Naphthalene	ND	0.62	0.15	mg/kg	
103-65-1	n-Propylbenzene	0.178	0.62	0.13	mg/kg	J
100-42-5	Styrene	ND	0.62	0.029	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.62	0.12	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.25	0.053	mg/kg	
127-18-4	Tetrachloroethene	ND	0.25	0.028	mg/kg	
108-88-3	Toluene	ND	0.62	0.11	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.62	0.029	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.62	0.028	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.25	0.039	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.25	0.091	mg/kg	
79-01-6	Trichloroethene	ND	0.25	0.026	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.25	0.038	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.62	0.036	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.62	0.028	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.62	0.026	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.62	0.069	mg/kg	
75-01-4	Vinyl chloride	ND	0.25	0.034	mg/kg	
	m,p-Xylene	ND	0.25	0.098	mg/kg	
95-47-6	o-Xylene	ND	0.25	0.030	mg/kg	
1330-20-7	Xylene (total)	ND	0.25	0.030	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

<b>Client Sample ID:</b> MW-20-21		<b>Date Sampled:</b> 12/05/12
<b>Lab Sample ID:</b> MC16587-6		<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil		<b>Percent Solids:</b> 81.1
<b>Method:</b> SW846 8260B		
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL		

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
2037-26-5	Toluene-D8	93%		70-130%
460-00-4	4-Bromofluorobenzene	96%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-20-21	<b>Date Sampled:</b> 12/05/12
<b>Lab Sample ID:</b> MC16587-6	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.1
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19750.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 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	0.0031	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0031	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	103%		61-167%
460-00-4	Bromofluorobenzene (S)	101%		61-167%

---

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

4.6  
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## Report of Analysis

Client Sample ID:	MW-20-41	Date Sampled:	12/05/12
Lab Sample ID:	MC16587-7	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	97.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G122787.D	1	12/11/12	JM	n/a	n/a	MSG4880
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.55 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.57	0.14	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	2.9	1.1	mg/kg	
107-13-1	Acrylonitrile	ND	2.9	0.14	mg/kg	
71-43-2	Benzene	ND	0.057	0.034	mg/kg	
108-86-1	Bromobenzene	ND	0.57	0.026	mg/kg	
74-97-5	Bromochloromethane	ND	0.57	0.043	mg/kg	
75-27-4	Bromodichloromethane	ND	0.23	0.024	mg/kg	
75-25-2	Bromoform	ND	0.23	0.23	mg/kg	
74-83-9	Bromomethane	ND	0.23	0.060	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.57	0.14	mg/kg	
104-51-8	n-Butylbenzene	ND	0.57	0.021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.57	0.026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.57	0.10	mg/kg	
75-15-0	Carbon disulfide	ND	0.57	0.019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.23	0.083	mg/kg	
108-90-7	Chlorobenzene	ND	0.23	0.032	mg/kg	
75-00-3	Chloroethane	ND	0.57	0.14	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.57	0.23	mg/kg	
67-66-3	Chloroform	ND	0.23	0.059	mg/kg	
74-87-3	Chloromethane	ND	0.57	0.053	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.57	0.13	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.57	0.026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.23	0.034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.23	0.025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.23	0.026	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.23	0.024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.23	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.23	0.031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.23	0.033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.23	0.042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.23	0.035	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.23	0.033	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:	MW-20-41	Date Sampled:	12/05/12
Lab Sample ID:	MC16587-7	Date Received:	12/06/12
Matrix:	SO - Soil	Percent Solids:	97.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.23	0.043	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.57	0.026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.57	0.099	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.57	0.030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.23	0.020	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.23	0.057	mg/kg	
123-91-1	1,4-Dioxane	ND	2.9	2.9	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.57	0.078	mg/kg	
100-41-4	Ethylbenzene	0.0345	0.23	0.028	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.57	0.053	mg/kg	
591-78-6	2-Hexanone	ND	0.57	0.057	mg/kg	
98-82-8	Isopropylbenzene	0.0314	0.57	0.026	mg/kg	J
99-87-6	p-Isopropyltoluene	ND	0.57	0.020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.23	0.033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.57	0.057	mg/kg	
74-95-3	Methylene bromide	ND	0.57	0.057	mg/kg	
75-09-2	Methylene chloride	ND	0.23	0.13	mg/kg	
91-20-3	Naphthalene	ND	0.57	0.14	mg/kg	
103-65-1	n-Propylbenzene	ND	0.57	0.12	mg/kg	
100-42-5	Styrene	ND	0.57	0.027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.57	0.11	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.23	0.049	mg/kg	
127-18-4	Tetrachloroethene	ND	0.23	0.026	mg/kg	
108-88-3	Toluene	ND	0.57	0.097	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.57	0.027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.57	0.026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.23	0.036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.23	0.084	mg/kg	
79-01-6	Trichloroethene	ND	0.23	0.024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.23	0.035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.57	0.034	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.57	0.026	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.57	0.025	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.57	0.064	mg/kg	
75-01-4	Vinyl chloride	ND	0.23	0.031	mg/kg	
	m,p-Xylene	ND	0.23	0.090	mg/kg	
95-47-6	o-Xylene	0.0398	0.23	0.027	mg/kg	J
1330-20-7	Xylene (total)	0.0398	0.23	0.027	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

<b>Client Sample ID:</b> MW-20-41	<b>Date Sampled:</b> 12/05/12
<b>Lab Sample ID:</b> MC16587-7	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 97.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
2037-26-5	Toluene-D8	94%		70-130%
460-00-4	4-Bromofluorobenzene	93%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-20-41	<b>Date Sampled:</b> 12/05/12
<b>Lab Sample ID:</b> MC16587-7	<b>Date Received:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 97.1
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19753.D	1	12/10/12	AP	12/10/12	OP31352	GBK712
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 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	0.0026	0.0011	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.00098	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	117%		61-167%
460-00-4	Bromofluorobenzene (S)	118%		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

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## Misc. Forms

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### Custody Documents and Other Forms

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Includes the following where applicable:

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

FED-EX Tracking #	Order Control #
Accutest Quote #	Accutest Job # <b>MC16587</b>
Requested Analysis (see TEST CODE sheet)	
Matrix Codes	
DV - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank	
LAB USE ONLY	

Client / Reporting Information		Project Information																					
Company Name <b>URS</b>		Project Name <b>Roxana Drilling</b>																					
Street Address		Street																					
City State Zip		City, State Zip																					
Project Contact <b>E. Kunkel</b>		Billing Information (if different from Report to) Company Name <b>URS</b>																					
E-mail		Street Address																					
Phone #		City State Zip																					
Fax #		Attention																					
Sample(s) Name(s) <b>W. Peabody</b> <b>J. Steadler</b>		Project Manager <b>D. Palmer</b>																					
Phone #		PO#																					
Acute# Sample #	Field ID / Point of Collection	MECHDI / Lot #	Collection				Number of preserved Bottles																
			Date	Time	Sampled by	Matrix	# of bottles	HCl	NH <sub>4</sub> OH	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NONE	DI Water	MECON	ENCORE	Residual							
-1	MW-16-14		12/4/12	1440	WP/AS	50	4							X	X	X	X						
-2	MW-16-27		↓	1450	↓	↓	↓							X	X	X	X						
-3	MW-16-37		↓	1455	↓	↓	↓							X	X	X	X						
-4	Trip Blank		↓				4									X	X						
-5	MW-20-11		12/5/12	1325	WP/AS	50	4							X	X	X	X						
-6	MW-20-21		↓	1335	↓	↓	↓							X	X	X	X						
-7	MW-20-41		↓	1340	↓	↓	↓							X	X	X	X						
<i>UMP</i>																							
10H6.3E 304																							
Turnaround Time ( Business days)										Data Deliverable Information										Comments / Special Instructions			
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush T/A data available V/A Lablink										Approved By (Accutest PM) / Date: _____ _____ _____ _____										<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input checked="" type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> CT RCP <input type="checkbox"/> MA MCP  <input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input checked="" type="checkbox"/> EDD Format <input type="checkbox"/> Other _____  Commercial "A" = Results Only Commercial "B" = Results + QC Summary			
Sample Custody must be documented below each time samples change possession, including courier delivery.																							
Relinquished by Sampler 1 <i>W. Peabody</i>		Date Time 12/5/12 1500		Received By: 1 <i>Fed Ex</i>		Relinquished By: 2 <i>FEDX</i>		Date Time 12-6-12 930		Received By: 2 <i>W. Peabody</i>		Relinquished by: 3		Date Time		Received By: 3		Relinquished By: 4		Date Time		Received By: 4	
Relinquished by: 5		Date Time		Received By: 5		Custody Seal #		Intact <input type="checkbox"/> Intact <input type="checkbox"/> Not intact		Preserved where applicable <input type="checkbox"/>		On Ice <input checked="" type="checkbox"/>		Cooler Temp. 0.6									

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## Accutest Laboratories Sample Receipt Summary

**Accutest Job Number:** MC16587      **Client:** URS      **Immediate Client Services Action Required:** Yes  
**Date / Time Received:** 12/6/2012 9:30      **Delivery Method:** Accutest Courier  
**Project:** ROXANA DRILLING      **No. Coolers:** 1      **Airbill #'s:**

<u>Cooler Security</u>		<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Cooler Temperature</u>		<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Cooler temp verification:	Infrared gun		
3. Cooler media:	Ice (bag)		

<u>Quality Control Preservation</u>			
	<u>Y</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>		<u>Y or N</u>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

<u>Sample Integrity - Condition</u>		<u>Y or N</u>	
1. Sample rec'd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Broken / Leaking		

<u>Sample Integrity - Instructions</u>			
	<u>Y</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Comments**

-3 MEOH vial was received without any MEOH inside.

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## Sample Receipt Summary - Problem Resolution

**Accutest Job Number:** MC16587

**CSR:** Jeremy Vienneau

**Response Date:** 12/10/2012

**Response:** Client was notified and an aliquot was made from intact soil. See phone log.

5.1  
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Accutest Laboratories  
V: 508.481.6200

495 Technology Center West, Bldg One  
F: 508.481.7753

Marlborough, MA  
[www.accutest.com](http://www.accutest.com)

**MC16587: Chain of Custody**  
**Page 3 of 3**

## Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16587

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

5.2  
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Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16587-1 Collected: 04-DEC-12 14:40 By: WPJS Received: 06-DEC-12 By: MW-16-14						
MC16587-1	SM21 2540 B MOD.	07-DEC-12	CF			%SOL
MC16587-1	SW846 8011	10-DEC-12 04:01	AP	10-DEC-12	NK	V8011SL
MC16587-1	SW846 8260B	10-DEC-12 16:51	JM			V8260SL+
MC16587-2 Collected: 04-DEC-12 14:50 By: WPJS Received: 06-DEC-12 By: MW-16-27						
MC16587-2	SM21 2540 B MOD.	07-DEC-12	CF			%SOL
MC16587-2	SW846 8011	10-DEC-12 04:25	AP	10-DEC-12	NK	V8011SL
MC16587-2	SW846 8260B	10-DEC-12 17:20	JM			V8260SL+
MC16587-3 Collected: 04-DEC-12 14:55 By: WPJS Received: 06-DEC-12 By: MW-16-37						
MC16587-3	SM21 2540 B MOD.	07-DEC-12	CF			%SOL
MC16587-3	SW846 8011	10-DEC-12 05:39	AP	10-DEC-12	NK	V8011SL
MC16587-3	SW846 8260B	10-DEC-12 17:49	JM			V8260SL+
MC16587-4 Collected: 04-DEC-12 00:00 By: WPJS Received: 06-DEC-12 By: TRIP BLANK						
MC16587-4	SW846 8011	13-DEC-12 23:19	AP	13-DEC-12	BJ	V8011SL
MC16587-4	SW846 8260B	18-DEC-12 08:22	JP			V8260SL+
MC16587-5 Collected: 05-DEC-12 13:25 By: WPJS Received: 06-DEC-12 By: MW-20-11						
MC16587-5	SM21 2540 B MOD.	07-DEC-12	CF			%SOL
MC16587-5	SW846 8011	10-DEC-12 06:04	AP	10-DEC-12	NK	V8011SL
MC16587-5	SW846 8260B	11-DEC-12 18:43	JM			V8260SL+
MC16587-6 Collected: 05-DEC-12 13:35 By: WPJS Received: 06-DEC-12 By: MW-20-21						
MC16587-6	SM21 2540 B MOD.	07-DEC-12	CF			%SOL
MC16587-6	SW846 8011	10-DEC-12 05:14	AP	10-DEC-12	NK	V8011SL
MC16587-6	SW846 8260B	11-DEC-12 19:12	JM			V8260SL+

### Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16587

URSMOSTL: Roxana Drilling, Roxana, IL  
Project No: 21562735.00015

5.2  
5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
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MC16587-7 Collected: 05-DEC-12 13:40 By: WPJS Received: 06-DEC-12 By: MW-20-41

MC16587-7 SM21 2540 B MOD.	07-DEC-12	CF				%SOL
MC16587-7 SW846 8011	10-DEC-12 06:28	AP	10-DEC-12	NK		V8011SL
MC16587-7 SW846 8260B	11-DEC-12 19:41	JM				V8260SL +

# SGS Accutest Internal Chain of Custody

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/06/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16587-1.1	Walk In Ref #5	Crystall Woodruff	12/07/12 16:36	Retrieve from Storage
MC16587-1.1	Crystall Woodruff	Walk In Ref #5	12/07/12 18:14	Return to Storage
MC16587-1.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16587-1.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16587-1.1	Scott Parsick		02/13/13 11:50	Disposed
MC16587-1.4	VOC Ref #10	Jaime Maslowski	12/10/12 10:33	Retrieve from Storage
MC16587-1.4	Jaime Maslowski	VOC Ref #10	12/11/12 09:55	Return to Storage
MC16587-1.4	Scott Parsick		02/13/13 11:50	Disposed
MC16587-2.1	Walk In Ref #5	Crystall Woodruff	12/07/12 16:36	Retrieve from Storage
MC16587-2.1	Crystall Woodruff	Walk In Ref #5	12/07/12 18:14	Return to Storage
MC16587-2.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16587-2.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16587-2.1	Scott Parsick		02/13/13 11:50	Disposed
MC16587-2.4	VOC Ref #10	Jaime Maslowski	12/10/12 10:33	Retrieve from Storage
MC16587-2.4	Jaime Maslowski	VOC Ref #10	12/11/12 09:55	Return to Storage
MC16587-2.4	Scott Parsick		02/13/13 11:50	Disposed
MC16587-3.1	Walk In Ref #5	Crystall Woodruff	12/07/12 16:36	Retrieve from Storage
MC16587-3.1	Crystall Woodruff	Walk In Ref #5	12/07/12 18:14	Return to Storage
MC16587-3.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16587-3.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16587-3.1	Scott Parsick		02/13/13 11:50	Disposed
MC16587-3.4	VOC Ref #10	Jaime Maslowski	12/10/12 10:33	Retrieve from Storage
MC16587-3.4	Jaime Maslowski	VOC Ref #10	12/11/12 09:55	Return to Storage
MC16587-3.4	Scott Parsick		02/13/13 11:50	Disposed
MC16587-4.1	VOC Ref #3	Amy Min Yang	12/18/12 07:55	Retrieve from Storage
MC16587-4.1	Amy Min Yang	GCMSN	12/18/12 07:56	Load on Instrument
MC16587-4.1	GCMSN	Jugal Patel	12/18/12 16:56	Unload from Instrument
MC16587-4.1	Jugal Patel	VOC Ref #3	12/18/12 16:57	Return to Storage
MC16587-4.1	Scott Parsick		02/13/13 11:50	Disposed
MC16587-4.3	VOC Ref #3	Bijan Jafari	12/13/12 04:40	Retrieve from Storage
MC16587-4.3	Bijan Jafari		12/14/12 17:43	Depleted
MC16587-5.1	Walk In Ref #5	Crystall Woodruff	12/07/12 16:36	Retrieve from Storage
MC16587-5.1	Crystall Woodruff	Walk In Ref #5	12/07/12 18:14	Return to Storage
MC16587-5.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16587-5.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16587-5.1	Scott Parsick		02/13/13 11:50	Disposed

5.3  
5

# SGS Accutest Internal Chain of Custody

**Job Number:** MC16587  
**Account:** SHELLWIC Shell Oil  
**Project:** URSMOSTL: Roxana Drilling, Roxana, IL  
**Received:** 12/06/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16587-5.4	VOC Ref #10	Jaime Maslowski	12/11/12 14:32	Retrieve from Storage
MC16587-5.4	Jaime Maslowski	VOC Ref #10	12/12/12 10:08	Return to Storage
MC16587-5.4	Scott Parsick		02/13/13 11:50	Disposed
MC16587-6.1	Walk In Ref #5	Crystall Woodruff	12/07/12 16:36	Retrieve from Storage
MC16587-6.1	Crystall Woodruff	Walk In Ref #5	12/07/12 18:14	Return to Storage
MC16587-6.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:32	Retrieve from Storage
MC16587-6.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16587-6.1	Scott Parsick		02/13/13 11:50	Disposed
MC16587-6.4	VOC Ref #10	Jaime Maslowski	12/11/12 14:32	Retrieve from Storage
MC16587-6.4	Jaime Maslowski	VOC Ref #10	12/12/12 10:08	Return to Storage
MC16587-6.4	Scott Parsick		02/13/13 11:50	Disposed
MC16587-7.1	Walk In Ref #5	Crystall Woodruff	12/07/12 16:36	Retrieve from Storage
MC16587-7.1	Crystall Woodruff	Walk In Ref #5	12/07/12 18:14	Return to Storage
MC16587-7.1	Walk In Ref #5	Chris Cataldo	12/08/12 10:33	Retrieve from Storage
MC16587-7.1	Chris Cataldo	Walk In Ref #5	12/08/12 21:08	Return to Storage
MC16587-7.1	Scott Parsick		02/13/13 11:50	Disposed
MC16587-7.4	VOC Ref #10	Jaime Maslowski	12/11/12 14:32	Retrieve from Storage
MC16587-7.4	Jaime Maslowski	VOC Ref #10	12/12/12 10:08	Return to Storage
MC16587-7.4	Scott Parsick		02/13/13 11:50	Disposed

5.3  
5

## GC/MS Volatiles

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## QC Data Summaries

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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: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4879-MB	G122725.D	1	12/10/12	JM	n/a	n/a	MSG4879

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-1, MC16587-2, MC16587-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

# Method Blank Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4879-MB	G122725.D	1	12/10/12	JM	n/a	n/a	MSG4879

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-1, MC16587-2, MC16587-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.1  
6

# Method Blank Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4879-MB	G122725.D	1	12/10/12	JM	n/a	n/a	MSG4879

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-1, MC16587-2, MC16587-3

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	133%* a 70-130%
2037-26-5	Toluene-D8	122% 70-130%
460-00-4	4-Bromofluorobenzene	123% 70-130%

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

(a) Outside control limits. Associated target analytes are non-detect.

6.1.1  
6

# Method Blank Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-MB	G122775.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-5, MC16587-6, MC16587-7

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

# Method Blank Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-MB	G122775.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-5, MC16587-6, MC16587-7

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

# Method Blank Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-MB	G122775.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-5, MC16587-6, MC16587-7

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	111%	70-130%
2037-26-5	Toluene-D8	103%	70-130%
460-00-4	4-Bromofluorobenzene	101%	70-130%

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

6.1.2  
6

# Method Blank Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2676-MB	N71221.D	1	12/18/12	JP	n/a	n/a	MSN2676

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-4

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	

# Method Blank Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2676-MB	N71221.D	1	12/18/12	JP	n/a	n/a	MSN2676

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-4

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	ug/l	

# Method Blank Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2676-MB	N71221.D	1	12/18/12	JP	n/a	n/a	MSN2676

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-4

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	102%	70-130%
2037-26-5	Toluene-D8	101%	70-130%
460-00-4	4-Bromofluorobenzene	116%	70-130%

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

# Blank Spike Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4879-BS	G122722.D	1	12/10/12	JM	n/a	n/a	MSG4879

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-1, MC16587-2, MC16587-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	2500	3200	128	70-130
107-02-8	Acrolein	12500	4350	35* a	70-130
107-13-1	Acrylonitrile	2500	2650	106	70-130
71-43-2	Benzene	2500	2970	119	70-130
108-86-1	Bromobenzene	2500	2630	105	70-130
74-97-5	Bromochloromethane	2500	2970	119	70-130
75-27-4	Bromodichloromethane	2500	2610	104	70-130
75-25-2	Bromoform	2500	2030	81	70-130
74-83-9	Bromomethane	2500	3020	121	70-130
78-93-3	2-Butanone (MEK)	2500	3060	122	70-130
104-51-8	n-Butylbenzene	2500	2870	115	70-130
135-98-8	sec-Butylbenzene	2500	3090	124	70-130
98-06-6	tert-Butylbenzene	2500	3230	129	70-130
75-15-0	Carbon disulfide	2500	3620	145* a	70-130
56-23-5	Carbon tetrachloride	2500	2600	104	70-130
108-90-7	Chlorobenzene	2500	2900	116	70-130
75-00-3	Chloroethane	2500	3240	130	70-130
110-75-8	2-Chloroethyl vinyl ether	2500	1050	42	10-160
67-66-3	Chloroform	2500	3070	123	70-130
74-87-3	Chloromethane	2500	3790	152* a	70-130
95-49-8	o-Chlorotoluene	2500	3050	122	70-130
106-43-4	p-Chlorotoluene	2500	3180	127	70-130
124-48-1	Dibromochloromethane	2500	2300	92	70-130
95-50-1	1,2-Dichlorobenzene	2500	2900	116	70-130
541-73-1	1,3-Dichlorobenzene	2500	2920	117	70-130
106-46-7	1,4-Dichlorobenzene	2500	2750	110	70-130
75-71-8	Dichlorodifluoromethane	2500	2500	100	70-130
75-34-3	1,1-Dichloroethane	2500	3420	137* a	70-130
107-06-2	1,2-Dichloroethane	2500	2530	101	70-130
75-35-4	1,1-Dichloroethene	2500	3220	129	70-130
156-59-2	cis-1,2-Dichloroethene	2500	3260	130	70-130
156-60-5	trans-1,2-Dichloroethene	2500	3150	126	70-130
78-87-5	1,2-Dichloropropane	2500	2930	117	70-130
142-28-9	1,3-Dichloropropane	2500	2560	102	70-130
594-20-7	2,2-Dichloropropane	2500	3520	141* a	70-130
563-58-6	1,1-Dichloropropene	2500	2950	118	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4879-BS	G122722.D	1	12/10/12	JM	n/a	n/a	MSG4879

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-1, MC16587-2, MC16587-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	2500	2700	108	70-130
10061-02-6	trans-1,3-Dichloropropene	2500	2720	109	70-130
123-91-1	1,4-Dioxane	12500	11900	95	70-130
97-63-2	Ethyl methacrylate	2500	2490	100	76-141
100-41-4	Ethylbenzene	2500	2760	110	70-130
87-68-3	Hexachlorobutadiene	2500	2640	106	70-130
591-78-6	2-Hexanone	2500	2410	96	70-130
98-82-8	Isopropylbenzene	2500	3130	125	70-130
99-87-6	p-Isopropyltoluene	2500	2930	117	70-130
1634-04-4	Methyl Tert Butyl Ether	2500	2930	117	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	1800	72	70-130
74-95-3	Methylene bromide	2500	2550	102	70-130
75-09-2	Methylene chloride	2500	3300	132* a	70-130
91-20-3	Naphthalene	2500	3160	126	70-130
103-65-1	n-Propylbenzene	2500	3130	125	70-130
100-42-5	Styrene	2500	2600	104	70-130
630-20-6	1,1,1,2-Tetrachloroethane	2500	2420	97	70-130
79-34-5	1,1,2,2-Tetrachloroethane	2500	2720	109	70-130
127-18-4	Tetrachloroethene	2500	2570	103	70-130
108-88-3	Toluene	2500	2950	118	70-130
87-61-6	1,2,3-Trichlorobenzene	2500	3300	132* a	70-130
120-82-1	1,2,4-Trichlorobenzene	2500	2840	114	70-130
71-55-6	1,1,1-Trichloroethane	2500	3210	128	70-130
79-00-5	1,1,2-Trichloroethane	2500	2620	105	70-130
79-01-6	Trichloroethene	2500	2810	112	70-130
75-69-4	Trichlorofluoromethane	2500	3030	121	70-130
96-18-4	1,2,3-Trichloropropane	2500	2620	105	70-130
95-63-6	1,2,4-Trimethylbenzene	2500	2780	111	70-130
108-67-8	1,3,5-Trimethylbenzene	2500	2780	111	70-130
108-05-4	Vinyl Acetate	2500	3040	122	70-130
75-01-4	Vinyl chloride	2500	3210	128	70-130
	m,p-Xylene	5000	5680	114	70-130
95-47-6	o-Xylene	2500	2900	116	70-130
1330-20-7	Xylene (total)	7500	8580	114	70-130

\* = Outside of Control Limits.

## Blank Spike Summary

Job Number: MC16587  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4879-BS	G122722.D	1	12/10/12	JM	n/a	n/a	MSG4879

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-1, MC16587-2, MC16587-3

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	128%	70-130%
2037-26-5	Toluene-D8	117%	70-130%
460-00-4	4-Bromofluorobenzene	117%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-BS	G122773.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-5, MC16587-6, MC16587-7

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	2500	2390	96	70-130
107-02-8	Acrolein	12500	5000	40* a	70-130
107-13-1	Acrylonitrile	2500	2510	100	70-130
71-43-2	Benzene	2500	2620	105	70-130
108-86-1	Bromobenzene	2500	2350	94	70-130
74-97-5	Bromochloromethane	2500	2620	105	70-130
75-27-4	Bromodichloromethane	2500	2310	92	70-130
75-25-2	Bromoform	2500	1840	74	70-130
74-83-9	Bromomethane	2500	2590	104	70-130
78-93-3	2-Butanone (MEK)	2500	2610	104	70-130
104-51-8	n-Butylbenzene	2500	2490	100	70-130
135-98-8	sec-Butylbenzene	2500	2690	108	70-130
98-06-6	tert-Butylbenzene	2500	2820	113	70-130
75-15-0	Carbon disulfide	2500	3120	125	70-130
56-23-5	Carbon tetrachloride	2500	2240	90	70-130
108-90-7	Chlorobenzene	2500	2550	102	70-130
75-00-3	Chloroethane	2500	2830	113	70-130
110-75-8	2-Chloroethyl vinyl ether	2500	890	36	10-160
67-66-3	Chloroform	2500	2700	108	70-130
74-87-3	Chloromethane	2500	3260	130	70-130
95-49-8	o-Chlorotoluene	2500	2670	107	70-130
106-43-4	p-Chlorotoluene	2500	2780	111	70-130
124-48-1	Dibromochloromethane	2500	2060	82	70-130
95-50-1	1,2-Dichlorobenzene	2500	2580	103	70-130
541-73-1	1,3-Dichlorobenzene	2500	2570	103	70-130
106-46-7	1,4-Dichlorobenzene	2500	2410	96	70-130
75-71-8	Dichlorodifluoromethane	2500	2050	82	70-130
75-34-3	1,1-Dichloroethane	2500	2990	120	70-130
107-06-2	1,2-Dichloroethane	2500	2290	92	70-130
75-35-4	1,1-Dichloroethene	2500	2820	113	70-130
156-59-2	cis-1,2-Dichloroethene	2500	2840	114	70-130
156-60-5	trans-1,2-Dichloroethene	2500	2740	110	70-130
78-87-5	1,2-Dichloropropane	2500	2590	104	70-130
142-28-9	1,3-Dichloropropane	2500	2320	93	70-130
594-20-7	2,2-Dichloropropane	2500	2940	118	70-130
563-58-6	1,1-Dichloropropene	2500	2570	103	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-BS	G122773.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-5, MC16587-6, MC16587-7

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	2500	2400	96	70-130
10061-02-6	trans-1,3-Dichloropropene	2500	2400	96	70-130
123-91-1	1,4-Dioxane	12500	11300	90	70-130
97-63-2	Ethyl methacrylate	2500	2290	92	76-141
100-41-4	Ethylbenzene	2500	2430	97	70-130
87-68-3	Hexachlorobutadiene	2500	2320	93	70-130
591-78-6	2-Hexanone	2500	2010	80	70-130
98-82-8	Isopropylbenzene	2500	2730	109	70-130
99-87-6	p-Isopropyltoluene	2500	2550	102	70-130
1634-04-4	Methyl Tert Butyl Ether	2500	2660	106	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	1640	66* a	70-130
74-95-3	Methylene bromide	2500	2330	93	70-130
75-09-2	Methylene chloride	2500	2880	115	70-130
91-20-3	Naphthalene	2500	2870	115	70-130
103-65-1	n-Propylbenzene	2500	2730	109	70-130
100-42-5	Styrene	2500	2280	91	70-130
630-20-6	1,1,1,2-Tetrachloroethane	2500	2140	86	70-130
79-34-5	1,1,2,2-Tetrachloroethane	2500	2530	101	70-130
127-18-4	Tetrachloroethene	2500	2250	90	70-130
108-88-3	Toluene	2500	2560	102	70-130
87-61-6	1,2,3-Trichlorobenzene	2500	2960	118	70-130
120-82-1	1,2,4-Trichlorobenzene	2500	2530	101	70-130
71-55-6	1,1,1-Trichloroethane	2500	2740	110	70-130
79-00-5	1,1,2-Trichloroethane	2500	2360	94	70-130
79-01-6	Trichloroethene	2500	2450	98	70-130
75-69-4	Trichlorofluoromethane	2500	2670	107	70-130
96-18-4	1,2,3-Trichloropropane	2500	2480	99	70-130
95-63-6	1,2,4-Trimethylbenzene	2500	2430	97	70-130
108-67-8	1,3,5-Trimethylbenzene	2500	2420	97	70-130
108-05-4	Vinyl Acetate	2500	2790	112	70-130
75-01-4	Vinyl chloride	2500	2850	114	70-130
	m,p-Xylene	5000	4980	100	70-130
95-47-6	o-Xylene	2500	2540	102	70-130
1330-20-7	Xylene (total)	7500	7530	100	70-130

\* = Outside of Control Limits.

## Blank Spike Summary

Job Number: MC16587  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4880-BS	G122773.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-5, MC16587-6, MC16587-7

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	109%	70-130%
2037-26-5	Toluene-D8	100%	70-130%
460-00-4	4-Bromofluorobenzene	101%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2676-BS	N71219.D	1	12/18/12	JP	n/a	n/a	MSN2676

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	50	51.2	102	70-130
107-02-8	Acrolein	250	140	56* a	70-130
107-13-1	Acrylonitrile	50	236	472* b	70-130
71-43-2	Benzene	50	51.3	103	70-130
108-86-1	Bromobenzene	50	50.8	102	70-130
74-97-5	Bromochloromethane	50	50.3	101	70-130
75-27-4	Bromodichloromethane	50	52.5	105	70-130
75-25-2	Bromoform	50	50.0	100	70-130
74-83-9	Bromomethane	50	57.4	115	70-130
78-93-3	2-Butanone (MEK)	50	46.5	93	70-130
104-51-8	n-Butylbenzene	50	48.1	96	70-130
135-98-8	sec-Butylbenzene	50	49.7	99	70-130
98-06-6	tert-Butylbenzene	50	49.5	99	70-130
75-15-0	Carbon disulfide	50	52.1	104	70-130
56-23-5	Carbon tetrachloride	50	46.6	93	70-130
108-90-7	Chlorobenzene	50	50.3	101	70-130
75-00-3	Chloroethane	50	55.8	112	70-130
110-75-8	2-Chloroethyl vinyl ether	50	51.5	103	70-130
67-66-3	Chloroform	50	51.6	103	70-130
74-87-3	Chloromethane	50	58.7	117	70-130
95-49-8	o-Chlorotoluene	50	46.7	93	70-130
106-43-4	p-Chlorotoluene	50	48.1	96	70-130
124-48-1	Dibromochloromethane	50	55.3	111	70-130
95-50-1	1,2-Dichlorobenzene	50	47.6	95	70-130
541-73-1	1,3-Dichlorobenzene	50	47.1	94	70-130
106-46-7	1,4-Dichlorobenzene	50	48.9	98	70-130
75-71-8	Dichlorodifluoromethane	50	69.0	138* a	70-130
75-34-3	1,1-Dichloroethane	50	52.6	105	70-130
107-06-2	1,2-Dichloroethane	50	50.1	100	70-130
75-35-4	1,1-Dichloroethene	50	53.2	106	70-130
156-59-2	cis-1,2-Dichloroethene	50	50.0	100	70-130
156-60-5	trans-1,2-Dichloroethene	50	51.2	102	70-130
78-87-5	1,2-Dichloropropane	50	51.5	103	70-130
142-28-9	1,3-Dichloropropane	50	50.8	102	70-130
594-20-7	2,2-Dichloropropane	50	34.4	69* a	70-130
563-58-6	1,1-Dichloropropene	50	52.3	105	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2676-BS	N71219.D	1	12/18/12	JP	n/a	n/a	MSN2676

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	42.9	86	70-130
10061-02-6	trans-1,3-Dichloropropene	50	44.6	89	70-130
123-91-1	1,4-Dioxane	250	257	103	70-130
97-63-2	Ethyl methacrylate	50	45.2	90	77-137
100-41-4	Ethylbenzene	50	53.6	107	70-130
87-68-3	Hexachlorobutadiene	50	50.4	101	70-130
591-78-6	2-Hexanone	50	52.4	105	70-130
98-82-8	Isopropylbenzene	50	49.2	98	70-130
99-87-6	p-Isopropyltoluene	50	53.5	107	70-130
1634-04-4	Methyl Tert Butyl Ether	50	42.2	84	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	48.0	96	70-130
74-95-3	Methylene bromide	50	52.1	104	70-130
75-09-2	Methylene chloride	50	51.2	102	70-130
91-20-3	Naphthalene	50	49.9	100	70-130
103-65-1	n-Propylbenzene	50	48.5	97	70-130
100-42-5	Styrene	50	50.7	101	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	54.1	108	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	49.4	99	70-130
127-18-4	Tetrachloroethene	50	57.2	114	70-130
108-88-3	Toluene	50	52.0	104	70-130
87-61-6	1,2,3-Trichlorobenzene	50	49.3	99	70-130
120-82-1	1,2,4-Trichlorobenzene	50	49.1	98	70-130
71-55-6	1,1,1-Trichloroethane	50	45.7	91	70-130
79-00-5	1,1,2-Trichloroethane	50	50.8	102	70-130
79-01-6	Trichloroethene	50	50.4	101	70-130
75-69-4	Trichlorofluoromethane	50	55.0	110	70-130
96-18-4	1,2,3-Trichloropropane	50	48.1	96	70-130
95-63-6	1,2,4-Trimethylbenzene	50	49.2	98	70-130
108-67-8	1,3,5-Trimethylbenzene	50	49.5	99	70-130
108-05-4	Vinyl Acetate	50	50.4	101	70-130
75-01-4	Vinyl chloride	50	50.7	101	70-130
	m,p-Xylene	100	102	102	70-130
95-47-6	o-Xylene	50	51.0	102	70-130
1330-20-7	Xylene (total)	150	153	102	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16587  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2676-BS	N71219.D	1	12/18/12	JP	n/a	n/a	MSN2676

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-4

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	70-130%
2037-26-5	Toluene-D8	102%	70-130%
460-00-4	4-Bromofluorobenzene	101%	70-130%

- (a) Outside control limits. Blank Spike meets program technical requirements.
- (b) Outside control limits. Associated samples are non-detect for this compound.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16503-2MS	G122733.D	1	12/10/12	JM	n/a	n/a	MSG4879
MC16503-2MSD	G122734.D	1	12/10/12	JM	n/a	n/a	MSG4879
MC16503-2 <sup>a</sup>	G122736.D	1	12/10/12	JM	n/a	n/a	MSG4879

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-1, MC16587-2, MC16587-3

CAS No.	Compound	MC16503-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	1540	1610	105	1540	1590	103	1	70-130/30
107-02-8	Acrolein	ND	7690	1760	23* b	7690	1910	25* b	8	70-130/30
107-13-1	Acrylonitrile	ND	1540	1550	101	1540	1640	107	6	70-130/30
71-43-2	Benzene	ND	1540	1690	110	1540	1650	107	2	70-130/30
108-86-1	Bromobenzene	ND	1540	1480	96	1540	1470	96	1	70-130/30
74-97-5	Bromochloromethane	ND	1540	1690	110	1540	1680	109	1	70-130/30
75-27-4	Bromodichloromethane	ND	1540	1460	95	1540	1440	94	1	70-130/30
75-25-2	Bromoform	ND	1540	1040	68* b	1540	1060	69* b	2	70-130/30
74-83-9	Bromomethane	ND	1540	1670	109	1540	1590	103	5	70-130/30
78-93-3	2-Butanone (MEK)	ND	1540	1580	103	1540	1680	109	6	70-130/30
104-51-8	n-Butylbenzene	708	1540	2430	112	1540	2380	109	2	70-130/30
135-98-8	sec-Butylbenzene	102	1540	1890	116	1540	1870	115	1	70-130/30
98-06-6	tert-Butylbenzene	ND	1540	2950	192* b	1540	2940	191* b	0	70-130/30
75-15-0	Carbon disulfide	ND	1540	2020	131* b	1540	1980	129	2	70-130/30
56-23-5	Carbon tetrachloride	ND	1540	1410	92	1540	1360	88	4	70-130/30
108-90-7	Chlorobenzene	ND	1540	1530	100	1540	1540	100	1	70-130/30
75-00-3	Chloroethane	ND	1540	1840	120	1540	1810	118	2	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	1540	626	41	1540	634	41	1	10-160/30
67-66-3	Chloroform	ND	1540	1740	113	1540	1720	112	1	70-130/30
74-87-3	Chloromethane	ND	1540	2170	141* b	1540	2100	137* b	3	70-130/30
95-49-8	o-Chlorotoluene	ND	1540	1870	122	1540	1790	116	4	70-130/30
106-43-4	p-Chlorotoluene	ND	1540	1820	118	1540	1810	118	1	70-130/30
124-48-1	Dibromochloromethane	ND	1540	1200	78	1540	1210	79	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	1540	1640	107	1540	1620	105	1	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	1540	1670	109	1540	1630	106	2	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	1540	1550	101	1540	1530	100	1	70-130/30
75-71-8	Dichlorodifluoromethane	ND	1540	1450	94	1540	1370	89	6	70-130/30
75-34-3	1,1-Dichloroethane	ND	1540	1920	125	1540	1910	124	1	70-130/30
107-06-2	1,2-Dichloroethane	ND	1540	1440	94	1540	1430	93	1	70-130/30
75-35-4	1,1-Dichloroethene	ND	1540	1870	122	1540	1890	123	1	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	1540	1840	120	1540	1820	118	1	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	1540	1810	118	1540	1770	115	2	70-130/30
78-87-5	1,2-Dichloropropane	ND	1540	1640	107	1540	1650	107	1	70-130/30
142-28-9	1,3-Dichloropropane	ND	1540	1370	89	1540	1390	90	1	70-130/30
594-20-7	2,2-Dichloropropane	ND	1540	1790	116	1540	1770	115	1	70-130/30
563-58-6	1,1-Dichloropropene	ND	1540	1680	109	1540	1640	107	2	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16503-2MS	G122733.D	1	12/10/12	JM	n/a	n/a	MSG4879
MC16503-2MSD	G122734.D	1	12/10/12	JM	n/a	n/a	MSG4879
MC16503-2 <sup>a</sup>	G122736.D	1	12/10/12	JM	n/a	n/a	MSG4879

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-1, MC16587-2, MC16587-3

CAS No.	Compound	MC16503-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	1540	1500	98	1540	1500	98	0	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	1540	1500	98	1540	1510	98	1	70-130/30
123-91-1	1,4-Dioxane	ND	7690	7970	104	7690	7370	96	8	70-130/30
97-63-2	Ethyl methacrylate	ND	1540	1420	92	1540	1440	94	1	41-160/30
100-41-4	Ethylbenzene	660	1540	2100	94	1540	2090	93	0	70-130/30
87-68-3	Hexachlorobutadiene	ND	1540	1630	106	1540	1620	105	1	70-130/30
591-78-6	2-Hexanone	ND	1540	ND	0* <sup>b</sup>	1540	ND	0* <sup>b</sup>	nc	70-130/30
98-82-8	Isopropylbenzene	144	1540	1900	114	1540	1880	113	1	70-130/30
99-87-6	p-Isopropyltoluene	93.8	1540	1780	110	1540	1750	108	2	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	1540	1670	109	1540	1700	111	2	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	1540	1410	92	1540	1450	94	3	70-130/30
74-95-3	Methylene bromide	ND	1540	1480	96	1540	1460	95	1	70-130/30
75-09-2	Methylene chloride	ND	1540	1830	119	1540	1820	118	1	70-130/30
91-20-3	Naphthalene	1360	1540	3100	113	1540	3260	124	5	70-130/30
103-65-1	n-Propylbenzene	553	1540	2340	116	1540	2300	114	2	70-130/30
100-42-5	Styrene	ND	1540	1440	94	1540	1450	94	1	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	1540	1270	83	1540	1260	82	1	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	1540	1660	108	1540	1710	111	3	70-130/30
127-18-4	Tetrachloroethene	ND	1540	1390	90	1540	1360	88	2	70-130/30
108-88-3	Toluene	613	1540	2260	107	1540	2230	105	1	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	1540	1890	123	1540	1960	127	4	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	1540	1650	107	1540	1660	108	1	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	1540	1690	110	1540	1620	105	4	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	1540	1480	96	1540	1500	98	1	70-130/30
79-01-6	Trichloroethene	ND	1540	1590	103	1540	1560	101	2	70-130/30
75-69-4	Trichlorofluoromethane	ND	1540	1720	112	1540	1630	106	5	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	1540	1490	97	1540	1530	100	3	70-130/30
95-63-6	1,2,4-Trimethylbenzene	6280	1540	7950	109	1540	7850	102	1	70-130/30
108-67-8	1,3,5-Trimethylbenzene	1720	1540	3260	100	1540	3310	103	2	70-130/30
108-05-4	Vinyl Acetate	ND	1540	1740	113	1540	1840	120	6	70-130/30
75-01-4	Vinyl chloride	ND	1540	1860	121	1540	1900	124	2	70-130/30
	m,p-Xylene	3520	3070	6450	95	3070	6400	94	1	70-130/30
95-47-6	o-Xylene	1830	1540	3330	98	1540	3350	99	1	70-130/30
1330-20-7	Xylene (total)	5360	4610	9780	96	4610	9750	95	0	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16503-2MS	G122733.D	1	12/10/12	JM	n/a	n/a	MSG4879
MC16503-2MSD	G122734.D	1	12/10/12	JM	n/a	n/a	MSG4879
MC16503-2 <sup>a</sup>	G122736.D	1	12/10/12	JM	n/a	n/a	MSG4879

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-1, MC16587-2, MC16587-3

CAS No.	Surrogate Recoveries	MS	MSD	MC16503-2	Limits
1868-53-7	Dibromofluoromethane	106%	106%	100%	70-130%
2037-26-5	Toluene-D8	98%	97%	93%	70-130%
460-00-4	4-Bromofluorobenzene	100%	101%	96%	70-130%

- (a) Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.
- (b) Outside control limits due to possible matrix interference. Refer to Blank Spike.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16587-5MS	G122788.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5MSD	G122789.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5	G122785.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-5, MC16587-6, MC16587-7

CAS No.	Compound	MC16587-5 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	5730	5900	103	5730	6180	108	5	70-130/30
107-02-8	Acrolein	ND	28700	9120	32* a	28700	9690	34* a	6	70-130/30
107-13-1	Acrylonitrile	ND	5730	5750	100	5730	6040	105	5	70-130/30
71-43-2	Benzene	ND	5730	6150	107	5730	6110	107	1	70-130/30
108-86-1	Bromobenzene	ND	5730	5390	94	5730	5420	95	1	70-130/30
74-97-5	Bromochloromethane	ND	5730	6220	108	5730	6220	108	0	70-130/30
75-27-4	Bromodichloromethane	ND	5730	5380	94	5730	5430	95	1	70-130/30
75-25-2	Bromoform	ND	5730	4190	73	5730	4280	75	2	70-130/30
74-83-9	Bromomethane	ND	5730	6020	105	5730	6080	106	1	70-130/30
78-93-3	2-Butanone (MEK)	ND	5730	6320	110	5730	6210	108	2	70-130/30
104-51-8	n-Butylbenzene	ND	5730	5790	101	5730	5760	100	1	70-130/30
135-98-8	sec-Butylbenzene	ND	5730	6180	108	5730	6190	108	0	70-130/30
98-06-6	tert-Butylbenzene	ND	5730	6510	114	5730	6530	114	0	70-130/30
75-15-0	Carbon disulfide	ND	5730	7360	128	5730	7250	126	2	70-130/30
56-23-5	Carbon tetrachloride	ND	5730	5230	91	5730	5170	90	1	70-130/30
108-90-7	Chlorobenzene	ND	5730	5980	104	5730	5950	104	1	70-130/30
75-00-3	Chloroethane	ND	5730	6790	118	5730	6740	118	1	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	5730	2080	36	5730	2190	38	5	10-160/30
67-66-3	Chloroform	ND	5730	6420	112	5730	6420	112	0	70-130/30
74-87-3	Chloromethane	ND	5730	7740	135* a	5730	7800	136* a	1	70-130/30
95-49-8	o-Chlorotoluene	ND	5730	6110	107	5730	6110	107	0	70-130/30
106-43-4	p-Chlorotoluene	ND	5730	6450	112	5730	6550	114	2	70-130/30
124-48-1	Dibromochloromethane	ND	5730	4840	84	5730	4910	86	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	5730	5930	103	5730	5970	104	1	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	5730	5930	103	5730	5980	104	1	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	5730	5550	97	5730	5590	97	1	70-130/30
75-71-8	Dichlorodifluoromethane	ND	5730	4970	87	5730	5000	87	1	70-130/30
75-34-3	1,1-Dichloroethane	ND	5730	7080	123	5730	7000	122	1	70-130/30
107-06-2	1,2-Dichloroethane	ND	5730	5350	93	5730	5390	94	1	70-130/30
75-35-4	1,1-Dichloroethene	ND	5730	6680	116	5730	6680	116	0	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	5730	6760	118	5730	6780	118	0	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	5730	6540	114	5730	6550	114	0	70-130/30
78-87-5	1,2-Dichloropropane	ND	5730	6130	107	5730	6130	107	0	70-130/30
142-28-9	1,3-Dichloropropane	ND	5730	5410	94	5730	5470	95	1	70-130/30
594-20-7	2,2-Dichloropropane	ND	5730	6610	115	5730	6460	113	2	70-130/30
563-58-6	1,1-Dichloropropene	ND	5730	6110	107	5730	6010	105	2	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16587-5MS	G122788.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5MSD	G122789.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5	G122785.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-5, MC16587-6, MC16587-7

CAS No.	Compound	MC16587-5 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
10061-01-5	cis-1,3-Dichloropropene	ND		5730	5620	98	5730	5550	97	1	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		5730	5580	97	5730	5630	98	1	70-130/30
123-91-1	1,4-Dioxane	ND		28700	27300	95	28700	27000	94	1	70-130/30
97-63-2	Ethyl methacrylate	ND		5730	5370	94	5730	5410	94	1	41-160/30
100-41-4	Ethylbenzene	36.7	J	5730	5670	98	5730	5670	98	0	70-130/30
87-68-3	Hexachlorobutadiene	ND		5730	5200	91	5730	5260	92	1	70-130/30
591-78-6	2-Hexanone	ND		5730	4750	83	5730	4740	83	0	70-130/30
98-82-8	Isopropylbenzene	ND		5730	6270	109	5730	6310	110	1	70-130/30
99-87-6	p-Isopropyltoluene	ND		5730	5870	102	5730	5830	102	1	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		5730	6270	109	5730	6340	111	1	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5730	3920	68* a	5730	3910	68* a	0	70-130/30
74-95-3	Methylene bromide	ND		5730	5500	96	5730	5520	96	0	70-130/30
75-09-2	Methylene chloride	ND		5730	6900	120	5730	6880	120	0	70-130/30
91-20-3	Naphthalene	ND		5730	6690	117	5730	6890	120	3	70-130/30
103-65-1	n-Propylbenzene	ND		5730	6320	110	5730	6340	111	0	70-130/30
100-42-5	Styrene	ND		5730	5360	93	5730	5340	93	0	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		5730	4980	87	5730	5030	88	1	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		5730	5680	99	5730	5810	101	2	70-130/30
127-18-4	Tetrachloroethene	ND		5730	5180	90	5730	5200	91	0	70-130/30
108-88-3	Toluene	ND		5730	6100	106	5730	6070	106	0	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		5730	6720	117	5730	6970	122	4	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		5730	5790	101	5730	5870	102	1	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		5730	6380	111	5730	6340	111	1	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		5730	5510	96	5730	5620	98	2	70-130/30
79-01-6	Trichloroethene	ND		5730	5780	101	5730	5740	100	1	70-130/30
75-69-4	Trichlorofluoromethane	ND		5730	6180	108	5730	6120	107	1	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		5730	5610	98	5730	5680	99	1	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND		5730	5610	98	5730	5620	98	0	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		5730	5580	97	5730	5590	97	0	70-130/30
108-05-4	Vinyl Acetate	ND		5730	6510	114	5730	6580	115	1	70-130/30
75-01-4	Vinyl chloride	ND		5730	6810	119	5730	6650	116	2	70-130/30
	m,p-Xylene	ND		11500	11600	101	11500	11600	101	0	70-130/30
95-47-6	o-Xylene	ND		5730	6000	105	5730	5990	104	0	70-130/30
1330-20-7	Xylene (total)	80.3	J	17200	17600	102	17200	17600	102	0	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16587-5MS	G122788.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5MSD	G122789.D	1	12/11/12	JM	n/a	n/a	MSG4880
MC16587-5	G122785.D	1	12/11/12	JM	n/a	n/a	MSG4880

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-5, MC16587-6, MC16587-7

6.3.2  
6

CAS No.	Surrogate Recoveries	MS	MSD	MC16587-5	Limits
1868-53-7	Dibromofluoromethane	106%	106%	100%	70-130%
2037-26-5	Toluene-D8	97%	97%	90%	70-130%
460-00-4	4-Bromofluorobenzene	97%	98%	90%	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: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16648-12MS	N71233.D	5	12/18/12	JP	n/a	n/a	MSN2676
MC16648-12MSD	N71234.D	5	12/18/12	JP	n/a	n/a	MSN2676
MC16648-12	N71230.D	1	12/18/12	JP	n/a	n/a	MSN2676

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-4

CAS No.	Compound	MC16648-12 Spike		MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
		ug/l	Q ug/l							
67-64-1	Acetone	ND	250	253	101	250	236	94	7	70-130/30
107-02-8	Acrolein	ND	1250	652	52* a	1250	621	50* a	5	70-130/30
107-13-1	Acrylonitrile	ND	250	1160	464* a	250	1180	472* a	2	70-130/30
71-43-2	Benzene	ND	250	268	107	250	245	98	9	70-130/30
108-86-1	Bromobenzene	ND	250	261	104	250	240	96	8	70-130/30
74-97-5	Bromochloromethane	ND	250	272	109	250	250	100	8	70-130/30
75-27-4	Bromodichloromethane	ND	250	274	110	250	257	103	6	70-130/30
75-25-2	Bromoform	ND	250	256	102	250	250	100	2	70-130/30
74-83-9	Bromomethane	ND	250	261	104	250	266	106	2	70-130/30
78-93-3	2-Butanone (MEK)	ND	250	233	93	250	236	94	1	70-130/30
104-51-8	n-Butylbenzene	ND	250	255	102	250	239	96	6	70-130/30
135-98-8	sec-Butylbenzene	ND	250	261	104	250	236	94	10	70-130/30
98-06-6	tert-Butylbenzene	ND	250	252	101	250	231	92	9	70-130/30
75-15-0	Carbon disulfide	ND	250	277	111	250	247	99	11	70-130/30
56-23-5	Carbon tetrachloride	ND	250	241	96	250	230	92	5	70-130/30
108-90-7	Chlorobenzene	ND	250	259	104	250	242	97	7	70-130/30
75-00-3	Chloroethane	ND	250	298	119	250	265	106	12	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	250	273	109	250	247	99	10	70-130/30
67-66-3	Chloroform	ND	250	271	108	250	246	98	10	70-130/30
74-87-3	Chloromethane	ND	250	315	126	250	301	120	5	70-130/30
95-49-8	o-Chlorotoluene	ND	250	245	98	250	221	88	10	70-130/30
106-43-4	p-Chlorotoluene	ND	250	251	100	250	232	93	8	70-130/30
124-48-1	Dibromochloromethane	ND	250	280	112	250	264	106	6	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	250	244	98	250	225	90	8	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	250	242	97	250	224	90	8	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	250	255	102	250	232	93	9	70-130/30
75-71-8	Dichlorodifluoromethane	ND	250	367	147* b	250	333	133* b	10	70-130/30
75-34-3	1,1-Dichloroethane	ND	250	277	111	250	250	100	10	70-130/30
107-06-2	1,2-Dichloroethane	ND	250	259	104	250	244	98	6	70-130/30
75-35-4	1,1-Dichloroethene	ND	250	283	113	250	251	100	12	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	250	268	107	250	240	96	11	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	250	262	105	250	237	95	10	70-130/30
78-87-5	1,2-Dichloropropane	ND	250	273	109	250	247	99	10	70-130/30
142-28-9	1,3-Dichloropropane	ND	250	252	101	250	241	96	4	70-130/30
594-20-7	2,2-Dichloropropane	ND	250	211	84	250	200	80	5	70-130/30
563-58-6	1,1-Dichloropropene	ND	250	273	109	250	253	101	8	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16648-12MS	N71233.D	5	12/18/12	JP	n/a	n/a	MSN2676
MC16648-12MSD	N71234.D	5	12/18/12	JP	n/a	n/a	MSN2676
MC16648-12	N71230.D	1	12/18/12	JP	n/a	n/a	MSN2676

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-4

CAS No.	Compound	MC16648-12 Spike		MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
		ug/l	Q ug/l							
10061-01-5	cis-1,3-Dichloropropene	ND	250	227	91	250	216	86	5	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	250	235	94	250	232	93	1	70-130/30
123-91-1	1,4-Dioxane	ND	1250	1360	109	1250	1300	104	5	70-130/30
97-63-2	Ethyl methacrylate	ND	250	221	88	250	220	88	0	72-139/30
100-41-4	Ethylbenzene	ND	250	276	110	250	254	102	8	70-130/30
87-68-3	Hexachlorobutadiene	ND	250	249	100	250	239	96	4	70-130/30
591-78-6	2-Hexanone	ND	250	254	102	250	258	103	2	70-130/30
98-82-8	Isopropylbenzene	ND	250	258	103	250	232	93	11	70-130/30
99-87-6	p-Isopropyltoluene	ND	250	277	111	250	255	102	8	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	250	211	84	250	210	84	0	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	244	98	250	241	96	1	70-130/30
74-95-3	Methylene bromide	ND	250	268	107	250	254	102	5	70-130/30
75-09-2	Methylene chloride	ND	250	272	109	250	241	96	12	70-130/30
91-20-3	Naphthalene	ND	250	217	87	250	239	96	10	70-130/30
103-65-1	n-Propylbenzene	ND	250	256	102	250	231	92	10	70-130/30
100-42-5	Styrene	ND	250	261	104	250	245	98	6	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	282	113	250	266	106	6	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	249	100	250	233	93	7	70-130/30
127-18-4	Tetrachloroethene	ND	250	304	122	250	281	112	8	70-130/30
108-88-3	Toluene	ND	250	269	108	250	250	100	7	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	250	231	92	250	234	94	1	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	250	240	96	250	237	95	1	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	250	241	96	250	224	90	7	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	250	261	104	250	248	99	5	70-130/30
79-01-6	Trichloroethene	1.1	250	262	104	250	244	97	7	70-130/30
75-69-4	Trichlorofluoromethane	ND	250	295	118	250	267	107	10	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	250	243	97	250	235	94	3	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	250	256	102	250	233	93	9	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	250	257	103	250	234	94	9	70-130/30
108-05-4	Vinyl Acetate	ND	250	260	104	250	248	99	5	70-130/30
75-01-4	Vinyl chloride	ND	250	276	110	250	243	97	13	70-130/30
	m,p-Xylene	ND	500	533	107	500	493	99	8	70-130/30
95-47-6	o-Xylene	ND	250	261	104	250	248	99	5	70-130/30
1330-20-7	Xylene (total)	ND	750	794	106	750	741	99	7	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16648-12MS	N71233.D	5	12/18/12	JP	n/a	n/a	MSN2676
MC16648-12MSD	N71234.D	5	12/18/12	JP	n/a	n/a	MSN2676
MC16648-12	N71230.D	1	12/18/12	JP	n/a	n/a	MSN2676

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16587-4

CAS No.	Surrogate Recoveries	MS	MSD	MC16648-12	Limits
1868-53-7	Dibromofluoromethane	102%	101%	99%	70-130%
2037-26-5	Toluene-D8	103%	103%	102%	70-130%
460-00-4	4-Bromofluorobenzene	101%	99%	118%	70-130%

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

\* = Outside of Control Limits.

# Volatile Internal Standard Area Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSG4879-CC4851	Injection Date:	12/10/12
Lab File ID:	G122721.D	Injection Time:	08:41
Instrument ID:	GCMSG	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	263984	5.13	359014	6.27	169893	9.62	203716	12.25	52431	3.11
Upper Limit <sup>a</sup>	527968	5.63	718028	6.77	339786	10.12	407432	12.75	104862	3.61
Lower Limit <sup>b</sup>	131992	4.63	179507	5.77	84947	9.12	101858	11.75	26216	2.61

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSG4879-BS	255080	5.13	344612	6.27	166053	9.62	201343	12.25	49252	3.10
MSG4879-MB	242412	5.13	329894	6.27	156563	9.62	187534	12.25	45957	3.10
ZZZZZZ	235773	5.13	318591	6.27	151704	9.62	182341	12.25	45174	3.14
ZZZZZZ	278994	5.13	375703	6.27	181908	9.62	217968	12.25	52891	3.10
ZZZZZZ	280507	5.13	375410	6.27	181319	9.62	218083	12.25	52726	3.10
ZZZZZZ	279777	5.13	374572	6.27	182673	9.62	219888	12.25	54765	3.10
ZZZZZZ	278675	5.13	375822	6.27	179276	9.62	217855	12.25	52551	3.10
ZZZZZZ	276053	5.13	373094	6.27	178716	9.62	224843	12.25	54811	3.10
ZZZZZZ	278630	5.13	373976	6.27	181379	9.62	219328	12.25	56447	3.10
MC16503-2MS	273024	5.13	370263	6.27	189308	9.63	218334	12.25	56892	3.14
MC16503-2MSD	268453	5.13	369366	6.27	185812	9.63	216693	12.25	56775	3.14
ZZZZZZ	287132	5.14	391088	6.27	198088	9.63	221284	12.25	58490	3.09
MC16503-2	273289	5.13	371717	6.27	185097	9.62	218005	12.25	60131	3.13
ZZZZZZ	283634	5.13	387313	6.27	195586	9.63	222618	12.25	60658	3.09
MC16587-1 <sup>c</sup>	271982	5.13	374249	6.27	180955	9.62	217972	12.25	56654	3.10
MC16587-2 <sup>c</sup>	276049	5.13	374349	6.27	179675	9.62	218027	12.25	59068	3.11
MC16587-3 <sup>c</sup>	279446	5.13	378598	6.27	182826	9.62	224653	12.25	61865	3.11
ZZZZZZ	281401	5.13	380645	6.27	181193	9.62	224701	12.25	59422	3.10
ZZZZZZ	281602	5.13	378605	6.27	181303	9.62	221226	12.25	58435	3.11
ZZZZZZ	277905	5.13	379871	6.27	180459	9.62	221077	12.25	61488	3.11
ZZZZZZ	277759	5.13	376156	6.27	180096	9.62	218808	12.25	58600	3.10

- 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.
- (c) Vinyl chloride(CCC's)potentially do not meet the reference method acceptance criteria in instrument QC and results may be biased high.

6.4.1  
6

# Volatile Internal Standard Area Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSG4880-CC4851	Injection Date:	12/11/12
Lab File ID:	G122772.D	Injection Time:	12:27
Instrument ID:	GCMSG	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	282854	5.13	386682	6.27	185876	9.62	224758	12.25	55938	3.10
Upper Limit <sup>a</sup>	565708	5.63	773364	6.77	371752	10.12	449516	12.75	111876	3.60
Lower Limit <sup>b</sup>	141427	4.63	193341	5.77	92938	9.12	112379	11.75	27969	2.60

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSG4880-BS	279361	5.13	378357	6.27	182624	9.62	221524	12.25	56696	3.10
MSG4880-MB	277809	5.13	374897	6.27	182434	9.62	223449	12.25	56868	3.10
ZZZZZZ	280559	5.13	380568	6.27	185584	9.62	225884	12.25	57852	3.10
ZZZZZZ	279090	5.13	377463	6.27	191881	9.62	222529	12.25	55692	3.10
ZZZZZZ	282810	5.13	378518	6.27	187896	9.62	225464	12.25	52941	3.10
ZZZZZZ	287554	5.13	399703	6.27	222422	9.63	223337	12.25	58402	3.09
MC16587-5	273233	5.13	377003	6.27	182140	9.62	225333	12.25	56555	3.10
MC16587-6	282645	5.13	383059	6.27	188745	9.62	230746	12.25	55493	3.10
MC16587-7	269959	5.13	368584	6.27	180494	9.62	220361	12.25	55539	3.10
MC16587-5MS	274869	5.13	372600	6.27	181935	9.62	224033	12.25	56514	3.10
MC16587-5MSD	272912	5.13	371776	6.27	180464	9.62	221659	12.25	58561	3.10
ZZZZZZ	276540	5.13	376992	6.27	182311	9.62	221396	12.25	58586	3.14
ZZZZZZ	274965	5.13	371930	6.27	181572	9.62	218163	12.25	56459	3.13
ZZZZZZ	271327	5.13	365963	6.27	178291	9.62	215271	12.25	62280	3.14
ZZZZZZ	272406	5.13	366878	6.27	177996	9.62	216973	12.25	54588	3.13
ZZZZZZ	276682	5.13	370068	6.27	179261	9.62	218768	12.25	57430	3.13
ZZZZZZ	282570	5.13	381461	6.27	181918	9.62	183642	12.25	53900	3.10

- 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.

6.4.2  
6

# Volatile Internal Standard Area Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSN2676-CC2675	Injection Date:	12/18/12
Lab File ID:	N71218.D	Injection Time:	06:29
Instrument ID:	GCMSN	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	580216	9.01	774279	9.88	390883	13.14	396507	15.70	182181	6.56
Upper Limit <sup>a</sup>	1160432	9.51	1548558	10.38	781766	13.64	793014	16.20	364362	7.06
Lower Limit <sup>b</sup>	290108	8.51	387140	9.38	195442	12.64	198254	15.20	91091	6.06

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSN2676-BS	585774	9.01	777713	9.88	388773	13.14	392587	15.70	184608	6.56
MSN2676-MB	558031	9.01	763423	9.88	353961	13.14	303911	15.70	187121	6.58
MC16587-4	517021	9.01	688359	9.88	316346	13.14	258822	15.70	176730	6.58
ZZZZZZ	567847	9.01	748376	9.88	349213	13.14	290130	15.70	164804	6.57
ZZZZZZ	575691	9.01	759020	9.88	355622	13.14	289380	15.70	168799	6.58
ZZZZZZ	550570	9.01	741534	9.88	349776	13.14	293029	15.70	158207	6.58
ZZZZZZ	547396	9.01	731850	9.88	337788	13.14	291441	15.70	155640	6.58
ZZZZZZ	544346	9.01	723597	9.88	332316	13.14	284190	15.70	174652	6.59
MC16648-12	550948	9.01	737094	9.88	346132	13.14	285823	15.70	167856	6.57
ZZZZZZ	546604	9.01	718548	9.88	334652	13.14	277041	15.70	155893	6.58
ZZZZZZ	509230	9.01	671403	9.88	309891	13.14	257151	15.70	169098	6.57
MC16648-12MS	517266	9.01	694941	9.88	355150	13.14	355502	15.70	159406	6.55
MC16648-12MSD	579841	9.01	769109	9.88	389310	13.14	401442	15.70	185877	6.56
ZZZZZZ	564180	9.01	749205	9.88	351694	13.14	325149	15.70	181588	6.57
ZZZZZZ	557459	9.01	743025	9.88	346348	13.14	296641	15.70	171315	6.58
ZZZZZZ	546105	9.01	739975	9.88	346724	13.14	289114	15.70	171146	6.57
ZZZZZZ	555586	9.01	722667	9.88	339566	13.14	295467	15.70	180970	6.57
ZZZZZZ	541823	9.01	712036	9.88	337962	13.14	280902	15.70	169144	6.57
ZZZZZZ	554899	9.01	734338	9.88	334620	13.14	298824	15.70	168932	6.57
ZZZZZZ	546689	9.01	731731	9.88	351523	13.14	355670	15.70	169301	6.57
ZZZZZZ	561653	9.01	748676	9.88	350911	13.14	339081	15.70	190795	6.57
ZZZZZZ	573934	9.01	756463	9.88	351642	13.14	355677	15.70	170572	6.57

- 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.

# Volatile Surrogate Recovery Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16587-4	N71222.D	97	102	120
MC16648-12MS	N71233.D	102	103	101
MC16648-12MSD	N71234.D	101	103	99
MSN2676-BS	N71219.D	101	102	101
MSN2676-MB	N71221.D	102	101	116

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

6.5.1  
**6**

# Volatile Surrogate Recovery Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16587-1	G122738.D	102	94	95
MC16587-2	G122739.D	101	92	94
MC16587-3	G122740.D	101	93	93
MC16587-5	G122785.D	100	90	90
MC16587-6	G122786.D	100	93	96
MC16587-7	G122787.D	100	94	93
MC16503-2MS	G122733.D	106	98	100
MC16503-2MSD	G122734.D	106	97	101
MC16587-5MS	G122788.D	106	97	97
MC16587-5MSD	G122789.D	106	97	98
MSG4879-BS	G122722.D	128	117	117
MSG4879-MB	G122725.D	133* a	122	123
MSG4880-BS	G122773.D	109	100	101
MSG4880-MB	G122775.D	111	103	101

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

(a) Outside control limits. Associated target analytes are non-detect.

6.5.2  
6

**GC Volatiles**

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**QC Data Summaries****7**

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**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: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-MB	BK19728.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16587-1, MC16587-2, MC16587-3, MC16587-5, MC16587-6, MC16587-7

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.5	0.96	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	108% 61-167%
460-00-4	Bromofluorobenzene (S)	98% 61-167%

7.1.1

7

# Method Blank Summary

Job Number: MC16587  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-MB	BK19937.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16587-4

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Limits	
460-00-4	Bromofluorobenzene (S)	100%	36-173%
460-00-4	Bromofluorobenzene (S)	95%	36-173%

7.1.2

7

# Blank Spike Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-BS	BK19729.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16587-1, MC16587-2, MC16587-3, MC16587-5, MC16587-6, MC16587-7

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	65	66.5	102	59-142
106-93-4	1,2-Dibromoethane	65	60.3	93	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	107%	61-167%
460-00-4	Bromofluorobenzene (S)	97%	61-167%

7.2.1  
7

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-BS	BK19938.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16587-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.067	94	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)	104%	36-173%
460-00-4	Bromofluorobenzene (S)	96%	36-173%

7.2.2  
7

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31352-MS	BK19730.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
OP31352-MSD	BK19731.D	1	12/09/12	AP	12/08/12	OP31352	GBK712
MC16336-6	BK19735.D	1	12/09/12	AP	12/08/12	OP31352	GBK712

The QC reported here applies to the following samples:

Method: SW846 8011

MC16587-1, MC16587-2, MC16587-3, MC16587-5, MC16587-6, MC16587-7

CAS No.	Compound	MC16336-6 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	367	337	92	419	382	91	13	40-156/27
106-93-4	1,2-Dibromoethane	ND	367	304	83	419	342	82	12	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16336-6	Limits
460-00-4	Bromofluorobenzene (S)	99%	91%	96%	61-167%
460-00-4	Bromofluorobenzene (S)	91%	85%	94%	61-167%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-MS	BK19941.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
OP31406-MSD	BK19942.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
MC16600-6	BK19943.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16587-4

CAS No.	Compound	MC16600-6 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.071	0.066	93	0.071	0.064	90	3	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.071	0.072	101	0.071	0.067	94	7	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16600-6	Limits
460-00-4	Bromofluorobenzene (S)	110%	108%	107%	36-173%
460-00-4	Bromofluorobenzene (S)	100%	100%	99%	36-173%

\* = Outside of Control Limits.

7.3.2  
 7

# Volatile Surrogate Recovery Summary

Job Number: MC16587  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: AQ
--------------------	------------

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16587-4	BK19945.D	111	95
OP31406-BS	BK19938.D	104	96
OP31406-MB	BK19937.D	100	95
OP31406-MS	BK19941.D	110	100
OP31406-MSD	BK19942.D	108	100

Surrogate Compounds	Recovery Limits
---------------------	-----------------

S1 = Bromofluorobenzene (S)	36-173%
-----------------------------	---------

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

# Volatile Surrogate Recovery Summary

Job Number: MC16587  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011 Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16587-1	BK19747.D	72	76
MC16587-2	BK19748.D	72	73
MC16587-3	BK19751.D	112	124
MC16587-5	BK19752.D	96	104
MC16587-6	BK19750.D	103	101
MC16587-7	BK19753.D	117	118
OP31352-BS	BK19729.D	107	97
OP31352-MB	BK19728.D	108	98
OP31352-MS	BK19730.D	99	91
OP31352-MSD	BK19731.D	91	85

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 61-167%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

# GC Surrogate Retention Time Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK712-ICC712	Injection Date:	12/09/12
Lab File ID:	BK19722.D	Injection Time:	17:47
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.56	4.90
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP31352-MB	BK19728.D	12/09/12	20:14	4.57	4.90
OP31352-BS	BK19729.D	12/09/12	20:38	4.56	4.90
OP31352-MS	BK19730.D	12/09/12	21:03	4.57	4.90
OP31352-MSD	BK19731.D	12/09/12	21:27	4.57	4.90
ZZZZZZ	BK19732.D	12/09/12	21:52	4.56	4.90
ZZZZZZ	BK19733.D	12/09/12	22:16	4.56	4.90
ZZZZZZ	BK19734.D	12/09/12	22:41	4.56	4.90
MC16336-6	BK19735.D	12/09/12	23:05	4.57	4.90
ZZZZZZ	BK19736.D	12/09/12	23:30	4.56	4.90
ZZZZZZ	BK19737.D	12/09/12	23:55	4.56	4.90

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.1  
7

# GC Surrogate Retention Time Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK712-CC712	Injection Date:	12/10/12
Lab File ID:	BK19738.D	Injection Time:	00:20
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.56	4.90
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
ZZZZZZ	BK19739.D	12/10/12	00:44	4.57	4.90
ZZZZZZ	BK19740.D	12/10/12	01:09	4.57	4.90
ZZZZZZ	BK19741.D	12/10/12	01:33	4.56	4.90
ZZZZZZ	BK19742.D	12/10/12	01:58	4.56	4.90
ZZZZZZ	BK19743.D	12/10/12	02:23	4.56	4.90
ZZZZZZ	BK19744.D	12/10/12	02:47	4.56	4.90
ZZZZZZ	BK19745.D	12/10/12	03:12	4.56	4.90
ZZZZZZ	BK19746.D	12/10/12	03:36	4.56	4.90
MC16587-1	BK19747.D	12/10/12	04:01	4.56	4.90
MC16587-2	BK19748.D	12/10/12	04:25	4.56	4.90

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

# GC Surrogate Retention Time Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK712-CC712	Injection Date:	12/10/12
Lab File ID:	BK19749.D	Injection Time:	04:50
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.56	4.90
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
MC16587-6	BK19750.D	12/10/12	05:14	4.56	4.90
MC16587-3	BK19751.D	12/10/12	05:39	4.56	4.90
MC16587-5	BK19752.D	12/10/12	06:04	4.56	4.90
MC16587-7	BK19753.D	12/10/12	06:28	4.56	4.90
GBK712-ECC712	BK19754.D	12/10/12	06:53	4.56	4.90

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

# GC Surrogate Retention Time Summary

Job Number: MC16587  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK716-ICC716	Injection Date:	12/13/12
Lab File ID:	BK19932.D	Injection Time:	18:03
Instrument ID:	GCBK	Method:	SW846 8011

	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
Check Std	4.52	4.85

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
ZZZZZZ	BK19935A.D	12/13/12	19:16	4.52	4.85
ZZZZZZ	BK19935B.D	12/13/12	19:16	4.52	4.85
OP31405-MB	BK19937A.D	12/13/12	20:04	4.52	4.85
OP31406-MB	BK19937.D	12/13/12	20:04	4.52	4.85
OP31406-BS	BK19938.D	12/13/12	20:28	4.52	4.85
OP31405-BS	BK19938A.D	12/13/12	20:28	4.52	4.85
OP31405-BSD	BK19939.D	12/13/12	20:52	4.52	4.85
ZZZZZZ	BK19940.D	12/13/12	21:17	4.52	4.85
OP31406-MS	BK19941.D	12/13/12	21:41	4.52	4.85
OP31406-MSD	BK19942.D	12/13/12	22:06	4.52	4.85
MC16600-6	BK19943.D	12/13/12	22:30	4.52	4.85
ZZZZZZ	BK19944.D	12/13/12	22:55	4.52	4.85
MC16587-4	BK19945.D	12/13/12	23:19	4.52	4.85
ZZZZZZ	BK19946.D	12/13/12	23:43	4.52	4.85

**Surrogate  
Compounds**

S1 = Bromofluorobenzene (S)

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

## General Chemistry

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### QC Data Summaries



---

Includes the following where applicable:

- Percent Solids Raw Data Summary

# Percent Solids Raw Data Summary

Job Number: MC16587  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

---

Sample: MC16587-1      Analyzed: 07-DEC-12 by CF      Method: SM21 2540 B MOD.  
ClientID: MW-16-14

Wet Weight (Total)	33.122	g
Tare Weight	24.612	g
Dry Weight (Total)	32.818	g
Solids, Percent	96.4	%

---

Sample: MC16587-2      Analyzed: 07-DEC-12 by CF      Method: SM21 2540 B MOD.  
ClientID: MW-16-27

Wet Weight (Total)	11.537	g
Tare Weight	2.611	g
Dry Weight (Total)	11.255	g
Solids, Percent	96.8	%

---

Sample: MC16587-3      Analyzed: 07-DEC-12 by CF      Method: SM21 2540 B MOD.  
ClientID: MW-16-37

Wet Weight (Total)	11.128	g
Tare Weight	2.625	g
Dry Weight (Total)	10.81	g
Solids, Percent	96.3	%

---

Sample: MC16587-5      Analyzed: 07-DEC-12 by CF      Method: SM21 2540 B MOD.  
ClientID: MW-20-11

Wet Weight (Total)	11.434	g
Tare Weight	2.631	g
Dry Weight (Total)	10.401	g
Solids, Percent	88.3	%

---

Sample: MC16587-6      Analyzed: 07-DEC-12 by CF      Method: SM21 2540 B MOD.  
ClientID: MW-20-21

Wet Weight (Total)	13.709	g
Tare Weight	2.642	g
Dry Weight (Total)	11.615	g
Solids, Percent	81.1	%

---

Sample: MC16587-7      Analyzed: 07-DEC-12 by CF      Method: SM21 2540 B MOD.  
ClientID: MW-20-41

Wet Weight (Total)	12.196	g
Tare Weight	2.629	g
Dry Weight (Total)	11.917	g
Solids, Percent	97.1	%

---

8.1  
8

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VERIFICATION, TESTING AND CERTIFICATION COMPANY.



*e-Hardcopy 2.0*  
*Automated Report*

### Technical Report for

### Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562735.00015

SGS Accutest Job Number: MC16644

Sampling Date: 12/06/12

### Report to:

AECOM, INC.

Melissa.mansker@aecom.com

ATTN: Melissa Mansker

Total number of pages in report: 80



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

H. (Brad) Madadian  
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

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

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Test results relate only to samples analyzed.



ACCUTEST

October 27, 2016

AECOM  
1001 Highlands Plaza Drive West Suite 300  
St. Louis, MO 63110

RE: SGS Accutest Job # MC16644

Dear Elizabeth Kunkel

As you are aware, SGS Accutest Inc. - Marlborough has been conducting an extensive review of data associated with some historical Gas Chromatography-Mass Spectroscopy volatiles analyses. As a result of this review it was determined that some revisions of the original test report for this job were needed. These corrections have been incorporated into the revised report.

Please be assured that corrective actions have been put in place to address this matter and prevent a recurrence.

We apologize for any inconvenience that this issue may have caused. Please don't hesitate to contact us if we can be of further assistance.

Sincerely,

**H. (Brad) Madadian**

Regional Laboratory Director  
SGS Accutest Inc. - Marlborough

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TESTING AND CERTIFICATION COMPANY.

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### Sample Summary

Shell Oil

Job No: MC16644

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
MC16644-1	12/06/12	11:55 WPJS	12/07/12	SO	Soil	MW-21-21
MC16644-2	12/06/12	12:00 WPJS	12/07/12	SO	Soil	MW-21-31
MC16644-3	12/06/12	12:00 WPJS	12/07/12	SO	Soil	MW-21-31 DUP
MC16644-4	12/06/12	12:05 WPJS	12/07/12	SO	Soil	MW-21-41
MC16644-5	12/06/12	00:00 WPJS	12/07/12	AQ	Trip Blank Water	TRIP BLANK

---

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

## SAMPLE DELIVERY GROUP CASE NARRATIVE

2

**Client:** She O

**Job No** MC 6644

**Site:** URSMOSTL: Roxana Dr ing, Roxana, IL

**Report Date** 0/27/20 6 0:54:03 A

4 Samp e(s), Tr p B ank(s) and 0 F e d B ank(s) were co ected on 2/06/20 2 and were rece ved at SGS Accutest New Eng and on 2/07/20 2 proper y preserved, at 2 9 Deg C and n tact These Samp es rece ved a job number of MC 6644 A st ng of the Laboratory Samp e ID, C ent Samp e ID and dates of co ect on are presented n the Resu ts Summary Sect on of th s repo t - Ch orohexane was searched n the brary search and reported on y f detect ons were found

Except as noted be ow, a method spec f ed ca brat ons and qua ty contro performance cr ter a were met for th s job For more nformat on, p ease refer to QC summary pages

### Volatiles by GCMS By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** MSG4888

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6643-8MS, MC 6643-8MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for ,4-D oxane, 2,2-D ch oropropane, 2-Ch oroethy v ny ether, Acro e n, Ch oromethane, D ch orod f uoromethane are outs de contro m ts
- Matr x Sp ke Recovery(s) for 2,2-D ch oropropane, 2-Ch oroethy v ny ether, 4-Methy -2-pentanone (MIBK), Acro e n, Bromoform, Ch oromethane, D ch orod f uoromethane, V ny ch or de are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for 2,2-D ch oropropane, 2-Ch oroethy v ny ether, 4-Methy -2-pentanone (MIBK), Acro e n, Bromoform, Ch oromethane, D ch orod f uoromethane, V ny ch or de are outs de contro m ts Probab e cause due to matr x nterference
- Acro e n, Acry on tr e, V ny Acetate, 2-Ch oroethy v ny ether: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow

**Matrix:** SO

**Batch ID:** MSK2 6

- A samp es were ana yzed w th n the recommended method ho d ng t me
- A method b anks for th s batch meet method spec f c cr ter a
- Samp e(s) MC 6644-2MS, MC 6644-2MSD were used as the QC samp es nd cated
- B ank Sp ke Recove y(s) for Acro e n, Ch oromethane are outs de contro m ts
- Matr x Sp ke Recovery(s) for Acro e n, Ch oromethane are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for Acro e n, Ch oromethane, D ch orod f uoromethane, V ny ch or de are outs de contro m ts Probab e cause due to matr x nterference
- Acro e n: Cont nu ng Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow
- 2-Butanone (MEK), Acetone, 2-Hexanone: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Sp ke B ank(second source standard)was used to ver fy ca brat on standard accuracy

**Matrix:** SO

**Batch ID:** MSM 796

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6639- 3MS, MC 6639- 3MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for 2-Butanone (MEK), 2-Hexanone, Acetone, Acro e n are outs de contro m ts
- Matr x Sp ke Recovery(s) for ,2,3-Tr ch orobenzene, ,2,4-Tr ch orobenzene, Acetone, Acro e n, D ch orod f uoromethane, Naphtha ene, Styrene are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for ,2-D ch orobenzene, Acro e n, Styrene, ,2,3-Tr ch orobenzene, ,2,4-Tr ch orobenzene, Naphtha ene are outs de contro m ts H gh RPD due to poss b e matr x nterference and/or samp e non-homogene ty

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### Volatiles by GCMS By Method SW846 8260B

**Matrix:** SO **Batch ID:** MSM 796

- RPD(s) for MSD for , 2,2-Tetrachloroethane, 2,3-Trichlorobenzene, 2,3-Trichloropropane, 2,4-Trichlorobenzene, 2-Dichloroethane, Naphthalene, Vinyl Acetate are outside control limits for sample MC 6639- 3MSD. High RPD due to possible matrix interference and/or sample non-homogeneity

### Volatiles by GC By Method SW846 8011

**Matrix:** AQ **Batch ID:** OP3 406

- All samples were extracted within the recommended method holding time
- All samples were analyzed within the recommended method holding time
- Sample(s) MC 6600-6MS, MC 6600-6MSD were used as the QC samples indicated
- All method blanks for this batch meet method specification

**Matrix:** SO **Batch ID:** OP3 434

- All samples were extracted within the recommended method holding time
- All samples were analyzed within the recommended method holding time
- Sample(s) MC 6644- MS, MC 6644- MSD were used as the QC samples indicated
- All method blanks for this batch meet method specification

### Wet Chemistry By Method SM21 2540 B MOD.

**Matrix:** SO **Batch ID:** GN4 238

- Sample(s) MC 6644- DUP were used as the QC samples for Solids, Percent

SGS Accutest New England certifies that all analyses were performed within method specification. It is further recommended that this report be used in its entirety. The Laboratory Director for SGS Accutest New England or assignee as verified by the signature on the cover page has authorized the release of this report (MC 6644)

## Summary of Hits

Job Number: MC16644  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 12/06/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
MC16644-1	MW-21-21					
n-Butylbenzene		0.0915 J	0.57	0.021	mg/kg	SW846 8260B
Naphthalene		0.289 J	0.57	0.14	mg/kg	SW846 8260B
MC16644-2	MW-21-31					
n-Butylbenzene		0.116 J	0.57	0.021	mg/kg	SW846 8260B
sec-Butylbenzene		0.0600 J	0.57	0.026	mg/kg	SW846 8260B
MC16644-3	MW-21-31 DUP					
n-Butylbenzene		2.12	2.0	0.075	mg/kg	SW846 8260B
sec-Butylbenzene		1.27 J	2.0	0.093	mg/kg	SW846 8260B
Isopropylbenzene		0.718 J	2.0	0.092	mg/kg	SW846 8260B
p-Isopropyltoluene		0.731 J	2.0	0.072	mg/kg	SW846 8260B
Naphthalene		1.25 J	2.0	0.51	mg/kg	SW846 8260B
n-Propylbenzene		1.34 J	2.0	0.41	mg/kg	SW846 8260B
MC16644-4	MW-21-41					
Benzene		0.282	0.00081	0.00048	mg/kg	SW846 8260B
n-Butylbenzene		0.0041 J	0.0081	0.00030	mg/kg	SW846 8260B
sec-Butylbenzene		0.0058 J	0.0081	0.00037	mg/kg	SW846 8260B
Ethylbenzene		0.0076	0.0032	0.00039	mg/kg	SW846 8260B
Isopropylbenzene		0.0186	0.0081	0.00037	mg/kg	SW846 8260B
p-Isopropyltoluene		0.0017 J	0.0081	0.00029	mg/kg	SW846 8260B
Naphthalene		0.0076 J	0.0081	0.0020	mg/kg	SW846 8260B
n-Propylbenzene		0.0239	0.0081	0.0016	mg/kg	SW846 8260B
Toluene		0.0060 J	0.0081	0.0014	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		0.00093 J	0.0081	0.00036	mg/kg	SW846 8260B
m,p-Xylene		0.0065	0.0032	0.0013	mg/kg	SW846 8260B
Xylene (total)		0.0065	0.0032	0.00039	mg/kg	SW846 8260B

MC16644-5 TRIP BLANK

No hits reported in this sample.

**Sample Results**

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**Report of Analysis**

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## Report of Analysis

Client Sample ID:	MW-21-21	Date Sampled:	12/06/12
Lab Sample ID:	MC16644-1	Date Received:	12/07/12
Matrix:	SO - Soil	Percent Solids:	95.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65709.D	1	12/14/12	GK	n/a	n/a	MSK2161
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.70 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone <sup>a</sup>	ND	0.57	0.14	mg/kg	
107-02-8	Acrolein <sup>b</sup>	ND	2.9	1.1	mg/kg	
107-13-1	Acrylonitrile	ND	2.9	0.14	mg/kg	
71-43-2	Benzene	ND	0.057	0.034	mg/kg	
108-86-1	Bromobenzene	ND	0.57	0.025	mg/kg	
74-97-5	Bromochloromethane	ND	0.57	0.043	mg/kg	
75-27-4	Bromodichloromethane	ND	0.23	0.024	mg/kg	
75-25-2	Bromoform	ND	0.23	0.23	mg/kg	
74-83-9	Bromomethane	ND	0.23	0.059	mg/kg	
78-93-3	2-Butanone (MEK) <sup>a</sup>	ND	0.57	0.14	mg/kg	
104-51-8	n-Butylbenzene	0.0915	0.57	0.021	mg/kg	J
135-98-8	sec-Butylbenzene	ND	0.57	0.026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.57	0.10	mg/kg	
75-15-0	Carbon disulfide	ND	0.57	0.019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.23	0.083	mg/kg	
108-90-7	Chlorobenzene	ND	0.23	0.031	mg/kg	
75-00-3	Chloroethane	ND	0.57	0.14	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.57	0.23	mg/kg	
67-66-3	Chloroform	ND	0.23	0.059	mg/kg	
74-87-3	Chloromethane	ND	0.57	0.053	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.57	0.13	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.57	0.026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.23	0.034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.23	0.025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.23	0.026	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.23	0.024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.23	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.23	0.031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.23	0.033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.23	0.042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.23	0.034	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.23	0.033	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:	MW-21-21	Date Sampled:	12/06/12
Lab Sample ID:	MC16644-1	Date Received:	12/07/12
Matrix:	SO - Soil	Percent Solids:	95.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.23	0.043	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.57	0.026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.57	0.099	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.57	0.030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.23	0.020	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.23	0.057	mg/kg	
123-91-1	1,4-Dioxane	ND	2.9	2.9	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.57	0.078	mg/kg	
100-41-4	Ethylbenzene	ND	0.23	0.028	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.57	0.053	mg/kg	
591-78-6	2-Hexanone <sup>a</sup>	ND	0.57	0.057	mg/kg	
98-82-8	Isopropylbenzene	ND	0.57	0.026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.57	0.020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.23	0.033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.57	0.057	mg/kg	
74-95-3	Methylene bromide	ND	0.57	0.056	mg/kg	
75-09-2	Methylene chloride	ND	0.23	0.13	mg/kg	
91-20-3	Naphthalene	0.289	0.57	0.14	mg/kg	J
103-65-1	n-Propylbenzene	ND	0.57	0.12	mg/kg	
100-42-5	Styrene	ND	0.57	0.027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.57	0.11	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.23	0.049	mg/kg	
127-18-4	Tetrachloroethene	ND	0.23	0.026	mg/kg	
108-88-3	Toluene	ND	0.57	0.097	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.57	0.027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.57	0.026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.23	0.036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.23	0.084	mg/kg	
79-01-6	Trichloroethene	ND	0.23	0.024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.23	0.035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.57	0.033	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.57	0.026	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.57	0.024	mg/kg	
108-05-4	Vinyl Acetate	ND	0.57	0.064	mg/kg	
75-01-4	Vinyl chloride	ND	0.23	0.031	mg/kg	
	m,p-Xylene	ND	0.23	0.090	mg/kg	
95-47-6	o-Xylene	ND	0.23	0.027	mg/kg	
1330-20-7	Xylene (total)	ND	0.23	0.027	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

<b>Client Sample ID:</b> MW-21-21	<b>Date Sampled:</b> 12/06/12
<b>Lab Sample ID:</b> MC16644-1	<b>Date Received:</b> 12/07/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 95.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	129%		70-130%
2037-26-5	Toluene-D8	113%		70-130%
460-00-4	4-Bromofluorobenzene	102%		70-130%

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

- (a) Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.
- (b) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-21-21	<b>Date Sampled:</b> 12/06/12
<b>Lab Sample ID:</b> MC16644-1	<b>Date Received:</b> 12/07/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 95.1
<b>Method:</b> SW846 8011 SW846 3546	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20059.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	156%		61-167%
460-00-4	Bromofluorobenzene (S)	166%		61-167%

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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

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## Report of Analysis

Client Sample ID:	MW-21-31	Date Sampled:	12/06/12
Lab Sample ID:	MC16644-2	Date Received:	12/07/12
Matrix:	SO - Soil	Percent Solids:	94.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65710.D	1	12/14/12	GK	n/a	n/a	MSK2161
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.77 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone <sup>a</sup>	ND	0.57	0.14	mg/kg	
107-02-8	Acrolein <sup>b</sup>	ND	2.9	1.1	mg/kg	
107-13-1	Acrylonitrile	ND	2.9	0.14	mg/kg	
71-43-2	Benzene	ND	0.057	0.034	mg/kg	
108-86-1	Bromobenzene	ND	0.57	0.025	mg/kg	
74-97-5	Bromochloromethane	ND	0.57	0.043	mg/kg	
75-27-4	Bromodichloromethane	ND	0.23	0.024	mg/kg	
75-25-2	Bromoform	ND	0.23	0.23	mg/kg	
74-83-9	Bromomethane	ND	0.23	0.059	mg/kg	
78-93-3	2-Butanone (MEK) <sup>a</sup>	ND	0.57	0.14	mg/kg	
104-51-8	n-Butylbenzene	0.116	0.57	0.021	mg/kg	J
135-98-8	sec-Butylbenzene	0.0600	0.57	0.026	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.57	0.10	mg/kg	
75-15-0	Carbon disulfide	ND	0.57	0.019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.23	0.083	mg/kg	
108-90-7	Chlorobenzene	ND	0.23	0.031	mg/kg	
75-00-3	Chloroethane	ND	0.57	0.14	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.57	0.23	mg/kg	
67-66-3	Chloroform	ND	0.23	0.059	mg/kg	
74-87-3	Chloromethane	ND	0.57	0.053	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.57	0.13	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.57	0.026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.23	0.034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.23	0.025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.23	0.026	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.23	0.024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.23	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.23	0.031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.23	0.033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.23	0.042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.23	0.034	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.23	0.033	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:	MW-21-31	Date Sampled:	12/06/12
Lab Sample ID:	MC16644-2	Date Received:	12/07/12
Matrix:	SO - Soil	Percent Solids:	94.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.23	0.042	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.57	0.026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.57	0.099	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.57	0.030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.23	0.019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.23	0.057	mg/kg	
123-91-1	1,4-Dioxane	ND	2.9	2.9	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.57	0.078	mg/kg	
100-41-4	Ethylbenzene	ND	0.23	0.028	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.57	0.053	mg/kg	
591-78-6	2-Hexanone <sup>a</sup>	ND	0.57	0.057	mg/kg	
98-82-8	Isopropylbenzene	ND	0.57	0.026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.57	0.020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.23	0.033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.57	0.057	mg/kg	
74-95-3	Methylene bromide	ND	0.57	0.056	mg/kg	
75-09-2	Methylene chloride	ND	0.23	0.13	mg/kg	
91-20-3	Naphthalene	ND	0.57	0.14	mg/kg	
103-65-1	n-Propylbenzene	ND	0.57	0.12	mg/kg	
100-42-5	Styrene	ND	0.57	0.027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.57	0.11	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.23	0.048	mg/kg	
127-18-4	Tetrachloroethene	ND	0.23	0.026	mg/kg	
108-88-3	Toluene	ND	0.57	0.097	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.57	0.027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.57	0.026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.23	0.036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.23	0.084	mg/kg	
79-01-6	Trichloroethene	ND	0.23	0.024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.23	0.035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.57	0.033	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.57	0.026	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.57	0.024	mg/kg	
108-05-4	Vinyl Acetate	ND	0.57	0.064	mg/kg	
75-01-4	Vinyl chloride	ND	0.23	0.031	mg/kg	
	m,p-Xylene	ND	0.23	0.090	mg/kg	
95-47-6	o-Xylene	ND	0.23	0.027	mg/kg	
1330-20-7	Xylene (total)	ND	0.23	0.027	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

<b>Client Sample ID:</b> MW-21-31	<b>Date Sampled:</b> 12/06/12
<b>Lab Sample ID:</b> MC16644-2	<b>Date Received:</b> 12/07/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.4
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	118%		70-130%
2037-26-5	Toluene-D8	110%		70-130%
460-00-4	4-Bromofluorobenzene	101%		70-130%

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

- (a) Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.
- (b) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-21-31	<b>Date Sampled:</b> 12/06/12
<b>Lab Sample ID:</b> MC16644-2	<b>Date Received:</b> 12/07/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.4
<b>Method:</b> SW846 8011 SW846 3546	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20060.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.3 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	126%		61-167%
460-00-4	Bromofluorobenzene (S)	136%		61-167%

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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

4.2  
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## Report of Analysis

<b>Client Sample ID:</b> MW-21-31 DUP <b>Lab Sample ID:</b> MC16644-3 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8260B <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 12/06/12 <b>Date Received:</b> 12/07/12 <b>Percent Solids:</b> 94.9
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65711.D	1	12/14/12	GK	n/a	n/a	MSK2161
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	1.31 g	10.0 ml	100 ul
Run #2			

**VOA Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone <sup>a</sup>	ND	2.0	0.51	mg/kg	
107-02-8	Acrolein <sup>b</sup>	ND	10	4.0	mg/kg	
107-13-1	Acrylonitrile	ND	10	0.51	mg/kg	
71-43-2	Benzene	ND	0.20	0.12	mg/kg	
108-86-1	Bromobenzene	ND	2.0	0.090	mg/kg	
74-97-5	Bromochloromethane	ND	2.0	0.15	mg/kg	
75-27-4	Bromodichloromethane	ND	0.81	0.086	mg/kg	
75-25-2	Bromoform	ND	0.81	0.81	mg/kg	
74-83-9	Bromomethane	ND	0.81	0.21	mg/kg	
78-93-3	2-Butanone (MEK) <sup>a</sup>	ND	2.0	0.51	mg/kg	
104-51-8	n-Butylbenzene	2.12	2.0	0.075	mg/kg	
135-98-8	sec-Butylbenzene	1.27	2.0	0.093	mg/kg	J
98-06-6	tert-Butylbenzene	ND	2.0	0.36	mg/kg	
75-15-0	Carbon disulfide	ND	2.0	0.067	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.81	0.29	mg/kg	
108-90-7	Chlorobenzene	ND	0.81	0.11	mg/kg	
75-00-3	Chloroethane	ND	2.0	0.51	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	2.0	0.81	mg/kg	
67-66-3	Chloroform	ND	0.81	0.21	mg/kg	
74-87-3	Chloromethane	ND	2.0	0.19	mg/kg	
95-49-8	o-Chlorotoluene	ND	2.0	0.45	mg/kg	
106-43-4	p-Chlorotoluene	ND	2.0	0.092	mg/kg	
124-48-1	Dibromochloromethane	ND	0.81	0.12	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.81	0.087	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.81	0.091	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.81	0.085	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.81	0.46	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.81	0.11	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.81	0.12	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.81	0.15	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.81	0.12	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.81	0.12	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

4.3  
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## Report of Analysis

Client Sample ID:	MW-21-31 DUP	Date Sampled:	12/06/12
Lab Sample ID:	MC16644-3	Date Received:	12/07/12
Matrix:	SO - Soil	Percent Solids:	94.9
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.81	0.15	mg/kg	
142-28-9	1,3-Dichloropropane	ND	2.0	0.094	mg/kg	
594-20-7	2,2-Dichloropropane	ND	2.0	0.35	mg/kg	
563-58-6	1,1-Dichloropropene	ND	2.0	0.11	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.81	0.069	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.81	0.20	mg/kg	
123-91-1	1,4-Dioxane	ND	10	10	mg/kg	
97-63-2	Ethyl methacrylate	ND	2.0	0.28	mg/kg	
100-41-4	Ethylbenzene	ND	0.81	0.098	mg/kg	
87-68-3	Hexachlorobutadiene	ND	2.0	0.19	mg/kg	
591-78-6	2-Hexanone <sup>a</sup>	ND	2.0	0.20	mg/kg	
98-82-8	Isopropylbenzene	0.718	2.0	0.092	mg/kg	J
99-87-6	p-Isopropyltoluene	0.731	2.0	0.072	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.81	0.12	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	2.0	0.20	mg/kg	
74-95-3	Methylene bromide	ND	2.0	0.20	mg/kg	
75-09-2	Methylene chloride	ND	0.81	0.47	mg/kg	
91-20-3	Naphthalene	1.25	2.0	0.51	mg/kg	J
103-65-1	n-Propylbenzene	1.34	2.0	0.41	mg/kg	J
100-42-5	Styrene	ND	2.0	0.095	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	2.0	0.40	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.81	0.17	mg/kg	
127-18-4	Tetrachloroethene	ND	0.81	0.093	mg/kg	
108-88-3	Toluene	ND	2.0	0.34	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	0.096	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	0.093	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.81	0.13	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.81	0.30	mg/kg	
79-01-6	Trichloroethene	ND	0.81	0.086	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.81	0.12	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	2.0	0.12	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	0.091	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.087	mg/kg	
108-05-4	Vinyl Acetate	ND	2.0	0.23	mg/kg	
75-01-4	Vinyl chloride	ND	0.81	0.11	mg/kg	
	m,p-Xylene	ND	0.81	0.32	mg/kg	
95-47-6	o-Xylene	ND	0.81	0.097	mg/kg	
1330-20-7	Xylene (total)	ND	0.81	0.097	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

<b>Client Sample ID:</b> MW-21-31 DUP	<b>Date Sampled:</b> 12/06/12
<b>Lab Sample ID:</b> MC16644-3	<b>Date Received:</b> 12/07/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.9
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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4

**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	118%		70-130%
2037-26-5	Toluene-D8	112%		70-130%
460-00-4	4-Bromofluorobenzene	111%		70-130%

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

- (a) Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.
- (b) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> MW-21-31 DUP	
<b>Lab Sample ID:</b> MC16644-3	<b>Date Sampled:</b> 12/06/12
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 12/07/12
<b>Method:</b> SW846 8011 SW846 3546	<b>Percent Solids:</b> 94.9
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20061.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	124%		61-167%
460-00-4	Bromofluorobenzene (S)	132%		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:	MW-21-41	Date Sampled:	12/06/12
Lab Sample ID:	MC16644-4	Date Received:	12/07/12
Matrix:	SO - Soil	Percent Solids:	81.5
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M52943.D	1	12/17/12	AMY	n/a	n/a	MSM1796
Run #2							

Run #	Initial Weight	Final Volume
Run #1	3.79 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0081	0.0020	mg/kg	
107-02-8	Acrolein	ND	0.040	0.016	mg/kg	
107-13-1	Acrylonitrile	ND	0.040	0.0020	mg/kg	
71-43-2	Benzene	0.282	0.00081	0.00048	mg/kg	
108-86-1	Bromobenzene	ND	0.0081	0.00036	mg/kg	
74-97-5	Bromochloromethane	ND	0.0081	0.00060	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0032	0.00034	mg/kg	
75-25-2	Bromoform	ND	0.0032	0.0032	mg/kg	
74-83-9	Bromomethane	ND	0.0032	0.00084	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0081	0.0020	mg/kg	
104-51-8	n-Butylbenzene	0.0041	0.0081	0.00030	mg/kg	J
135-98-8	sec-Butylbenzene	0.0058	0.0081	0.00037	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.0081	0.0014	mg/kg	
75-15-0	Carbon disulfide	ND	0.0081	0.00027	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0032	0.0012	mg/kg	
108-90-7	Chlorobenzene	ND	0.0032	0.00045	mg/kg	
75-00-3	Chloroethane	ND	0.0081	0.0020	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0081	0.0032	mg/kg	
67-66-3	Chloroform	ND	0.0032	0.00083	mg/kg	
74-87-3	Chloromethane	ND	0.0081	0.00075	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0081	0.0018	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0081	0.00037	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0032	0.00048	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0032	0.00035	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0032	0.00037	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0032	0.00034	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0032	0.0018	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0032	0.00044	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0032	0.00047	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0032	0.00059	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0032	0.00049	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0032	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

## Report of Analysis

Client Sample ID:	MW-21-41	Date Sampled:	12/06/12
Lab Sample ID:	MC16644-4	Date Received:	12/07/12
Matrix:	SO - Soil	Percent Solids:	81.5
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0032	0.00060	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0081	0.00037	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0081	0.0014	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0081	0.00043	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0032	0.00028	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0032	0.00080	mg/kg	
123-91-1	1,4-Dioxane	ND	0.040	0.040	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0081	0.0011	mg/kg	
100-41-4	Ethylbenzene	0.0076	0.0032	0.00039	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0081	0.00075	mg/kg	
591-78-6	2-Hexanone	ND	0.0081	0.00081	mg/kg	
98-82-8	Isopropylbenzene	0.0186	0.0081	0.00037	mg/kg	
99-87-6	p-Isopropyltoluene	0.0017	0.0081	0.00029	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.0032	0.00047	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0081	0.00081	mg/kg	
74-95-3	Methylene bromide	ND	0.0081	0.00080	mg/kg	
75-09-2	Methylene chloride	ND	0.0032	0.0019	mg/kg	
91-20-3	Naphthalene	0.0076	0.0081	0.0020	mg/kg	J
103-65-1	n-Propylbenzene	0.0239	0.0081	0.0016	mg/kg	
100-42-5	Styrene	ND	0.0081	0.00038	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0081	0.0016	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0032	0.00069	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0032	0.00037	mg/kg	
108-88-3	Toluene	0.0060	0.0081	0.0014	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0081	0.00038	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0081	0.00037	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0032	0.00051	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0032	0.0012	mg/kg	
79-01-6	Trichloroethene	ND	0.0032	0.00034	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0032	0.00049	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0081	0.00047	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.00093	0.0081	0.00036	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	ND	0.0081	0.00035	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0081	0.00090	mg/kg	
75-01-4	Vinyl chloride	ND	0.0032	0.00044	mg/kg	
	m,p-Xylene	0.0065	0.0032	0.0013	mg/kg	
95-47-6	o-Xylene	ND	0.0032	0.00039	mg/kg	
1330-20-7	Xylene (total)	0.0065	0.0032	0.00039	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

<b>Client Sample ID:</b> MW-21-41	<b>Date Sampled:</b> 12/06/12
<b>Lab Sample ID:</b> MC16644-4	<b>Date Received:</b> 12/07/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.5
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	91%		70-130%
2037-26-5	Toluene-D8	119%		70-130%
460-00-4	4-Bromofluorobenzene	93%		70-130%

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

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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

<b>Client Sample ID:</b> MW-21-41	<b>Date Sampled:</b> 12/06/12
<b>Lab Sample ID:</b> MC16644-4	<b>Date Received:</b> 12/07/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.5
<b>Method:</b> SW846 8011 SW846 3546	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20062.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.3 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	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0030	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	150%		61-167%
460-00-4	Bromofluorobenzene (S)	154%		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:	TRIP BLANK	Date Sampled:	12/06/12
Lab Sample ID:	MC16644-5	Date Received:	12/07/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G122990.D	1	12/18/12	JM	n/a	n/a	MSG4888
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	5.0	3.0	ug/l	
107-02-8	Acrolein <sup>a</sup>	ND	25	10	ug/l	
107-13-1	Acrylonitrile <sup>a</sup>	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
110-75-8	2-Chloroethyl vinyl ether <sup>a</sup>	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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:	TRIP BLANK	Date Sampled:	12/06/12
Lab Sample ID:	MC16644-5	Date Received:	12/07/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate <sup>a</sup>	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 12/06/12
<b>Lab Sample ID:</b> MC16644-5	<b>Date Received:</b> 12/07/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	78%		70-130%
2037-26-5	Toluene-D8	84%		70-130%
460-00-4	4-Bromofluorobenzene	91%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 12/06/12
<b>Lab Sample ID:</b> MC16644-5	<b>Date Received:</b> 12/07/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19946.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
Run #2							

Run #	Initial Volume	Final Volume
Run #1	35.3 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	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	122%		36-173%
460-00-4	Bromofluorobenzene (S)	105%		36-173%

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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

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**Misc. Forms**

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**Custody Documents and Other Forms**

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**Includes the following where applicable:**

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

FED-EX Tracking #	Bill of Lading Control #
Accutest Quote #	Accutest Job # <b>MC16644</b>

Client / Reporting Information			Project Information										Requested Analysis ( see TEST CODE sheet)										Matrix Codes														
Company Name <b>URS</b>			Project Name <b>Roxana Drilling</b>										<div style="display: flex; justify-content: space-between;"> <span>100 8260</span> <span>111</span> </div> <div style="display: flex; justify-content: space-between;"> <span>VOC</span> <span>8011</span> </div>										DW - Drinking Water GW - Ground Water LW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIO - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank														
Street Address			Street																																		
City State Zip			Billing Information ( if different from Report to ) City: <b>Roxana, IL</b> Company Name: <b>URS</b>																																		
Project Contact <b>E. Kunkel</b>			Project # <b>21562735.00015</b>																																		
E-mail			Street Address																																		
Phone #			City State Zip																																		
Sampler(s) Name(s) <b>W. Pennington J. Staetter</b>			Project Manager <b>D. Palmer</b>										Attention: PO#																								
Acidul Sample #	Field ID / Point of Collection	MECHDI Val #	Date	Time	Sampled by	Matrix	# of bottles	NI	NIH	NIH3	NIH3A	NIH3B	NIH3C	NIH3D	NIH3E	NIH3F	NIH3G	NIH3H	NIH3I	NIH3J	NIH3K	NIH3L	NIH3M	NIH3N	NIH3O	NIH3P	NIH3Q	NIH3R	NIH3S	NIH3T	NIH3U	NIH3V	NIH3W	NIH3X	NIH3Y	NIH3Z	LAB USE ONLY
-1	MW-21-21		12/6/12	1155	WP/55	SO	4																														
-2	MW-21-31			1200																																	
-3	MW-21-31 Dup			1200																																	
-4	MW-21-41			1205																																	
-5	Trip Blank																																				

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Turnaround Time ( Business days )		Approved By ( Accutest PM ) / Date:		Data Deliverable Information										Comments / Special Instructions											
<input checked="" type="checkbox"/> Std. 10 Business Days				<input type="checkbox"/> Commercial "A" ( Level 1 )						<input type="checkbox"/> NYASP Category A															
<input type="checkbox"/> Std. 5 Business Days ( By Contract only )				<input type="checkbox"/> Commercial "B" ( Level 2 )						<input type="checkbox"/> NYASP Category B															
<input type="checkbox"/> 5 Day RUSH				<input checked="" type="checkbox"/> FULLT1 ( Level 3+4 )						<input type="checkbox"/> State Forms															
<input type="checkbox"/> 3 Day EMERGENCY				<input type="checkbox"/> CT RCP						<input checked="" type="checkbox"/> EDD Format															
<input type="checkbox"/> 2 Day EMERGENCY				<input type="checkbox"/> MA MCP						<input type="checkbox"/> Other															
<input type="checkbox"/> 1 Day EMERGENCY				Commercial "A" = Results Only Commercial "B" = Results + QC Summary																					

Sample Custody must be documented below each time samples change possession, including courier delivery.									
Relinquished by Sampler <b>W. Pennington</b>	Date Time: <b>12/6/12 1400</b>	Received By: <b>Fed Ex</b>	Relinquished By: <b>FX</b>	Date Time: <b>930</b>	Received By: <b>Pennington</b>				
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:				
Relinquished by:	Date Time:	Received By:	Custody Seal #	<input type="checkbox"/> Intact	Preserved where applicable				
				<input type="checkbox"/> Not Intact	On Ice <input type="checkbox"/>				
					Cooler Temp: <b>2.9°C</b>				

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## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC16644      Client: URS      Immediate Client Services Action Required: No  
 Date / Time Received: 12/7/2012      Delivery Method: \_\_\_\_\_      Client Service Action Required at Login: No  
 Project: ROXANA DRILLING      No. Coolers: 1      Airbill #'s: \_\_\_\_\_

**Cooler Security**

	<u>Y</u>	<u>or</u>	<u>N</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

**Cooler Temperature**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:	<u>Infrared gun</u>		
3. Cooler media:	<u>Ice (bag)</u>		

**Quality Control Preservation**

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

**Sample Integrity - Documentation**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

**Sample Integrity - Condition**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	<u>Intact</u>		

**Sample Integrity - Instructions**

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

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## Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16644

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

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Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16644-1 Collected: 06-DEC-12 11:55 By: WPJS Received: 07-DEC-12 By: MW-21-21						
MC16644-1	SM21 2540 B MOD.	11-DEC-12	MC			%SOL
MC16644-1	SW846 8260B	14-DEC-12 10:32	GK			V8260SL+
MC16644-1	SW846 8011	16-DEC-12 18:43	AP	14-DEC-12	BJ	V8011SL
MC16644-2 Collected: 06-DEC-12 12:00 By: WPJS Received: 07-DEC-12 By: MW-21-31						
MC16644-2	SM21 2540 B MOD.	11-DEC-12	MC			%SOL
MC16644-2	SW846 8260B	14-DEC-12 10:59	GK			V8260SL+
MC16644-2	SW846 8011	16-DEC-12 19:08	AP	14-DEC-12	BJ	V8011SL
MC16644-3 Collected: 06-DEC-12 12:00 By: WPJS Received: 07-DEC-12 By: MW-21-31 DUP						
MC16644-3	SM21 2540 B MOD.	11-DEC-12	MC			%SOL
MC16644-3	SW846 8260B	14-DEC-12 11:26	GK			V8260SL+
MC16644-3	SW846 8011	16-DEC-12 19:33	AP	14-DEC-12	BJ	V8011SL
MC16644-4 Collected: 06-DEC-12 12:05 By: WPJS Received: 07-DEC-12 By: MW-21-41						
MC16644-4	SM21 2540 B MOD.	11-DEC-12	MC			%SOL
MC16644-4	SW846 8011	16-DEC-12 19:58	AP	14-DEC-12	BJ	V8011SL
MC16644-4	SW846 8260B	17-DEC-12 11:27	AMY			V8260SL+
MC16644-5 Collected: 06-DEC-12 00:00 By: WPJS Received: 07-DEC-12 By: TRIP BLANK						
MC16644-5	SW846 8011	13-DEC-12 23:43	AP	13-DEC-12	BJ	V8011SL
MC16644-5	SW846 8260B	18-DEC-12 12:48	JM			V8260SL+

# SGS Accutest Internal Chain of Custody

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/07/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16644-1.1	Walk In Ref #5	Miranda Cardullo	12/11/12 08:51	Retrieve from Storage
MC16644-1.1	Miranda Cardullo	Walk In Ref #5	12/11/12 09:54	Return to Storage
MC16644-1.1	Walk In Ref #5	Chris Cataldo	12/14/12 13:57	Retrieve from Storage
MC16644-1.1	Chris Cataldo	Walk In Ref #5	12/14/12 20:59	Return to Storage
MC16644-1.1	Scott Parsick		02/13/13 11:50	Disposed
MC16644-1.4	VOC Ref #10	Gary Krasinski	12/11/12 14:38	Retrieve from Storage
MC16644-1.4	Gary Krasinski	VOC Ref #10	12/17/12 09:04	Return to Storage
MC16644-1.4	VOC Ref #10	Gary Krasinski	12/27/12 12:32	Retrieve from Storage
MC16644-1.4	Gary Krasinski	VOC Ref #10	12/28/12 12:41	Return to Storage
MC16644-1.4	VOC Ref #10	Jaime Maslowski	12/28/12 12:44	Retrieve from Storage
MC16644-1.4	Jaime Maslowski	VOC Ref #10	01/02/13 10:04	Return to Storage
MC16644-1.4	Scott Parsick		02/13/13 11:50	Disposed
MC16644-2.1	Walk In Ref #5	Miranda Cardullo	12/11/12 08:51	Retrieve from Storage
MC16644-2.1	Miranda Cardullo	Walk In Ref #5	12/11/12 09:54	Return to Storage
MC16644-2.1	Walk In Ref #5	Chris Cataldo	12/14/12 13:57	Retrieve from Storage
MC16644-2.1	Chris Cataldo	Walk In Ref #5	12/14/12 20:59	Return to Storage
MC16644-2.1	Scott Parsick		02/13/13 11:50	Disposed
MC16644-2.4	VOC Ref #10	Gary Krasinski	12/11/12 14:38	Retrieve from Storage
MC16644-2.4	Gary Krasinski	VOC Ref #10	12/17/12 09:04	Return to Storage
MC16644-2.4	VOC Ref #10	Gary Krasinski	12/27/12 12:32	Retrieve from Storage
MC16644-2.4	Gary Krasinski	VOC Ref #10	12/28/12 12:41	Return to Storage
MC16644-2.4	VOC Ref #10	Jaime Maslowski	12/28/12 12:44	Retrieve from Storage
MC16644-2.4	Jaime Maslowski	VOC Ref #10	01/02/13 10:04	Return to Storage
MC16644-2.4	Scott Parsick		02/13/13 11:50	Disposed
MC16644-3.1	Walk In Ref #5	Miranda Cardullo	12/11/12 08:51	Retrieve from Storage
MC16644-3.1	Miranda Cardullo	Walk In Ref #5	12/11/12 09:54	Return to Storage
MC16644-3.1	Walk In Ref #5	Chris Cataldo	12/14/12 13:57	Retrieve from Storage
MC16644-3.1	Chris Cataldo	Walk In Ref #5	12/14/12 20:59	Return to Storage
MC16644-3.1	Scott Parsick		02/13/13 11:50	Disposed
MC16644-3.4	VOC Ref #10	Gary Krasinski	12/11/12 14:38	Retrieve from Storage
MC16644-3.4	Gary Krasinski	VOC Ref #10	12/17/12 09:04	Return to Storage
MC16644-3.4	VOC Ref #10	Gary Krasinski	12/27/12 12:32	Retrieve from Storage
MC16644-3.4	Gary Krasinski	VOC Ref #10	12/28/12 12:41	Return to Storage
MC16644-3.4	VOC Ref #10	Jaime Maslowski	12/28/12 12:44	Retrieve from Storage
MC16644-3.4	Jaime Maslowski	VOC Ref #10	01/02/13 10:04	Return to Storage
MC16644-3.4	Scott Parsick		02/13/13 11:50	Disposed
MC16644-4.1	Walk In Ref #5	Miranda Cardullo	12/11/12 08:51	Retrieve from Storage
MC16644-4.1	Miranda Cardullo	Walk In Ref #5	12/11/12 09:54	Return to Storage

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# SGS Accutest Internal Chain of Custody

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/07/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16644-4.1	Walk In Ref #5	Chris Cataldo	12/14/12 13:57	Retrieve from Storage
MC16644-4.1	Chris Cataldo	Walk In Ref #5	12/14/12 20:59	Return to Storage
MC16644-4.1	Scott Parsick		02/13/13 11:50	Disposed
MC16644-4.3	VOC Ref #10	Amy Min Yang	12/17/12 11:08	Retrieve from Storage
MC16644-4.3	Amy Min Yang	GCMSM	12/17/12 11:08	Load on Instrument
MC16644-4.3	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16644-4.3	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16644-4.3	Scott Parsick		02/13/13 11:50	Disposed
MC16644-4.4	VOC Ref #10	Gary Krasinski	12/11/12 14:38	Retrieve from Storage
MC16644-4.4	Gary Krasinski	VOC Ref #10	12/12/12 10:27	Return to Storage
MC16644-4.4	Scott Parsick		02/13/13 11:50	Disposed
MC16644-5.1	VOC Ref #3	Jaime Maslowski	12/18/12 11:34	Retrieve from Storage
MC16644-5.1	Jaime Maslowski	GCMSG	12/18/12 11:35	Load on Instrument
MC16644-5.1	GCMSG	Jaime Maslowski	12/19/12 14:26	Unload from Instrument
MC16644-5.1	Jaime Maslowski	VOC Ref #3	12/19/12 14:28	Return to Storage
MC16644-5.1	Scott Parsick		02/13/13 11:50	Disposed
MC16644-5.3	VOC Ref #3	Bijan Jafari	12/13/12 04:40	Retrieve from Storage
MC16644-5.3	Bijan Jafari		12/14/12 17:43	Depleted

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## GC/MS Volatiles

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## QC Data Summaries

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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: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2161-MB	K65707.D	1	12/14/12	GK	n/a	n/a	MSK2161

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-1, MC16644-2, MC16644-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

6.1.1  
6

# Method Blank Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2161-MB	K65707.D	1	12/14/12	GK	n/a	n/a	MSK2161

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-1, MC16644-2, MC16644-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.1  
6

# Method Blank Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2161-MB	K65707.D	1	12/14/12	GK	n/a	n/a	MSK2161

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-1, MC16644-2, MC16644-3

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	128%	70-130%
2037-26-5	Toluene-D8	110%	70-130%
460-00-4	4-Bromofluorobenzene	99%	70-130%

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

6.1.1  
6

# Method Blank Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1796-MB	M52942.D	1	12/17/12	AMY	n/a	n/a	MSM1796

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-4

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

# Method Blank Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1796-MB	M52942.D	1	12/17/12	AMY	n/a	n/a	MSM1796

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-4

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

# Method Blank Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1796-MB	M52942.D	1	12/17/12	AMY	n/a	n/a	MSM1796

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-4

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	93% 70-130%
2037-26-5	Toluene-D8	111% 70-130%
460-00-4	4-Bromofluorobenzene	89% 70-130%

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

# Method Blank Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4888-MB	G122987.D	1	12/18/12	JM	n/a	n/a	MSG4888

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-5

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	

# Method Blank Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4888-MB	G122987.D	1	12/18/12	JM	n/a	n/a	MSG4888

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-5

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	ug/l	

# Method Blank Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4888-MB	G122987.D	1	12/18/12	JM	n/a	n/a	MSG4888

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-5

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	79% 70-130%
2037-26-5	Toluene-D8	84% 70-130%
460-00-4	4-Bromofluorobenzene	91% 70-130%

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

# Blank Spike Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1796-BS	M52939.D	1	12/17/12	AMY	n/a	n/a	MSM1796

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	50	73.0	146* a	70-130
107-02-8	Acrolein	250	164	66* a	70-130
107-13-1	Acrylonitrile	50	39.2	78	70-130
71-43-2	Benzene	50	50.4	101	70-130
108-86-1	Bromobenzene	50	55.5	111	70-130
74-97-5	Bromochloromethane	50	52.6	105	70-130
75-27-4	Bromodichloromethane	50	53.3	107	70-130
75-25-2	Bromoform	50	52.4	105	70-130
74-83-9	Bromomethane	50	50.4	101	70-130
78-93-3	2-Butanone (MEK)	50	65.9	132* a	70-130
104-51-8	n-Butylbenzene	50	52.7	105	70-130
135-98-8	sec-Butylbenzene	50	52.1	104	70-130
98-06-6	tert-Butylbenzene	50	51.1	102	70-130
75-15-0	Carbon disulfide	50	50.3	101	70-130
56-23-5	Carbon tetrachloride	50	53.1	106	70-130
108-90-7	Chlorobenzene	50	52.3	105	70-130
75-00-3	Chloroethane	50	48.1	96	70-130
110-75-8	2-Chloroethyl vinyl ether	50	41.1	82	10-160
67-66-3	Chloroform	50	50.5	101	70-130
74-87-3	Chloromethane	50	51.4	103	70-130
95-49-8	o-Chlorotoluene	50	49.0	98	70-130
106-43-4	p-Chlorotoluene	50	50.5	101	70-130
124-48-1	Dibromochloromethane	50	56.4	113	70-130
95-50-1	1,2-Dichlorobenzene	50	52.3	105	70-130
541-73-1	1,3-Dichlorobenzene	50	52.7	105	70-130
106-46-7	1,4-Dichlorobenzene	50	53.4	107	70-130
75-71-8	Dichlorodifluoromethane	50	60.7	121	70-130
75-34-3	1,1-Dichloroethane	50	47.0	94	70-130
107-06-2	1,2-Dichloroethane	50	48.3	97	70-130
75-35-4	1,1-Dichloroethene	50	52.7	105	70-130
156-59-2	cis-1,2-Dichloroethene	50	50.4	101	70-130
156-60-5	trans-1,2-Dichloroethene	50	50.1	100	70-130
78-87-5	1,2-Dichloropropane	50	49.5	99	70-130
142-28-9	1,3-Dichloropropane	50	52.4	105	70-130
594-20-7	2,2-Dichloropropane	50	50.9	102	70-130
563-58-6	1,1-Dichloropropene	50	52.5	105	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1796-BS	M52939.D	1	12/17/12	AMY	n/a	n/a	MSM1796

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	51.3	103	70-130
10061-02-6	trans-1,3-Dichloropropene	50	55.6	111	70-130
123-91-1	1,4-Dioxane	250	247	99	70-130
97-63-2	Ethyl methacrylate	50	55.6	111	76-141
100-41-4	Ethylbenzene	50	54.4	109	70-130
87-68-3	Hexachlorobutadiene	50	58.2	116	70-130
591-78-6	2-Hexanone	50	67.1	134* a	70-130
98-82-8	Isopropylbenzene	50	52.6	105	70-130
99-87-6	p-Isopropyltoluene	50	55.9	112	70-130
1634-04-4	Methyl Tert Butyl Ether	50	56.2	112	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	45.1	90	70-130
74-95-3	Methylene bromide	50	51.4	103	70-130
75-09-2	Methylene chloride	50	48.2	96	70-130
91-20-3	Naphthalene	50	55.8	112	70-130
103-65-1	n-Propylbenzene	50	50.6	101	70-130
100-42-5	Styrene	50	53.9	108	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	56.2	112	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	47.9	96	70-130
127-18-4	Tetrachloroethene	50	59.2	118	70-130
108-88-3	Toluene	50	57.2	114	70-130
87-61-6	1,2,3-Trichlorobenzene	50	55.5	111	70-130
120-82-1	1,2,4-Trichlorobenzene	50	57.7	115	70-130
71-55-6	1,1,1-Trichloroethane	50	51.3	103	70-130
79-00-5	1,1,2-Trichloroethane	50	52.1	104	70-130
79-01-6	Trichloroethene	50	53.0	106	70-130
75-69-4	Trichlorofluoromethane	50	51.0	102	70-130
96-18-4	1,2,3-Trichloropropane	50	47.9	96	70-130
95-63-6	1,2,4-Trimethylbenzene	50	53.4	107	70-130
108-67-8	1,3,5-Trimethylbenzene	50	52.6	105	70-130
108-05-4	Vinyl Acetate	50	40.0	80	70-130
75-01-4	Vinyl chloride	50	47.0	94	70-130
	m,p-Xylene	100	108	108	70-130
95-47-6	o-Xylene	50	52.8	106	70-130
1330-20-7	Xylene (total)	150	161	107	70-130

\* = Outside of Control Limits.

## Blank Spike Summary

Job Number: MC16644  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1796-BS	M52939.D	1	12/17/12	AMY	n/a	n/a	MSM1796

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-4

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	94%	70-130%
2037-26-5	Toluene-D8	118%	70-130%
460-00-4	4-Bromofluorobenzene	89%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4888-BS	G122984.D	1	12/18/12	JM	n/a	n/a	MSG4888

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	50	62.6	125	70-130
107-02-8	Acrolein	250	114	46* a	70-130
107-13-1	Acrylonitrile	50	41.1	82	70-130
71-43-2	Benzene	50	56.7	113	70-130
108-86-1	Bromobenzene	50	53.4	107	70-130
74-97-5	Bromochloromethane	50	45.9	92	70-130
75-27-4	Bromodichloromethane	50	50.9	102	70-130
75-25-2	Bromoform	50	39.0	78	70-130
74-83-9	Bromomethane	50	54.0	108	70-130
78-93-3	2-Butanone (MEK)	50	53.8	108	70-130
104-51-8	n-Butylbenzene	50	59.6	119	70-130
135-98-8	sec-Butylbenzene	50	56.7	113	70-130
98-06-6	tert-Butylbenzene	50	54.8	110	70-130
75-15-0	Carbon disulfide	50	58.2	116	70-130
56-23-5	Carbon tetrachloride	50	53.5	107	70-130
108-90-7	Chlorobenzene	50	50.1	100	70-130
75-00-3	Chloroethane	50	58.7	117	70-130
110-75-8	2-Chloroethyl vinyl ether	50	31.5	63* a	70-130
67-66-3	Chloroform	50	54.5	109	70-130
74-87-3	Chloromethane	50	69.7	139* a	70-130
95-49-8	o-Chlorotoluene	50	57.0	114	70-130
106-43-4	p-Chlorotoluene	50	57.5	115	70-130
124-48-1	Dibromochloromethane	50	46.1	92	70-130
95-50-1	1,2-Dichlorobenzene	50	50.7	101	70-130
541-73-1	1,3-Dichlorobenzene	50	54.2	108	70-130
106-46-7	1,4-Dichlorobenzene	50	55.6	111	70-130
75-71-8	Dichlorodifluoromethane	50	89.3	179* a	70-130
75-34-3	1,1-Dichloroethane	50	59.1	118	70-130
107-06-2	1,2-Dichloroethane	50	46.5	93	70-130
75-35-4	1,1-Dichloroethene	50	57.1	114	70-130
156-59-2	cis-1,2-Dichloroethene	50	54.5	109	70-130
156-60-5	trans-1,2-Dichloroethene	50	56.1	112	70-130
78-87-5	1,2-Dichloropropane	50	53.6	107	70-130
142-28-9	1,3-Dichloropropane	50	45.6	91	70-130
594-20-7	2,2-Dichloropropane	50	70.3	141* a	70-130
563-58-6	1,1-Dichloropropene	50	54.9	110	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4888-BS	G122984.D	1	12/18/12	JM	n/a	n/a	MSG4888

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	50.9	102	70-130
10061-02-6	trans-1,3-Dichloropropene	50	51.3	103	70-130
123-91-1	1,4-Dioxane	250	172	69* a	70-130
97-63-2	Ethyl methacrylate	50	42.1	84	77-137
100-41-4	Ethylbenzene	50	55.0	110	70-130
87-68-3	Hexachlorobutadiene	50	55.2	110	70-130
591-78-6	2-Hexanone	50	53.3	107	70-130
98-82-8	Isopropylbenzene	50	56.5	113	70-130
99-87-6	p-Isopropyltoluene	50	60.3	121	70-130
1634-04-4	Methyl Tert Butyl Ether	50	47.0	94	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	37.0	74	70-130
74-95-3	Methylene bromide	50	43.5	87	70-130
75-09-2	Methylene chloride	50	53.8	108	70-130
91-20-3	Naphthalene	50	38.6	77	70-130
103-65-1	n-Propylbenzene	50	56.8	114	70-130
100-42-5	Styrene	50	48.9	98	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	48.6	97	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	50.9	102	70-130
127-18-4	Tetrachloroethene	50	50.7	101	70-130
108-88-3	Toluene	50	54.7	109	70-130
87-61-6	1,2,3-Trichlorobenzene	50	42.6	85	70-130
120-82-1	1,2,4-Trichlorobenzene	50	47.4	95	70-130
71-55-6	1,1,1-Trichloroethane	50	59.2	118	70-130
79-00-5	1,1,2-Trichloroethane	50	46.1	92	70-130
79-01-6	Trichloroethene	50	52.1	104	70-130
75-69-4	Trichlorofluoromethane	50	57.0	114	70-130
96-18-4	1,2,3-Trichloropropane	50	46.7	93	70-130
95-63-6	1,2,4-Trimethylbenzene	50	60.0	120	70-130
108-67-8	1,3,5-Trimethylbenzene	50	60.1	120	70-130
108-05-4	Vinyl Acetate	50	43.1	86	70-130
75-01-4	Vinyl chloride	50	62.7	125	70-130
	m,p-Xylene	100	109	109	70-130
95-47-6	o-Xylene	50	53.2	106	70-130
1330-20-7	Xylene (total)	150	162	108	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16644  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4888-BS	G122984.D	1	12/18/12	JM	n/a	n/a	MSG4888

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-5

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	79%	70-130%
2037-26-5	Toluene-D8	83%	70-130%
460-00-4	4-Bromofluorobenzene	90%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2161-BS	K65704.D	1	12/14/12	GK	n/a	n/a	MSK2161
MSK2161-BSD	K65705.D	1	12/14/12	GK	n/a	n/a	MSK2161

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-1, MC16644-2, MC16644-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	2500	2120	85	1900	76	11	70-130/25
107-02-8	Acrolein	12500	ND	0* a	ND	0* a	nc	70-130/25
107-13-1	Acrylonitrile	2500	2550	102	2460	98	4	70-130/25
71-43-2	Benzene	2500	2800	112	2640	106	6	70-130/25
108-86-1	Bromobenzene	2500	2480	99	2450	98	1	70-130/25
74-97-5	Bromochloromethane	2500	2780	111	2640	106	5	70-130/25
75-27-4	Bromodichloromethane	2500	2770	111	2700	108	3	70-130/25
75-25-2	Bromoform	2500	2380	95	2600	104	9	70-130/25
74-83-9	Bromomethane	2500	3060	122	2980	119	3	70-130/25
78-93-3	2-Butanone (MEK)	2500	2230	89	2020	81	10	70-130/25
104-51-8	n-Butylbenzene	2500	2620	105	2410	96	8	70-130/25
135-98-8	sec-Butylbenzene	2500	2910	116	2650	106	9	70-130/25
98-06-6	tert-Butylbenzene	2500	2970	119	2640	106	12	70-130/25
75-15-0	Carbon disulfide	2500	3020	121	2970	119	2	70-130/25
56-23-5	Carbon tetrachloride	2500	2840	114	2800	112	1	70-130/25
108-90-7	Chlorobenzene	2500	2710	108	2810	112	4	70-130/25
75-00-3	Chloroethane	2500	3080	123	3210	128	4	70-130/25
110-75-8	2-Chloroethyl vinyl ether	2500	752	30	710	28	6	10-160/25
67-66-3	Chloroform	2500	3050	122	2910	116	5	70-130/25
74-87-3	Chloromethane	2500	3270	131* b	2790	112	16	70-130/25
95-49-8	o-Chlorotoluene	2500	2850	114	2580	103	10	70-130/25
106-43-4	p-Chlorotoluene	2500	2990	120	2670	107	11	70-130/25
124-48-1	Dibromochloromethane	2500	2520	101	2690	108	7	70-130/25
95-50-1	1,2-Dichlorobenzene	2500	2620	105	2560	102	2	70-130/25
541-73-1	1,3-Dichlorobenzene	2500	2700	108	2640	106	2	70-130/25
106-46-7	1,4-Dichlorobenzene	2500	2480	99	2400	96	3	70-130/25
75-71-8	Dichlorodifluoromethane	2500	1950	78	1770	71	10	70-130/25
75-34-3	1,1-Dichloroethane	2500	3060	122	2950	118	4	70-130/25
107-06-2	1,2-Dichloroethane	2500	2720	109	2630	105	3	70-130/25
75-35-4	1,1-Dichloroethene	2500	3110	124	3030	121	3	70-130/25
156-59-2	cis-1,2-Dichloroethene	2500	2910	116	2860	114	2	70-130/25
156-60-5	trans-1,2-Dichloroethene	2500	2880	115	2820	113	2	70-130/25
78-87-5	1,2-Dichloropropane	2500	2640	106	2600	104	2	70-130/25
142-28-9	1,3-Dichloropropane	2500	2490	100	2600	104	4	70-130/25
594-20-7	2,2-Dichloropropane	2500	3110	124	2950	118	5	70-130/25
563-58-6	1,1-Dichloropropene	2500	2960	118	2750	110	7	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2161-BS	K65704.D	1	12/14/12	GK	n/a	n/a	MSK2161
MSK2161-BSD	K65705.D	1	12/14/12	GK	n/a	n/a	MSK2161

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-1, MC16644-2, MC16644-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	2500	2680	107	2610	104	3	70-130/25
10061-02-6	trans-1,3-Dichloropropene	2500	2810	112	2790	112	1	70-130/25
123-91-1	1,4-Dioxane	12500	13700	110	11000	88	22	70-130/25
97-63-2	Ethyl methacrylate	2500	2460	98	2410	96	2	76-141/25
100-41-4	Ethylbenzene	2500	2690	108	2630	105	2	70-130/25
87-68-3	Hexachlorobutadiene	2500	2720	109	2540	102	7	70-130/25
591-78-6	2-Hexanone	2500	1840	74	1880	75	2	70-130/25
98-82-8	Isopropylbenzene	2500	2920	117	2690	108	8	70-130/25
99-87-6	p-Isopropyltoluene	2500	2750	110	2600	104	6	70-130/25
1634-04-4	Methyl Tert Butyl Ether	2500	2880	115	2800	112	3	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	2180	87	2120	85	3	70-130/25
74-95-3	Methylene bromide	2500	2670	107	2560	102	4	70-130/25
75-09-2	Methylene chloride	2500	3000	120	2950	118	2	70-130/25
91-20-3	Naphthalene	2500	2230	89	2120	85	5	70-130/25
103-65-1	n-Propylbenzene	2500	2920	117	2610	104	11	70-130/25
100-42-5	Styrene	2500	2550	102	2560	102	0	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	2500	2550	102	2790	112	9	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	2500	2470	99	2160	86	13	70-130/25
127-18-4	Tetrachloroethene	2500	2550	102	2670	107	5	70-130/25
108-88-3	Toluene	2500	2750	110	2680	107	3	70-130/25
87-61-6	1,2,3-Trichlorobenzene	2500	2280	91	2190	88	4	70-130/25
120-82-1	1,2,4-Trichlorobenzene	2500	2410	96	2290	92	5	70-130/25
71-55-6	1,1,1-Trichloroethane	2500	3110	124	2950	118	5	70-130/25
79-00-5	1,1,2-Trichloroethane	2500	2560	102	2540	102	1	70-130/25
79-01-6	Trichloroethene	2500	2730	109	2700	108	1	70-130/25
75-69-4	Trichlorofluoromethane	2500	2980	119	2910	116	2	70-130/25
96-18-4	1,2,3-Trichloropropane	2500	2430	97	2170	87	11	70-130/25
95-63-6	1,2,4-Trimethylbenzene	2500	2680	107	2480	99	8	70-130/25
108-67-8	1,3,5-Trimethylbenzene	2500	2620	105	2430	97	8	70-130/25
108-05-4	Vinyl Acetate	2500	2550	102	2420	97	5	70-130/25
75-01-4	Vinyl chloride	2500	2320	93	2370	95	2	70-130/25
	m,p-Xylene	5000	5550	111	5590	112	1	70-130/25
95-47-6	o-Xylene	2500	2830	113	2910	116	3	70-130/25
1330-20-7	Xylene (total)	7500	8380	112	8500	113	1	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2161-BS	K65704.D	1	12/14/12	GK	n/a	n/a	MSK2161
MSK2161-BSD	K65705.D	1	12/14/12	GK	n/a	n/a	MSK2161

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-1, MC16644-2, MC16644-3

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	125%	118%	70-130%
2037-26-5	Toluene-D8	115%	112%	70-130%
460-00-4	4-Bromofluorobenzene	110%	98%	70-130%

- (a) Outside control limits due to standard degradation. Refer to Continuing Calibration.
- (b) Outside control limits. Blank Spike meets program technical requirements.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16644-2MS	K65724.D	1	12/14/12	GK	n/a	n/a	MSK2161
MC16644-2MSD	K65725.D	1	12/14/12	GK	n/a	n/a	MSK2161
MC16644-2	K65710.D	1	12/14/12	GK	n/a	n/a	MSK2161

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-1, MC16644-2, MC16644-3

CAS No.	Compound	MC16644-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND		5700	91	5700	4940	87	5	70-130/30
107-02-8	Acrolein	ND		28500	27* a	28500	7620	27* a	1	70-130/30
107-13-1	Acrylonitrile	ND		5700	92	5700	5310	93	1	70-130/30
71-43-2	Benzene	ND		5700	99	5700	5830	102	3	70-130/30
108-86-1	Bromobenzene	ND		5700	95	5700	5390	95	0	70-130/30
74-97-5	Bromochloromethane	ND		5700	104	5700	6150	108	3	70-130/30
75-27-4	Bromodichloromethane	ND		5700	105	5700	6040	106	1	70-130/30
75-25-2	Bromoform	ND		5700	108	5700	6100	107	1	70-130/30
74-83-9	Bromomethane	ND		5700	119	5700	7150	125	6	70-130/30
78-93-3	2-Butanone (MEK)	ND		5700	97	5700	5310	93	4	70-130/30
104-51-8	n-Butylbenzene	116	J	5700	95	5700	5680	98	2	70-130/30
135-98-8	sec-Butylbenzene	60.0	J	5700	107	5700	6400	111	3	70-130/30
98-06-6	tert-Butylbenzene	ND		5700	111	5700	6460	113	3	70-130/30
75-15-0	Carbon disulfide	ND		5700	105	5700	6210	109	4	70-130/30
56-23-5	Carbon tetrachloride	ND		5700	111	5700	6680	117	6	70-130/30
108-90-7	Chlorobenzene	ND		5700	114	5700	6610	116	1	70-130/30
75-00-3	Chloroethane	ND		5700	99	5700	6340	111	12	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND		5700	86	5700	5000	88	2	10-160/30
67-66-3	Chloroform	ND		5700	108	5700	6160	108	0	70-130/30
74-87-3	Chloromethane	ND		5700	131* b	5700	7860	138* b	5	70-130/30
95-49-8	o-Chlorotoluene	ND		5700	105	5700	6080	107	1	70-130/30
106-43-4	p-Chlorotoluene	ND		5700	106	5700	6070	106	1	70-130/30
124-48-1	Dibromochloromethane	ND		5700	108	5700	6120	107	0	70-130/30
95-50-1	1,2-Dichlorobenzene	ND		5700	104	5700	6030	106	2	70-130/30
541-73-1	1,3-Dichlorobenzene	ND		5700	103	5700	5990	105	2	70-130/30
106-46-7	1,4-Dichlorobenzene	ND		5700	90	5700	5230	92	2	70-130/30
75-71-8	Dichlorodifluoromethane	ND		5700	125	5700	7450	131* b	5	70-130/30
75-34-3	1,1-Dichloroethane	ND		5700	102	5700	5820	102	0	70-130/30
107-06-2	1,2-Dichloroethane	ND		5700	101	5700	5750	101	0	70-130/30
75-35-4	1,1-Dichloroethene	ND		5700	106	5700	6320	111	4	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND		5700	104	5700	5940	104	0	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND		5700	104	5700	6000	105	1	70-130/30
78-87-5	1,2-Dichloropropane	ND		5700	95	5700	5700	100	5	70-130/30
142-28-9	1,3-Dichloropropane	ND		5700	96	5700	5480	96	0	70-130/30
594-20-7	2,2-Dichloropropane	ND		5700	101	5700	5750	101	0	70-130/30
563-58-6	1,1-Dichloropropene	ND		5700	99	5700	5890	103	4	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16644-2MS	K65724.D	1	12/14/12	GK	n/a	n/a	MSK2161
MC16644-2MSD	K65725.D	1	12/14/12	GK	n/a	n/a	MSK2161
MC16644-2	K65710.D	1	12/14/12	GK	n/a	n/a	MSK2161

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-1, MC16644-2, MC16644-3

CAS No.	Compound	MC16644-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	5700	5830	102	5700	5880	103	1	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	5700	5680	100	5700	5860	103	3	70-130/30
123-91-1	1,4-Dioxane	ND	28500	28500	100	28500	27100	95	5	70-130/30
97-63-2	Ethyl methacrylate	ND	5700	5440	95	5700	5510	97	1	41-160/30
100-41-4	Ethylbenzene	ND	5700	5930	104	5700	5960	105	1	70-130/30
87-68-3	Hexachlorobutadiene	ND	5700	5900	104	5700	6060	106	3	70-130/30
591-78-6	2-Hexanone	ND	5700	5060	89	5700	4770	84	6	70-130/30
98-82-8	Isopropylbenzene	ND	5700	6200	109	5700	6350	111	2	70-130/30
99-87-6	p-Isopropyltoluene	ND	5700	5520	97	5700	5670	99	3	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	5700	5970	105	5700	5990	105	0	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5700	4900	86	5700	5080	89	4	70-130/30
74-95-3	Methylene bromide	ND	5700	5690	100	5700	5850	103	3	70-130/30
75-09-2	Methylene chloride	ND	5700	6030	106	5700	6140	108	2	70-130/30
91-20-3	Naphthalene	ND	5700	5040	88	5700	4880	86	3	70-130/30
103-65-1	n-Propylbenzene	ND	5700	6170	108	5700	6240	109	1	70-130/30
100-42-5	Styrene	ND	5700	5870	103	5700	5900	104	1	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	5700	6140	108	5700	6280	110	2	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	5700	5070	89	5700	4960	87	2	70-130/30
127-18-4	Tetrachloroethene	ND	5700	5900	104	5700	6050	106	3	70-130/30
108-88-3	Toluene	ND	5700	5860	103	5700	6110	107	4	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	5700	4820	85	5700	4950	87	3	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	5700	4920	86	5700	4950	87	1	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	5700	6310	111	5700	6580	115	4	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	5700	5610	98	5700	5680	100	1	70-130/30
79-01-6	Trichloroethene	ND	5700	5940	104	5700	6140	108	3	70-130/30
75-69-4	Trichlorofluoromethane	ND	5700	6450	113	5700	6770	119	5	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	5700	4910	86	5700	4780	84	3	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	5700	5620	99	5700	5680	100	1	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	5700	5520	97	5700	5600	98	1	70-130/30
108-05-4	Vinyl Acetate	ND	5700	5380	94	5700	5270	92	2	70-130/30
75-01-4	Vinyl chloride	ND	5700	6750	118	5700	7470	131* b	10	70-130/30
	m,p-Xylene	ND	11400	12800	112	11400	12900	113	1	70-130/30
95-47-6	o-Xylene	ND	5700	6660	117	5700	6790	119	2	70-130/30
1330-20-7	Xylene (total)	ND	17100	19500	114	17100	19700	115	1	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16644-2MS	K65724.D	1	12/14/12	GK	n/a	n/a	MSK2161
MC16644-2MSD	K65725.D	1	12/14/12	GK	n/a	n/a	MSK2161
MC16644-2	K65710.D	1	12/14/12	GK	n/a	n/a	MSK2161

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-1, MC16644-2, MC16644-3

CAS No.	Surrogate Recoveries	MS	MSD	MC16644-2	Limits
1868-53-7	Dibromofluoromethane	113%	115%	118%	70-130%
2037-26-5	Toluene-D8	108%	113%	110%	70-130%
460-00-4	4-Bromofluorobenzene	96%	100%	101%	70-130%

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

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16639-13MS	M52952.D	1	12/17/12	AMY	n/a	n/a	MSM1796
MC16639-13MSD	M52953.D	1	12/17/12	AMY	n/a	n/a	MSM1796
MC16639-13	M52947.D	1	12/17/12	AMY	n/a	n/a	MSM1796

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-4

CAS No.	Compound	MC16639-13 Spike		MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q							
67-64-1	Acetone	ND	94.2	337	358* a	76.4	252	330* a	29	70-130/30
107-02-8	Acrolein	ND	471	210	45* a	382	181	47* a	15	70-130/30
107-13-1	Acrylonitrile	ND	94.2	88.4	94	76.4	67.0	88	28	70-130/30
71-43-2	Benzene	ND	94.2	94.9	101	76.4	74.5	97	24	70-130/30
108-86-1	Bromobenzene	ND	94.2	82.9	88	76.4	64.5	84	25	70-130/30
74-97-5	Bromochloromethane	ND	94.2	85.0	90	76.4	68.9	90	21	70-130/30
75-27-4	Bromodichloromethane	ND	94.2	84.7	90	76.4	70.0	92	19	70-130/30
75-25-2	Bromoform	ND	94.2	88.3	94	76.4	69.3	91	24	70-130/30
74-83-9	Bromomethane	ND	94.2	89.4	95	76.4	72.1	94	21	70-130/30
78-93-3	2-Butanone (MEK)	ND	94.2	83.1	88	76.4	64.0	84	26	70-130/30
104-51-8	n-Butylbenzene	ND	94.2	79.5	84	76.4	63.5	83	22	70-130/30
135-98-8	sec-Butylbenzene	ND	94.2	85.1	90	76.4	66.7	87	24	70-130/30
98-06-6	tert-Butylbenzene	ND	94.2	85.0	90	76.4	66.2	87	25	70-130/30
75-15-0	Carbon disulfide	ND	94.2	87.8	93	76.4	71.0	93	21	70-130/30
56-23-5	Carbon tetrachloride	ND	94.2	97.8	104	76.4	77.2	101	24	70-130/30
108-90-7	Chlorobenzene	ND	94.2	83.6	89	76.4	68.7	90	20	70-130/30
75-00-3	Chloroethane	ND	94.2	80.8	86	76.4	70.1	92	14	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	94.2	77.9	83	76.4	71.4	93	9	10-160/30
67-66-3	Chloroform	ND	94.2	85.6	91	76.4	67.0	88	24	70-130/30
74-87-3	Chloromethane	ND	94.2	98.3	104	76.4	78.4	103	23	70-130/30
95-49-8	o-Chlorotoluene	ND	94.2	76.8	81	76.4	60.2	79	24	70-130/30
106-43-4	p-Chlorotoluene	ND	94.2	77.1	82	76.4	61.7	81	22	70-130/30
124-48-1	Dibromochloromethane	ND	94.2	88.4	94	76.4	75.2	98	16	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	94.2	67.3	71	76.4	50.9	67* a	28	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	94.2	73.1	78	76.4	56.4	74	26	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	94.2	74.0	79	76.4	56.3	74	27	70-130/30
75-71-8	Dichlorodifluoromethane	ND	94.2	123	131* a	76.4	99.6	130	21	70-130/30
75-34-3	1,1-Dichloroethane	ND	94.2	85.4	91	76.4	66.2	87	25	70-130/30
107-06-2	1,2-Dichloroethane	ND	94.2	85.3	91	76.4	61.4	80	33* b	70-130/30
75-35-4	1,1-Dichloroethene	ND	94.2	96.5	102	76.4	77.0	101	22	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	94.2	84.1	89	76.4	67.9	89	21	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	94.2	89.8	95	76.4	71.6	94	23	70-130/30
78-87-5	1,2-Dichloropropane	ND	94.2	80.3	85	76.4	66.4	87	19	70-130/30
142-28-9	1,3-Dichloropropane	ND	94.2	83.5	89	76.4	72.4	95	14	70-130/30
594-20-7	2,2-Dichloropropane	ND	94.2	90.2	96	76.4	70.7	93	24	70-130/30
563-58-6	1,1-Dichloropropene	ND	94.2	101	107	76.4	75.9	99	28	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16639-13MS	M52952.D	1	12/17/12	AMY	n/a	n/a	MSM1796
MC16639-13MSD	M52953.D	1	12/17/12	AMY	n/a	n/a	MSM1796
MC16639-13	M52947.D	1	12/17/12	AMY	n/a	n/a	MSM1796

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-4

CAS No.	Compound	MC16639-13 Spike		MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q							
10061-01-5	cis-1,3-Dichloropropene	ND	94.2	79.1	84	76.4	65.1	85	19	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	94.2	87.3	93	76.4	69.7	91	22	70-130/30
123-91-1	1,4-Dioxane	ND	471	517	110	382	400	105	26	70-130/30
97-63-2	Ethyl methacrylate	ND	94.2	92.0	98	76.4	73.3	96	23	41-160/30
100-41-4	Ethylbenzene	ND	94.2	96.9	103	76.4	79.1	104	20	70-130/30
87-68-3	Hexachlorobutadiene	ND	94.2	82.2	87	76.4	67.9	89	19	70-130/30
591-78-6	2-Hexanone	ND	94.2	84.2	89	76.4	71.6	94	16	70-130/30
98-82-8	Isopropylbenzene	ND	94.2	89.4	95	76.4	68.8	90	26	70-130/30
99-87-6	p-Isopropyltoluene	ND	94.2	89.7	95	76.4	71.0	93	23	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	94.2	100	106	76.4	76.2	100	27	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	94.2	90.7	96	76.4	71.6	94	24	70-130/30
74-95-3	Methylene bromide	ND	94.2	85.7	91	76.4	69.3	91	21	70-130/30
75-09-2	Methylene chloride	ND	94.2	75.8	80	76.4	63.5	83	18	70-130/30
91-20-3	Naphthalene	ND	94.2	62.5	66* a	76.4	44.5	58* a	34* b	70-130/30
103-65-1	n-Propylbenzene	ND	94.2	84.9	90	76.4	66.1	87	25	70-130/30
100-42-5	Styrene	ND	94.2	54.8	58* a	76.4	49.0	64* a	11	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	94.2	87.2	93	76.4	70.3	92	21	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	94.2	85.5	91	76.4	58.3	76	38* b	70-130/30
127-18-4	Tetrachloroethene	ND	94.2	105	111	76.4	87.7	115	18	70-130/30
108-88-3	Toluene	ND	94.2	106	112	76.4	85.1	111	22	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	94.2	57.4	61* a	76.4	41.6	54* a	32* b	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	94.2	63.8	68* a	76.4	46.6	61* a	31* b	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	94.2	92.1	98	76.4	71.5	94	25	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	94.2	84.8	90	76.4	67.4	88	23	70-130/30
79-01-6	Trichloroethene	ND	94.2	93.2	99	76.4	75.3	99	21	70-130/30
75-69-4	Trichlorofluoromethane	ND	94.2	94.1	100	76.4	79.8	104	16	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	94.2	91.5	97	76.4	62.9	82	37* b	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	94.2	85.9	91	76.4	65.8	86	26	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	94.2	84.8	90	76.4	67.5	88	23	70-130/30
108-05-4	Vinyl Acetate	ND	94.2	74.5	79	76.4	54.2	71	32* b	70-130/30
75-01-4	Vinyl chloride	ND	94.2	91.5	97	76.4	71.0	93	25	70-130/30
	m,p-Xylene	ND	188	190	101	153	155	101	20	70-130/30
95-47-6	o-Xylene	ND	94.2	91.0	97	76.4	71.7	94	24	70-130/30
1330-20-7	Xylene (total)	ND	283	281	99	229	226	99	22	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16639-13MS	M52952.D	1	12/17/12	AMY	n/a	n/a	MSM1796
MC16639-13MSD	M52953.D	1	12/17/12	AMY	n/a	n/a	MSM1796
MC16639-13	M52947.D	1	12/17/12	AMY	n/a	n/a	MSM1796

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-4

CAS No.	Surrogate Recoveries	MS	MSD	MC16639-13 Limits	
1868-53-7	Dibromofluoromethane	93%	92%	91%	70-130%
2037-26-5	Toluene-D8	109%	112%	110%	70-130%
460-00-4	4-Bromofluorobenzene	97%	91%	90%	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.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16643-8MS	G122997.D	5	12/18/12	JM	n/a	n/a	MSG4888
MC16643-8MSD	G122998.D	5	12/18/12	JM	n/a	n/a	MSG4888
MC16643-8	G122996.D	1	12/18/12	JM	n/a	n/a	MSG4888

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-5

CAS No.	Compound	MC16643-8 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	250	191	76	250	174	70	9	70-130/30
107-02-8	Acrolein	ND	1250	464	37* a	1250	467	37* a	1	70-130/30
107-13-1	Acrylonitrile	ND	250	201	80	250	199	80	1	70-130/30
71-43-2	Benzene	ND	250	298	119	250	294	118	1	70-130/30
108-86-1	Bromobenzene	ND	250	277	111	250	272	109	2	70-130/30
74-97-5	Bromochloromethane	ND	250	240	96	250	234	94	3	70-130/30
75-27-4	Bromodichloromethane	ND	250	259	104	250	256	102	1	70-130/30
75-25-2	Bromoform	ND	250	173	69* a	250	172	69* a	1	70-130/30
74-83-9	Bromomethane	ND	250	283	113	250	277	111	2	70-130/30
78-93-3	2-Butanone (MEK)	ND	250	201	80	250	202	81	0	70-130/30
104-51-8	n-Butylbenzene	ND	250	303	121	250	294	118	3	70-130/30
135-98-8	sec-Butylbenzene	ND	250	292	117	250	287	115	2	70-130/30
98-06-6	tert-Butylbenzene	ND	250	286	114	250	279	112	2	70-130/30
75-15-0	Carbon disulfide	ND	250	258	103	250	250	100	3	70-130/30
56-23-5	Carbon tetrachloride	ND	250	281	112	250	275	110	2	70-130/30
108-90-7	Chlorobenzene	ND	250	260	104	250	256	102	2	70-130/30
75-00-3	Chloroethane	ND	250	305	122	250	303	121	1	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	250	ND	0* a	250	ND	0* a	nc	70-130/30
67-66-3	Chloroform	ND	250	284	114	250	280	112	1	70-130/30
74-87-3	Chloromethane	ND	250	369	148* a	250	386	154* a	5	70-130/30
95-49-8	o-Chlorotoluene	ND	250	289	116	250	284	114	2	70-130/30
106-43-4	p-Chlorotoluene	ND	250	304	122	250	297	119	2	70-130/30
124-48-1	Dibromochloromethane	ND	250	220	88	250	217	87	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	250	255	102	250	255	102	0	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	250	275	110	250	270	108	2	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	250	285	114	250	275	110	4	70-130/30
75-71-8	Dichlorodifluoromethane	ND	250	468	187* a	250	466	186* a	0	70-130/30
75-34-3	1,1-Dichloroethane	ND	250	310	124	250	308	123	1	70-130/30
107-06-2	1,2-Dichloroethane	ND	250	245	98	250	240	96	2	70-130/30
75-35-4	1,1-Dichloroethene	ND	250	302	121	250	297	119	2	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	250	285	114	250	284	114	0	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	250	292	117	250	289	116	1	70-130/30
78-87-5	1,2-Dichloropropane	ND	250	286	114	250	278	111	3	70-130/30
142-28-9	1,3-Dichloropropane	ND	250	239	96	250	233	93	3	70-130/30
594-20-7	2,2-Dichloropropane	ND	250	371	148* a	250	363	145* a	2	70-130/30
563-58-6	1,1-Dichloropropene	ND	250	292	117	250	287	115	2	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16643-8MS	G122997.D	5	12/18/12	JM	n/a	n/a	MSG4888
MC16643-8MSD	G122998.D	5	12/18/12	JM	n/a	n/a	MSG4888
MC16643-8	G122996.D	1	12/18/12	JM	n/a	n/a	MSG4888

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-5

CAS No.	Compound	MC16643-8 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	250	264	106	250	259	104	2	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	250	260	104	250	256	102	2	70-130/30
123-91-1	1,4-Dioxane	ND	1250	1040	83	1250	936	75	11	70-130/30
97-63-2	Ethyl methacrylate	ND	250	203	81	250	202	81	0	72-139/30
100-41-4	Ethylbenzene	ND	250	285	114	250	281	112	1	70-130/30
87-68-3	Hexachlorobutadiene	ND	250	287	115	250	284	114	1	70-130/30
591-78-6	2-Hexanone	ND	250	202	81	250	206	82	2	70-130/30
98-82-8	Isopropylbenzene	ND	250	295	118	250	289	116	2	70-130/30
99-87-6	p-Isopropyltoluene	ND	250	308	123	250	301	120	2	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	250	241	96	250	238	95	1	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	135	54* a	250	136	54* a	1	70-130/30
74-95-3	Methylene bromide	ND	250	226	90	250	218	87	4	70-130/30
75-09-2	Methylene chloride	ND	250	277	111	250	276	110	0	70-130/30
91-20-3	Naphthalene	ND	250	175	70	250	182	73	4	70-130/30
103-65-1	n-Propylbenzene	ND	250	294	118	250	286	114	3	70-130/30
100-42-5	Styrene	ND	250	208	83	250	205	82	1	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	254	102	250	251	100	1	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	258	103	250	256	102	1	70-130/30
127-18-4	Tetrachloroethene	ND	250	271	108	250	260	104	4	70-130/30
108-88-3	Toluene	ND	250	284	114	250	280	112	1	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	250	197	79	250	205	82	4	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	250	226	90	250	227	91	0	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	250	311	124	250	304	122	2	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	250	239	96	250	236	94	1	70-130/30
79-01-6	Trichloroethene	ND	250	278	111	250	272	109	2	70-130/30
75-69-4	Trichlorofluoromethane	ND	250	301	120	250	293	117	3	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	250	242	97	250	239	96	1	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	250	283	113	250	274	110	3	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	250	293	117	250	287	115	2	70-130/30
108-05-4	Vinyl Acetate	ND	250	214	86	250	216	86	1	70-130/30
75-01-4	Vinyl chloride	ND	250	336	134* a	250	329	132* a	2	70-130/30
	m,p-Xylene	ND	500	551	110	500	543	109	1	70-130/30
95-47-6	o-Xylene	ND	250	269	108	250	267	107	1	70-130/30
1330-20-7	Xylene (total)	ND	750	820	109	750	811	108	1	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16643-8MS	G122997.D	5	12/18/12	JM	n/a	n/a	MSG4888
MC16643-8MSD	G122998.D	5	12/18/12	JM	n/a	n/a	MSG4888
MC16643-8	G122996.D	1	12/18/12	JM	n/a	n/a	MSG4888

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16644-5

CAS No.	Surrogate Recoveries	MS	MSD	MC16643-8	Limits
1868-53-7	Dibromofluoromethane	78%	78%	78%	70-130%
2037-26-5	Toluene-D8	83%	84%	82%	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.

\* = Outside of Control Limits.

# Volatile Internal Standard Area Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSG4888-CC4862	Injection Date:	12/18/12
Lab File ID:	G122983.D	Injection Time:	09:27
Instrument ID:	GCMSG	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	290449	5.13	378350	6.27	166690	9.62	183927	12.25	33812	3.09
Upper Limit <sup>a</sup>	580898	5.63	756700	6.77	333380	10.12	367854	12.75	67624	3.59
Lower Limit <sup>b</sup>	145225	4.63	189175	5.77	83345	9.12	91964	11.75	16906	2.59

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSG4888-BS	291713	5.13	379250	6.27	167016	9.62	186481	12.25	33609	3.09
MSG4888-MB	292436	5.14	379524	6.27	166278	9.62	179552	12.25	36183	3.09
ZZZZZZ	291132	5.14	377565	6.27	165679	9.62	172028	12.25	31001	3.09
ZZZZZZ	295494	5.13	386369	6.27	170536	9.62	181170	12.25	37412	3.09
MC16644-5	291382	5.14	378866	6.27	167402	9.62	180745	12.25	37553	3.09
ZZZZZZ	291726	5.14	380909	6.27	166339	9.62	179833	12.25	39582	3.09
ZZZZZZ	290809	5.14	375691	6.27	164787	9.62	176924	12.25	39859	3.09
ZZZZZZ	290141	5.13	374591	6.27	167100	9.62	177362	12.25	39164	3.09
ZZZZZZ	291689	5.14	381074	6.27	165971	9.62	178333	12.25	39921	3.09
ZZZZZZ	289326	5.14	370199	6.27	164437	9.62	175788	12.25	38614	3.09
MC16643-8	294562	5.14	383079	6.27	166531	9.62	174876	12.25	36546	3.09
MC16643-8MS	294714	5.13	380545	6.27	167578	9.62	184368	12.25	37055	3.09
MC16643-8MSD	292342	5.14	378118	6.27	166891	9.62	185102	12.25	36409	3.09
ZZZZZZ	289713	5.13	378161	6.27	165718	9.62	174662	12.25	35601	3.09
ZZZZZZ	288415	5.14	374591	6.27	165018	9.62	169570	12.25	34268	3.09
ZZZZZZ	300393	5.14	387702	6.27	166185	9.62	171057	12.25	34974	3.09
ZZZZZZ	301241	5.14	392408	6.27	167843	9.62	174484	12.25	34772	3.09
ZZZZZZ	300944	5.13	388757	6.27	170047	9.62	175464	12.25	33764	3.09
ZZZZZZ	286041	5.14	356835	6.27	153908	9.62	161892	12.25	30328	3.09
ZZZZZZ	288457	5.13	360253	6.27	156229	9.62	162346	12.25	31156	3.09
ZZZZZZ	289245	5.13	371625	6.27	159863	9.62	167521	12.25	31410	3.09

- 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: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSK2161-CC2132	Injection Date:	12/14/12
Lab File ID:	K65703.D	Injection Time:	07:48
Instrument ID:	GCMSK	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	108586	8.81	188387	9.66	98053	12.93	105299	15.49	33780	6.43
Upper Limit <sup>a</sup>	217172	9.31	376774	10.16	196106	13.43	210598	15.99	67560	6.93
Lower Limit <sup>b</sup>	54293	8.31	94194	9.16	49027	12.43	52650	14.99	16890	5.93

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSK2161-BS	103942	8.81	180092	9.66	94882	12.93	101478	15.49	28611	6.42
MSK2161-BSD	107069	8.82	181640	9.67	89949	12.93	107186	15.49	26193	6.42
MSK2161-MB	106268	8.82	182309	9.67	86179	12.93	108782	15.49	21245	6.41
ZZZZZZ	109604	8.82	179356	9.67	88212	12.93	103946	15.49	21277	6.41
MC16644-1	110609	8.82	190188	9.67	91869	12.93	112910	15.49	25807	6.42
MC16644-2	118223	8.82	193245	9.67	93160	12.93	115226	15.49	24128	6.41
MC16644-3	119313	8.82	193974	9.67	93050	12.93	114213	15.49	23779	6.42
ZZZZZZ	118500	8.81	191085	9.66	85232	12.93	108202	15.49	26111	6.43
ZZZZZZ	120256	8.81	184836	9.66	82961	12.93	114528	15.49	26560	6.43
ZZZZZZ	128186	8.82	192353	9.67	95228	12.93	111329	15.49	30215	6.42
ZZZZZZ	119445	8.82	196836	9.67	97045	12.93	121259	15.49	28957	6.45
ZZZZZZ	119169	8.82	184991	9.67	90383	12.93	112147	15.49	30369	6.44
ZZZZZZ	117752	8.81	192051	9.66	95477	12.93	117384	15.49	29018	6.44
ZZZZZZ	114428	8.82	190773	9.67	94413	12.93	117953	15.49	30309	6.42
ZZZZZZ	113906	8.82	186617	9.67	94428	12.93	114882	15.49	28149	6.41
ZZZZZZ	114924	8.82	183315	9.67	92864	12.93	112739	15.49	28925	6.41
ZZZZZZ	117425	8.82	191381	9.67	96508	12.93	119842	15.49	27011	6.41
ZZZZZZ	113160	8.82	190887	9.67	95725	12.93	118990	15.49	28480	6.42
MC16644-2MS	110329	8.82	181423	9.67	92639	12.93	111120	15.49	27560	6.42
MC16644-2MSD	110353	8.82	178580	9.67	92739	12.93	112152	15.49	26659	6.42
ZZZZZZ	113372	8.82	188503	9.67	96587	12.93	118479	15.49	29899	6.41
ZZZZZZ	112397	8.81	188413	9.66	95285	12.93	108879	15.49	29790	6.41
ZZZZZZ	116096	8.82	193736	9.67	96136	12.93	117642	15.49	33917	6.45
ZZZZZZ	111174	8.82	185569	9.67	93354	12.93	111884	15.49	20657	6.42

- 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 Internal Standard Area Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1796-CC1784	Injection Date:	12/17/12
Lab File ID:	M52938.D	Injection Time:	08:56
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	221844	9.36	335814	10.24	172291	13.52	182419	16.08	59340	6.86
Upper Limit <sup>a</sup>	443688	9.86	671628	10.74	344582	14.02	364838	16.58	118680	7.36
Lower Limit <sup>b</sup>	110922	8.86	167907	9.74	86146	13.02	91210	15.58	29670	6.36

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSM1796-BS	212032	9.36	308390	10.24	167395	13.52	169149	16.08	54558	6.86
MSM1796-MB	199718	9.36	284728	10.24	147389	13.52	160889	16.08	56945	6.86
MC16644-4	187633	9.36	268188	10.24	144851	13.52	155599	16.08	91058	6.86
ZZZZZZ	193919	9.36	282567	10.24	141686	13.52	165698	16.08	60922	6.86
ZZZZZZ	205897	9.36	305961	10.24	138633	13.52	163105	16.08	60141	6.86
ZZZZZZ	212663	9.36	311279	10.24	156281	13.52	147686	16.08	61249	6.86
MC16639-13	211857	9.36	303270	10.24	153242	13.52	173641	16.08	55912	6.86
ZZZZZZ	212439	9.36	303253	10.24	144809	13.52	173942	16.08	54171	6.85
ZZZZZZ	213361	9.36	313295	10.24	144569	13.52	167400	16.09	31605	6.86
ZZZZZZ	215463	9.36	309467	10.24	158123	13.52	174023	16.08	59129	6.86
ZZZZZZ	208711	9.36	302749	10.24	154053	13.52	153989	16.08	65138	6.86
MC16639-13MS	193721	9.36	270918	10.24	148016	13.52	150124	16.08	111350	6.86
MC16639-13MSD	198282	9.36	297546	10.24	149121	13.52	159871	16.08	105111	6.85
ZZZZZZ	202856	9.36	288911	10.24	147116	13.52	165716	16.08	53706	6.86
ZZZZZZ	209459	9.36	288383	10.24	150690	13.52	164946	16.08	47725	6.86
ZZZZZZ	211259	9.36	288215	10.24	153563	13.52	173947	16.08	55690	6.86
ZZZZZZ	212822	9.36	301844	10.24	153073	13.52	166602	16.08	52160	6.86
ZZZZZZ	208772	9.36	302388	10.24	147101	13.52	169781	16.08	55186	6.86
ZZZZZZ	208227	9.36	298635	10.24	139964	13.52	160799	16.08	51976	6.86

- 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.

6.5.3  
6

# Volatile Surrogate Recovery Summary

Job Number: MC16644  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16644-5	G122990.D	78	84	91
MC16643-8MS	G122997.D	78	83	90
MC16643-8MSD	G122998.D	78	84	90
MSG4888-BS	G122984.D	79	83	90
MSG4888-MB	G122987.D	79	84	91

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: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16644-1	K65709.D	129	113	102
MC16644-2	K65710.D	118	110	101
MC16644-3	K65711.D	118	112	111
MC16644-4	M52943.D	91	119	93
MC16639-13MS	M52952.D	93	109	97
MC16639-13MSD	M52953.D	92	112	91
MC16644-2MS	K65724.D	113	108	96
MC16644-2MSD	K65725.D	115	113	100
MSK2161-BS	K65704.D	125	115	110
MSK2161-BSD	K65705.D	118	112	98
MSK2161-MB	K65707.D	128	110	99
MSM1796-BS	M52939.D	94	118	89
MSM1796-MB	M52942.D	93	111	89

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

6.6.2  
6

**GC Volatiles**

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**QC Data Summaries****7**

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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: MC16644  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-MB	BK19937.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16644-5

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Limits	
460-00-4	Bromofluorobenzene (S)	100%	36-173%
460-00-4	Bromofluorobenzene (S)	95%	36-173%

7.1.1  
7

# Method Blank Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31434-MB	BK20055.D	1	12/16/12	AP	12/14/12	OP31434	GBK720

The QC reported here applies to the following samples:

Method: SW846 8011

MC16644-1, MC16644-2, MC16644-3, MC16644-4

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.4	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.4	0.94	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	150% 61-167%
460-00-4	Bromofluorobenzene (S)	148% 61-167%

7.1.2

7

# Blank Spike Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-BS	BK19938.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16644-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.067	94	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)	104%	36-173%
460-00-4	Bromofluorobenzene (S)	96%	36-173%

7.2.1  
7

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31434-BS	BK20056.D	1	12/16/12	AP	12/14/12	OP31434	GBK720

The QC reported here applies to the following samples:

Method: SW846 8011

MC16644-1, MC16644-2, MC16644-3, MC16644-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	33	46.0	139	59-142
106-93-4	1,2-Dibromoethane	33	43.8	133	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	142%	61-167%
460-00-4	Bromofluorobenzene (S)	143%	61-167%

7.2.2  
7

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-MS	BK19941.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
OP31406-MSD	BK19942.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
MC16600-6	BK19943.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16644-5

CAS No.	Compound	MC16600-6 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.071	0.066	93	0.071	0.064	90	3	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.071	0.072	101	0.071	0.067	94	7	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16600-6	Limits
460-00-4	Bromofluorobenzene (S)	110%	108%	107%	36-173%
460-00-4	Bromofluorobenzene (S)	100%	100%	99%	36-173%

\* = Outside of Control Limits.

7.3.1  
 7

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31434-MS	BK20057.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
OP31434-MSD	BK20058.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
MC16644-1	BK20059.D	1	12/16/12	AP	12/14/12	OP31434	GBK720

The QC reported here applies to the following samples:

Method: SW846 8011

MC16644-1, MC16644-2, MC16644-3, MC16644-4

CAS No.	Compound	MC16644-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	1	116	116	98	113	115	3	40-156/27
106-93-4	1,2-Dibromoethane	ND	1	132	132	98	128	131	2	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16644-1	Limits
460-00-4	Bromofluorobenzene (S)	130%	130%	156%	61-167%
460-00-4	Bromofluorobenzene (S)	124%	128%	166%	61-167%

\* = Outside of Control Limits.

# Volatile Surrogate Recovery Summary

Job Number: MC16644  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: AQ
--------------------	------------

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16644-5	BK19946.D	122	105
OP31406-BS	BK19938.D	104	96
OP31406-MB	BK19937.D	100	95
OP31406-MS	BK19941.D	110	100
OP31406-MSD	BK19942.D	108	100

Surrogate Compounds                      Recovery Limits

S1 = Bromofluorobenzene (S)                      36-173%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

7.4.1  
7

# Volatile Surrogate Recovery Summary

Job Number: MC16644  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011 Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16644-1	BK20059.D	156	166
MC16644-2	BK20060.D	126	136
MC16644-3	BK20061.D	124	132
MC16644-4	BK20062.D	150	154
OP31434-BS	BK20056.D	142	143
OP31434-MB	BK20055.D	150	148
OP31434-MS	BK20057.D	130	124
OP31434-MSD	BK20058.D	130	128

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 61-167%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

# GC Surrogate Retention Time Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK716-ICC716	Injection Date:	12/13/12
Lab File ID:	BK19932.D	Injection Time:	18:03
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.52	4.85
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
ZZZZZZ	BK19935A.D	12/13/12	19:16	4.52	4.85
ZZZZZZ	BK19935B.D	12/13/12	19:16	4.52	4.85
OP31405-MB	BK19937A.D	12/13/12	20:04	4.52	4.85
OP31406-MB	BK19937.D	12/13/12	20:04	4.52	4.85
OP31406-BS	BK19938.D	12/13/12	20:28	4.52	4.85
OP31405-BS	BK19938A.D	12/13/12	20:28	4.52	4.85
OP31405-BSD	BK19939.D	12/13/12	20:52	4.52	4.85
ZZZZZZ	BK19940.D	12/13/12	21:17	4.52	4.85
OP31406-MS	BK19941.D	12/13/12	21:41	4.52	4.85
OP31406-MSD	BK19942.D	12/13/12	22:06	4.52	4.85
MC16600-6	BK19943.D	12/13/12	22:30	4.52	4.85
ZZZZZZ	BK19944.D	12/13/12	22:55	4.52	4.85
ZZZZZZ	BK19945.D	12/13/12	23:19	4.52	4.85
MC16644-5	BK19946.D	12/13/12	23:43	4.52	4.85

**Surrogate Compounds**

S1 = Bromofluorobenzene (S)

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

7.5.1  
7

# GC Surrogate Retention Time Summary

Job Number: MC16644  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK720-ICC720	Injection Date:	12/16/12
Lab File ID:	BK20049.D	Injection Time:	14:38
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.45	4.78
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP31434-MB	BK20055.D	12/16/12	17:05	4.45	4.78
OP31434-BS	BK20056.D	12/16/12	17:29	4.45	4.78
OP31434-MS	BK20057.D	12/16/12	17:54	4.45	4.78
OP31434-MSD	BK20058.D	12/16/12	18:19	4.45	4.78
MC16644-1	BK20059.D	12/16/12	18:43	4.45	4.78
MC16644-2	BK20060.D	12/16/12	19:08	4.45	4.78
MC16644-3	BK20061.D	12/16/12	19:33	4.45	4.78
MC16644-4	BK20062.D	12/16/12	19:58	4.45	4.78
ZZZZZZ	BK20063.D	12/16/12	20:22	4.45	4.78
ZZZZZZ	BK20064.D	12/16/12	20:47	4.45	4.78

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.2  
7

## General Chemistry

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### QC Data Summaries



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Includes the following where applicable:

- Percent Solids Raw Data Summary

# Percent Solids Raw Data Summary

Job Number: MC16644  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

---

Sample: MC16644-1      Analyzed: 11-DEC-12 by MC      Method: SM21 2540 B MOD.  
ClientID: MW-21-21

Wet Weight (Total)	29.811	g
Tare Weight	21.026	g
Dry Weight (Total)	29.38	g
Solids, Percent	95.1	%

---

Sample: MC16644-2      Analyzed: 11-DEC-12 by MC      Method: SM21 2540 B MOD.  
ClientID: MW-21-31

Wet Weight (Total)	32.753	g
Tare Weight	19.011	g
Dry Weight (Total)	31.978	g
Solids, Percent	94.4	%

---

Sample: MC16644-3      Analyzed: 11-DEC-12 by MC      Method: SM21 2540 B MOD.  
ClientID: MW-21-31 DUP

Wet Weight (Total)	29.948	g
Tare Weight	20.61	g
Dry Weight (Total)	29.472	g
Solids, Percent	94.9	%

---

Sample: MC16644-4      Analyzed: 11-DEC-12 by MC      Method: SM21 2540 B MOD.  
ClientID: MW-21-41

Wet Weight (Total)	33.012	g
Tare Weight	21.267	g
Dry Weight (Total)	30.834	g
Solids, Percent	81.5	%

---

8.1  
8

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VERIFICATION, TESTING AND CERTIFICATION COMPANY.



*e-Hardcopy 2.0*  
*Automated Report*

### Technical Report for

## Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562735.00015

SGS Accutest Job Number: MC16798

Sampling Dates: 12/10/12 - 12/11/12

### Report to:

AECOM, INC.

Melissa.mansker@aecom.com

ATTN: Melissa Mansker

Total number of pages in report: 112



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

H. (Brad) Madadian  
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

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

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Test results relate only to samples analyzed.



ACCUTEST

October 27, 2016

AECOM  
1001 Highlands Plaza Drive West Suite 300  
St. Louis, MO 63110

RE: SGS Accutest Job # MC16798

Dear Elizabeth Kunkel

As you are aware, SGS Accutest Inc. - Marlborough has been conducting an extensive review of data associated with some historical Gas Chromatography-Mass Spectroscopy volatiles analyses. As a result of this review it was determined that some revisions of the original test report for this job were needed. These corrections have been incorporated into the revised report.

Please be assured that corrective actions have been put in place to address this matter and prevent a recurrence.

We apologize for any inconvenience that this issue may have caused. Please don't hesitate to contact us if we can be of further assistance.

Sincerely,

**H. (Brad) Madadian**

Regional Laboratory Director  
SGS Accutest Inc. - Marlborough

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TESTING AND CERTIFICATION COMPANY.

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## Sample Summary

Shell Oil

Job No: MC16798

URSMOSTL: Roxana Drilling, Roxana, IL  
Project No: 21562735.00015

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
MC16798-1	12/10/12	13:40 WP	12/12/12	SO	Soil	VMP-47-12
MC16798-2	12/10/12	13:45 WP	12/12/12	SO	Soil	VMP-47-19
MC16798-3	12/10/12	13:50 WP	12/12/12	SO	Soil	VMP-47-29
MC16798-4	12/10/12	00:00 WP	12/12/12	AQ	Trip Blank Water	TRIP BLANK
MC16798-5	12/11/12	09:55 WP	12/12/12	SO	Soil	VMP-48-13
MC16798-6	12/11/12	10:00 WP	12/12/12	SO	Soil	VMP-48-21
MC16798-7	12/11/12	10:05 WP	12/12/12	SO	Soil	VMP-48-27
MC16798-8	12/11/12	13:30 WP	12/12/12	SO	Soil	VMP-50-13
MC16798-9	12/11/12	13:35 WP	12/12/12	SO	Soil	VMP-50-21
MC16798-10	12/11/12	13:35 WP	12/12/12	SO	Soil	VMP-50-21 DUP
MC16798-11	12/11/12	13:40 WP	12/12/12	SO	Soil	VMP-50-29

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

## SAMPLE DELIVERY GROUP CASE NARRATIVE



**Client:** She O

**Job No** MC 6798

**Site:** URSMOSTL: Roxana Dr ing, Roxana, IL

**Report Date** 0/27/20 6 : 4:57 A

0 Samp e(s), Trip B ank(s) and 0 F e d B ank(s) were co ected on between 2/ 0/20 2 and 2/ /20 2 and were rece ved at SGS Accutest New Eng and on 2/ 2/20 2 properly preserved, at 5 Deg C and intact These Samp es rece ved a job number of MC 6798 A st ng of the Laboratory Samp e ID, C ent Samp e ID and dates of co ect on are presented n the Resu ts Summary Sect on of th s report -Ch orohexane was searched n the brary search and reported on y f detect ons were found

Except as noted be ow, a method spec f ed ca brat ons and qua ty contro performance cr ter a were met for th s job For more nformat on, please refer to QC summary pages

### Volatiles by GCMS By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** MSH 96

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6752-3MS, MC 6752-3MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for 2,2-D ch oropropane, Acro e n, Carbon tetrach or de, D ch orod f uoromethane are outs de contro m ts
- Matr x Sp ke/Matr x Sp ke Dup cate Recovery(s) for Ethy benzene, 2,2-D ch oropropane, 2-Ch oroethy v ny ether, Acro e n, Carbon tetrach or de, D ch orod f uoromethane are outs de contro m ts Outs de contro m ts due to h gh eve n samp e re at ve to sp ke amount

**Matrix:** SO

**Batch ID:** MSK2 62

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6697-2MS, MC 6697-2MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for Acro e n, 2,3-Tr ch orobenzene, 2-Butanone (MEK), Acetone, D ch orod f uoromethane, Naphtha ene, V ny Acetate are outs de contro m ts
- Matr x Sp ke/Matr x Sp ke Dup cate Recovery(s) for Acro e n are outs de contro m ts Probab e cause due to matr x nterference
- 2-Hexanone: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Sp ke B ank(second source standard)was used to ver fy ca brat on standard accuracy
- 2-Butanone (MEK), Acetone: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow
- In t a ca brat on ver f cat on standard MSK2 32-ICV2 32 for acro e n: Acro e n not present n ICV due to standard degradat on

**Matrix:** SO

**Batch ID:** MSM 80

- A samp es were ana yzed w th n the recommended method ho d ng t me
- A method b anks for th s batch meet method spec f c cr ter a
- Samp e(s) MC 6889- MS, MC 6889- MSD were used as the QC samp es nd cated
- B ank Sp ke Recove y(s) for 2-Hexanone, Acro e n are outs de contro m ts

**Volatiles by GCMS By Method SW846 8260B**

<b>Matrix:</b> SO	<b>Batch ID:</b> MSM 80
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- Matr x Sp ke Recovery(s) for , , ,2-Tetrach oroethane, , , -Tr ch oroethane, , ,2,2-Tetrach oroethane, , ,2-Tr ch oroethane, , -D ch oroethane, , , -D ch oroethene, , , -D ch oropropene, ,2,3-Tr ch orobenzene, ,2,3-Tr ch oropropane, ,2,4-Tr ch orobenzene, ,2,4-Tr methy benzene, ,2-D ch orobenzene, ,2-D ch oroethane, ,2-D ch oropropane, ,3,5-Tr methy benzene, ,3-D ch orobenzene, ,3-D ch oropropane, ,4-D ch orobenzene, ,4-D oxane, 2,2-D ch oropropane, 2-Butanone (MEK), 2-Ch oroethy v ny ether, 2-Hexanone, 4-Methy -2-pentanone (MIBK), Acro e n, Acry on tr e, Benzene, Bromobenzene, Bromoch oromethane, Bromod ch oromethane, Bromoform, Bromomethane, Carbon d su f de, Carbon tetrach or de, Ch orobenzene, Ch oroethane, Ch oroform, Ch oromethane, c s- ,2-D ch oroethene, c s- ,3-D ch oropropene, D bromoch oromethane, D ch orod f uoromethane, Ethy methacry ate, Ethy benzene, Hexach orobutad ene, Isopropy benzene, m,p-Xy ene, Methy Tert Buty Ether, Methy ene brom de, Methy ene ch or de, n-Buty benzene, n-Propy benzene, Naphtha ene, o-Ch oroto uene, o-Xy ene, p-Ch oroto uene, p-Isopropy to uene, sec-Buty benzene, Styrene, tert-Buty benzene, Tetrach oroethene, To uene, trans- ,2-D ch oroethene, trans- ,3-D ch oropropene, Tr ch oroethene, Tr ch orof uoromethane, V ny Acetate, V ny ch or de, Xy ene (tota ) are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for 2-Ch oroethy v ny ether, Acro e n, , , ,2-Tetrach oroethane, , ,2,2-Tetrach oroethane, , ,2-Tr ch oroethane, ,2,3-Tr ch orobenzene, ,2,3-Tr ch oropropane, ,2,4-Tr ch orobenzene, ,2,4-Tr methy benzene, ,2-D ch orobenzene, ,2-D ch oropropane, ,3,5-Tr methy benzene, ,3-D ch orobenzene, ,3-D ch oropropane, ,4-D ch orobenzene, Acetone, Benzene, Bromobenzene, Bromod ch oromethane, Bromoform, Ch orobenzene, c s- ,3-D ch oropropene, D bromoch oromethane, Ethy benzene, Hexach orobutad ene, Isopropy benzene, m,p-Xy ene, Methy Tert Buty Ether, n-Buty benzene, n-Propy benzene, Naphtha ene, o-Ch oroto uene, o-Xy ene, p-Ch oroto uene, p-Isopropy to uene, sec-Buty benzene, Styrene, tert-Buty benzene, Tetrach oroethene, To uene, trans- ,3-D ch oropropene, Tr ch oroethene, V ny Acetate, Xy ene (tota ) are outs de contro m ts H gh RPD due to poss b e matr x nterference and/or samp e non-homogene ty
- RPD(s) for MSD for , , ,2-Tetrach oroethane, , , -Tr ch oroethane, , ,2,2-Tetrach oroethane, , ,2-Tr ch oroethane, , -D ch oroethane, , -D ch oroethene, , -D ch oropropene, ,2,3-Tr ch orobenzene, ,2,3-Tr ch oropropane, ,2,4-Tr ch orobenzene, ,2,4-Tr methy benzene, ,2-D ch orobenzene, ,2-D ch oroethane, ,2-D ch oropropane, ,3,5-Tr methy benzene, ,3-D ch orobenzene, ,3-D ch oropropane, ,4-D ch orobenzene, ,4-D oxane, 2,2-D ch oropropane, 2-Butanone (MEK), 2-Hexanone, 4-Methy -2-pentanone (MIBK), Acetone, Acry on tr e, Benzene, Bromobenzene, Bromoch oromethane, Bromod ch oromethane, Bromoform, Bromomethane, Carbon d su f de, Carbon tetrach or de, Ch orobenzene, Ch oroethane, Ch oroform, Ch oromethane, c s- ,2-D ch oroethene, c s- ,3-D ch oropropene, D bromoch oromethane, D ch orod f uoromethane, Ethy methacry ate, Ethy benzene, Hexach orobutad ene, Isopropy benzene, m,p-Xy ene, Methy Tert Buty Ether, Methy ene brom de, Methy ene ch or de, n-Buty benzene, n-Propy benzene, Naphtha ene, o-Ch oroto uene, o-Xy ene, p-Ch oroto uene, p-Isopropy to uene, sec-Buty benzene, Styrene, tert-Buty benzene, Tetrach oroethene, Tr ch oroethene, Tr ch orof uoromethane, V ny Acetate, V ny ch or de, Xy ene (tota ) are outs de contro m ts for samp e MC 6889- MSD H gh RPD due to poss b e matr x nterference and/or samp e non-homogene ty
- Acro e n: Cont nu ng Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow
- V ny Acetate: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow
- MC 6889- MSD has nterna standards outs de contro m ts due to poss b e matr x nterference Conf rmed by MS/MSD

**Volatiles by GC By Method SW846 8011**

<b>Matrix:</b> AQ	<b>Batch ID:</b> OP3 406
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- A samp es were extracted w th n the recommended method ho d ng t me
- A samp es were ana yzed w th n the recommended method ho d ng t me
- A method b anks for th s batch meet method spec f c cr ter a
- Samp e(s) MC 6600-6MS, MC 6600-6MSD were used as the QC samp es nd cated

<b>Matrix:</b> SO	<b>Batch ID:</b> OP3 434
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- A samp es were extracted w th n the recommended method ho d ng t me
- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 6644- MS, MC 6644- MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- MC 6798-9 for Bromof uorobenzene (S): Outs de contro m ts due to poss b e matr x nterference

## Wet Chemistry By Method SM21 2540 B MOD.

**Matrix:** SO

**Batch ID:** GN4 308

- Sample(s) MC 6798- 2DUP were used as the QC samples for Solids, Percent

**Matrix:** SO

**Batch ID:** GN4 309

- Sample(s) MC 6889- 2DUP were used as the QC samples for Solids, Percent

SGS Accutest New England certifies that all analyses were performed within method specification. It is further recommended that this report be used in its entirety. The Laboratory Director for SGS Accutest New England or assignee as verified by the signature on the cover page has authorized the release of this report (MC 6798).

Thursday, October 27, 2016

Page 3 of 3

## Summary of Hits

Job Number: MC16798  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 12/10/12 thru 12/11/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**MC16798-1 VMP-47-12**

Benzene	0.0017	0.00059	0.00035	mg/kg	SW846 8260B
Ethylbenzene	0.0066	0.0023	0.00028	mg/kg	SW846 8260B
Methylene chloride	0.0015 J	0.0023	0.0014	mg/kg	SW846 8260B
Toluene	0.0064	0.0059	0.0010	mg/kg	SW846 8260B
m,p-Xylene	0.0013 J	0.0023	0.00092	mg/kg	SW846 8260B
o-Xylene	0.00055 J	0.0023	0.00028	mg/kg	SW846 8260B
Xylene (total)	0.0018 J	0.0023	0.00028	mg/kg	SW846 8260B

**MC16798-2 VMP-47-19**

Benzene	0.0017	0.00057	0.00033	mg/kg	SW846 8260B
Ethylbenzene	0.0066	0.0023	0.00027	mg/kg	SW846 8260B
Toluene	0.0064	0.0057	0.00096	mg/kg	SW846 8260B
m,p-Xylene	0.0013 J	0.0023	0.00090	mg/kg	SW846 8260B
o-Xylene	0.00053 J	0.0023	0.00027	mg/kg	SW846 8260B
Xylene (total)	0.0018 J	0.0023	0.00027	mg/kg	SW846 8260B

**MC16798-3 VMP-47-29**

Benzene	0.00080	0.00056	0.00033	mg/kg	SW846 8260B
Ethylbenzene	0.0016 J	0.0022	0.00027	mg/kg	SW846 8260B
Methylene chloride	0.0014 J	0.0022	0.0013	mg/kg	SW846 8260B
Toluene	0.0022 J	0.0056	0.00095	mg/kg	SW846 8260B
Xylene (total)	0.00063 J	0.0022	0.00027	mg/kg	SW846 8260B

**MC16798-4 TRIP BLANK**

No hits reported in this sample.

**MC16798-5 VMP-48-13**

Benzene	0.0011	0.00057	0.00034	mg/kg	SW846 8260B
Ethylbenzene	0.0030	0.0023	0.00028	mg/kg	SW846 8260B
Toluene	0.0034 J	0.0057	0.00097	mg/kg	SW846 8260B
o-Xylene	0.00036 J	0.0023	0.00027	mg/kg	SW846 8260B
Xylene (total)	0.0010 J	0.0023	0.00027	mg/kg	SW846 8260B

**MC16798-6 VMP-48-21**

Benzene	0.0011	0.00058	0.00034	mg/kg	SW846 8260B
Ethylbenzene	0.0029	0.0023	0.00028	mg/kg	SW846 8260B
Methylene chloride	0.0014 J	0.0023	0.0013	mg/kg	SW846 8260B
Toluene	0.0034 J	0.0058	0.00098	mg/kg	SW846 8260B

# Summary of Hits

Job Number: MC16798  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 12/10/12 thru 12/11/12



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
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o-Xylene		0.00043 J	0.0023	0.00028	mg/kg	SW846 8260B
Xylene (total)		0.0013 J	0.0023	0.00028	mg/kg	SW846 8260B

**MC16798-7 VMP-48-27**

Benzene		0.0014	0.00071	0.00042	mg/kg	SW846 8260B
Carbon disulfide		0.0017 J	0.0071	0.00023	mg/kg	SW846 8260B
Ethylbenzene		0.0048	0.0029	0.00034	mg/kg	SW846 8260B
Methylene chloride		0.0017 J	0.0029	0.0017	mg/kg	SW846 8260B
Toluene		0.0051 J	0.0071	0.0012	mg/kg	SW846 8260B
m,p-Xylene		0.0013 J	0.0029	0.0011	mg/kg	SW846 8260B
o-Xylene		0.00054 J	0.0029	0.00034	mg/kg	SW846 8260B
Xylene (total)		0.0018 J	0.0029	0.00034	mg/kg	SW846 8260B

**MC16798-8 VMP-50-13**

Benzene		0.0017	0.00091	0.00053	mg/kg	SW846 8260B
Ethylbenzene		0.0054	0.0036	0.00044	mg/kg	SW846 8260B
Toluene		0.0056 J	0.0091	0.0015	mg/kg	SW846 8260B
Vinyl chloride		0.0017 J	0.0036	0.00049	mg/kg	SW846 8260B
m,p-Xylene		0.0015 J	0.0036	0.0014	mg/kg	SW846 8260B
o-Xylene		0.00054 J	0.0036	0.00043	mg/kg	SW846 8260B
Xylene (total)		0.0020 J	0.0036	0.00043	mg/kg	SW846 8260B

**MC16798-9 VMP-50-21**

n-Butylbenzene		15.6	3.0	0.11	mg/kg	SW846 8260B
sec-Butylbenzene		3.99	3.0	0.14	mg/kg	SW846 8260B
tert-Butylbenzene		2.43 J	3.0	0.53	mg/kg	SW846 8260B
Ethylbenzene		45.8	1.2	0.15	mg/kg	SW846 8260B
Isopropylbenzene		9.40	3.0	0.14	mg/kg	SW846 8260B
p-Isopropyltoluene		3.31	3.0	0.11	mg/kg	SW846 8260B
Naphthalene		15.4	3.0	0.75	mg/kg	SW846 8260B
n-Propylbenzene		32.0	3.0	0.61	mg/kg	SW846 8260B
Toluene		0.937 J	3.0	0.51	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		146	3.0	0.13	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		41.6	3.0	0.13	mg/kg	SW846 8260B
m,p-Xylene		117	1.2	0.47	mg/kg	SW846 8260B
o-Xylene		46.6	1.2	0.14	mg/kg	SW846 8260B
Xylene (total)		164	1.2	0.14	mg/kg	SW846 8260B

**MC16798-10 VMP-50-21 DUP**

n-Butylbenzene		14.0	2.7	0.10	mg/kg	SW846 8260B
sec-Butylbenzene		3.69	2.7	0.12	mg/kg	SW846 8260B

## Summary of Hits

Job Number: MC16798  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 12/10/12 thru 12/11/12



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
		tert-Butylbenzene	2.19 J	2.7	0.48	mg/kg SW846 8260B
		Ethylbenzene	50.8	1.1	0.13	mg/kg SW846 8260B
		Isopropylbenzene	9.63	2.7	0.12	mg/kg SW846 8260B
		p-Isopropyltoluene	2.94	2.7	0.096	mg/kg SW846 8260B
		Naphthalene	15.0	2.7	0.68	mg/kg SW846 8260B
		n-Propylbenzene	31.0	2.7	0.55	mg/kg SW846 8260B
		Toluene	1.29 J	2.7	0.46	mg/kg SW846 8260B
		1,2,4-Trimethylbenzene	134	2.7	0.12	mg/kg SW846 8260B
		1,3,5-Trimethylbenzene	38.6	2.7	0.12	mg/kg SW846 8260B
		m,p-Xylene	127	1.1	0.43	mg/kg SW846 8260B
		o-Xylene	49.2	1.1	0.13	mg/kg SW846 8260B
		Xylene (total)	177	1.1	0.13	mg/kg SW846 8260B

MC16798-11 VMP-50-29

Benzene	0.0037	0.00048	0.00028	mg/kg	SW846 8260B
n-Butylbenzene	0.0206	0.0048	0.00018	mg/kg	SW846 8260B
sec-Butylbenzene	0.0071	0.0048	0.00022	mg/kg	SW846 8260B
tert-Butylbenzene	0.0032 J	0.0048	0.00084	mg/kg	SW846 8260B
Ethylbenzene	0.0427	0.0019	0.00023	mg/kg	SW846 8260B
Isopropylbenzene	0.0102	0.0048	0.00022	mg/kg	SW846 8260B
p-Isopropyltoluene	0.0043 J	0.0048	0.00017	mg/kg	SW846 8260B
Naphthalene	0.0501	0.0048	0.0012	mg/kg	SW846 8260B
n-Propylbenzene	0.0396	0.0048	0.00097	mg/kg	SW846 8260B
Toluene	0.0330	0.0048	0.00081	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	0.246	0.0048	0.00021	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	0.0676	0.0048	0.00020	mg/kg	SW846 8260B
Vinyl chloride	0.00074 J	0.0019	0.00026	mg/kg	SW846 8260B
m,p-Xylene	0.111	0.0019	0.00075	mg/kg	SW846 8260B
o-Xylene	0.0808	0.0019	0.00023	mg/kg	SW846 8260B
Xylene (total)	0.192	0.0019	0.00023	mg/kg	SW846 8260B

**Sample Results**

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**Report of Analysis**

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## Report of Analysis

Client Sample ID:	VMP-47-12	Date Sampled:	12/10/12
Lab Sample ID:	MC16798-1	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	93.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53046.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.58 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0059	0.0015	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.029	0.012	mg/kg	
107-13-1	Acrylonitrile	ND	0.029	0.0015	mg/kg	
71-43-2	Benzene	0.0017	0.00059	0.00035	mg/kg	
108-86-1	Bromobenzene	ND	0.0059	0.00026	mg/kg	
74-97-5	Bromochloromethane	ND	0.0059	0.00044	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0023	0.00025	mg/kg	
75-25-2	Bromoform	ND	0.0023	0.0023	mg/kg	
74-83-9	Bromomethane	ND	0.0023	0.00061	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0059	0.0015	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0059	0.00022	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0059	0.00027	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0059	0.0010	mg/kg	
75-15-0	Carbon disulfide	ND	0.0059	0.00019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0023	0.00085	mg/kg	
108-90-7	Chlorobenzene	ND	0.0023	0.00032	mg/kg	
75-00-3	Chloroethane	ND	0.0059	0.0015	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0059	0.0023	mg/kg	
67-66-3	Chloroform	ND	0.0023	0.00060	mg/kg	
74-87-3	Chloromethane	ND	0.0059	0.00054	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0059	0.0013	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0059	0.00027	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0023	0.00035	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0023	0.00025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0023	0.00026	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0023	0.00025	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0023	0.0013	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0023	0.00032	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0023	0.00034	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0023	0.00043	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0023	0.00035	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0023	0.00034	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:	VMP-47-12	Date Sampled:	12/10/12
Lab Sample ID:	MC16798-1	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	93.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0023	0.00044	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0059	0.00027	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0059	0.0010	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0059	0.00031	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0023	0.00020	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0023	0.00058	mg/kg	
123-91-1	1,4-Dioxane	ND	0.029	0.029	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0059	0.00080	mg/kg	
100-41-4	Ethylbenzene	0.0066	0.0023	0.00028	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0059	0.00055	mg/kg	
591-78-6	2-Hexanone	ND	0.0059	0.00059	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0059	0.00027	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0059	0.00021	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0023	0.00034	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0059	0.00059	mg/kg	
74-95-3	Methylene bromide	ND	0.0059	0.00058	mg/kg	
75-09-2	Methylene chloride	0.0015	0.0023	0.0014	mg/kg	J
91-20-3	Naphthalene	ND	0.0059	0.0015	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0059	0.0012	mg/kg	
100-42-5	Styrene	ND	0.0059	0.00027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0059	0.0012	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0023	0.00050	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0023	0.00027	mg/kg	
108-88-3	Toluene	0.0064	0.0059	0.0010	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0059	0.00028	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0059	0.00027	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0023	0.00037	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0023	0.00086	mg/kg	
79-01-6	Trichloroethene	ND	0.0023	0.00025	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0023	0.00036	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0059	0.00034	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0059	0.00026	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0059	0.00025	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0059	0.00066	mg/kg	
75-01-4	Vinyl chloride	ND	0.0023	0.00032	mg/kg	
	m,p-Xylene	0.0013	0.0023	0.00092	mg/kg	J
95-47-6	o-Xylene	0.00055	0.0023	0.00028	mg/kg	J
1330-20-7	Xylene (total)	0.0018	0.0023	0.00028	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

<b>Client Sample ID:</b> VMP-47-12	<b>Date Sampled:</b> 12/10/12
<b>Lab Sample ID:</b> MC16798-1	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 93.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	84%		70-130%
2037-26-5	Toluene-D8	87%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-47-12 <b>Lab Sample ID:</b> MC16798-1 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 3546 <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 12/10/12 <b>Date Received:</b> 12/12/12 <b>Percent Solids:</b> 93.1
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20063.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.6 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	131%		61-167%
460-00-4	Bromofluorobenzene (S)	142%		61-167%

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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

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## Report of Analysis

Client Sample ID:	VMP-47-19	Date Sampled:	12/10/12
Lab Sample ID:	MC16798-2	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	89.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53063.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.93 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0057	0.0014	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.028	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.028	0.0014	mg/kg	
71-43-2	Benzene	0.0017	0.00057	0.00033	mg/kg	
108-86-1	Bromobenzene	ND	0.0057	0.00025	mg/kg	
74-97-5	Bromochloromethane	ND	0.0057	0.00042	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0023	0.00024	mg/kg	
75-25-2	Bromoform	ND	0.0023	0.0023	mg/kg	
74-83-9	Bromomethane	ND	0.0023	0.00059	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0057	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0057	0.00021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0057	0.00026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0057	0.0010	mg/kg	
75-15-0	Carbon disulfide	ND	0.0057	0.00019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0023	0.00083	mg/kg	
108-90-7	Chlorobenzene	ND	0.0023	0.00031	mg/kg	
75-00-3	Chloroethane	ND	0.0057	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0057	0.0023	mg/kg	
67-66-3	Chloroform	ND	0.0023	0.00059	mg/kg	
74-87-3	Chloromethane	ND	0.0057	0.00053	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0057	0.0013	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0057	0.00026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0023	0.00034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0023	0.00025	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	0.00031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0023	0.00033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0023	0.00042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0023	0.00034	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0023	0.00033	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:	VMP-47-19	Date Sampled:	12/10/12
Lab Sample ID:	MC16798-2	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	89.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0023	0.00042	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0057	0.00026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0057	0.00099	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0057	0.00030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0023	0.00019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0023	0.00056	mg/kg	
123-91-1	1,4-Dioxane	ND	0.028	0.028	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0057	0.00077	mg/kg	
100-41-4	Ethylbenzene	0.0066	0.0023	0.00027	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0057	0.00053	mg/kg	
591-78-6	2-Hexanone	ND	0.0057	0.00057	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0057	0.00026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0057	0.00020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0023	0.00033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0057	0.00057	mg/kg	
74-95-3	Methylene bromide	ND	0.0057	0.00056	mg/kg	
75-09-2	Methylene chloride	ND	0.0023	0.0013	mg/kg	
91-20-3	Naphthalene	ND	0.0057	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0057	0.0012	mg/kg	
100-42-5	Styrene	ND	0.0057	0.00027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0057	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0023	0.00048	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0023	0.00026	mg/kg	
108-88-3	Toluene	0.0064	0.0057	0.00096	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0057	0.00027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0057	0.00026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0023	0.00036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0023	0.00084	mg/kg	
79-01-6	Trichloroethene	ND	0.0023	0.00024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0023	0.00035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0057	0.00033	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0057	0.00025	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0057	0.00024	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0057	0.00064	mg/kg	
75-01-4	Vinyl chloride	ND	0.0023	0.00031	mg/kg	
	m,p-Xylene	0.0013	0.0023	0.00090	mg/kg	J
95-47-6	o-Xylene	0.00053	0.0023	0.00027	mg/kg	J
1330-20-7	Xylene (total)	0.0018	0.0023	0.00027	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

<b>Client Sample ID:</b> VMP-47-19	<b>Date Sampled:</b> 12/10/12
<b>Lab Sample ID:</b> MC16798-2	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.2
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
2037-26-5	Toluene-D8	87%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-47-19	<b>Date Sampled:</b> 12/10/12
<b>Lab Sample ID:</b> MC16798-2	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.2
<b>Method:</b> SW846 8011 SW846 3546	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20064.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
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	0.0028	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	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)	140%		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

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## Report of Analysis

Client Sample ID:	VMP-47-29	Date Sampled:	12/10/12
Lab Sample ID:	MC16798-3	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	94.9
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53048.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.73 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0056	0.0014	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.028	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.028	0.0014	mg/kg	
71-43-2	Benzene	0.00080	0.00056	0.00033	mg/kg	
108-86-1	Bromobenzene	ND	0.0056	0.00025	mg/kg	
74-97-5	Bromochloromethane	ND	0.0056	0.00042	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0022	0.00024	mg/kg	
75-25-2	Bromoform	ND	0.0022	0.0022	mg/kg	
74-83-9	Bromomethane	ND	0.0022	0.00058	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0056	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0056	0.00021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0056	0.00026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0056	0.00098	mg/kg	
75-15-0	Carbon disulfide	ND	0.0056	0.00018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0022	0.00081	mg/kg	
108-90-7	Chlorobenzene	ND	0.0022	0.00031	mg/kg	
75-00-3	Chloroethane	ND	0.0056	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0056	0.0022	mg/kg	
67-66-3	Chloroform	ND	0.0022	0.00057	mg/kg	
74-87-3	Chloromethane	ND	0.0056	0.00052	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0056	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0056	0.00025	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0022	0.00033	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0022	0.00024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0022	0.00025	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0022	0.00023	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0022	0.0013	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0022	0.00030	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0022	0.00032	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0022	0.00041	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0022	0.00034	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0022	0.00032	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:	VMP-47-29	Date Sampled:	12/10/12
Lab Sample ID:	MC16798-3	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	94.9
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0022	0.00041	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0056	0.00026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0056	0.00097	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0056	0.00029	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0022	0.00019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0022	0.00055	mg/kg	
123-91-1	1,4-Dioxane	ND	0.028	0.028	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0056	0.00076	mg/kg	
100-41-4	Ethylbenzene	0.0016	0.0022	0.00027	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.0056	0.00052	mg/kg	
591-78-6	2-Hexanone	ND	0.0056	0.00056	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0056	0.00025	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0056	0.00020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0022	0.00032	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0056	0.00056	mg/kg	
74-95-3	Methylene bromide	ND	0.0056	0.00055	mg/kg	
75-09-2	Methylene chloride	0.0014	0.0022	0.0013	mg/kg	J
91-20-3	Naphthalene	ND	0.0056	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0056	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0056	0.00026	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0056	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0022	0.00047	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0022	0.00025	mg/kg	
108-88-3	Toluene	0.0022	0.0056	0.00095	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0056	0.00026	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0056	0.00026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0022	0.00035	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0022	0.00082	mg/kg	
79-01-6	Trichloroethene	ND	0.0022	0.00024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0022	0.00034	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0056	0.00033	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0056	0.00025	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0056	0.00024	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0056	0.00062	mg/kg	
75-01-4	Vinyl chloride	ND	0.0022	0.00030	mg/kg	
	m,p-Xylene	ND	0.0022	0.00088	mg/kg	
95-47-6	o-Xylene	ND	0.0022	0.00027	mg/kg	
1330-20-7	Xylene (total)	0.00063	0.0022	0.00027	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

<b>Client Sample ID:</b> VMP-47-29	<b>Date Sampled:</b> 12/10/12
<b>Lab Sample ID:</b> MC16798-3	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.9
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-47-29 <b>Lab Sample ID:</b> MC16798-3 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 3546 <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 12/10/12 <b>Date Received:</b> 12/12/12 <b>Percent Solids:</b> 94.9
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20066.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.6 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.00099	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	135%		61-167%
460-00-4	Bromofluorobenzene (S)	143%		61-167%

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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

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4

## Report of Analysis

<b>Client Sample ID:</b>	TRIP BLANK	<b>Date Sampled:</b>	12/10/12
<b>Lab Sample ID:</b>	MC16798-4	<b>Date Received:</b>	12/12/12
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H59392.D	1	12/20/12	JP	n/a	n/a	MSH1961
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	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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:	TRIP BLANK	Date Sampled:	12/10/12
Lab Sample ID:	MC16798-4	Date Received:	12/12/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 12/10/12
<b>Lab Sample ID:</b> MC16798-4	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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### VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-130%
2037-26-5	Toluene-D8	99%		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      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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 12/10/12
<b>Lab Sample ID:</b> MC16798-4	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK19948.D	1	12/14/12	AP	12/13/12	OP31406	GBK716
Run #2							

	Initial Volume	Final Volume
Run #1	35.8 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	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	116%		36-173%
460-00-4	Bromofluorobenzene (S)	102%		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

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## Report of Analysis

Client Sample ID:	VMP-48-13	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-5	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	92.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53049.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.73 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0057	0.0014	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.029	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.029	0.0014	mg/kg	
71-43-2	Benzene	0.0011	0.00057	0.00034	mg/kg	
108-86-1	Bromobenzene	ND	0.0057	0.00025	mg/kg	
74-97-5	Bromochloromethane	ND	0.0057	0.00043	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0023	0.00024	mg/kg	
75-25-2	Bromoform	ND	0.0023	0.0023	mg/kg	
74-83-9	Bromomethane	ND	0.0023	0.00059	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0057	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0057	0.00021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0057	0.00026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0057	0.0010	mg/kg	
75-15-0	Carbon disulfide	ND	0.0057	0.00019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0023	0.00083	mg/kg	
108-90-7	Chlorobenzene	ND	0.0023	0.00031	mg/kg	
75-00-3	Chloroethane	ND	0.0057	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0057	0.0023	mg/kg	
67-66-3	Chloroform	ND	0.0023	0.00059	mg/kg	
74-87-3	Chloromethane	ND	0.0057	0.00053	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0057	0.0013	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0057	0.00026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0023	0.00034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0023	0.00025	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	0.00031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0023	0.00033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0023	0.00042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0023	0.00034	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0023	0.00033	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:	VMP-48-13	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-5	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	92.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0023	0.00043	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0057	0.00026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0057	0.00099	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0057	0.00030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0023	0.00020	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0023	0.00057	mg/kg	
123-91-1	1,4-Dioxane	ND	0.029	0.029	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0057	0.00078	mg/kg	
100-41-4	Ethylbenzene	0.0030	0.0023	0.00028	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0057	0.00053	mg/kg	
591-78-6	2-Hexanone	ND	0.0057	0.00057	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0057	0.00026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0057	0.00020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0023	0.00033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0057	0.00057	mg/kg	
74-95-3	Methylene bromide	ND	0.0057	0.00056	mg/kg	
75-09-2	Methylene chloride	ND	0.0023	0.0013	mg/kg	
91-20-3	Naphthalene	ND	0.0057	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0057	0.0012	mg/kg	
100-42-5	Styrene	ND	0.0057	0.00027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0057	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0023	0.00049	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0023	0.00026	mg/kg	
108-88-3	Toluene	0.0034	0.0057	0.00097	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0057	0.00027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0057	0.00026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0023	0.00036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0023	0.00084	mg/kg	
79-01-6	Trichloroethene	ND	0.0023	0.00024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0023	0.00035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0057	0.00033	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0057	0.00026	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0057	0.00024	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0057	0.00064	mg/kg	
75-01-4	Vinyl chloride	ND	0.0023	0.00031	mg/kg	
	m,p-Xylene	ND	0.0023	0.00090	mg/kg	
95-47-6	o-Xylene	0.00036	0.0023	0.00027	mg/kg	J
1330-20-7	Xylene (total)	0.0010	0.0023	0.00027	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

<b>Client Sample ID:</b> VMP-48-13	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-5	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 92.4
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-48-13	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-5	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 92.4
<b>Method:</b> SW846 8011 SW846 3546	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20067.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
Run #2							

Run #	Initial Weight	Final Volume
Run #1	31.0 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	138%		61-167%
460-00-4	Bromofluorobenzene (S)	139%		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

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## Report of Analysis

Client Sample ID:	VMP-48-21	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-6	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	94.7
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53055.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.59 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0058	0.0015	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.029	0.012	mg/kg	
107-13-1	Acrylonitrile	ND	0.029	0.0014	mg/kg	
71-43-2	Benzene	0.0011	0.00058	0.00034	mg/kg	
108-86-1	Bromobenzene	ND	0.0058	0.00026	mg/kg	
74-97-5	Bromochloromethane	ND	0.0058	0.00043	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0023	0.00024	mg/kg	
75-25-2	Bromoform	ND	0.0023	0.0023	mg/kg	
74-83-9	Bromomethane	ND	0.0023	0.00060	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0058	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0058	0.00021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0058	0.00026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0058	0.0010	mg/kg	
75-15-0	Carbon disulfide	ND	0.0058	0.00019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0023	0.00084	mg/kg	
108-90-7	Chlorobenzene	ND	0.0023	0.00032	mg/kg	
75-00-3	Chloroethane	ND	0.0058	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0058	0.0023	mg/kg	
67-66-3	Chloroform	ND	0.0023	0.00059	mg/kg	
74-87-3	Chloromethane	ND	0.0058	0.00053	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0058	0.0013	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0058	0.00026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0023	0.00034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0023	0.00025	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	0.00031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0023	0.00033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0023	0.00042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0023	0.00035	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0023	0.00033	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:	VMP-48-21	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-6	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	94.7
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0023	0.00043	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0058	0.00027	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0058	0.0010	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0058	0.00030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0023	0.00020	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0023	0.00057	mg/kg	
123-91-1	1,4-Dioxane	ND	0.029	0.029	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0058	0.00078	mg/kg	
100-41-4	Ethylbenzene	0.0029	0.0023	0.00028	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0058	0.00053	mg/kg	
591-78-6	2-Hexanone	ND	0.0058	0.00058	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0058	0.00026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0058	0.00020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0023	0.00033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0058	0.00058	mg/kg	
74-95-3	Methylene bromide	ND	0.0058	0.00057	mg/kg	
75-09-2	Methylene chloride	0.0014	0.0023	0.0013	mg/kg	J
91-20-3	Naphthalene	ND	0.0058	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0058	0.0012	mg/kg	
100-42-5	Styrene	ND	0.0058	0.00027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0058	0.0012	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0023	0.00049	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0023	0.00026	mg/kg	
108-88-3	Toluene	0.0034	0.0058	0.00098	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0058	0.00027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0058	0.00026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0023	0.00036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0023	0.00084	mg/kg	
79-01-6	Trichloroethene	ND	0.0023	0.00024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0023	0.00035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0058	0.00034	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0058	0.00026	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0058	0.00025	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0058	0.00064	mg/kg	
75-01-4	Vinyl chloride	ND	0.0023	0.00031	mg/kg	
	m,p-Xylene	ND	0.0023	0.00091	mg/kg	
95-47-6	o-Xylene	0.00043	0.0023	0.00028	mg/kg	J
1330-20-7	Xylene (total)	0.0013	0.0023	0.00028	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

<b>Client Sample ID:</b> VMP-48-21	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-6	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.7
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	84%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-48-21	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-6	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.7
<b>Method:</b> SW846 8011 SW846 3546	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20068.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
Run #2							

	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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	135%		61-167%
460-00-4	Bromofluorobenzene (S)	137%		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

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## Report of Analysis

Client Sample ID:	VMP-48-27	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-7	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	94.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53056.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	3.70 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0071	0.0018	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.036	0.014	mg/kg	
107-13-1	Acrylonitrile	ND	0.036	0.0018	mg/kg	
71-43-2	Benzene	0.0014	0.00071	0.00042	mg/kg	
108-86-1	Bromobenzene	ND	0.0071	0.00032	mg/kg	
74-97-5	Bromochloromethane	ND	0.0071	0.00053	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0029	0.00030	mg/kg	
75-25-2	Bromoform	ND	0.0029	0.0029	mg/kg	
74-83-9	Bromomethane	ND	0.0029	0.00074	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0071	0.0018	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0071	0.00026	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0071	0.00033	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0071	0.0013	mg/kg	
75-15-0	Carbon disulfide	0.0017	0.0071	0.00023	mg/kg	J
56-23-5	Carbon tetrachloride	ND	0.0029	0.0010	mg/kg	
108-90-7	Chlorobenzene	ND	0.0029	0.00039	mg/kg	
75-00-3	Chloroethane	ND	0.0071	0.0018	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0071	0.0029	mg/kg	
67-66-3	Chloroform	ND	0.0029	0.00073	mg/kg	
74-87-3	Chloromethane	ND	0.0071	0.00066	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0071	0.0016	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0071	0.00032	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0029	0.00042	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0029	0.00031	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0029	0.00032	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0029	0.00030	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0029	0.0016	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0029	0.00039	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0029	0.00041	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0029	0.00052	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0029	0.00043	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0029	0.00041	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:	VMP-48-27	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-7	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	94.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0029	0.00053	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0071	0.00033	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0071	0.0012	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0071	0.00037	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0029	0.00024	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0029	0.00071	mg/kg	
123-91-1	1,4-Dioxane	ND	0.036	0.036	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0071	0.00097	mg/kg	
100-41-4	Ethylbenzene	0.0048	0.0029	0.00034	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0071	0.00066	mg/kg	
591-78-6	2-Hexanone	ND	0.0071	0.00071	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0071	0.00033	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0071	0.00025	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0029	0.00041	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0071	0.00071	mg/kg	
74-95-3	Methylene bromide	ND	0.0071	0.00070	mg/kg	
75-09-2	Methylene chloride	0.0017	0.0029	0.0017	mg/kg	J
91-20-3	Naphthalene	ND	0.0071	0.0018	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0071	0.0014	mg/kg	
100-42-5	Styrene	ND	0.0071	0.00033	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0071	0.0014	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0029	0.00061	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0029	0.00033	mg/kg	
108-88-3	Toluene	0.0051	0.0071	0.0012	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0071	0.00034	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0071	0.00033	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0029	0.00045	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0029	0.0010	mg/kg	
79-01-6	Trichloroethene	ND	0.0029	0.00030	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0029	0.00043	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0071	0.00042	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0071	0.00032	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0071	0.00030	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0071	0.00080	mg/kg	
75-01-4	Vinyl chloride	ND	0.0029	0.00039	mg/kg	
	m,p-Xylene	0.0013	0.0029	0.0011	mg/kg	J
95-47-6	o-Xylene	0.00054	0.0029	0.00034	mg/kg	J
1330-20-7	Xylene (total)	0.0018	0.0029	0.00034	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

<b>Client Sample ID:</b> VMP-48-27	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-7	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.8
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	80%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-48-27	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-7	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.8
<b>Method:</b> SW846 8011 SW846 3546	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20069.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.8 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	0.0026	0.0011	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.00099	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	145%		61-167%
460-00-4	Bromofluorobenzene (S)	149%		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

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## Report of Analysis

Client Sample ID:	VMP-50-13	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-8	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	86.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53057.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	3.20 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0091	0.0023	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.045	0.018	mg/kg	
107-13-1	Acrylonitrile	ND	0.045	0.0023	mg/kg	
71-43-2	Benzene	0.0017	0.00091	0.00053	mg/kg	
108-86-1	Bromobenzene	ND	0.0091	0.00040	mg/kg	
74-97-5	Bromochloromethane	ND	0.0091	0.00068	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0036	0.00038	mg/kg	
75-25-2	Bromoform	ND	0.0036	0.0036	mg/kg	
74-83-9	Bromomethane	ND	0.0036	0.00094	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0091	0.0023	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0091	0.00033	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0091	0.00042	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0091	0.0016	mg/kg	
75-15-0	Carbon disulfide	ND	0.0091	0.00030	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0036	0.0013	mg/kg	
108-90-7	Chlorobenzene	ND	0.0036	0.00050	mg/kg	
75-00-3	Chloroethane	ND	0.0091	0.0023	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0091	0.0036	mg/kg	
67-66-3	Chloroform	ND	0.0036	0.00093	mg/kg	
74-87-3	Chloromethane	ND	0.0091	0.00084	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0091	0.0020	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0091	0.00041	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0036	0.00054	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0036	0.00039	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0036	0.00041	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0036	0.00038	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0036	0.0021	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0036	0.00049	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0036	0.00052	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0036	0.00067	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0036	0.00055	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0036	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:	VMP-50-13	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-8	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	86.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0036	0.00067	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0091	0.00042	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0091	0.0016	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0091	0.00048	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0036	0.00031	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0036	0.00090	mg/kg	
123-91-1	1,4-Dioxane	ND	0.045	0.045	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0091	0.0012	mg/kg	
100-41-4	Ethylbenzene	0.0054	0.0036	0.00044	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0091	0.00084	mg/kg	
591-78-6	2-Hexanone	ND	0.0091	0.00091	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0091	0.00041	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0091	0.00032	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0036	0.00052	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0091	0.00091	mg/kg	
74-95-3	Methylene bromide	ND	0.0091	0.00089	mg/kg	
75-09-2	Methylene chloride	ND	0.0036	0.0021	mg/kg	
91-20-3	Naphthalene	ND	0.0091	0.0023	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0091	0.0018	mg/kg	
100-42-5	Styrene	ND	0.0091	0.00042	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0091	0.0018	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0036	0.00077	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0036	0.00041	mg/kg	
108-88-3	Toluene	0.0056	0.0091	0.0015	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0091	0.00043	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0091	0.00042	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0036	0.00057	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0036	0.0013	mg/kg	
79-01-6	Trichloroethene	ND	0.0036	0.00038	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0036	0.00055	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0091	0.00053	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0091	0.00041	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0091	0.00039	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0091	0.0010	mg/kg	
75-01-4	Vinyl chloride	0.0017	0.0036	0.00049	mg/kg	J
	m,p-Xylene	0.0015	0.0036	0.0014	mg/kg	J
95-47-6	o-Xylene	0.00054	0.0036	0.00043	mg/kg	J
1330-20-7	Xylene (total)	0.0020	0.0036	0.00043	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

<b>Client Sample ID:</b> VMP-50-13	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-8	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.2
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	83%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-50-13	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-8	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.2
<b>Method:</b> SW846 8011 SW846 3546	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20070.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
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	0.0013	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)	146%		61-167%
460-00-4	Bromofluorobenzene (S)	148%		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

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## Report of Analysis

Client Sample ID:	VMP-50-21	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-9	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	84.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65759.D	1	12/17/12	GK	n/a	n/a	MSK2162
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.34 g	10.0 ml	20.0 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone <sup>a</sup>	ND	3.0	0.76	mg/kg	
107-02-8	Acrolein	ND	15	6.0	mg/kg	
107-13-1	Acrylonitrile	ND	15	0.75	mg/kg	
71-43-2	Benzene	ND	0.30	0.18	mg/kg	
108-86-1	Bromobenzene	ND	3.0	0.13	mg/kg	
74-97-5	Bromochloromethane	ND	3.0	0.22	mg/kg	
75-27-4	Bromodichloromethane	ND	1.2	0.13	mg/kg	
75-25-2	Bromoform	ND	1.2	1.2	mg/kg	
74-83-9	Bromomethane	ND	1.2	0.31	mg/kg	
78-93-3	2-Butanone (MEK) <sup>a</sup>	ND	3.0	0.75	mg/kg	
104-51-8	n-Butylbenzene	15.6	3.0	0.11	mg/kg	
135-98-8	sec-Butylbenzene	3.99	3.0	0.14	mg/kg	
98-06-6	tert-Butylbenzene	2.43	3.0	0.53	mg/kg	J
75-15-0	Carbon disulfide	ND	3.0	0.099	mg/kg	
56-23-5	Carbon tetrachloride	ND	1.2	0.44	mg/kg	
108-90-7	Chlorobenzene	ND	1.2	0.17	mg/kg	
75-00-3	Chloroethane	ND	3.0	0.76	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	3.0	1.2	mg/kg	
67-66-3	Chloroform	ND	1.2	0.31	mg/kg	
74-87-3	Chloromethane	ND	3.0	0.28	mg/kg	
95-49-8	o-Chlorotoluene	ND	3.0	0.66	mg/kg	
106-43-4	p-Chlorotoluene	ND	3.0	0.14	mg/kg	
124-48-1	Dibromochloromethane	ND	1.2	0.18	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.2	0.13	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.2	0.14	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.2	0.13	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	1.2	0.68	mg/kg	
75-34-3	1,1-Dichloroethane	ND	1.2	0.16	mg/kg	
107-06-2	1,2-Dichloroethane	ND	1.2	0.17	mg/kg	
75-35-4	1,1-Dichloroethene	ND	1.2	0.22	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	1.2	0.18	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	1.2	0.17	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:	VMP-50-21	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-9	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	84.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	1.2	0.22	mg/kg	
142-28-9	1,3-Dichloropropane	ND	3.0	0.14	mg/kg	
594-20-7	2,2-Dichloropropane	ND	3.0	0.52	mg/kg	
563-58-6	1,1-Dichloropropene	ND	3.0	0.16	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.2	0.10	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.2	0.30	mg/kg	
123-91-1	1,4-Dioxane	ND	15	15	mg/kg	
97-63-2	Ethyl methacrylate	ND	3.0	0.41	mg/kg	
100-41-4	Ethylbenzene	45.8	1.2	0.15	mg/kg	
87-68-3	Hexachlorobutadiene	ND	3.0	0.28	mg/kg	
591-78-6	2-Hexanone <sup>b</sup>	ND	3.0	0.30	mg/kg	
98-82-8	Isopropylbenzene	9.40	3.0	0.14	mg/kg	
99-87-6	p-Isopropyltoluene	3.31	3.0	0.11	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.2	0.17	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	3.0	0.30	mg/kg	
74-95-3	Methylene bromide	ND	3.0	0.30	mg/kg	
75-09-2	Methylene chloride	ND	1.2	0.70	mg/kg	
91-20-3	Naphthalene	15.4	3.0	0.75	mg/kg	
103-65-1	n-Propylbenzene	32.0	3.0	0.61	mg/kg	
100-42-5	Styrene	ND	3.0	0.14	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	3.0	0.60	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.2	0.26	mg/kg	
127-18-4	Tetrachloroethene	ND	1.2	0.14	mg/kg	
108-88-3	Toluene	0.937	3.0	0.51	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	3.0	0.14	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	3.0	0.14	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	1.2	0.19	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.2	0.44	mg/kg	
79-01-6	Trichloroethene	ND	1.2	0.13	mg/kg	
75-69-4	Trichlorofluoromethane	ND	1.2	0.18	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	3.0	0.18	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	146	3.0	0.13	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	41.6	3.0	0.13	mg/kg	
108-05-4	Vinyl Acetate	ND	3.0	0.34	mg/kg	
75-01-4	Vinyl chloride	ND	1.2	0.16	mg/kg	
	m,p-Xylene	117	1.2	0.47	mg/kg	
95-47-6	o-Xylene	46.6	1.2	0.14	mg/kg	
1330-20-7	Xylene (total)	164	1.2	0.14	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: VMP-50-21		Date Sampled: 12/11/12
Lab Sample ID: MC16798-9		Date Received: 12/12/12
Matrix: SO - Soil		Percent Solids: 84.4
Method: SW846 8260B		
Project: URSMOSTL: Roxana Drilling, Roxana, IL		

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		70-130%
2037-26-5	Toluene-D8	96%		70-130%
460-00-4	4-Bromofluorobenzene	110%		70-130%

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

- (a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.

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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

<b>Client Sample ID:</b> VMP-50-21 <b>Lab Sample ID:</b> MC16798-9 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 3546 <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 12/11/12 <b>Date Received:</b> 12/12/12 <b>Percent Solids:</b> 84.4
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20071.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 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	0.0013	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)	137%		61-167%
460-00-4	Bromofluorobenzene (S)	216% <sup>a</sup>		61-167%

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

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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

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## Report of Analysis

Client Sample ID:	VMP-50-21 DUP	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-10	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	90.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65760.D	1	12/17/12	GK	n/a	n/a	MSK2162
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.39 g	10.0 ml	20.0 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone <sup>a</sup>	ND	2.7	0.68	mg/kg	
107-02-8	Acrolein	ND	14	5.4	mg/kg	
107-13-1	Acrylonitrile	ND	14	0.68	mg/kg	
71-43-2	Benzene	ND	0.27	0.16	mg/kg	
108-86-1	Bromobenzene	ND	2.7	0.12	mg/kg	
74-97-5	Bromochloromethane	ND	2.7	0.20	mg/kg	
75-27-4	Bromodichloromethane	ND	1.1	0.11	mg/kg	
75-25-2	Bromoform	ND	1.1	1.1	mg/kg	
74-83-9	Bromomethane	ND	1.1	0.28	mg/kg	
78-93-3	2-Butanone (MEK) <sup>a</sup>	ND	2.7	0.68	mg/kg	
104-51-8	n-Butylbenzene	14.0	2.7	0.10	mg/kg	
135-98-8	sec-Butylbenzene	3.69	2.7	0.12	mg/kg	
98-06-6	tert-Butylbenzene	2.19	2.7	0.48	mg/kg	J
75-15-0	Carbon disulfide	ND	2.7	0.089	mg/kg	
56-23-5	Carbon tetrachloride	ND	1.1	0.39	mg/kg	
108-90-7	Chlorobenzene	ND	1.1	0.15	mg/kg	
75-00-3	Chloroethane	ND	2.7	0.68	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	2.7	1.1	mg/kg	
67-66-3	Chloroform	ND	1.1	0.28	mg/kg	
74-87-3	Chloromethane	ND	2.7	0.25	mg/kg	
95-49-8	o-Chlorotoluene	ND	2.7	0.60	mg/kg	
106-43-4	p-Chlorotoluene	ND	2.7	0.12	mg/kg	
124-48-1	Dibromochloromethane	ND	1.1	0.16	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.1	0.12	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.1	0.12	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.1	0.11	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	1.1	0.62	mg/kg	
75-34-3	1,1-Dichloroethane	ND	1.1	0.15	mg/kg	
107-06-2	1,2-Dichloroethane	ND	1.1	0.16	mg/kg	
75-35-4	1,1-Dichloroethene	ND	1.1	0.20	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	1.1	0.16	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	1.1	0.15	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:	VMP-50-21 DUP	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-10	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	90.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	1.1	0.20	mg/kg	
142-28-9	1,3-Dichloropropane	ND	2.7	0.12	mg/kg	
594-20-7	2,2-Dichloropropane	ND	2.7	0.47	mg/kg	
563-58-6	1,1-Dichloropropene	ND	2.7	0.14	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.1	0.092	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.1	0.27	mg/kg	
123-91-1	1,4-Dioxane	ND	14	14	mg/kg	
97-63-2	Ethyl methacrylate	ND	2.7	0.37	mg/kg	
100-41-4	Ethylbenzene	50.8	1.1	0.13	mg/kg	
87-68-3	Hexachlorobutadiene	ND	2.7	0.25	mg/kg	
591-78-6	2-Hexanone <sup>b</sup>	ND	2.7	0.27	mg/kg	
98-82-8	Isopropylbenzene	9.63	2.7	0.12	mg/kg	
99-87-6	p-Isopropyltoluene	2.94	2.7	0.096	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.1	0.16	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	2.7	0.27	mg/kg	
74-95-3	Methylene bromide	ND	2.7	0.27	mg/kg	
75-09-2	Methylene chloride	ND	1.1	0.63	mg/kg	
91-20-3	Naphthalene	15.0	2.7	0.68	mg/kg	
103-65-1	n-Propylbenzene	31.0	2.7	0.55	mg/kg	
100-42-5	Styrene	ND	2.7	0.13	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	2.7	0.54	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.1	0.23	mg/kg	
127-18-4	Tetrachloroethene	ND	1.1	0.12	mg/kg	
108-88-3	Toluene	1.29	2.7	0.46	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	2.7	0.13	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	2.7	0.12	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	1.1	0.17	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.1	0.40	mg/kg	
79-01-6	Trichloroethene	ND	1.1	0.11	mg/kg	
75-69-4	Trichlorofluoromethane	ND	1.1	0.16	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	2.7	0.16	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	134	2.7	0.12	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	38.6	2.7	0.12	mg/kg	
108-05-4	Vinyl Acetate	ND	2.7	0.30	mg/kg	
75-01-4	Vinyl chloride	ND	1.1	0.15	mg/kg	
	m,p-Xylene	127	1.1	0.43	mg/kg	
95-47-6	o-Xylene	49.2	1.1	0.13	mg/kg	
1330-20-7	Xylene (total)	177	1.1	0.13	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

<b>Client Sample ID:</b> VMP-50-21 DUP	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-10	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.3
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		70-130%
2037-26-5	Toluene-D8	94%		70-130%
460-00-4	4-Bromofluorobenzene	113%		70-130%

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

- (a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Spike Blank(second source standard)was used to verify calibration standard accuracy.

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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

<b>Client Sample ID:</b> VMP-50-21 DUP	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-10	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.3
<b>Method:</b> SW846 8011 SW846 3546	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20072.D	1	12/17/12	AP	12/14/12	OP31434	GBK720
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.7 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	0.0027	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0027	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	130%		61-167%
460-00-4	Bromofluorobenzene (S)	156%		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

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## Report of Analysis

Client Sample ID:	VMP-50-29	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-11	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	96.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53058.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.44 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0048	0.0012	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.024	0.0096	mg/kg	
107-13-1	Acrylonitrile	ND	0.024	0.0012	mg/kg	
71-43-2	Benzene	0.0037	0.00048	0.00028	mg/kg	
108-86-1	Bromobenzene	ND	0.0048	0.00021	mg/kg	
74-97-5	Bromochloromethane	ND	0.0048	0.00036	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0019	0.00020	mg/kg	
75-25-2	Bromoform	ND	0.0019	0.0019	mg/kg	
74-83-9	Bromomethane	ND	0.0019	0.00050	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0048	0.0012	mg/kg	
104-51-8	n-Butylbenzene	0.0206	0.0048	0.00018	mg/kg	
135-98-8	sec-Butylbenzene	0.0071	0.0048	0.00022	mg/kg	
98-06-6	tert-Butylbenzene	0.0032	0.0048	0.00084	mg/kg	J
75-15-0	Carbon disulfide	ND	0.0048	0.00016	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0019	0.00069	mg/kg	
108-90-7	Chlorobenzene	ND	0.0019	0.00026	mg/kg	
75-00-3	Chloroethane	ND	0.0048	0.0012	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0048	0.0019	mg/kg	
67-66-3	Chloroform	ND	0.0019	0.00049	mg/kg	
74-87-3	Chloromethane	ND	0.0048	0.00044	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0048	0.0011	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0048	0.00022	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0019	0.00028	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0019	0.00021	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0019	0.00022	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0019	0.00020	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0019	0.0011	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0019	0.00026	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0019	0.00027	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0019	0.00035	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0019	0.00029	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0019	0.00027	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:	VMP-50-29	Date Sampled:	12/11/12
Lab Sample ID:	MC16798-11	Date Received:	12/12/12
Matrix:	SO - Soil	Percent Solids:	96.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0019	0.00036	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0048	0.00022	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0048	0.00083	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0048	0.00025	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0019	0.00016	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0019	0.00047	mg/kg	
123-91-1	1,4-Dioxane	ND	0.024	0.024	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0048	0.00065	mg/kg	
100-41-4	Ethylbenzene	0.0427	0.0019	0.00023	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0048	0.00044	mg/kg	
591-78-6	2-Hexanone	ND	0.0048	0.00048	mg/kg	
98-82-8	Isopropylbenzene	0.0102	0.0048	0.00022	mg/kg	
99-87-6	p-Isopropyltoluene	0.0043	0.0048	0.00017	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.0019	0.00028	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0048	0.00048	mg/kg	
74-95-3	Methylene bromide	ND	0.0048	0.00047	mg/kg	
75-09-2	Methylene chloride	ND	0.0019	0.0011	mg/kg	
91-20-3	Naphthalene	0.0501	0.0048	0.0012	mg/kg	
103-65-1	n-Propylbenzene	0.0396	0.0048	0.00097	mg/kg	
100-42-5	Styrene	ND	0.0048	0.00022	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0048	0.00096	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0019	0.00041	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0019	0.00022	mg/kg	
108-88-3	Toluene	0.0330	0.0048	0.00081	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0048	0.00023	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0048	0.00022	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0019	0.00030	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0019	0.00070	mg/kg	
79-01-6	Trichloroethene	ND	0.0019	0.00020	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0019	0.00029	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0048	0.00028	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.246	0.0048	0.00021	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	0.0676	0.0048	0.00020	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0048	0.00053	mg/kg	
75-01-4	Vinyl chloride	0.00074	0.0019	0.00026	mg/kg	J
	m,p-Xylene	0.111	0.0019	0.00075	mg/kg	
95-47-6	o-Xylene	0.0808	0.0019	0.00023	mg/kg	
1330-20-7	Xylene (total)	0.192	0.0019	0.00023	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

<b>Client Sample ID:</b> VMP-50-29	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-11	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	82%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-50-29	<b>Date Sampled:</b> 12/11/12
<b>Lab Sample ID:</b> MC16798-11	<b>Date Received:</b> 12/12/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.1
<b>Method:</b> SW846 8011 SW846 3546	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20073.D	1	12/17/12	AP	12/14/12	OP31434	GBK720
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	0.0026	0.0011	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.00099	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	130%		61-167%
460-00-4	Bromofluorobenzene (S)	134%		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

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Misc. Forms

Custody Documents and Other Forms

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Includes the following where applicable:

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



## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC16798      Client: URS      Immediate Client Services Action Required: No  
 Date / Time Received: 12/12/2012      Delivery Method: \_\_\_\_\_      Client Service Action Required at Login: No  
 Project: ROXANA DRILLING      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

## Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16798

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

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Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16798-1 Collected: 10-DEC-12 13:40 By: WP      Received: 12-DEC-12 By: VMP-47-12						
MC16798-1	SW846 8011	16-DEC-12 20:22	AP	14-DEC-12	BJ	V8011SL
MC16798-1	SM21 2540 B MOD.	17-DEC-12	HS			%SOL
MC16798-1	SW846 8260B	21-DEC-12 13:30	AMY			V8260SL +
MC16798-2 Collected: 10-DEC-12 13:45 By: WP      Received: 12-DEC-12 By: VMP-47-19						
MC16798-2	SW846 8011	16-DEC-12 20:47	AP	14-DEC-12	BJ	V8011SL
MC16798-2	SM21 2540 B MOD.	17-DEC-12	HS			%SOL
MC16798-2	SW846 8260B	21-DEC-12 22:03	AMY			V8260SL +
MC16798-3 Collected: 10-DEC-12 13:50 By: WP      Received: 12-DEC-12 By: VMP-47-29						
MC16798-3	SW846 8011	16-DEC-12 21:36	AP	14-DEC-12	BJ	V8011SL
MC16798-3	SM21 2540 B MOD.	17-DEC-12	HS			%SOL
MC16798-3	SW846 8260B	21-DEC-12 14:30	AMY			V8260SL +
MC16798-4 Collected: 10-DEC-12 00:00 By: WP      Received: 12-DEC-12 By: TRIP BLANK						
MC16798-4	SW846 8011	14-DEC-12 00:32	AP	13-DEC-12	BJ	V8011SL
MC16798-4	SW846 8260B	20-DEC-12 12:49	JP			V8260SL +
MC16798-5 Collected: 11-DEC-12 09:55 By: WP      Received: 12-DEC-12 By: VMP-48-13						
MC16798-5	SW846 8011	16-DEC-12 22:01	AP	14-DEC-12	BJ	V8011SL
MC16798-5	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16798-5	SW846 8260B	21-DEC-12 15:01	AMY			V8260SL +
MC16798-6 Collected: 11-DEC-12 10:00 By: WP      Received: 12-DEC-12 By: VMP-48-21						
MC16798-6	SW846 8011	16-DEC-12 22:25	AP	14-DEC-12	BJ	V8011SL
MC16798-6	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16798-6	SW846 8260B	21-DEC-12 18:02	AMY			V8260SL +

### Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16798

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562735.00015

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Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16798-7 Collected: 11-DEC-12 10:05 By: WP Received: 12-DEC-12 By: VMP-48-27						
MC16798-7	SW846 8011	16-DEC-12 22:50	AP	14-DEC-12	BJ	V8011SL
MC16798-7	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16798-7	SW846 8260B	21-DEC-12 18:32	AMY			V8260SL +
MC16798-8 Collected: 11-DEC-12 13:30 By: WP Received: 12-DEC-12 By: VMP-50-13						
MC16798-8	SW846 8011	16-DEC-12 23:14	AP	14-DEC-12	BJ	V8011SL
MC16798-8	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16798-8	SW846 8260B	21-DEC-12 19:02	AMY			V8260SL +
MC16798-9 Collected: 11-DEC-12 13:35 By: WP Received: 12-DEC-12 By: VMP-50-21						
MC16798-9	SW846 8011	16-DEC-12 23:39	AP	14-DEC-12	BJ	V8011SL
MC16798-9	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16798-9	SW846 8260B	17-DEC-12 20:05	GK			V8260SL +
MC16798-10 Collected: 11-DEC-12 13:35 By: WP Received: 12-DEC-12 By: VMP-50-21 DUP						
MC16798-10	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16798-10	SW846 8011	17-DEC-12 00:03	AP	14-DEC-12	BJ	V8011SL
MC16798-10	SW846 8260B	17-DEC-12 20:32	GK			V8260SL +
MC16798-11 Collected: 11-DEC-12 13:40 By: WP Received: 12-DEC-12 By: VMP-50-29						
MC16798-11	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16798-11	SW846 8011	17-DEC-12 00:28	AP	14-DEC-12	BJ	V8011SL
MC16798-11	SW846 8260B	21-DEC-12 19:32	AMY			V8260SL +

# SGS Accutest Internal Chain of Custody

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/12/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16798-1.1	Walk In Ref #9	Chris Cataldo	12/14/12 13:59	Retrieve from Storage
MC16798-1.1	Chris Cataldo	Walk In Ref #9	12/14/12 20:59	Return to Storage
MC16798-1.1	Walk In Ref #9	Hamid Siamak	12/17/12 08:00	Retrieve from Storage
MC16798-1.1	Hamid Siamak	Walk In Ref #9	12/17/12 14:19	Return to Storage
MC16798-1.1	Scott Parsick		02/13/13 11:51	Disposed
MC16798-1.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16798-1.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16798-1.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16798-1.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16798-1.2	Scott Parsick		02/13/13 11:51	Disposed
MC16798-1.4	VOC Ref #10	Gary Krasinski	12/13/12 14:37	Retrieve from Storage
MC16798-1.4	Gary Krasinski	VOC Ref #10	12/14/12 10:41	Return to Storage
MC16798-1.4	Scott Parsick		02/13/13 11:51	Disposed
MC16798-2.1	Walk In Ref #9	Chris Cataldo	12/14/12 13:59	Retrieve from Storage
MC16798-2.1	Chris Cataldo	Walk In Ref #9	12/14/12 20:59	Return to Storage
MC16798-2.1	Walk In Ref #9	Hamid Siamak	12/17/12 08:00	Retrieve from Storage
MC16798-2.1	Hamid Siamak	Walk In Ref #9	12/17/12 14:19	Return to Storage
MC16798-2.1	Scott Parsick		02/13/13 11:51	Disposed
MC16798-2.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16798-2.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16798-2.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16798-2.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16798-2.2	Scott Parsick		02/13/13 11:51	Disposed
MC16798-2.3	VOC Ref #10	Amy Min Yang	12/21/12 18:05	Retrieve from Storage
MC16798-2.3	Amy Min Yang	GCMSM	12/21/12 18:05	Load on Instrument
MC16798-2.3	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16798-2.3	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16798-2.3	Scott Parsick		02/13/13 11:51	Disposed
MC16798-2.4	VOC Ref #10	Gary Krasinski	12/13/12 14:37	Retrieve from Storage
MC16798-2.4	Gary Krasinski	VOC Ref #10	12/14/12 10:41	Return to Storage
MC16798-2.4	Scott Parsick		02/13/13 11:51	Disposed
MC16798-3.1	Walk In Ref #9	Chris Cataldo	12/14/12 13:59	Retrieve from Storage
MC16798-3.1	Chris Cataldo	Walk In Ref #9	12/14/12 20:59	Return to Storage
MC16798-3.1	Walk In Ref #9	Hamid Siamak	12/17/12 08:00	Retrieve from Storage
MC16798-3.1	Hamid Siamak	Walk In Ref #9	12/17/12 14:19	Return to Storage
MC16798-3.1	Scott Parsick		02/13/13 11:51	Disposed

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# SGS Accutest Internal Chain of Custody

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/12/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16798-3.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16798-3.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16798-3.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16798-3.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16798-3.2	Scott Parsick		02/13/13 11:51	Disposed
MC16798-3.4	VOC Ref #10	Gary Krasinski	12/13/12 14:37	Retrieve from Storage
MC16798-3.4	Gary Krasinski	VOC Ref #10	12/14/12 10:41	Return to Storage
MC16798-3.4	Scott Parsick		02/13/13 11:51	Disposed
MC16798-4.1	VOC Ref #3	Jugal Patel	12/20/12 11:28	Retrieve from Storage
MC16798-4.1	Jugal Patel	GCMSH	12/20/12 11:28	Load on Instrument
MC16798-4.1	GCMSH	Jugal Patel	12/21/12 13:18	Unload from Instrument
MC16798-4.1	Jugal Patel	VOC Ref #3	12/21/12 13:18	Return to Storage
MC16798-4.1	Scott Parsick		02/13/13 11:51	Disposed
MC16798-4.3	VOC Ref #3	Bijan Jafari	12/13/12 04:40	Retrieve from Storage
MC16798-4.3	Bijan Jafari		12/14/12 17:43	Depleted
MC16798-4.4	VOC Ref #3	Jugal Patel	12/20/12 11:06	Retrieve from Storage
MC16798-4.4	Jugal Patel	GCMSH	12/20/12 11:06	Load on Instrument
MC16798-4.4	GCMSH	Jugal Patel	12/20/12 11:13	Unload from Instrument
MC16798-4.4	Jugal Patel	VOC Ref #3	12/20/12 11:13	Return to Storage
MC16798-4.4	Scott Parsick		02/13/13 11:51	Disposed
MC16798-5.1	Walk In Ref #9	Chris Cataldo	12/14/12 13:59	Retrieve from Storage
MC16798-5.1	Chris Cataldo	Walk In Ref #9	12/14/12 20:59	Return to Storage
MC16798-5.1	Scott Parsick		02/13/13 11:51	Disposed
MC16798-5.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16798-5.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16798-5.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16798-5.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16798-5.2	Scott Parsick		02/13/13 11:51	Disposed
MC16798-5.4	VOC Ref #10	Jaime Maslowski	12/14/12 13:45	Retrieve from Storage
MC16798-5.4	Jaime Maslowski	VOC Ref #10	12/17/12 09:31	Return to Storage
MC16798-5.4	Scott Parsick		02/13/13 11:51	Disposed
MC16798-6.1	Walk In Ref #9	Chris Cataldo	12/14/12 13:59	Retrieve from Storage
MC16798-6.1	Chris Cataldo	Walk In Ref #9	12/14/12 20:59	Return to Storage
MC16798-6.1	Scott Parsick		02/13/13 11:51	Disposed
MC16798-6.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage

5.3  
5

# SGS Accutest Internal Chain of Custody

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/12/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16798-6.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16798-6.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16798-6.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16798-6.2	Scott Parsick		02/13/13 11:51	Disposed
MC16798-6.4	VOC Ref #10	Jaime Maslowski	12/14/12 13:45	Retrieve from Storage
MC16798-6.4	Jaime Maslowski	VOC Ref #10	12/17/12 09:31	Return to Storage
MC16798-6.4	Scott Parsick		02/13/13 11:51	Disposed
MC16798-7.1	Walk In Ref #9	Chris Cataldo	12/14/12 13:59	Retrieve from Storage
MC16798-7.1	Chris Cataldo	Walk In Ref #9	12/14/12 20:59	Return to Storage
MC16798-7.1	Scott Parsick		02/13/13 11:51	Disposed
MC16798-7.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16798-7.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16798-7.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16798-7.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16798-7.2	Scott Parsick		02/13/13 11:51	Disposed
MC16798-7.4	VOC Ref #10	Jaime Maslowski	12/14/12 13:45	Retrieve from Storage
MC16798-7.4	Jaime Maslowski	VOC Ref #10	12/17/12 09:31	Return to Storage
MC16798-7.4	Scott Parsick		02/13/13 11:51	Disposed
MC16798-8.1	Walk In Ref #9	Chris Cataldo	12/14/12 13:59	Retrieve from Storage
MC16798-8.1	Chris Cataldo	Walk In Ref #9	12/14/12 20:59	Return to Storage
MC16798-8.1	Scott Parsick		02/13/13 11:51	Disposed
MC16798-8.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16798-8.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16798-8.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16798-8.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16798-8.2	Scott Parsick		02/13/13 11:51	Disposed
MC16798-8.4	VOC Ref #10	Jaime Maslowski	12/14/12 13:45	Retrieve from Storage
MC16798-8.4	Jaime Maslowski	VOC Ref #10	12/17/12 09:31	Return to Storage
MC16798-8.4	Scott Parsick		02/13/13 11:51	Disposed
MC16798-9.1	Walk In Ref #9	Chris Cataldo	12/14/12 13:59	Retrieve from Storage
MC16798-9.1	Chris Cataldo	Walk In Ref #9	12/14/12 20:59	Return to Storage
MC16798-9.1	Scott Parsick		02/13/13 11:51	Disposed
MC16798-9.4	VOC Ref #10	Jaime Maslowski	12/14/12 13:45	Retrieve from Storage
MC16798-9.4	Jaime Maslowski	VOC Ref #10	12/17/12 09:31	Return to Storage
MC16798-9.4	VOC Ref #10	Gary Krasinski	12/17/12 10:29	Retrieve from Storage

5.3  
5

# SGS Accutest Internal Chain of Custody

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/12/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16798-9.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16798-9.4	Scott Parsick		02/13/13 11:51	Disposed
MC16798-10.1	Walk In Ref #9	Chris Cataldo	12/14/12 14:00	Retrieve from Storage
MC16798-10.1	Chris Cataldo	Walk In Ref #9	12/14/12 20:59	Return to Storage
MC16798-10.1	Scott Parsick		02/13/13 11:51	Disposed
MC16798-10.4	VOC Ref #10	Jaime Maslowski	12/14/12 13:45	Retrieve from Storage
MC16798-10.4	Jaime Maslowski	VOC Ref #10	12/17/12 09:31	Return to Storage
MC16798-10.4	VOC Ref #10	Gary Krasinski	12/17/12 10:29	Retrieve from Storage
MC16798-10.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16798-10.4	Scott Parsick		02/13/13 11:51	Disposed
MC16798-11.1	Walk In Ref #9	Chris Cataldo	12/14/12 14:00	Retrieve from Storage
MC16798-11.1	Chris Cataldo	Walk In Ref #9	12/14/12 20:59	Return to Storage
MC16798-11.1	Scott Parsick		02/13/13 11:51	Disposed
MC16798-11.3	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16798-11.3	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16798-11.3	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16798-11.3	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16798-11.3	Scott Parsick		02/13/13 11:51	Disposed
MC16798-11.4	VOC Ref #10	Jaime Maslowski	12/14/12 13:45	Retrieve from Storage
MC16798-11.4	Jaime Maslowski	VOC Ref #10	12/17/12 09:31	Return to Storage
MC16798-11.4	VOC Ref #10	Gary Krasinski	12/17/12 10:29	Retrieve from Storage
MC16798-11.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16798-11.4	Scott Parsick		02/13/13 11:51	Disposed

5.3  
5

## GC/MS Volatiles

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## QC Data Summaries

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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: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2162-MB	K65739.D	1	12/17/12	GK	n/a	n/a	MSK2162

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-9, MC16798-10

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

6.1.1  
6

# Method Blank Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2162-MB	K65739.D	1	12/17/12	GK	n/a	n/a	MSK2162

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-9, MC16798-10

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.1  
6

# Method Blank Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2162-MB	K65739.D	1	12/17/12	GK	n/a	n/a	MSK2162

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-9, MC16798-10

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	96% 70-130%
2037-26-5	Toluene-D8	97% 70-130%
460-00-4	4-Bromofluorobenzene	99% 70-130%

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

6.1.1  
6

# Method Blank Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1961-MB	H59388.D	1	12/20/12	JP	n/a	n/a	MSH1961

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-4

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	

# Method Blank Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1961-MB	H59388.D	1	12/20/12	JP	n/a	n/a	MSH1961

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-4

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	ug/l	

# Method Blank Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1961-MB	H59388.D	1	12/20/12	JP	n/a	n/a	MSH1961

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-4

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	100%	70-130%
2037-26-5	Toluene-D8	101%	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	

# Method Blank Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-MB	M53045.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-11

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

# Method Blank Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-MB	M53045.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-11

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

# Method Blank Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-MB	M53045.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples: Method: SW846 8260B

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-11

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	82% 70-130%
2037-26-5	Toluene-D8	88% 70-130%
460-00-4	4-Bromofluorobenzene	80% 70-130%

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

6.1.3  
6

# Blank Spike Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2162-BS	K65737.D	1	12/17/12	GK	n/a	n/a	MSK2162

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-9, MC16798-10

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	2500	1360	54* a	70-130
107-02-8	Acrolein	12500	ND	0* b	70-130
107-13-1	Acrylonitrile	2500	1830	73	70-130
71-43-2	Benzene	2500	2330	93	70-130
108-86-1	Bromobenzene	2500	2610	104	70-130
74-97-5	Bromochloromethane	2500	2200	88	70-130
75-27-4	Bromodichloromethane	2500	2490	100	70-130
75-25-2	Bromoform	2500	2780	111	70-130
74-83-9	Bromomethane	2500	2530	101	70-130
78-93-3	2-Butanone (MEK)	2500	1400	56* a	70-130
104-51-8	n-Butylbenzene	2500	2730	109	70-130
135-98-8	sec-Butylbenzene	2500	2840	114	70-130
98-06-6	tert-Butylbenzene	2500	2800	112	70-130
75-15-0	Carbon disulfide	2500	2380	95	70-130
56-23-5	Carbon tetrachloride	2500	2590	104	70-130
108-90-7	Chlorobenzene	2500	2930	117	70-130
75-00-3	Chloroethane	2500	2100	84	70-130
110-75-8	2-Chloroethyl vinyl ether	2500	1650	66	10-160
67-66-3	Chloroform	2500	2210	88	70-130
74-87-3	Chloromethane	2500	3100	124	70-130
95-49-8	o-Chlorotoluene	2500	2700	108	70-130
106-43-4	p-Chlorotoluene	2500	2850	114	70-130
124-48-1	Dibromochloromethane	2500	2940	118	70-130
95-50-1	1,2-Dichlorobenzene	2500	2880	115	70-130
541-73-1	1,3-Dichlorobenzene	2500	2870	115	70-130
106-46-7	1,4-Dichlorobenzene	2500	2570	103	70-130
75-71-8	Dichlorodifluoromethane	2500	3440	138* a	70-130
75-34-3	1,1-Dichloroethane	2500	2050	82	70-130
107-06-2	1,2-Dichloroethane	2500	2350	94	70-130
75-35-4	1,1-Dichloroethene	2500	2430	97	70-130
156-59-2	cis-1,2-Dichloroethene	2500	2140	86	70-130
156-60-5	trans-1,2-Dichloroethene	2500	2130	85	70-130
78-87-5	1,2-Dichloropropane	2500	2140	86	70-130
142-28-9	1,3-Dichloropropane	2500	2460	98	70-130
594-20-7	2,2-Dichloropropane	2500	2190	88	70-130
563-58-6	1,1-Dichloropropene	2500	2370	95	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2162-BS	K65737.D	1	12/17/12	GK	n/a	n/a	MSK2162

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-9, MC16798-10

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	2500	2240	90	70-130
10061-02-6	trans-1,3-Dichloropropene	2500	2410	96	70-130
123-91-1	1,4-Dioxane	12500	9080	73	70-130
97-63-2	Ethyl methacrylate	2500	2140	86	76-141
100-41-4	Ethylbenzene	2500	2760	110	70-130
87-68-3	Hexachlorobutadiene	2500	2600	104	70-130
591-78-6	2-Hexanone	2500	1990	80	70-130
98-82-8	Isopropylbenzene	2500	2870	115	70-130
99-87-6	p-Isopropyltoluene	2500	2810	112	70-130
1634-04-4	Methyl Tert Butyl Ether	2500	2070	83	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	1840	74	70-130
74-95-3	Methylene bromide	2500	2330	93	70-130
75-09-2	Methylene chloride	2500	2310	92	70-130
91-20-3	Naphthalene	2500	1680	67* a	70-130
103-65-1	n-Propylbenzene	2500	2760	110	70-130
100-42-5	Styrene	2500	2710	108	70-130
630-20-6	1,1,1,2-Tetrachloroethane	2500	2880	115	70-130
79-34-5	1,1,2,2-Tetrachloroethane	2500	2250	90	70-130
127-18-4	Tetrachloroethene	2500	2980	119	70-130
108-88-3	Toluene	2500	2410	96	70-130
87-61-6	1,2,3-Trichlorobenzene	2500	1580	63* a	70-130
120-82-1	1,2,4-Trichlorobenzene	2500	2090	84	70-130
71-55-6	1,1,1-Trichloroethane	2500	2300	92	70-130
79-00-5	1,1,2-Trichloroethane	2500	2210	88	70-130
79-01-6	Trichloroethene	2500	2470	99	70-130
75-69-4	Trichlorofluoromethane	2500	2390	96	70-130
96-18-4	1,2,3-Trichloropropane	2500	2260	90	70-130
95-63-6	1,2,4-Trimethylbenzene	2500	2650	106	70-130
108-67-8	1,3,5-Trimethylbenzene	2500	2570	103	70-130
108-05-4	Vinyl Acetate	2500	1720	69* a	70-130
75-01-4	Vinyl chloride	2500	2760	110	70-130
	m,p-Xylene	5000	5870	117	70-130
95-47-6	o-Xylene	2500	3060	122	70-130
1330-20-7	Xylene (total)	7500	8930	119	70-130

\* = Outside of Control Limits.

## Blank Spike Summary

Job Number: MC16798  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2162-BS	K65737.D	1	12/17/12	GK	n/a	n/a	MSK2162

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-9, MC16798-10

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	90%	70-130%
2037-26-5	Toluene-D8	98%	70-130%
460-00-4	4-Bromofluorobenzene	101%	70-130%

- (a) Outside control limits. Blank Spike meets program technical requirements.
- (b) Outside control limits due to standard degradation. Refer to Continuing Calibration.

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1961-BS	H59387.D	1	12/20/12	JP	n/a	n/a	MSH1961

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	50	58.0	116	70-130
107-02-8	Acrolein	250	109	44* a	70-130
107-13-1	Acrylonitrile	50	38.3	77	70-130
71-43-2	Benzene	50	46.4	93	70-130
108-86-1	Bromobenzene	50	50.0	100	70-130
74-97-5	Bromochloromethane	50	48.8	98	70-130
75-27-4	Bromodichloromethane	50	57.7	115	70-130
75-25-2	Bromoform	50	59.5	119	70-130
74-83-9	Bromomethane	50	47.9	96	70-130
78-93-3	2-Butanone (MEK)	50	49.3	99	70-130
104-51-8	n-Butylbenzene	50	52.5	105	70-130
135-98-8	sec-Butylbenzene	50	54.3	109	70-130
98-06-6	tert-Butylbenzene	50	55.6	111	70-130
75-15-0	Carbon disulfide	50	49.5	99	70-130
56-23-5	Carbon tetrachloride	50	65.6	131* a	70-130
108-90-7	Chlorobenzene	50	50.4	101	70-130
75-00-3	Chloroethane	50	46.9	94	70-130
110-75-8	2-Chloroethyl vinyl ether	50	58.5	117	70-130
67-66-3	Chloroform	50	54.0	108	70-130
74-87-3	Chloromethane	50	57.2	114	70-130
95-49-8	o-Chlorotoluene	50	53.4	107	70-130
106-43-4	p-Chlorotoluene	50	55.9	112	70-130
124-48-1	Dibromochloromethane	50	52.0	104	70-130
95-50-1	1,2-Dichlorobenzene	50	52.3	105	70-130
541-73-1	1,3-Dichlorobenzene	50	53.4	107	70-130
106-46-7	1,4-Dichlorobenzene	50	48.8	98	70-130
75-71-8	Dichlorodifluoromethane	50	65.6	131* a	70-130
75-34-3	1,1-Dichloroethane	50	50.4	101	70-130
107-06-2	1,2-Dichloroethane	50	54.8	110	70-130
75-35-4	1,1-Dichloroethene	50	50.9	102	70-130
156-59-2	cis-1,2-Dichloroethene	50	48.4	97	70-130
156-60-5	trans-1,2-Dichloroethene	50	48.5	97	70-130
78-87-5	1,2-Dichloropropane	50	46.0	92	70-130
142-28-9	1,3-Dichloropropane	50	46.3	93	70-130
594-20-7	2,2-Dichloropropane	50	68.0	136* a	70-130
563-58-6	1,1-Dichloropropene	50	51.7	103	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1961-BS	H59387.D	1	12/20/12	JP	n/a	n/a	MSH1961

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	48.7	97	70-130
10061-02-6	trans-1,3-Dichloropropene	50	54.6	109	70-130
123-91-1	1,4-Dioxane	250	214	86	70-130
97-63-2	Ethyl methacrylate	50	48.1	96	77-137
100-41-4	Ethylbenzene	50	50.1	100	70-130
87-68-3	Hexachlorobutadiene	50	50.0	100	70-130
591-78-6	2-Hexanone	50	48.9	98	70-130
98-82-8	Isopropylbenzene	50	54.3	109	70-130
99-87-6	p-Isopropyltoluene	50	51.5	103	70-130
1634-04-4	Methyl Tert Butyl Ether	50	49.9	100	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	42.6	85	70-130
74-95-3	Methylene bromide	50	47.8	96	70-130
75-09-2	Methylene chloride	50	47.9	96	70-130
91-20-3	Naphthalene	50	41.3	83	70-130
103-65-1	n-Propylbenzene	50	54.3	109	70-130
100-42-5	Styrene	50	52.2	104	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	62.9	126	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	47.1	94	70-130
127-18-4	Tetrachloroethene	50	49.6	99	70-130
108-88-3	Toluene	50	47.3	95	70-130
87-61-6	1,2,3-Trichlorobenzene	50	43.6	87	70-130
120-82-1	1,2,4-Trichlorobenzene	50	45.8	92	70-130
71-55-6	1,1,1-Trichloroethane	50	59.0	118	70-130
79-00-5	1,1,2-Trichloroethane	50	46.7	93	70-130
79-01-6	Trichloroethene	50	49.4	99	70-130
75-69-4	Trichlorofluoromethane	50	56.4	113	70-130
96-18-4	1,2,3-Trichloropropane	50	53.0	106	70-130
95-63-6	1,2,4-Trimethylbenzene	50	50.4	101	70-130
108-67-8	1,3,5-Trimethylbenzene	50	49.8	100	70-130
108-05-4	Vinyl Acetate	50	45.5	91	70-130
75-01-4	Vinyl chloride	50	52.2	104	70-130
	m,p-Xylene	100	102	102	70-130
95-47-6	o-Xylene	50	53.2	106	70-130
1330-20-7	Xylene (total)	150	156	104	70-130

\* = Outside of Control Limits.

## Blank Spike Summary

Job Number: MC16798  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1961-BS	H59387.D	1	12/20/12	JP	n/a	n/a	MSH1961

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-4

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	109%	70-130%
2037-26-5	Toluene-D8	99%	70-130%
460-00-4	4-Bromofluorobenzene	102%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-BS	M53043.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-11

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	50	37.5	75	70-130
107-02-8	Acrolein	250	118	47* a	70-130
107-13-1	Acrylonitrile	50	55.1	110	70-130
71-43-2	Benzene	50	50.9	102	70-130
108-86-1	Bromobenzene	50	47.4	95	70-130
74-97-5	Bromochloromethane	50	49.0	98	70-130
75-27-4	Bromodichloromethane	50	47.4	95	70-130
75-25-2	Bromoform	50	46.9	94	70-130
74-83-9	Bromomethane	50	55.4	111	70-130
78-93-3	2-Butanone (MEK)	50	52.0	104	70-130
104-51-8	n-Butylbenzene	50	54.1	108	70-130
135-98-8	sec-Butylbenzene	50	51.0	102	70-130
98-06-6	tert-Butylbenzene	50	49.7	99	70-130
75-15-0	Carbon disulfide	50	61.1	122	70-130
56-23-5	Carbon tetrachloride	50	56.9	114	70-130
108-90-7	Chlorobenzene	50	46.4	93	70-130
75-00-3	Chloroethane	50	58.4	117	70-130
110-75-8	2-Chloroethyl vinyl ether	50	50.3	101	10-160
67-66-3	Chloroform	50	50.2	100	70-130
74-87-3	Chloromethane	50	62.6	125	70-130
95-49-8	o-Chlorotoluene	50	46.9	94	70-130
106-43-4	p-Chlorotoluene	50	48.2	96	70-130
124-48-1	Dibromochloromethane	50	46.1	92	70-130
95-50-1	1,2-Dichlorobenzene	50	44.6	89	70-130
541-73-1	1,3-Dichlorobenzene	50	46.5	93	70-130
106-46-7	1,4-Dichlorobenzene	50	46.8	94	70-130
75-71-8	Dichlorodifluoromethane	50	63.6	127	70-130
75-34-3	1,1-Dichloroethane	50	53.7	107	70-130
107-06-2	1,2-Dichloroethane	50	48.7	97	70-130
75-35-4	1,1-Dichloroethene	50	59.9	120	70-130
156-59-2	cis-1,2-Dichloroethene	50	49.5	99	70-130
156-60-5	trans-1,2-Dichloroethene	50	54.4	109	70-130
78-87-5	1,2-Dichloropropane	50	47.7	95	70-130
142-28-9	1,3-Dichloropropane	50	47.9	96	70-130
594-20-7	2,2-Dichloropropane	50	56.0	112	70-130
563-58-6	1,1-Dichloropropene	50	57.1	114	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-BS	M53043.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-11

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	47.2	94	70-130
10061-02-6	trans-1,3-Dichloropropene	50	50.3	101	70-130
123-91-1	1,4-Dioxane	250	291	116	70-130
97-63-2	Ethyl methacrylate	50	54.8	110	76-141
100-41-4	Ethylbenzene	50	51.0	102	70-130
87-68-3	Hexachlorobutadiene	50	54.0	108	70-130
591-78-6	2-Hexanone	50	65.7	131* a	70-130
98-82-8	Isopropylbenzene	50	49.8	100	70-130
99-87-6	p-Isopropyltoluene	50	54.8	110	70-130
1634-04-4	Methyl Tert Butyl Ether	50	46.7	93	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	60.8	122	70-130
74-95-3	Methylene bromide	50	49.2	98	70-130
75-09-2	Methylene chloride	50	46.5	93	70-130
91-20-3	Naphthalene	50	61.1	122	70-130
103-65-1	n-Propylbenzene	50	49.6	99	70-130
100-42-5	Styrene	50	47.4	95	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	47.1	94	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	50.1	100	70-130
127-18-4	Tetrachloroethene	50	55.3	111	70-130
108-88-3	Toluene	50	53.3	107	70-130
87-61-6	1,2,3-Trichlorobenzene	50	49.9	100	70-130
120-82-1	1,2,4-Trichlorobenzene	50	50.3	101	70-130
71-55-6	1,1,1-Trichloroethane	50	55.5	111	70-130
79-00-5	1,1,2-Trichloroethane	50	48.1	96	70-130
79-01-6	Trichloroethene	50	53.7	107	70-130
75-69-4	Trichlorofluoromethane	50	62.8	126	70-130
96-18-4	1,2,3-Trichloropropane	50	53.3	107	70-130
95-63-6	1,2,4-Trimethylbenzene	50	49.6	99	70-130
108-67-8	1,3,5-Trimethylbenzene	50	50.3	101	70-130
108-05-4	Vinyl Acetate	50	41.8	84	70-130
75-01-4	Vinyl chloride	50	58.7	117	70-130
	m,p-Xylene	100	101	101	70-130
95-47-6	o-Xylene	50	48.4	97	70-130
1330-20-7	Xylene (total)	150	149	99	70-130

\* = Outside of Control Limits.

## Blank Spike Summary

Job Number: MC16798  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-BS	M53043.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-11

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	85%	70-130%
2037-26-5	Toluene-D8	89%	70-130%
460-00-4	4-Bromofluorobenzene	82%	70-130%

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

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16697-2MS	K65753.D	1	12/17/12	GK	n/a	n/a	MSK2162
MC16697-2MSD	K65754.D	1	12/17/12	GK	n/a	n/a	MSK2162
MC16697-2	K65744.D	1	12/17/12	GK	n/a	n/a	MSK2162

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-9, MC16798-10

CAS No.	Compound	MC16697-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	3200	2360	74	3200	2280	71	3	70-130/30
107-02-8	Acrolein	ND	16000	3190	20* a	16000	3360	21* a	5	70-130/30
107-13-1	Acrylonitrile	ND	3200	2350	73	3200	2290	71	3	70-130/30
71-43-2	Benzene	ND	3200	2900	91	3200	2900	91	0	70-130/30
108-86-1	Bromobenzene	ND	3200	3300	103	3200	3280	102	1	70-130/30
74-97-5	Bromochloromethane	ND	3200	2750	86	3200	2740	86	0	70-130/30
75-27-4	Bromodichloromethane	ND	3200	3040	95	3200	2990	93	2	70-130/30
75-25-2	Bromoform	ND	3200	3590	112	3200	3600	112	0	70-130/30
74-83-9	Bromomethane	ND	3200	2700	84	3200	2650	83	2	70-130/30
78-93-3	2-Butanone (MEK)	ND	3200	2580	81	3200	2480	77	4	70-130/30
104-51-8	n-Butylbenzene	ND	3200	3310	103	3200	3280	102	1	70-130/30
135-98-8	sec-Butylbenzene	ND	3200	3690	115	3200	3700	115	0	70-130/30
98-06-6	tert-Butylbenzene	ND	3200	3790	118	3200	3690	115	3	70-130/30
75-15-0	Carbon disulfide	ND	3200	2750	86	3200	2870	90	4	70-130/30
56-23-5	Carbon tetrachloride	ND	3200	3240	101	3200	3190	100	2	70-130/30
108-90-7	Chlorobenzene	ND	3200	3750	117	3200	3670	115	2	70-130/30
75-00-3	Chloroethane	ND	3200	2460	77	3200	2560	80	4	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	3200	2460	77	3200	2400	75	2	10-160/30
67-66-3	Chloroform	ND	3200	2760	86	3200	2720	85	1	70-130/30
74-87-3	Chloromethane	ND	3200	3260	102	3200	3180	99	2	70-130/30
95-49-8	o-Chlorotoluene	ND	3200	3640	114	3200	3600	112	1	70-130/30
106-43-4	p-Chlorotoluene	ND	3200	3630	113	3200	3600	112	1	70-130/30
124-48-1	Dibromochloromethane	ND	3200	3550	111	3200	3490	109	2	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	3200	3650	114	3200	3600	112	1	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	3200	3660	114	3200	3700	115	1	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	3200	3190	100	3200	3180	99	0	70-130/30
75-71-8	Dichlorodifluoromethane	ND	3200	3120	97	3200	3080	96	1	70-130/30
75-34-3	1,1-Dichloroethane	ND	3200	2640	82	3200	2550	80	3	70-130/30
107-06-2	1,2-Dichloroethane	ND	3200	2860	89	3200	2850	89	0	70-130/30
75-35-4	1,1-Dichloroethene	ND	3200	2780	87	3200	2770	86	0	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	3200	2700	84	3200	2690	84	0	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	3200	2710	85	3200	2750	86	1	70-130/30
78-87-5	1,2-Dichloropropane	ND	3200	2850	89	3200	2850	89	0	70-130/30
142-28-9	1,3-Dichloropropane	ND	3200	3130	98	3200	3110	97	1	70-130/30
594-20-7	2,2-Dichloropropane	ND	3200	2640	82	3200	2600	81	2	70-130/30
563-58-6	1,1-Dichloropropene	ND	3200	2970	93	3200	2940	92	1	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16697-2MS	K65753.D	1	12/17/12	GK	n/a	n/a	MSK2162
MC16697-2MSD	K65754.D	1	12/17/12	GK	n/a	n/a	MSK2162
MC16697-2	K65744.D	1	12/17/12	GK	n/a	n/a	MSK2162

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-9, MC16798-10

CAS No.	Compound	MC16697-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	3200	2960	92	3200	2970	93	0	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	3200	2950	92	3200	2910	91	1	70-130/30
123-91-1	1,4-Dioxane	ND	16000	17800	111	16000	18000	112	1	70-130/30
97-63-2	Ethyl methacrylate	ND	3200	2870	90	3200	2820	88	2	41-160/30
100-41-4	Ethylbenzene	ND	3200	3480	109	3200	3400	106	2	70-130/30
87-68-3	Hexachlorobutadiene	ND	3200	3360	105	3200	3360	105	0	70-130/30
591-78-6	2-Hexanone	ND	3200	2990	93	3200	2910	91	3	70-130/30
98-82-8	Isopropylbenzene	ND	3200	3740	117	3200	3680	115	2	70-130/30
99-87-6	p-Isopropyltoluene	ND	3200	3350	105	3200	3320	104	1	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	3200	2730	85	3200	2680	84	2	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	3200	2560	80	3200	2580	81	1	70-130/30
74-95-3	Methylene bromide	ND	3200	2890	90	3200	2950	92	2	70-130/30
75-09-2	Methylene chloride	ND	3200	2730	85	3200	2650	83	3	70-130/30
91-20-3	Naphthalene	ND	3200	3070	96	3200	3010	94	2	70-130/30
103-65-1	n-Propylbenzene	ND	3200	3700	115	3200	3650	114	1	70-130/30
100-42-5	Styrene	ND	3200	3440	107	3200	3340	104	3	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	3200	3590	112	3200	3580	112	0	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	3200	2980	93	3200	2900	91	3	70-130/30
127-18-4	Tetrachloroethene	ND	3200	3550	111	3200	3480	109	2	70-130/30
108-88-3	Toluene	ND	3200	3020	94	3200	2970	93	2	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	3200	2910	91	3200	2920	91	0	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	3200	3050	95	3200	3080	96	1	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	3200	2920	91	3200	2860	89	2	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	3200	2840	89	3200	2890	90	2	70-130/30
79-01-6	Trichloroethene	ND	3200	3030	95	3200	3010	94	1	70-130/30
75-69-4	Trichlorofluoromethane	ND	3200	2970	93	3200	2920	91	2	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	3200	2930	91	3200	2930	91	0	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	3200	3390	106	3200	3360	105	1	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	3200	3380	105	3200	3340	104	1	70-130/30
108-05-4	Vinyl Acetate	ND	3200	2430	76	3200	2390	75	2	70-130/30
75-01-4	Vinyl chloride	ND	3200	2860	89	3200	2750	86	4	70-130/30
	m,p-Xylene	ND	6410	7500	117	6410	7230	113	4	70-130/30
95-47-6	o-Xylene	ND	3200	3980	124	3200	3810	119	4	70-130/30
1330-20-7	Xylene (total)	ND	9610	11500	120	9610	11000	114	4	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16697-2MS	K65753.D	1	12/17/12	GK	n/a	n/a	MSK2162
MC16697-2MSD	K65754.D	1	12/17/12	GK	n/a	n/a	MSK2162
MC16697-2	K65744.D	1	12/17/12	GK	n/a	n/a	MSK2162

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-9, MC16798-10

CAS No.	Surrogate Recoveries	MS	MSD	MC16697-2	Limits
1868-53-7	Dibromofluoromethane	89%	88%	96%	70-130%
2037-26-5	Toluene-D8	96%	95%	98%	70-130%
460-00-4	4-Bromofluorobenzene	100%	100%	99%	70-130%

(a) Outside control limits due to standard degradation. Refer to Continuing Calibration.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16752-3MS	H59405.D	1	12/20/12	JP	n/a	n/a	MSH1961
MC16752-3MSD	H59406.D	1	12/20/12	JP	n/a	n/a	MSH1961
MC16752-3	H59396.D	1	12/20/12	JP	n/a	n/a	MSH1961

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-4

CAS No.	Compound	MC16752-3 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	50	41.1	82	50	40.3	81	2	70-130/30
107-02-8	Acrolein	ND	250	94.3	38* a	250	95.1	38* a	1	70-130/30
107-13-1	Acrylonitrile	ND	50	35.9	72	50	37.0	74	3	70-130/30
71-43-2	Benzene	97.1	50	136	78	50	134	74	1	70-130/30
108-86-1	Bromobenzene	ND	50	51.0	102	50	50.5	101	1	70-130/30
74-97-5	Bromochloromethane	ND	50	50.1	100	50	49.7	99	1	70-130/30
75-27-4	Bromodichloromethane	ND	50	59.5	119	50	56.1	112	6	70-130/30
75-25-2	Bromoform	ND	50	56.6	113	50	54.3	109	4	70-130/30
74-83-9	Bromomethane	ND	50	46.9	94	50	47.4	95	1	70-130/30
78-93-3	2-Butanone (MEK)	ND	50	42.3	85	50	42.2	84	0	70-130/30
104-51-8	n-Butylbenzene	ND	50	55.0	110	50	54.1	108	2	70-130/30
135-98-8	sec-Butylbenzene	ND	50	55.3	111	50	53.7	107	3	70-130/30
98-06-6	tert-Butylbenzene	ND	50	59.3	119	50	57.7	115	3	70-130/30
75-15-0	Carbon disulfide	ND	50	43.6	87	50	43.5	87	0	70-130/30
56-23-5	Carbon tetrachloride	ND	50	72.8	146* a	50	65.8	132* a	10	70-130/30
108-90-7	Chlorobenzene	ND	50	51.0	102	50	50.3	101	1	70-130/30
75-00-3	Chloroethane	4.3	50	50.2	92	50	50.3	92	0	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	50	15.2	30* a	50	15.5	31* a	2	70-130/30
67-66-3	Chloroform	ND	50	56.4	113	50	55.2	110	2	70-130/30
74-87-3	Chloromethane	ND	50	56.4	113	50	57.3	115	2	70-130/30
95-49-8	o-Chlorotoluene	ND	50	54.7	109	50	53.4	107	2	70-130/30
106-43-4	p-Chlorotoluene	ND	50	57.2	114	50	55.5	111	3	70-130/30
124-48-1	Dibromochloromethane	ND	50	50.4	101	50	48.8	98	3	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	50	55.8	112	50	54.8	110	2	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	50	55.0	110	50	54.6	109	1	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	50	50.3	101	50	49.0	98	3	70-130/30
75-71-8	Dichlorodifluoromethane	ND	50	69.0	138* a	50	65.2	130	6	70-130/30
75-34-3	1,1-Dichloroethane	26.1	50	73.5	95	50	74.3	96	1	70-130/30
107-06-2	1,2-Dichloroethane	ND	50	59.0	118	50	54.5	109	8	70-130/30
75-35-4	1,1-Dichloroethene	ND	50	51.2	102	50	51.2	102	0	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	50	49.0	98	50	48.8	98	0	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	50	47.4	95	50	47.4	95	0	70-130/30
78-87-5	1,2-Dichloropropane	ND	50	45.8	92	50	46.0	92	0	70-130/30
142-28-9	1,3-Dichloropropane	ND	50	46.3	93	50	45.1	90	3	70-130/30
594-20-7	2,2-Dichloropropane	ND	50	70.1	140* a	50	66.0	132* a	6	70-130/30
563-58-6	1,1-Dichloropropene	ND	50	53.6	107	50	51.4	103	4	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16752-3MS	H59405.D	1	12/20/12	JP	n/a	n/a	MSH1961
MC16752-3MSD	H59406.D	1	12/20/12	JP	n/a	n/a	MSH1961
MC16752-3	H59396.D	1	12/20/12	JP	n/a	n/a	MSH1961

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-4

CAS No.	Compound	MC16752-3 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	50	49.2	98	50	47.8	96	3	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	50	54.7	109	50	53.5	107	2	70-130/30
123-91-1	1,4-Dioxane	ND	250	203	81	250	200	80	1	70-130/30
97-63-2	Ethyl methacrylate	ND	50	49.2	98	50	48.3	97	2	72-139/30
100-41-4	Ethylbenzene	105	50	132	54* b	50	130	50* b	2	70-130/30
87-68-3	Hexachlorobutadiene	ND	50	53.7	107	50	51.3	103	5	70-130/30
591-78-6	2-Hexanone	ND	50	46.5	93	50	46.9	94	1	70-130/30
98-82-8	Isopropylbenzene	44.2	50	93.4	98	50	91.9	95	2	70-130/30
99-87-6	p-Isopropyltoluene	ND	50	52.5	105	50	50.8	102	3	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	50	50.3	101	50	50.5	101	0	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	50	44.3	89	50	44.5	89	0	70-130/30
74-95-3	Methylene bromide	ND	50	50.8	102	50	48.6	97	4	70-130/30
75-09-2	Methylene chloride	ND	50	47.4	95	50	48.7	97	3	70-130/30
91-20-3	Naphthalene	11.0	50	58.6	95	50	58.0	94	1	70-130/30
103-65-1	n-Propylbenzene	9.2	50	62.9	107	50	62.0	106	1	70-130/30
100-42-5	Styrene	ND	50	37.6	75	50	36.9	74	2	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	63.3	127	50	60.6	121	4	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	47.1	94	50	47.7	95	1	70-130/30
127-18-4	Tetrachloroethene	ND	50	49.6	99	50	48.6	97	2	70-130/30
108-88-3	Toluene	7.1	50	55.4	97	50	53.6	93	3	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	50	48.5	97	50	47.8	96	1	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	50	52.4	105	50	50.6	101	3	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	50	63.0	126	50	59.6	119	6	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	50	48.1	96	50	47.1	94	2	70-130/30
79-01-6	Trichloroethene	ND	50	51.5	103	50	49.7	99	4	70-130/30
75-69-4	Trichlorofluoromethane	ND	50	61.4	123	50	56.8	114	8	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	50	50.5	101	50	50.4	101	0	70-130/30
95-63-6	1,2,4-Trimethylbenzene	1.9	J 50	48.4	93	50	47.3	91	2	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	50	46.3	93	50	45.5	91	2	70-130/30
108-05-4	Vinyl Acetate	ND	50	40.8	82	50	42.2	84	3	70-130/30
75-01-4	Vinyl chloride	3.7	50	54.8	102	50	54.4	101	1	70-130/30
	m,p-Xylene	8.7	100	105	96	100	102	93	3	70-130/30
95-47-6	o-Xylene	35.0	50	81.3	93	50	79.2	88	3	70-130/30
1330-20-7	Xylene (total)	43.7	150	187	96	150	182	92	3	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16752-3MS	H59405.D	1	12/20/12	JP	n/a	n/a	MSH1961
MC16752-3MSD	H59406.D	1	12/20/12	JP	n/a	n/a	MSH1961
MC16752-3	H59396.D	1	12/20/12	JP	n/a	n/a	MSH1961

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-4

CAS No.	Surrogate Recoveries	MS	MSD	MC16752-3	Limits
1868-53-7	Dibromofluoromethane	108%	109%	103%	70-130%
2037-26-5	Toluene-D8	99%	98%	94%	70-130%
460-00-4	4-Bromofluorobenzene	102%	101%	106%	70-130%

- (a) Outside control limits due to possible matrix interference. Refer to Blank Spike.
- (b) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16889-1MS	M53064.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1MSD	M53065.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1	M53059.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-11

CAS No.	Compound	MC16889-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	52.8	40.1	76	50.9	78.5	154* a	65* b	70-130/30
107-02-8	Acrolein	ND	264	52.8	20* a	254	59.6	23* a	12	70-130/30
107-13-1	Acrylonitrile	ND	52.8	22.2	42* a	50.9	41.5	82	61* b	70-130/30
71-43-2	Benzene	ND	52.8	13.5	26* a	50.9	34.9	69* a	88* b	70-130/30
108-86-1	Bromobenzene	ND	52.8	7.5	14* a	50.9	26.9	53* a	113* b	70-130/30
74-97-5	Bromochloromethane	ND	52.8	20.1	38* a	50.9	37.3	73	60* b	70-130/30
75-27-4	Bromodichloromethane	ND	52.8	15.4	29* a	50.9	34.8	68* a	77* b	70-130/30
75-25-2	Bromoform	ND	52.8	15.4	29* a	50.9	33.1	65* a	73* b	70-130/30
74-83-9	Bromomethane	ND	52.8	21.6	41* a	50.9	44.4	87	69* b	70-130/30
78-93-3	2-Butanone (MEK)	ND	52.8	22.3	42* a	50.9	45.0	88	67* b	70-130/30
104-51-8	n-Butylbenzene	ND	52.8	2.7	5* a	50.9	24.0	47* a	160* b	70-130/30
135-98-8	sec-Butylbenzene	ND	52.8	2.8	5* a	50.9	23.7	47* a	158* b	70-130/30
98-06-6	tert-Butylbenzene	ND	52.8	2.9	5* a	50.9	23.0	45* a	155* b	70-130/30
75-15-0	Carbon disulfide	ND	52.8	19.5	37* a	50.9	44.4	87	78* b	70-130/30
56-23-5	Carbon tetrachloride	ND	52.8	10	19* a	50.9	35.6	70	112* b	70-130/30
108-90-7	Chlorobenzene	ND	52.8	8.7	16* a	50.9	28.4	56* a	106* b	70-130/30
75-00-3	Chloroethane	ND	52.8	20.5	39* a	50.9	45.4	89	76* b	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	52.8	ND	0* a	50.9	ND	0* a	nc	10-160/30
67-66-3	Chloroform	ND	52.8	16.1	31* a	50.9	35.6	70	75* b	70-130/30
74-87-3	Chloromethane	ND	52.8	23.4	44* a	50.9	47.7	94	68* b	70-130/30
95-49-8	o-Chlorotoluene	ND	52.8	4.5	9* a	50.9	23.4	46* a	135* b	70-130/30
106-43-4	p-Chlorotoluene	ND	52.8	4.6	9* a	50.9	24.1	47* a	136* b	70-130/30
124-48-1	Dibromochloromethane	ND	52.8	15.7	30* a	50.9	33.3	65* a	72* b	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	52.8	4.8	9* a	50.9	22.7	45* a	130* b	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	52.8	4.5	9* a	50.9	23.3	46* a	135* b	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	52.8	4.7	9* a	50.9	23.5	46* a	133* b	70-130/30
75-71-8	Dichlorodifluoromethane	ND	52.8	15.0	28* a	50.9	43.2	85	97* b	70-130/30
75-34-3	1,1-Dichloroethane	ND	52.8	16.5	31* a	50.9	37.5	74	78* b	70-130/30
107-06-2	1,2-Dichloroethane	ND	52.8	18.8	36* a	50.9	36.1	71	63* b	70-130/30
75-35-4	1,1-Dichloroethene	ND	52.8	17.8	34* a	50.9	44.0	86	85* b	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	52.8	16.6	31* a	50.9	35.5	70	73* b	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	52.8	17.4	33* a	50.9	39.6	78	78* b	70-130/30
78-87-5	1,2-Dichloropropane	ND	52.8	13.9	26* a	50.9	33.0	65* a	81* b	70-130/30
142-28-9	1,3-Dichloropropane	ND	52.8	15.6	30* a	50.9	33.2	65* a	72* b	70-130/30
594-20-7	2,2-Dichloropropane	ND	52.8	11.9	23* a	50.9	37.1	73	103* b	70-130/30
563-58-6	1,1-Dichloropropene	ND	52.8	11.6	22* a	50.9	36.4	72	103* b	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16889-1MS	M53064.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1MSD	M53065.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1	M53059.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-11

CAS No.	Compound	MC16889-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
10061-01-5	cis-1,3-Dichloropropene	ND		52.8	14.0	27* a	50.9	31.5	62* a	77* b	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		52.8	15.9	30* a	50.9	34.0	67* a	73* b	70-130/30
123-91-1	1,4-Dioxane	ND		264	90.9	34* a	254	290	114	105* b	70-130/30
97-63-2	Ethyl methacrylate	ND		52.8	14.8	28* a	50.9	33.3	65	77* b	41-160/30
100-41-4	Ethylbenzene	ND		52.8	5.8	11* a	50.9	28.2	55* a	132* b	70-130/30
87-68-3	Hexachlorobutadiene	ND		52.8	2.6	5* a	50.9	24.4	48* a	161* b	70-130/30
591-78-6	2-Hexanone	ND		52.8	18.7	35* a	50.9	40.2	79	73* b	70-130/30
98-82-8	Isopropylbenzene	ND		52.8	3.6	7* a	50.9	23.6	46* a	147* b	70-130/30
99-87-6	p-Isopropyltoluene	ND		52.8	2.9	5* a	50.9	25.4	50* a	159* b	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		52.8	15.4	29* a	50.9	29.3	58* a	62* b	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		52.8	19.5	37* a	50.9	40.7	80	70* b	70-130/30
74-95-3	Methylene bromide	ND		52.8	19.7	37* a	50.9	37.2	73	62* b	70-130/30
75-09-2	Methylene chloride	ND		52.8	18.8	36* a	50.9	36.2	71	63* b	70-130/30
91-20-3	Naphthalene	16.5		52.8	3.9	-24* a	50.9	17.4	2* a	127* b	70-130/30
103-65-1	n-Propylbenzene	ND		52.8	3.4	6* a	50.9	23.9	47* a	150* b	70-130/30
100-42-5	Styrene	ND		52.8	ND	0* a	50.9	3.1	6* a	200* b	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		52.8	9.5	18* a	50.9	30.1	59* a	104* b	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		52.8	14.7	28* a	50.9	34.5	68* a	80* b	70-130/30
127-18-4	Tetrachloroethene	ND		52.8	6.6	13* a	50.9	31.1	61* a	130* b	70-130/30
108-88-3	Toluene	1.3	J	52.8	10.3	17* a	50.9	33.4	63* a	106* b	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		52.8	3.1	6* a	50.9	19.6	39* a	145* b	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		52.8	3.1	6* a	50.9	19.1	38* a	144* b	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		52.8	11.7	22* a	50.9	35.9	71	102* b	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		52.8	16.1	31* a	50.9	33.9	67* a	71* b	70-130/30
79-01-6	Trichloroethene	ND		52.8	12.3	23* a	50.9	34.6	68* a	95* b	70-130/30
75-69-4	Trichlorofluoromethane	ND		52.8	14.1	27* a	50.9	42.1	83	100* b	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		52.8	14.9	28* a	50.9	34.5	68* a	79* b	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND		52.8	2.7	5* a	50.9	21.7	43* a	156* b	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		52.8	4.0	8* a	50.9	25.8	51* a	146* b	70-130/30
108-05-4	Vinyl Acetate	ND		52.8	6.7	13* a	50.9	16.6	33* a	85* b	70-130/30
75-01-4	Vinyl chloride	ND		52.8	21.0	40* a	50.9	42.9	84	69* b	70-130/30
	m,p-Xylene	2.3	J	106	11.3	9* a	102	54.0	51* a	131* b	70-130/30
95-47-6	o-Xylene	ND		52.8	5.7	11* a	50.9	26.0	51* a	128* b	70-130/30
1330-20-7	Xylene (total)	2.3	J	158	17.0	9* a	153	80.0	51* a	130* b	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16889-1MS	M53064.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1MSD	M53065.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1	M53059.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-11

CAS No.	Surrogate Recoveries	MS	MSD	MC16889-1	Limits
1868-53-7	Dibromofluoromethane	85%	83%	79%	70-130%
2037-26-5	Toluene-D8	88%	88%	90%	70-130%
460-00-4	4-Bromofluorobenzene	80%	82%	83%	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: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSH1961-CC1910	Injection Date:	12/20/12
Lab File ID:	H59386.D	Injection Time:	10:08
Instrument ID:	GCMSH	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	209170	8.70	302978	9.57	138999	12.83	165510	15.39	44134	6.27
Upper Limit <sup>a</sup>	418340	9.20	605956	10.07	277998	13.33	331020	15.89	88268	6.77
Lower Limit <sup>b</sup>	104585	8.20	151489	9.07	69500	12.33	82755	14.89	22067	5.77

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSH1961-BS	209415	8.70	305344	9.57	138721	12.83	164139	15.40	43072	6.27
MSH1961-MB	192306	8.70	265966	9.57	116693	12.83	135336	15.40	39193	6.27
ZZZZZZ	181898	8.71	254446	9.57	110631	12.83	126232	15.40	32539	6.28
ZZZZZZ	174614	8.70	241188	9.57	105293	12.83	123329	15.40	33698	6.28
ZZZZZZ	182552	8.70	252435	9.57	110304	12.83	125912	15.40	35972	6.28
MC16798-4	174920	8.70	239815	9.57	106082	12.83	121518	15.40	32158	6.28
ZZZZZZ	181740	8.70	247121	9.57	107102	12.83	127483	15.40	37865	6.28
ZZZZZZ	168225	8.70	234450	9.57	102244	12.83	116362	15.40	33903	6.28
ZZZZZZ	167513	8.71	234668	9.57	102777	12.83	119682	15.40	33014	6.28
MC16752-3	167800	8.71	250606	9.57	106861	12.83	138480	15.40	33223	6.28
ZZZZZZ	193755	8.70	260218	9.57	110290	12.83	130996	15.40	37814	6.28
MC16782-1	181867	8.70	249661	9.57	110592	12.83	127718	15.40	37152	6.28
ZZZZZZ	170045	8.70	238146	9.58	103754	12.83	119707	15.40	35856	6.28
ZZZZZZ	173842	8.70	240972	9.57	105289	12.83	122250	15.40	34758	6.29
ZZZZZZ	169531	8.71	231620	9.57	103129	12.83	119477	15.40	33801	6.28
ZZZZZZ	164860	8.70	231181	9.57	100785	12.83	116349	15.40	33564	6.27
ZZZZZZ	163387	8.71	230948	9.57	101972	12.83	117937	15.40	37024	6.29
ZZZZZZ	163804	8.71	225993	9.57	100693	12.83	118069	15.40	35364	6.28
MC16752-3MS	182107	8.70	259219	9.57	122877	12.83	146662	15.40	35604	6.26
MC16752-3MSD	203320	8.70	296748	9.57	137661	12.83	160842	15.40	42701	6.27
MC16782-1MS	218488	8.70	317487	9.57	144466	12.83	170179	15.39	44206	6.28
MC16782-1MSD	221500	8.70	321336	9.57	145890	12.83	171049	15.40	46367	6.27
ZZZZZZ	204295	8.70	289000	9.57	123586	12.83	145583	15.40	42590	6.28
ZZZZZZ	199736	8.71	279696	9.57	121224	12.83	140183	15.40	41636	6.28

- 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.

6.4.1  
6

# Volatile Internal Standard Area Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1801-CC1800	Injection Date:	12/21/12
Lab File ID:	M53043.D	Injection Time:	11:58
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1	IS 2	IS 3	IS 4	IS 5					
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	181618	9.36	253844	10.24	128665	13.52	146551	16.08	99307	6.86
Upper Limit <sup>a</sup>	363236	9.86	507688	10.74	257330	14.02	293102	16.58	198614	7.36
Lower Limit <sup>b</sup>	90809	8.86	126922	9.74	64333	13.02	73276	15.58	49654	6.36

Lab	IS 1	IS 2	IS 3	IS 4	IS 5					
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSM1801-BS	181618	9.36	253844	10.24	128665	13.52	146551	16.08	99307	6.86
MSM1801-MB	194908	9.36	266632	10.24	128589	13.52	151743	16.09	49991	6.86
MC16798-1	194294	9.36	267691	10.24	129377	13.52	151188	16.09	91038	6.86
MC16798-3	190628	9.36	261158	10.24	127423	13.52	147811	16.08	80958	6.85
MC16798-5	185568	9.36	253135	10.24	123892	13.52	143566	16.09	79703	6.85
ZZZZZZ	187170	9.36	258983	10.24	126389	13.52	150640	16.09	84223	6.85
ZZZZZZ	196284	9.36	268861	10.24	129804	13.52	157775	16.09	89360	6.86
ZZZZZZ	194273	9.36	268581	10.24	129253	13.52	156324	16.09	80746	6.86
ZZZZZZ	183563	9.36	252072	10.24	117978	13.52	122212	16.09	85614	6.85
ZZZZZZ	192938	9.36	261549	10.24	122456	13.52	128865	16.09	95380	6.86
MC16798-6	185650	9.36	253092	10.24	122823	13.52	142623	16.08	83649	6.86
MC16798-7	172892	9.36	233303	10.24	116066	13.52	131517	16.09	76745	6.85
MC16798-8	176885	9.36	241780	10.24	117110	13.52	137019	16.09	86646	6.86
MC16798-11	172805	9.36	238765	10.24	117819	13.52	134295	16.09	69790	6.86
MC16889-1	41026 <sup>c</sup>	9.36	53912 <sup>c</sup>	10.24	26823 <sup>c</sup>	13.52	31127 <sup>c</sup>	16.09	13531 <sup>c</sup>	6.86
ZZZZZZ	170809	9.36	231956	10.24	111955	13.52	129024	16.08	59943	6.85
ZZZZZZ	181721	9.36	248542	10.24	122962	13.52	141525	16.08	68958	6.86
ZZZZZZ	184822	9.36	253011	10.24	124220	13.52	142639	16.08	78363	6.86
MC16798-2	169863	9.36	233433	10.24	112955	13.52	131826	16.08	68539	6.85
MC16889-1MS	178686	9.36	244443	10.24	120161	13.52	145251	16.08	76253	6.86
MC16889-1MSD	87005 <sup>c</sup>	9.36	118165 <sup>c</sup>	10.24	58978 <sup>c</sup>	13.52	69356 <sup>c</sup>	16.08	33238 <sup>c</sup>	6.86

- 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.
- (c) Outside control limits due to possible matrix interference. Confirmed by MS/MSD.

6.4.2  
6

# Volatile Surrogate Recovery Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16798-4	H59392.D	101	99	106
MC16752-3MS	H59405.D	108	99	102
MC16752-3MSD	H59406.D	109	98	101
MSH1961-BS	H59387.D	109	99	102
MSH1961-MB	H59388.D	100	101	105

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

6.5.1  
**6**

# Volatile Surrogate Recovery Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16798-1	M53046.D	84	87	83
MC16798-2	M53063.D	82	87	83
MC16798-3	M53048.D	82	88	83
MC16798-5	M53049.D	82	88	83
MC16798-6	M53055.D	82	88	84
MC16798-7	M53056.D	80	88	83
MC16798-8	M53057.D	83	88	83
MC16798-9	K65759.D	94	96	110
MC16798-10	K65760.D	94	94	113
MC16798-11	M53058.D	82	88	82
MC16697-2MS	K65753.D	89	96	100
MC16697-2MSD	K65754.D	88	95	100
MC16889-1MS	M53064.D	85	88	80
MC16889-1MSD	M53065.D	83	88	82
MSK2162-BS	K65737.D	90	98	101
MSK2162-MB	K65739.D	96	97	99
MSM1801-BS	M53043.D	85	89	82
MSM1801-MB	M53045.D	82	88	80

Surrogate Compounds	Recovery Limits
---------------------	-----------------

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

6.5.2  
6

**GC Volatiles**

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**QC Data Summaries****7**

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**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: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-MB	BK19937.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16798-4

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Limits	
460-00-4	Bromofluorobenzene (S)	100%	36-173%
460-00-4	Bromofluorobenzene (S)	95%	36-173%

7.1.1

7

# Method Blank Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31434-MB	BK20055.D	1	12/16/12	AP	12/14/12	OP31434	GBK720

The QC reported here applies to the following samples:

Method: SW846 8011

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-9, MC16798-10, MC16798-11

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.4	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.4	0.94	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	150% 61-167%
460-00-4	Bromofluorobenzene (S)	148% 61-167%

7.1.2  
7

# Blank Spike Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-BS	BK19938.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16798-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.067	94	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)	104%	36-173%
460-00-4	Bromofluorobenzene (S)	96%	36-173%

7.2.1  
7

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31434-BS	BK20056.D	1	12/16/12	AP	12/14/12	OP31434	GBK720

The QC reported here applies to the following samples:

Method: SW846 8011

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-9, MC16798-10, MC16798-11

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	33	46.0	139	59-142
106-93-4	1,2-Dibromoethane	33	43.8	133	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	142%	61-167%
460-00-4	Bromofluorobenzene (S)	143%	61-167%

7.2.2  
7

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31406-MS	BK19941.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
OP31406-MSD	BK19942.D	1	12/13/12	AP	12/13/12	OP31406	GBK716
MC16600-6	BK19943.D	1	12/13/12	AP	12/13/12	OP31406	GBK716

The QC reported here applies to the following samples:

Method: SW846 8011

MC16798-4

CAS No.	Compound	MC16600-6 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.071	0.066	93	0.071	0.064	90	3	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.071	0.072	101	0.071	0.067	94	7	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16600-6	Limits
460-00-4	Bromofluorobenzene (S)	110%	108%	107%	36-173%
460-00-4	Bromofluorobenzene (S)	100%	100%	99%	36-173%

\* = Outside of Control Limits.

7.3.1  
7

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31434-MS	BK20057.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
OP31434-MSD	BK20058.D	1	12/16/12	AP	12/14/12	OP31434	GBK720
MC16644-1	BK20059.D	1	12/16/12	AP	12/14/12	OP31434	GBK720

The QC reported here applies to the following samples:

Method: SW846 8011

MC16798-1, MC16798-2, MC16798-3, MC16798-5, MC16798-6, MC16798-7, MC16798-8, MC16798-9, MC16798-10, MC16798-11

7.3.2  
7

CAS No.	Compound	MC16644-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	1	116	116	98	113	115	3	40-156/27
106-93-4	1,2-Dibromoethane	ND	1	132	132	98	128	131	2	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16644-1	Limits
460-00-4	Bromofluorobenzene (S)	130%	130%	156%	61-167%
460-00-4	Bromofluorobenzene (S)	124%	128%	166%	61-167%

\* = Outside of Control Limits.

# Volatile Surrogate Recovery Summary

Job Number: MC16798  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16798-4	BK19948.D	116	102
OP31406-BS	BK19938.D	104	96
OP31406-MB	BK19937.D	100	95
OP31406-MS	BK19941.D	110	100
OP31406-MSD	BK19942.D	108	100

Surrogate Compounds	Recovery Limits
---------------------	-----------------

S1 = Bromofluorobenzene (S)	36-173%
-----------------------------	---------

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

7.4.1

7

# Volatile Surrogate Recovery Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16798-1	BK20063.D	131	142
MC16798-2	BK20064.D	131	140
MC16798-3	BK20066.D	135	143
MC16798-5	BK20067.D	138	139
MC16798-6	BK20068.D	135	137
MC16798-7	BK20069.D	145	149
MC16798-8	BK20070.D	146	148
MC16798-9	BK20071.D	137	216* <sup>c</sup>
MC16798-10	BK20072.D	130	156
MC16798-11	BK20073.D	130	134
OP31434-BS	BK20056.D	142	143
OP31434-MB	BK20055.D	150	148
OP31434-MS	BK20057.D	130	124
OP31434-MSD	BK20058.D	130	128

Surrogate Compounds	Recovery Limits
---------------------	-----------------

S1 = Bromofluorobenzene (S)	61-167%
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- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1
- (c) Outside control limits due to possible matrix interference.

7.4.2  
7

# GC Surrogate Retention Time Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK716-ICC716	Injection Date:	12/13/12
Lab File ID:	BK19932.D	Injection Time:	18:03
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.52	4.85
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
ZZZZZZ	BK19935A.D	12/13/12	19:16	4.52	4.85
ZZZZZZ	BK19935B.D	12/13/12	19:16	4.52	4.85
OP31405-MB	BK19937A.D	12/13/12	20:04	4.52	4.85
OP31406-MB	BK19937.D	12/13/12	20:04	4.52	4.85
OP31406-BS	BK19938.D	12/13/12	20:28	4.52	4.85
OP31405-BS	BK19938A.D	12/13/12	20:28	4.52	4.85
OP31405-BSD	BK19939.D	12/13/12	20:52	4.52	4.85
ZZZZZZ	BK19940.D	12/13/12	21:17	4.52	4.85
OP31406-MS	BK19941.D	12/13/12	21:41	4.52	4.85
OP31406-MSD	BK19942.D	12/13/12	22:06	4.52	4.85
MC16600-6	BK19943.D	12/13/12	22:30	4.52	4.85
ZZZZZZ	BK19944.D	12/13/12	22:55	4.52	4.85
ZZZZZZ	BK19945.D	12/13/12	23:19	4.52	4.85
ZZZZZZ	BK19946.D	12/13/12	23:43	4.52	4.85

**Surrogate Compounds**

S1 = Bromofluorobenzene (S)

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

7.5.1  
7

# GC Surrogate Retention Time Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK716-CC716	Injection Date:	12/14/12
Lab File ID:	BK19947.D	Injection Time:	00:08
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.52	4.85
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
MC16798-4	BK19948.D	12/14/12	00:32	4.52	4.85
ZZZZZZ	BK19949.D	12/14/12	00:56	4.52	4.85
GBK716-ECC716	BK19953.D	12/14/12	02:34	4.52	4.85

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.2  
7

# GC Surrogate Retention Time Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK720-ICC720	Injection Date:	12/16/12
Lab File ID:	BK20049.D	Injection Time:	14:38
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.45	4.78
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP31434-MB	BK20055.D	12/16/12	17:05	4.45	4.78
OP31434-BS	BK20056.D	12/16/12	17:29	4.45	4.78
OP31434-MS	BK20057.D	12/16/12	17:54	4.45	4.78
OP31434-MSD	BK20058.D	12/16/12	18:19	4.45	4.78
MC16644-1	BK20059.D	12/16/12	18:43	4.45	4.78
ZZZZZZ	BK20060.D	12/16/12	19:08	4.45	4.78
ZZZZZZ	BK20061.D	12/16/12	19:33	4.45	4.78
ZZZZZZ	BK20062.D	12/16/12	19:58	4.45	4.78
MC16798-1	BK20063.D	12/16/12	20:22	4.45	4.78
MC16798-2	BK20064.D	12/16/12	20:47	4.45	4.78

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.3  
7

# GC Surrogate Retention Time Summary

Job Number: MC16798  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK720-CC720	Injection Date:	12/16/12
Lab File ID:	BK20065.D	Injection Time:	21:12
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	4.45	4.78
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
MC16798-3	BK20066.D	12/16/12	21:36	4.45	4.78
MC16798-5	BK20067.D	12/16/12	22:01	4.45	4.78
MC16798-6	BK20068.D	12/16/12	22:25	4.45	4.78
MC16798-7	BK20069.D	12/16/12	22:50	4.45	4.78
MC16798-8	BK20070.D	12/16/12	23:14	4.45	4.78
MC16798-9	BK20071.D	12/16/12	23:39	4.45	4.78
MC16798-10	BK20072.D	12/17/12	00:03	4.45	4.78
MC16798-11	BK20073.D	12/17/12	00:28	4.45	4.78
GBK720-ECC720	BK20074.D	12/17/12	00:52	4.45	4.78

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.4  
7

## General Chemistry

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### QC Data Summaries



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Includes the following where applicable:

- Percent Solids Raw Data Summary

# Percent Solids Raw Data Summary

Job Number: MC16798  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

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Sample: MC16798-1      Analyzed: 17-DEC-12 by HS      Method: SM21 2540 B MOD.  
ClientID: VMP-47-12

Wet Weight (Total)	25.411	g
Tare Weight	19.028	g
Dry Weight (Total)	24.973	g
Solids, Percent	93.1	%

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Sample: MC16798-2      Analyzed: 17-DEC-12 by HS      Method: SM21 2540 B MOD.  
ClientID: VMP-47-19

Wet Weight (Total)	25	g
Tare Weight	18.527	g
Dry Weight (Total)	24.302	g
Solids, Percent	89.2	%

---

Sample: MC16798-3      Analyzed: 17-DEC-12 by HS      Method: SM21 2540 B MOD.  
ClientID: VMP-47-29

Wet Weight (Total)	26.799	g
Tare Weight	18.672	g
Dry Weight (Total)	26.384	g
Solids, Percent	94.9	%

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Sample: MC16798-5      Analyzed: 17-DEC-12 by MA      Method: SM21 2540 B MOD.  
ClientID: VMP-48-13

Wet Weight (Total)	30.665	g
Tare Weight	18.268	g
Dry Weight (Total)	29.727	g
Solids, Percent	92.4	%

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Sample: MC16798-6      Analyzed: 17-DEC-12 by MA      Method: SM21 2540 B MOD.  
ClientID: VMP-48-21

Wet Weight (Total)	25.18	g
Tare Weight	18.841	g
Dry Weight (Total)	24.844	g
Solids, Percent	94.7	%

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Sample: MC16798-7      Analyzed: 17-DEC-12 by MA      Method: SM21 2540 B MOD.  
ClientID: VMP-48-27

Wet Weight (Total)	29.568	g
Tare Weight	23.081	g
Dry Weight (Total)	29.228	g
Solids, Percent	94.8	%

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8.1  
8

# Percent Solids Raw Data Summary

Job Number: MC16798  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

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Sample: MC16798-8      Analyzed: 17-DEC-12 by MA      Method: SM21 2540 B MOD.  
ClientID: VMP-50-13

Wet Weight (Total)	27.147	g
Tare Weight	21.157	g
Dry Weight (Total)	26.319	g
Solids, Percent	86.2	%

---

Sample: MC16798-9      Analyzed: 17-DEC-12 by MA      Method: SM21 2540 B MOD.  
ClientID: VMP-50-21

Wet Weight (Total)	32.413	g
Tare Weight	26.117	g
Dry Weight (Total)	31.428	g
Solids, Percent	84.4	%

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Sample: MC16798-10      Analyzed: 17-DEC-12 by MA      Method: SM21 2540 B MOD.  
ClientID: VMP-50-21 DUP

Wet Weight (Total)	29.63	g
Tare Weight	21.098	g
Dry Weight (Total)	28.802	g
Solids, Percent	90.3	%

---

Sample: MC16798-11      Analyzed: 17-DEC-12 by MA      Method: SM21 2540 B MOD.  
ClientID: VMP-50-29

Wet Weight (Total)	36.771	g
Tare Weight	28.208	g
Dry Weight (Total)	36.435	g
Solids, Percent	96.1	%

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8.1  
8

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### Technical Report for

### Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562850.15000

SGS Accutest Job Number: MC16889

Sampling Dates: 12/12/12 - 12/13/12



### Report to:

AECOM, INC.

Melissa.mansker@aecom.com

ATTN: Melissa Mansker

Total number of pages in report: 144



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

*H. Madadian*  
H. (Brad) Madadian  
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

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

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ACCUTEST

October 20, 2016

AECOM  
1001 Highlands Plaza Drive West Suite 300  
St. Louis, MO 63110

RE: SGS Accutest Job # MC16889

Dear Elizabeth Kunkel

As you are aware, SGS Accutest Inc. - Marlborough has been conducting an extensive review of data associated with some historical Gas Chromatography-Mass Spectroscopy volatiles analyses. As a result of this review it was determined that some revisions of the original test report for this job were needed. These corrections have been incorporated into the revised report.

Please be assured that corrective actions have been put in place to address this matter and prevent a recurrence.

We apologize for any inconvenience that this issue may have caused. Please don't hesitate to contact us if we can be of further assistance.

Sincerely,

**H. (Brad) Madadian**

Regional Laboratory Director  
SGS Accutest Inc. - Marlborough

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TESTING AND CERTIFICATION COMPANY.

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## Sample Summary

Shell Oil

Job No: MC16889

URSMOSTL: Roxana Drilling, Roxana, IL  
Project No: 21562850.15000

Sample Number	Collected		Matrix Code	Type	Client Sample ID
	Date	Time By			
MC16889-1	12/12/12	10:35 WPJS	12/14/12	SO Soil	VMP-49-11
MC16889-1D	12/12/12	10:35 WPJS	12/14/12	SO Soil Dup/MSD	VMP-49-11
MC16889-1S	12/12/12	10:35 WPJS	12/14/12	SO Soil Matrix Spike	VMP-49-11
MC16889-2	12/12/12	10:40 WPJS	12/14/12	SO Soil	VMP-49-21
MC16889-3	12/12/12	10:45 WPJS	12/14/12	SO Soil	VMP-49-31
MC16889-4	12/12/12	13:15 WPJS	12/14/12	SO Soil	VMP-51-14
MC16889-5	12/12/12	13:25 WPJS	12/14/12	SO Soil	VMP-51-21
MC16889-6	12/12/12	13:30 WPJS	12/14/12	SO Soil	VMP-51-31
MC16889-7	12/12/12	00:00 WPJS	12/14/12	AQ Trip Blank Water	TRIP BLANK
MC16889-8	12/13/12	10:15 WPJS	12/14/12	SO Soil	VMP-52-13
MC16889-9	12/13/12	10:20 WPJS	12/14/12	SO Soil	VMP-52-25
MC16889-10	12/13/12	10:20 WPJS	12/14/12	SO Soil	VMP-52-25 DUP
MC16889-11	12/13/12	10:25 WPJS	12/14/12	SO Soil	VMP-52-29

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



### Sample Summary (continued)

Shell Oil

Job No: MC16889

URSMOSTL: Roxana Drilling, Roxana, IL  
Project No: 21562850.15000

Sample Number	Collected		Matrix Code	Type	Client Sample ID
	Date	Time By			
MC16889-12	12/13/12	13:25 WPJS	12/14/12	SO Soil	VMP-53-15
MC16889-12D	12/13/12	13:25 WPJS	12/14/12	SO Soil Dup/MSD	VMP-53-15
MC16889-12S	12/13/12	13:25 WPJS	12/14/12	SO Soil Matrix Spike	VMP-53-15
MC16889-13	12/13/12	13:40 WPJS	12/14/12	SO Soil	VMP-53-27
MC16889-14	12/13/12	13:45 WPJS	12/14/12	SO Soil	VMP-53-31

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

## SAMPLE DELIVERY GROUP CASE NARRATIVE

2

**Client:** Shell Oil

**Job No** MC16889

**Site:** URSMOSTL: Roxana Drilling, Roxana, IL

**Report Date** 10/24/2016 9:26:13 A

13 Sample(s), 1 Trip Blank(s) and 0 Field Blank(s) were collected on between 12/12/2012 and 12/13/2012 and were received at SGS Accutest New England on 12/14/2012 properly preserved, at 1.3 Deg. C and intact. These Samples received a job number of MC16889. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report. 1-Chlorohexane, Benzenethiol, Dibenz(a,h)acridine, Indene and Quinoline were searched in the library search and reported only if detections were found.

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:** MSN2685

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC16880-6MS, MC16880-6MSD were used as the QC samples indicated.
- Sample(s) MC16889-7 have compounds reported with "D" qualifiers indicating results from the diluted analysis.
- Blank Spike Recovery(s) for Acrylonitrile, Acrolein, Dichlorodifluoromethane are outside control limits.
- Matrix Spike Recovery(s) for Acrolein, Dichlorodifluoromethane, Acrylonitrile are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for Acrolein, Dichlorodifluoromethane are outside control limits. Probable cause due to matrix interference.
- MC16889-7 for Acrolein: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- MSN2685-BS for Acrylonitrile: Outside control limits. Associated samples are non-detect for this compound.
- MC16880-6MS for Acrylonitrile: Outside control limits. Associated samples are non-detect for this compound.
- Continuing calibration check standard for Acrolein exceeds 50% Difference. Acrolein is considered a difficult method analyte

**Matrix:** SO

**Batch ID:** MSM1801

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC16889-1MS, MC16889-1MSD were used as the QC samples indicated.
- Sample(s) MC16889-1, MC16889-2, MC16889-3, MC16889-4, MC16889-1 have compounds reported with "D" qualifiers indicating results from the diluted analysis.
- Blank Spike Recovery(s) for 2-Hexanone, Acrolein are outside control limits.
- Matrix Spike Recovery(s) for 1,1,1,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,1-Dichloropropene, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 1,4-Dioxane, 2,2-Dichloropropane, 2-Butanone (MEK), 2-Chloroethyl vinyl ether, 2-Hexanone, 4-Methyl-2-pentanone (MIBK), Acrolein, Acrylonitrile, Benzene, Bromobenzene, Bromochloromethane, Bromodichloromethane, Bromoform, Bromomethane, Carbon disulfide, Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,2-Dichloroethene, cis-1,3-Dichloropropene, Dibromochloromethane, Dichlorodifluoromethane, Ethyl methacrylate, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, m,p-Xylene, Methyl Tert Butyl Ether, Methylene bromide, Methylene chloride, n-Butylbenzene, n-Propylbenzene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Isopropyltoluene, sec-Butylbenzene, Styrene, tert-Butylbenzene, Tetrachloroethane, Toluene, trans-1,2-Dichloroethene, trans-1,3-Dichloropropene, Trichloroethane, Trichlorofluoromethane, Vinyl Acetate, Vinyl chloride, Xylene (total) are outside control limits. Outside control limits due to possible matrix interference.

Monday, October 24, 2016

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## Volatiles by GCMS By Method SW846 8260B

**Matrix:** SO

**Batch ID:** MSM1801

- Matrix Spike Duplicate Recovery(s) for 2-Chloroethyl vinyl ether, Acrolein, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 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, Acetone, Benzene, Bromobenzene, Bromodichloromethane, Bromoform, Chlorobenzene, cis-1,3-Dichloropropene, Dibromochloromethane, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, m,p-Xylene, Methyl Tert Butyl Ether, 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, Vinyl Acetate, Xylene (total) are outside control limits. High RPD due to possible matrix interference and/or sample non-homogeneity.
- RPD(s) for MSD for 1,1,1,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,1-Dichloropropene, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 1,4-Dioxane, 2,2-Dichloropropane, 2-Butanone (MEK), 2-Hexanone, 4-Methyl-2-pentanone (MIBK), Acetone, Acrylonitrile, Benzene, Bromobenzene, Bromochloromethane, Bromodichloromethane, Bromoform, Bromomethane, Carbon disulfide, Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,2-Dichloroethene, cis-1,3-Dichloropropene, Dibromochloromethane, Dichlorodifluoromethane, Ethyl methacrylate, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, m,p-Xylene, Methyl Tert Butyl Ether, Methylene bromide, Methylene chloride, n-Butylbenzene, n-Propylbenzene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Isopropyltoluene, sec-Butylbenzene, Styrene, tert-Butylbenzene, Tetrachloroethene, Toluene, trans-1,2-Dichloroethene, trans-1,3-Dichloropropene, Trichloroethene, Trichlorofluoromethane, Vinyl Acetate, Vinyl chloride, Xylene (total) are outside control limits for sample MC16889-1MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.
- Vinyl Acetate: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- Acrolein: Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- MC16889-1, MC16889-1MSD has internal standard outside control limits due to possible matrix interference.

**Matrix:** SO

**Batch ID:** MSM1803

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC16889-12MS, MC16889-12MSD were used as the QC samples indicated.
- Blank Spike Recovery(s) for Acetone, Acrolein are outside control limits.
- Matrix Spike Recovery(s) for Acetone, 1,1,1,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,1-Dichloropropene, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 1,4-Dioxane, 2,2-Dichloropropane, 2-Chloroethyl vinyl ether, 2-Hexanone, 4-Methyl-2-pentanone (MIBK), Acrolein, Acrylonitrile, Benzene, Bromobenzene, Bromochloromethane, Bromodichloromethane, Bromoform, Bromomethane, Carbon disulfide, Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,2-Dichloroethene, cis-1,3-Dichloropropene, Dibromochloromethane, Dichlorodifluoromethane, Ethyl methacrylate, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, m,p-Xylene, Methyl Tert Butyl Ether, Methylene bromide, Methylene chloride, n-Butylbenzene, n-Propylbenzene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Isopropyltoluene, sec-Butylbenzene, Styrene, tert-Butylbenzene, Tetrachloroethene, Toluene, trans-1,2-Dichloroethene, trans-1,3-Dichloropropene, Trichloroethene, Trichlorofluoromethane, Vinyl Acetate, Vinyl chloride, Xylene (total) are outside control limits due to possible matrix interference. Refer to Blank Spike. Outside control limits due to high level in sample relative to spike amount.
- Matrix Spike Duplicate Recovery(s) for 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3-Dichloropropane, 2-Chloroethyl vinyl ether, 2-Hexanone, 4-Methyl-2-pentanone (MIBK), Acetone, Acrolein, Acrylonitrile, Benzene, Bromochloromethane, Bromodichloromethane, Bromomethane, Carbon disulfide, Chloroethane, Chloroform, Chloromethane, cis-1,2-Dichloroethene, cis-1,3-Dichloropropene, Dibromochloromethane, Ethyl methacrylate, Methyl Tert Butyl Ether, Methylene bromide, Methylene chloride, 1,1,2,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,1-Dichloropropene, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,4-Dioxane, 2,2-Dichloropropane, 2-Butanone (MEK), Bromobenzene, Bromoform, Carbon tetrachloride, Chlorobenzene, Dichlorodifluoromethane, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, m,p-Xylene, n-Butylbenzene, n-Propylbenzene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Isopropyltoluene, sec-Butylbenzene, Styrene, tert-Butylbenzene, Tetrachloroethene, Toluene, Trichloroethene, Trichlorofluoromethane, Vinyl Acetate, Xylene (total) are outside control limits. High RPD due to possible matrix interference and/or sample non-homogeneity.

## Volatiles by GCMS By Method SW846 8260B

**Matrix:** SO

**Batch ID:** MSM1803

- RPD(s) for MSD for 1,1,1,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1-Dichloroethene, 1,1-Dichloropropene, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,4-Dioxane, 2,2-Dichloropropane, 2-Butanone (MEK), Bromobenzene, Bromoform, Carbon tetrachloride, Chlorobenzene, Dichlorodifluoromethane, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, m,p-Xylene, n-Butylbenzene, n-Propylbenzene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Isopropyltoluene, sec-Butylbenzene, Styrene, tert-Butylbenzene, Tetrachloroethene, Toluene, Trichloroethene, Trichlorofluoromethane, Vinyl Acetate, Xylene (total) are outside control limits for sample MC16889-12MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.
- MC16889-1 has internal standard outside control limits due to possible matrix interference.

**Matrix:** SO

**Batch ID:** MSM1804

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC16931-1MS, MC16931-1MSD were used as the QC samples indicated.
- Blank Spike Recovery(s) for Acrolein are outside control limits.
- Matrix Spike Recovery(s) for Acrolein, Dichlorodifluoromethane are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for Acrolein, Dichlorodifluoromethane are outside control limits. Probable cause due to matrix interference.
- Vinyl Acetate: Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

## Volatiles by GC By Method SW846 8011

**Matrix:** AQ

**Batch ID:** OP31513

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17000-5MS, MC17000-5MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

**Matrix:** SO

**Batch ID:** OP31480

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) MC16889-12MS, MC16889-12MSD, MC16889-1MS, MC16889-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC16889-8, MC16889-9 have surrogates outside control limits. Surrogate standard not added. Results confirmed by re-extraction/reanalysis.

**Matrix:** SO

**Batch ID:** OP31493

- MC16889-8,9: Confirmation run.

## Wet Chemistry By Method SM21 2540 B MOD.

**Matrix:** SO

**Batch ID:** GN41318

- Sample(s) MC16889-1DUP were used as the QC samples for Solids, Percent.

**Matrix:** SO

**Batch ID:** GN41319

- Sample(s) MC16889-12DUP were used as the QC samples for Solids, Percent.

SGS Accutest 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 Laboratory Director for SGS Accutest New England or assignee as verified by the signature on the cover page has authorized the release of this report(MC16889).



Monday, October 24, 2016

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## Summary of Hits

Job Number: MC16889  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 12/12/12 thru 12/13/12



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method	
MC16889-1	VMP-49-11						
		Naphthalene	0.0165	0.0067	0.0017	mg/kg	SW846 8260B
		Toluene	0.0013 J	0.0067	0.0011	mg/kg	SW846 8260B
		m,p-Xylene	0.0023 J	0.0027	0.0011	mg/kg	SW846 8260B
		Xylene (total)	0.0023 J	0.0027	0.00032	mg/kg	SW846 8260B
MC16889-2	VMP-49-21						
		Benzene	0.0020	0.00095	0.00056	mg/kg	SW846 8260B
		Ethylbenzene	0.0062	0.0038	0.00046	mg/kg	SW846 8260B
		Toluene	0.0059 J	0.0095	0.0016	mg/kg	SW846 8260B
		m,p-Xylene	0.0015 J	0.0038	0.0015	mg/kg	SW846 8260B
		o-Xylene	0.00059 J	0.0038	0.00045	mg/kg	SW846 8260B
		Xylene (total)	0.0021 J	0.0038	0.00045	mg/kg	SW846 8260B
MC16889-3	VMP-49-31						
		Benzene	0.0023	0.00053	0.00031	mg/kg	SW846 8260B
		Ethylbenzene	0.0065	0.0021	0.00026	mg/kg	SW846 8260B
		Isopropylbenzene	0.00078 J	0.0053	0.00024	mg/kg	SW846 8260B
		Toluene	0.0053	0.0053	0.00090	mg/kg	SW846 8260B
		m,p-Xylene	0.0017 J	0.0021	0.00084	mg/kg	SW846 8260B
		o-Xylene	0.00072 J	0.0021	0.00025	mg/kg	SW846 8260B
		Xylene (total)	0.0024	0.0021	0.00025	mg/kg	SW846 8260B
MC16889-4	VMP-51-14						
		Benzene	0.00065	0.00056	0.00033	mg/kg	SW846 8260B
		1,3-Dichloropropane	0.0012 J	0.0056	0.00026	mg/kg	SW846 8260B
		Ethylbenzene	0.0017 J	0.0023	0.00027	mg/kg	SW846 8260B
		Toluene	0.0021 J	0.0056	0.00096	mg/kg	SW846 8260B
MC16889-5	VMP-51-21						
		Benzene	0.00086	0.00052	0.00031	mg/kg	SW846 8260B
		Ethylbenzene	0.0021	0.0021	0.00025	mg/kg	SW846 8260B
		Methylene chloride	0.0012 J	0.0021	0.0012	mg/kg	SW846 8260B
		Toluene	0.0026 J	0.0052	0.00088	mg/kg	SW846 8260B
		o-Xylene	0.00036 J	0.0021	0.00025	mg/kg	SW846 8260B
		Xylene (total)	0.0011 J	0.0021	0.00025	mg/kg	SW846 8260B
MC16889-6	VMP-51-31						
		Benzene	0.00084	0.00054	0.00032	mg/kg	SW846 8260B

## Summary of Hits

Job Number: MC16889  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 12/12/12 thru 12/13/12



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
		Ethylbenzene	0.0022	0.0022	0.00026	mg/kg SW846 8260B
		Methylene chloride	0.0013 J	0.0022	0.0013	mg/kg SW846 8260B
		Toluene	0.0028 J	0.0054	0.00092	mg/kg SW846 8260B
		o-Xylene	0.00032 J	0.0022	0.00026	mg/kg SW846 8260B
		Xylene (total)	0.0011 J	0.0022	0.00026	mg/kg SW846 8260B
<b>MC16889-7</b>	<b>TRIP BLANK</b>					
		No hits reported in this sample.				
<b>MC16889-8</b>	<b>VMP-52-13</b>					
		Methylene chloride	0.0013 J	0.0022	0.0013	mg/kg SW846 8260B
<b>MC16889-9</b>	<b>VMP-52-25</b>					
		Methylene chloride	0.0016 J	0.0022	0.0013	mg/kg SW846 8260B
<b>MC16889-10</b>	<b>VMP-52-25 DUP</b>					
		Methylene chloride	0.0014 J	0.0021	0.0012	mg/kg SW846 8260B
<b>MC16889-11</b>	<b>VMP-52-29</b>					
		Methylene chloride	0.0013 J	0.0021	0.0012	mg/kg SW846 8260B
<b>MC16889-12</b>	<b>VMP-53-15</b>					
		Acetone	0.158	0.0054	0.0014	mg/kg SW846 8260B
		Benzene	0.0014	0.00054	0.00032	mg/kg SW846 8260B
		Ethylbenzene	0.0022	0.0021	0.00026	mg/kg SW846 8260B
		Toluene	0.0033 J	0.0054	0.00091	mg/kg SW846 8260B
		Xylene (total)	0.00063 J	0.0021	0.00026	mg/kg SW846 8260B
<b>MC16889-13</b>	<b>VMP-53-27</b>					
		Acetone	0.0773	0.0052	0.0013	mg/kg SW846 8260B
		Benzene	0.00070	0.00052	0.00031	mg/kg SW846 8260B
		Ethylbenzene	0.0018 J	0.0021	0.00025	mg/kg SW846 8260B
		Toluene	0.0020 J	0.0052	0.00089	mg/kg SW846 8260B
		Xylene (total)	0.00046 J	0.0021	0.00025	mg/kg SW846 8260B
<b>MC16889-14</b>	<b>VMP-53-31</b>					
		Benzene	0.0012	0.00051	0.00030	mg/kg SW846 8260B

## Summary of Hits

Job Number: MC16889  
Account: Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL  
Collected: 12/12/12 thru 12/13/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Ethylbenzene		0.0019 J	0.0020	0.00025	mg/kg	SW846 8260B
Toluene		0.0027 J	0.0051	0.00087	mg/kg	SW846 8260B
Xylene (total)		0.00071 J	0.0020	0.00024	mg/kg	SW846 8260B

**Sample Results**

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**Report of Analysis**

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## Report of Analysis

Client Sample ID:	VMP-49-11	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-1	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	87.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53059.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2 <sup>a</sup>	M53096.D	1	12/26/12	AMY	n/a	n/a	MSM1803

Run #	Initial Weight	Final Volume
Run #1	4.30 g	5.0 ml
Run #2	5.90 g	5.0 ml

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0067	0.0017	mg/kg	
107-02-8	Acrolein <sup>b</sup>	ND	0.033	0.013	mg/kg	
107-13-1	Acrylonitrile	ND	0.033	0.0017	mg/kg	
71-43-2	Benzene	ND	0.00067	0.00039	mg/kg	
108-86-1	Bromobenzene	ND	0.0067	0.00030	mg/kg	
74-97-5	Bromochloromethane	ND	0.0067	0.00050	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0027	0.00028	mg/kg	
75-25-2	Bromoform	ND	0.0027	0.0027	mg/kg	
74-83-9	Bromomethane	ND	0.0027	0.00069	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0067	0.0017	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0067	0.00025	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0067	0.00031	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0067	0.0012	mg/kg	
75-15-0	Carbon disulfide	ND	0.0067	0.00022	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0027	0.00097	mg/kg	
108-90-7	Chlorobenzene	ND	0.0027	0.00037	mg/kg	
75-00-3	Chloroethane	ND	0.0067	0.0017	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0067	0.0027	mg/kg	
67-66-3	Chloroform	ND	0.0027	0.00069	mg/kg	
74-87-3	Chloromethane	ND	0.0067	0.00062	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0067	0.0015	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0067	0.00030	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0027	0.00039	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0027	0.00029	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0027	0.00030	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0027	0.00028	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0027	0.0015	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0027	0.00036	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0027	0.00038	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0027	0.00049	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0027	0.00040	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0027	0.00038	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:	VMP-49-11	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-1	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	87.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0027	0.00050	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0067	0.00031	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0067	0.0012	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0067	0.00035	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0027	0.00023	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0027	0.00066	mg/kg	
123-91-1	1,4-Dioxane	ND	0.033	0.033	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0067	0.00091	mg/kg	
100-41-4	Ethylbenzene	ND	0.0027	0.00032	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0067	0.00062	mg/kg	
591-78-6	2-Hexanone	ND	0.0067	0.00067	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0067	0.00030	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0067	0.00024	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0027	0.00038	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0067	0.00067	mg/kg	
74-95-3	Methylene bromide	ND	0.0067	0.00066	mg/kg	
75-09-2	Methylene chloride	ND	0.0027	0.0015	mg/kg	
91-20-3	Naphthalene	0.0165	0.0067	0.0017	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0067	0.0014	mg/kg	
100-42-5	Styrene	ND	0.0067	0.00031	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0067	0.0013	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0027	0.00057	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0027	0.00031	mg/kg	
108-88-3	Toluene	0.0013	0.0067	0.0011	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0067	0.00032	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0067	0.00031	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0027	0.00042	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0027	0.00098	mg/kg	
79-01-6	Trichloroethene	ND	0.0027	0.00028	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0027	0.00041	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0067	0.00039	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0067	0.00030	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0067	0.00029	mg/kg	
108-05-4	Vinyl Acetate <sup>c</sup>	ND	0.0067	0.00075	mg/kg	
75-01-4	Vinyl chloride	ND	0.0027	0.00036	mg/kg	
	m,p-Xylene	0.0023	0.0027	0.0011	mg/kg	J
95-47-6	o-Xylene	ND	0.0027	0.00032	mg/kg	
1330-20-7	Xylene (total)	0.0023	0.0027	0.00032	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

<b>Client Sample ID:</b> VMP-49-11	<b>Date Sampled:</b> 12/12/12
<b>Lab Sample ID:</b> MC16889-1	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	79%	84%	70-130%
2037-26-5	Toluene-D8	90%	91%	70-130%
460-00-4	4-Bromofluorobenzene	83%	82%	70-130%

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

- (a) Confirmation run.
- (b) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (c) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-49-11 <b>Lab Sample ID:</b> MC16889-1 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 8011 <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 12/12/12 <b>Date Received:</b> 12/14/12 <b>Percent Solids:</b> 87.1
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45003.D	1	12/19/12	CZ	12/18/12	OP31480	GBB2725
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 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	0.0013	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)	115%		61-167%
460-00-4	Bromofluorobenzene (S)	101%		61-167%

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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

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## Report of Analysis

Client Sample ID:	VMP-49-21	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-2	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	72.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53060.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	3.66 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0095	0.0024	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.047	0.019	mg/kg	
107-13-1	Acrylonitrile	ND	0.047	0.0024	mg/kg	
71-43-2	Benzene	0.0020	0.00095	0.00056	mg/kg	
108-86-1	Bromobenzene	ND	0.0095	0.00042	mg/kg	
74-97-5	Bromochloromethane	ND	0.0095	0.00071	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0038	0.00040	mg/kg	
75-25-2	Bromoform	ND	0.0038	0.0038	mg/kg	
74-83-9	Bromomethane	ND	0.0038	0.00098	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0095	0.0024	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0095	0.00035	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0095	0.00043	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0095	0.0017	mg/kg	
75-15-0	Carbon disulfide	ND	0.0095	0.00031	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0038	0.0014	mg/kg	
108-90-7	Chlorobenzene	ND	0.0038	0.00052	mg/kg	
75-00-3	Chloroethane	ND	0.0095	0.0024	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0095	0.0038	mg/kg	
67-66-3	Chloroform	ND	0.0038	0.00098	mg/kg	
74-87-3	Chloromethane	ND	0.0095	0.00088	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0095	0.0021	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0095	0.00043	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0038	0.00056	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0038	0.00041	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0038	0.00043	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0038	0.00040	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0038	0.0022	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0038	0.00051	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0038	0.00054	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0038	0.00070	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0038	0.00057	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0038	0.00054	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:	VMP-49-21	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-2	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	72.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0038	0.00070	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0095	0.00044	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0095	0.0016	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0095	0.00050	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0038	0.00032	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0038	0.00094	mg/kg	
123-91-1	1,4-Dioxane	ND	0.047	0.047	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0095	0.0013	mg/kg	
100-41-4	Ethylbenzene	0.0062	0.0038	0.00046	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0095	0.00088	mg/kg	
591-78-6	2-Hexanone	ND	0.0095	0.00095	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0095	0.00043	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0095	0.00034	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0038	0.00055	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0095	0.00095	mg/kg	
74-95-3	Methylene bromide	ND	0.0095	0.00093	mg/kg	
75-09-2	Methylene chloride	ND	0.0038	0.0022	mg/kg	
91-20-3	Naphthalene	ND	0.0095	0.0024	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0095	0.0019	mg/kg	
100-42-5	Styrene	ND	0.0095	0.00044	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0095	0.0019	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0038	0.00080	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0038	0.00043	mg/kg	
108-88-3	Toluene	0.0059	0.0095	0.0016	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0095	0.00045	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0095	0.00043	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0038	0.00060	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0038	0.0014	mg/kg	
79-01-6	Trichloroethene	ND	0.0038	0.00040	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0038	0.00058	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0095	0.00055	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0095	0.00042	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0095	0.00040	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0095	0.0011	mg/kg	
75-01-4	Vinyl chloride	ND	0.0038	0.00052	mg/kg	
	m,p-Xylene	0.0015	0.0038	0.0015	mg/kg	J
95-47-6	o-Xylene	0.00059	0.0038	0.00045	mg/kg	J
1330-20-7	Xylene (total)	0.0021	0.0038	0.00045	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

<b>Client Sample ID:</b> VMP-49-21	<b>Date Sampled:</b> 12/12/12
<b>Lab Sample ID:</b> MC16889-2	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 72.2
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	84%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-49-21 <b>Lab Sample ID:</b> MC16889-2 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 8011 <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 12/12/12 <b>Date Received:</b> 12/14/12 <b>Percent Solids:</b> 72.2
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45004.D	1	12/19/12	CZ	12/18/12	OP31480	GBB2725
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.8 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	0.0034	0.0015	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0034	0.0013	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	121%		61-167%
460-00-4	Bromofluorobenzene (S)	118%		61-167%

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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

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## Report of Analysis

Client Sample ID:	VMP-49-31	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-3	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	83.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53061.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.65 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0053	0.0013	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.027	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.027	0.0013	mg/kg	
71-43-2	Benzene	0.0023	0.00053	0.00031	mg/kg	
108-86-1	Bromobenzene	ND	0.0053	0.00024	mg/kg	
74-97-5	Bromochloromethane	ND	0.0053	0.00040	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0021	0.00022	mg/kg	
75-25-2	Bromoform	ND	0.0021	0.0021	mg/kg	
74-83-9	Bromomethane	ND	0.0021	0.00055	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0053	0.0013	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0053	0.00020	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0053	0.00024	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0053	0.00094	mg/kg	
75-15-0	Carbon disulfide	ND	0.0053	0.00017	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0021	0.00077	mg/kg	
108-90-7	Chlorobenzene	ND	0.0021	0.00029	mg/kg	
75-00-3	Chloroethane	ND	0.0053	0.0013	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0053	0.0021	mg/kg	
67-66-3	Chloroform	ND	0.0021	0.00055	mg/kg	
74-87-3	Chloromethane	ND	0.0053	0.00049	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0053	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0053	0.00024	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0021	0.00031	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0021	0.00023	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0021	0.00024	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0021	0.00022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0021	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0021	0.00029	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0021	0.00031	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0021	0.00039	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0021	0.00032	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0021	0.00030	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:	VMP-49-31	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-3	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	83.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0021	0.00040	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0053	0.00025	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0053	0.00092	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0053	0.00028	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0021	0.00018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0021	0.00053	mg/kg	
123-91-1	1,4-Dioxane	ND	0.027	0.027	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0053	0.00072	mg/kg	
100-41-4	Ethylbenzene	0.0065	0.0021	0.00026	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0053	0.00049	mg/kg	
591-78-6	2-Hexanone	ND	0.0053	0.00053	mg/kg	
98-82-8	Isopropylbenzene	0.00078	0.0053	0.00024	mg/kg	J
99-87-6	p-Isopropyltoluene	ND	0.0053	0.00019	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0021	0.00031	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0053	0.00053	mg/kg	
74-95-3	Methylene bromide	ND	0.0053	0.00052	mg/kg	
75-09-2	Methylene chloride	ND	0.0021	0.0012	mg/kg	
91-20-3	Naphthalene	ND	0.0053	0.0013	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0053	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0053	0.00025	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0053	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0021	0.00045	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0021	0.00024	mg/kg	
108-88-3	Toluene	0.0053	0.0053	0.00090	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0053	0.00025	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0053	0.00024	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0021	0.00033	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0021	0.00078	mg/kg	
79-01-6	Trichloroethene	ND	0.0021	0.00022	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0021	0.00032	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0053	0.00031	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0053	0.00024	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0053	0.00023	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0053	0.00059	mg/kg	
75-01-4	Vinyl chloride	ND	0.0021	0.00029	mg/kg	
	m,p-Xylene	0.0017	0.0021	0.00084	mg/kg	J
95-47-6	o-Xylene	0.00072	0.0021	0.00025	mg/kg	J
1330-20-7	Xylene (total)	0.0024	0.0021	0.00025	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

<b>Client Sample ID:</b> VMP-49-31	<b>Date Sampled:</b> 12/12/12
<b>Lab Sample ID:</b> MC16889-3	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.2
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	83%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	88%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-49-31	<b>Date Sampled:</b> 12/12/12
<b>Lab Sample ID:</b> MC16889-3	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.2
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45005.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.3 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	0.0013	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)	127%		61-167%
460-00-4	Bromofluorobenzene (S)	115%		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

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## Report of Analysis

Client Sample ID:	VMP-51-14	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-4	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	96.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53062.D	1	12/21/12	AMY	n/a	n/a	MSM1801
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.62 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0056	0.0014	mg/kg	
107-02-8	Acrolein <sup>a</sup>	ND	0.028	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.028	0.0014	mg/kg	
71-43-2	Benzene	0.00065	0.00056	0.00033	mg/kg	
108-86-1	Bromobenzene	ND	0.0056	0.00025	mg/kg	
74-97-5	Bromochloromethane	ND	0.0056	0.00042	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0023	0.00024	mg/kg	
75-25-2	Bromoform	ND	0.0023	0.0023	mg/kg	
74-83-9	Bromomethane	ND	0.0023	0.00058	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0056	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0056	0.00021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0056	0.00026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0056	0.00099	mg/kg	
75-15-0	Carbon disulfide	ND	0.0056	0.00019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0023	0.00082	mg/kg	
108-90-7	Chlorobenzene	ND	0.0023	0.00031	mg/kg	
75-00-3	Chloroethane	ND	0.0056	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0056	0.0023	mg/kg	
67-66-3	Chloroform	ND	0.0023	0.00058	mg/kg	
74-87-3	Chloromethane	ND	0.0056	0.00052	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0056	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0056	0.00026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0023	0.00033	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0023	0.00024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0023	0.00025	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	0.00030	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0023	0.00032	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0023	0.00041	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0023	0.00034	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0023	0.00032	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:	VMP-51-14	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-4	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	96.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0023	0.00042	mg/kg	
142-28-9	1,3-Dichloropropane	0.0012	0.0056	0.00026	mg/kg	J
594-20-7	2,2-Dichloropropane	ND	0.0056	0.00098	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0056	0.00030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0023	0.00019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0023	0.00056	mg/kg	
123-91-1	1,4-Dioxane	ND	0.028	0.028	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0056	0.00077	mg/kg	
100-41-4	Ethylbenzene	0.0017	0.0023	0.00027	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.0056	0.00052	mg/kg	
591-78-6	2-Hexanone	ND	0.0056	0.00056	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0056	0.00026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0056	0.00020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0023	0.00032	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0056	0.00056	mg/kg	
74-95-3	Methylene bromide	ND	0.0056	0.00056	mg/kg	
75-09-2	Methylene chloride	ND	0.0023	0.0013	mg/kg	
91-20-3	Naphthalene	ND	0.0056	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0056	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0056	0.00026	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0056	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0023	0.00048	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0023	0.00026	mg/kg	
108-88-3	Toluene	0.0021	0.0056	0.00096	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0056	0.00027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0056	0.00026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0023	0.00035	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0023	0.00083	mg/kg	
79-01-6	Trichloroethene	ND	0.0023	0.00024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0023	0.00034	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0056	0.00033	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0056	0.00025	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0056	0.00024	mg/kg	
108-05-4	Vinyl Acetate <sup>b</sup>	ND	0.0056	0.00063	mg/kg	
75-01-4	Vinyl chloride	ND	0.0023	0.00031	mg/kg	
	m,p-Xylene	ND	0.0023	0.00089	mg/kg	
95-47-6	o-Xylene	ND	0.0023	0.00027	mg/kg	
1330-20-7	Xylene (total)	ND	0.0023	0.00027	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

<b>Client Sample ID:</b> VMP-51-14	<b>Date Sampled:</b> 12/12/12
<b>Lab Sample ID:</b> MC16889-4	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	83%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

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

- (a) Continuing Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-51-14 <b>Lab Sample ID:</b> MC16889-4 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 8011 <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 12/12/12 <b>Date Received:</b> 12/14/12 <b>Percent Solids:</b> 96.1
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45006.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.3 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	0.0026	0.0011	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.00099	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	121%		61-167%
460-00-4	Bromofluorobenzene (S)	114%		61-167%

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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

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## Report of Analysis

Client Sample ID:	VMP-51-21	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-5	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	96.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53097.D	1	12/26/12	AMY	n/a	n/a	MSM1803
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.01 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0052	0.0013	mg/kg	
107-02-8	Acrolein	ND	0.026	0.010	mg/kg	
107-13-1	Acrylonitrile	ND	0.026	0.0013	mg/kg	
71-43-2	Benzene	0.00086	0.00052	0.00031	mg/kg	
108-86-1	Bromobenzene	ND	0.0052	0.00023	mg/kg	
74-97-5	Bromochloromethane	ND	0.0052	0.00039	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0021	0.00022	mg/kg	
75-25-2	Bromoform	ND	0.0021	0.0021	mg/kg	
74-83-9	Bromomethane	ND	0.0021	0.00054	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0052	0.0013	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0052	0.00019	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0052	0.00024	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0052	0.00092	mg/kg	
75-15-0	Carbon disulfide	ND	0.0052	0.00017	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0021	0.00076	mg/kg	
108-90-7	Chlorobenzene	ND	0.0021	0.00029	mg/kg	
75-00-3	Chloroethane	ND	0.0052	0.0013	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0052	0.0021	mg/kg	
67-66-3	Chloroform	ND	0.0021	0.00054	mg/kg	
74-87-3	Chloromethane	ND	0.0052	0.00048	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0052	0.0011	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0052	0.00024	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0021	0.00031	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	0.00022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0021	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0021	0.00028	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0021	0.00030	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0021	0.00038	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0021	0.00031	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0021	0.00030	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:	VMP-51-21	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-5	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	96.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0021	0.00039	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0052	0.00024	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0052	0.00090	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0052	0.00027	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0021	0.00018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0021	0.00052	mg/kg	
123-91-1	1,4-Dioxane	ND	0.026	0.026	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0052	0.00071	mg/kg	
100-41-4	Ethylbenzene	0.0021	0.0021	0.00025	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0052	0.00048	mg/kg	
591-78-6	2-Hexanone	ND	0.0052	0.00052	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0052	0.00024	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0052	0.00019	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0021	0.00030	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0052	0.00052	mg/kg	
74-95-3	Methylene bromide	ND	0.0052	0.00051	mg/kg	
75-09-2	Methylene chloride	0.0012	0.0021	0.0012	mg/kg	J
91-20-3	Naphthalene	ND	0.0052	0.0013	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0052	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0052	0.00024	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0052	0.0010	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0021	0.00044	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0021	0.00024	mg/kg	
108-88-3	Toluene	0.0026	0.0052	0.00088	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0052	0.00025	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0052	0.00024	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0021	0.00033	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0021	0.00076	mg/kg	
79-01-6	Trichloroethene	ND	0.0021	0.00022	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0021	0.00032	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0052	0.00030	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0052	0.00023	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0052	0.00022	mg/kg	
108-05-4	Vinyl Acetate <sup>a</sup>	ND	0.0052	0.00058	mg/kg	
75-01-4	Vinyl chloride	ND	0.0021	0.00028	mg/kg	
	m,p-Xylene	ND	0.0021	0.00082	mg/kg	
95-47-6	o-Xylene	0.00036	0.0021	0.00025	mg/kg	J
1330-20-7	Xylene (total)	0.0011	0.0021	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

<b>Client Sample ID:</b> VMP-51-21	<b>Date Sampled:</b> 12/12/12
<b>Lab Sample ID:</b> MC16889-5	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.0
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	84%		70-130%
2037-26-5	Toluene-D8	87%		70-130%
460-00-4	4-Bromofluorobenzene	80%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-51-21 <b>Lab Sample ID:</b> MC16889-5 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 8011 <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 12/12/12 <b>Date Received:</b> 12/14/12 <b>Percent Solids:</b> 96.0
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	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45008.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	121%		61-167%
460-00-4	Bromofluorobenzene (S)	114%		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

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## Report of Analysis

Client Sample ID:	VMP-51-31	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-6	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	96.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53098.D	1	12/26/12	AMY	n/a	n/a	MSM1803
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.74 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0054	0.0014	mg/kg	
107-02-8	Acrolein	ND	0.027	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.027	0.0014	mg/kg	
71-43-2	Benzene	0.00084	0.00054	0.00032	mg/kg	
108-86-1	Bromobenzene	ND	0.0054	0.00024	mg/kg	
74-97-5	Bromochloromethane	ND	0.0054	0.00041	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0022	0.00023	mg/kg	
75-25-2	Bromoform	ND	0.0022	0.0022	mg/kg	
74-83-9	Bromomethane	ND	0.0022	0.00057	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0054	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0054	0.00020	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0054	0.00025	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0054	0.00096	mg/kg	
75-15-0	Carbon disulfide	ND	0.0054	0.00018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0022	0.00079	mg/kg	
108-90-7	Chlorobenzene	ND	0.0022	0.00030	mg/kg	
75-00-3	Chloroethane	ND	0.0054	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0054	0.0022	mg/kg	
67-66-3	Chloroform	ND	0.0022	0.00056	mg/kg	
74-87-3	Chloromethane	ND	0.0054	0.00051	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0054	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0054	0.00025	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0022	0.00032	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0022	0.00024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0022	0.00025	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0022	0.00023	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0022	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0022	0.00029	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0022	0.00031	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0022	0.00040	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0022	0.00033	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0022	0.00031	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:	VMP-51-31	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-6	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	96.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0022	0.00041	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0054	0.00025	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0054	0.00095	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0054	0.00029	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0022	0.00019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0022	0.00054	mg/kg	
123-91-1	1,4-Dioxane	ND	0.027	0.027	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0054	0.00074	mg/kg	
100-41-4	Ethylbenzene	0.0022	0.0022	0.00026	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0054	0.00051	mg/kg	
591-78-6	2-Hexanone	ND	0.0054	0.00054	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0054	0.00025	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0054	0.00019	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0022	0.00031	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0054	0.00054	mg/kg	
74-95-3	Methylene bromide	ND	0.0054	0.00054	mg/kg	
75-09-2	Methylene chloride	0.0013	0.0022	0.0013	mg/kg	J
91-20-3	Naphthalene	ND	0.0054	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0054	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0054	0.00025	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0054	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0022	0.00046	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0022	0.00025	mg/kg	
108-88-3	Toluene	0.0028	0.0054	0.00092	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0054	0.00026	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0054	0.00025	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0022	0.00034	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0022	0.00080	mg/kg	
79-01-6	Trichloroethene	ND	0.0022	0.00023	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0022	0.00033	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0054	0.00032	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0054	0.00024	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0054	0.00023	mg/kg	
108-05-4	Vinyl Acetate <sup>a</sup>	ND	0.0054	0.00061	mg/kg	
75-01-4	Vinyl chloride	ND	0.0022	0.00030	mg/kg	
	m,p-Xylene	ND	0.0022	0.00086	mg/kg	
95-47-6	o-Xylene	0.00032	0.0022	0.00026	mg/kg	J
1330-20-7	Xylene (total)	0.0011	0.0022	0.00026	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

<b>Client Sample ID:</b> VMP-51-31	<b>Date Sampled:</b> 12/12/12
<b>Lab Sample ID:</b> MC16889-6	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.8
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	82%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-51-31	<b>Date Sampled:</b> 12/12/12
<b>Lab Sample ID:</b> MC16889-6	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.8
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45009.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
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	0.0026	0.0011	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.00099	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	124%		61-167%
460-00-4	Bromofluorobenzene (S)	119%		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

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## Report of Analysis

<b>Client Sample ID:</b> TRIP BLANK	
<b>Lab Sample ID:</b> MC16889-7	<b>Date Sampled:</b> 12/12/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Date Received:</b> 12/14/12
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> n/a
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N71417.D	1	12/24/12	KD	n/a	n/a	MSN2685
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	5.0	3.0	ug/l	
107-02-8	Acrolein <sup>a</sup>	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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:	TRIP BLANK	Date Sampled:	12/12/12
Lab Sample ID:	MC16889-7	Date Received:	12/14/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 12/12/12
<b>Lab Sample ID:</b> MC16889-7	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		70-130%
2037-26-5	Toluene-D8	103%		70-130%
460-00-4	4-Bromofluorobenzene	120%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 12/12/12
<b>Lab Sample ID:</b> MC16889-7	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45036.D	1	12/21/12	CZ	12/21/12	OP31513	GBB2726
Run #2							

	Initial Volume	Final Volume
Run #1	34.0 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	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.011	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	90%		36-173%
460-00-4	Bromofluorobenzene (S)	97%		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

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## Report of Analysis

Client Sample ID:	VMP-52-13	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-8	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	95.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53110.D	1	12/26/12	AMY	n/a	n/a	MSM1803
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.83 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0054	0.0014	mg/kg	
107-02-8	Acrolein	ND	0.027	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.027	0.0014	mg/kg	
71-43-2	Benzene	ND	0.00054	0.00032	mg/kg	
108-86-1	Bromobenzene	ND	0.0054	0.00024	mg/kg	
74-97-5	Bromochloromethane	ND	0.0054	0.00041	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0022	0.00023	mg/kg	
75-25-2	Bromoform	ND	0.0022	0.0022	mg/kg	
74-83-9	Bromomethane	ND	0.0022	0.00057	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0054	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0054	0.00020	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0054	0.00025	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0054	0.00096	mg/kg	
75-15-0	Carbon disulfide	ND	0.0054	0.00018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0022	0.00079	mg/kg	
108-90-7	Chlorobenzene	ND	0.0022	0.00030	mg/kg	
75-00-3	Chloroethane	ND	0.0054	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0054	0.0022	mg/kg	
67-66-3	Chloroform	ND	0.0022	0.00056	mg/kg	
74-87-3	Chloromethane	ND	0.0054	0.00050	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0054	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0054	0.00025	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0022	0.00032	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0022	0.00024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0022	0.00025	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0022	0.00023	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0022	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0022	0.00029	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0022	0.00031	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0022	0.00040	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0022	0.00033	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0022	0.00031	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:	VMP-52-13	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-8	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	95.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0022	0.00041	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0054	0.00025	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0054	0.00094	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0054	0.00029	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0022	0.00019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0022	0.00054	mg/kg	
123-91-1	1,4-Dioxane	ND	0.027	0.027	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0054	0.00074	mg/kg	
100-41-4	Ethylbenzene	ND	0.0022	0.00026	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0054	0.00051	mg/kg	
591-78-6	2-Hexanone	ND	0.0054	0.00054	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0054	0.00025	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0054	0.00019	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0022	0.00031	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0054	0.00054	mg/kg	
74-95-3	Methylene bromide	ND	0.0054	0.00054	mg/kg	
75-09-2	Methylene chloride	0.0013	0.0022	0.0013	mg/kg	J
91-20-3	Naphthalene	ND	0.0054	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0054	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0054	0.00025	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0054	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0022	0.00046	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0022	0.00025	mg/kg	
108-88-3	Toluene	ND	0.0054	0.00092	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0054	0.00026	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0054	0.00025	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0022	0.00034	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0022	0.00080	mg/kg	
79-01-6	Trichloroethene	ND	0.0022	0.00023	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0022	0.00033	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0054	0.00032	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0054	0.00024	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0054	0.00023	mg/kg	
108-05-4	Vinyl Acetate <sup>a</sup>	ND	0.0054	0.00061	mg/kg	
75-01-4	Vinyl chloride	ND	0.0022	0.00030	mg/kg	
	m,p-Xylene	ND	0.0022	0.00086	mg/kg	
95-47-6	o-Xylene	ND	0.0022	0.00026	mg/kg	
1330-20-7	Xylene (total)	ND	0.0022	0.00026	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

<b>Client Sample ID:</b> VMP-52-13	<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-8	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 95.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	85%		70-130%
2037-26-5	Toluene-D8	87%		70-130%
460-00-4	4-Bromofluorobenzene	80%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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:	VMP-52-13	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-8	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	95.1
Method:	SW846 8011 SW846 3550B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45010.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
Run #2 <sup>a</sup>	BK20276.D	1	12/28/12	AP	12/20/12	OP31493	GBK733

Run #	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2	15.6 g	50.0 ml

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	0% <sup>b</sup>	97%	61-167%
460-00-4	Bromofluorobenzene (S)	0% <sup>b</sup>	133%	61-167%

(a) Confirmation run.

(b) Surrogate standard not added. Results confirmed by re-extraction/reanalysis.

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:	VMP-52-25	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-9	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	95.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53111.D	1	12/26/12	AMY	n/a	n/a	MSM1803
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.76 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0055	0.0014	mg/kg	
107-02-8	Acrolein	ND	0.027	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.027	0.0014	mg/kg	
71-43-2	Benzene	ND	0.00055	0.00032	mg/kg	
108-86-1	Bromobenzene	ND	0.0055	0.00024	mg/kg	
74-97-5	Bromochloromethane	ND	0.0055	0.00041	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0022	0.00023	mg/kg	
75-25-2	Bromoform	ND	0.0022	0.0022	mg/kg	
74-83-9	Bromomethane	ND	0.0022	0.00057	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0055	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0055	0.00020	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0055	0.00025	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0055	0.00097	mg/kg	
75-15-0	Carbon disulfide	ND	0.0055	0.00018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0022	0.00080	mg/kg	
108-90-7	Chlorobenzene	ND	0.0022	0.00030	mg/kg	
75-00-3	Chloroethane	ND	0.0055	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0055	0.0022	mg/kg	
67-66-3	Chloroform	ND	0.0022	0.00057	mg/kg	
74-87-3	Chloromethane	ND	0.0055	0.00051	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0055	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0055	0.00025	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0022	0.00032	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0022	0.00024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0022	0.00025	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0022	0.00023	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0022	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0022	0.00030	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0022	0.00032	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0022	0.00040	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0022	0.00033	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0022	0.00031	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:	VMP-52-25	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-9	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	95.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0022	0.00041	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0055	0.00025	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0055	0.00095	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0055	0.00029	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0022	0.00019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0022	0.00054	mg/kg	
123-91-1	1,4-Dioxane	ND	0.027	0.027	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0055	0.00075	mg/kg	
100-41-4	Ethylbenzene	ND	0.0022	0.00026	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0055	0.00051	mg/kg	
591-78-6	2-Hexanone	ND	0.0055	0.00055	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0055	0.00025	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0055	0.00020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0022	0.00032	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0055	0.00055	mg/kg	
74-95-3	Methylene bromide	ND	0.0055	0.00054	mg/kg	
75-09-2	Methylene chloride	0.0016	0.0022	0.0013	mg/kg	J
91-20-3	Naphthalene	ND	0.0055	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0055	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0055	0.00026	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0055	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0022	0.00047	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0022	0.00025	mg/kg	
108-88-3	Toluene	ND	0.0055	0.00093	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0055	0.00026	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0055	0.00025	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0022	0.00035	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0022	0.00081	mg/kg	
79-01-6	Trichloroethene	ND	0.0022	0.00023	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0022	0.00033	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0055	0.00032	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0055	0.00025	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0055	0.00023	mg/kg	
108-05-4	Vinyl Acetate <sup>a</sup>	ND	0.0055	0.00061	mg/kg	
75-01-4	Vinyl chloride	ND	0.0022	0.00030	mg/kg	
	m,p-Xylene	ND	0.0022	0.00086	mg/kg	
95-47-6	o-Xylene	ND	0.0022	0.00026	mg/kg	
1330-20-7	Xylene (total)	ND	0.0022	0.00026	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

<b>Client Sample ID:</b> VMP-52-25	<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-9	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 95.8
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	84%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	80%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-52-25	<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-9	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 95.8
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45011.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
Run #2 <sup>a</sup>	BK20277.D	1	12/28/12	AP	12/20/12	OP31493	GBK733

Run #	Initial Weight	Final Volume
Run #1	30.3 g	50.0 ml
Run #2	15.5 g	50.0 ml

### VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.00099	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	0% <sup>b</sup>	104%	61-167%
460-00-4	Bromofluorobenzene (S)	0% <sup>b</sup>	132%	61-167%

(a) Confirmation run.

(b) Surrogate standard not added. Results confirmed by re-extraction/reanalysis.

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

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## Report of Analysis

Client Sample ID:	VMP-52-25 DUP	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-10	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	96.5
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53112.D	1	12/26/12	AMY	n/a	n/a	MSM1803
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.86 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0053	0.0013	mg/kg	
107-02-8	Acrolein	ND	0.027	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.027	0.0013	mg/kg	
71-43-2	Benzene	ND	0.00053	0.00031	mg/kg	
108-86-1	Bromobenzene	ND	0.0053	0.00024	mg/kg	
74-97-5	Bromochloromethane	ND	0.0053	0.00040	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0021	0.00023	mg/kg	
75-25-2	Bromoform	ND	0.0021	0.0021	mg/kg	
74-83-9	Bromomethane	ND	0.0021	0.00055	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0053	0.0013	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0053	0.00020	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0053	0.00024	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0053	0.00094	mg/kg	
75-15-0	Carbon disulfide	ND	0.0053	0.00018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0021	0.00077	mg/kg	
108-90-7	Chlorobenzene	ND	0.0021	0.00029	mg/kg	
75-00-3	Chloroethane	ND	0.0053	0.0013	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0053	0.0021	mg/kg	
67-66-3	Chloroform	ND	0.0021	0.00055	mg/kg	
74-87-3	Chloromethane	ND	0.0053	0.00049	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0053	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0053	0.00024	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0021	0.00031	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0021	0.00023	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0021	0.00024	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0021	0.00022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0021	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0021	0.00029	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0021	0.00031	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0021	0.00039	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0021	0.00032	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0021	0.00031	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:	VMP-52-25 DUP	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-10	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	96.5
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0021	0.00040	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0053	0.00025	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0053	0.00092	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0053	0.00028	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0021	0.00018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0021	0.00053	mg/kg	
123-91-1	1,4-Dioxane	ND	0.027	0.027	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0053	0.00073	mg/kg	
100-41-4	Ethylbenzene	ND	0.0021	0.00026	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0053	0.00050	mg/kg	
591-78-6	2-Hexanone	ND	0.0053	0.00053	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0053	0.00024	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0053	0.00019	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0021	0.00031	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0053	0.00053	mg/kg	
74-95-3	Methylene bromide	ND	0.0053	0.00053	mg/kg	
75-09-2	Methylene chloride	0.0014	0.0021	0.0012	mg/kg	J
91-20-3	Naphthalene	ND	0.0053	0.0013	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0053	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0053	0.00025	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0053	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0021	0.00045	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0021	0.00024	mg/kg	
108-88-3	Toluene	ND	0.0053	0.00090	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0053	0.00025	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0053	0.00024	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0021	0.00034	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0021	0.00078	mg/kg	
79-01-6	Trichloroethene	ND	0.0021	0.00023	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0021	0.00032	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0053	0.00031	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0053	0.00024	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0053	0.00023	mg/kg	
108-05-4	Vinyl Acetate <sup>a</sup>	ND	0.0053	0.00060	mg/kg	
75-01-4	Vinyl chloride	ND	0.0021	0.00029	mg/kg	
	m,p-Xylene	ND	0.0021	0.00084	mg/kg	
95-47-6	o-Xylene	ND	0.0021	0.00026	mg/kg	
1330-20-7	Xylene (total)	ND	0.0021	0.00026	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

<b>Client Sample ID:</b> VMP-52-25 DUP	<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-10	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.5
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	85%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	79%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-52-25 DUP	<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-10	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.5
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45012.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	130%		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

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## Report of Analysis

Client Sample ID:	VMP-52-29	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-11	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	95.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53113.D	1	12/26/12	AMY	n/a	n/a	MSM1803
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.03 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0052	0.0013	mg/kg	
107-02-8	Acrolein	ND	0.026	0.010	mg/kg	
107-13-1	Acrylonitrile	ND	0.026	0.0013	mg/kg	
71-43-2	Benzene	ND	0.00052	0.00031	mg/kg	
108-86-1	Bromobenzene	ND	0.0052	0.00023	mg/kg	
74-97-5	Bromochloromethane	ND	0.0052	0.00039	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0021	0.00022	mg/kg	
75-25-2	Bromoform	ND	0.0021	0.0021	mg/kg	
74-83-9	Bromomethane	ND	0.0021	0.00054	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0052	0.0013	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0052	0.00019	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0052	0.00024	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0052	0.00091	mg/kg	
75-15-0	Carbon disulfide	ND	0.0052	0.00017	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0021	0.00075	mg/kg	
108-90-7	Chlorobenzene	ND	0.0021	0.00029	mg/kg	
75-00-3	Chloroethane	ND	0.0052	0.0013	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0052	0.0021	mg/kg	
67-66-3	Chloroform	ND	0.0021	0.00053	mg/kg	
74-87-3	Chloromethane	ND	0.0052	0.00048	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0052	0.0011	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0052	0.00024	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0021	0.00031	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	0.00022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0021	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0021	0.00028	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0021	0.00030	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0021	0.00038	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0021	0.00031	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0021	0.00030	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:	VMP-52-29	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-11	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	95.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0021	0.00039	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0052	0.00024	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0052	0.00090	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0052	0.00027	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0021	0.00018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0021	0.00051	mg/kg	
123-91-1	1,4-Dioxane	ND	0.026	0.026	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0052	0.00071	mg/kg	
100-41-4	Ethylbenzene	ND	0.0021	0.00025	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0052	0.00048	mg/kg	
591-78-6	2-Hexanone	ND	0.0052	0.00052	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0052	0.00024	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0052	0.00018	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0021	0.00030	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0052	0.00052	mg/kg	
74-95-3	Methylene bromide	ND	0.0052	0.00051	mg/kg	
75-09-2	Methylene chloride	0.0013	0.0021	0.0012	mg/kg	J
91-20-3	Naphthalene	ND	0.0052	0.0013	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0052	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0052	0.00024	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0052	0.0010	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0021	0.00044	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0021	0.00024	mg/kg	
108-88-3	Toluene	ND	0.0052	0.00088	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0052	0.00025	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0052	0.00024	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0021	0.00033	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0021	0.00076	mg/kg	
79-01-6	Trichloroethene	ND	0.0021	0.00022	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0021	0.00032	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0052	0.00030	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0052	0.00023	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0052	0.00022	mg/kg	
108-05-4	Vinyl Acetate <sup>a</sup>	ND	0.0052	0.00058	mg/kg	
75-01-4	Vinyl chloride	ND	0.0021	0.00028	mg/kg	
	m,p-Xylene	ND	0.0021	0.00082	mg/kg	
95-47-6	o-Xylene	ND	0.0021	0.00025	mg/kg	
1330-20-7	Xylene (total)	ND	0.0021	0.00025	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

<b>Client Sample ID:</b> VMP-52-29	<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-11	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 95.8
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	85%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	80%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-52-29	<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-11	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 95.8
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45013.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.8 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	0.0025	0.0011	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0025	0.00098	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	129%		61-167%
460-00-4	Bromofluorobenzene (S)	124%		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

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## Report of Analysis

Client Sample ID:	VMP-53-15	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-12	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	94.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53106.D	1	12/26/12	AMY	n/a	n/a	MSM1803
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.94 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	0.158	0.0054	0.0014	mg/kg	
107-02-8	Acrolein	ND	0.027	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.027	0.0013	mg/kg	
71-43-2	Benzene	0.0014	0.00054	0.00032	mg/kg	
108-86-1	Bromobenzene	ND	0.0054	0.00024	mg/kg	
74-97-5	Bromochloromethane	ND	0.0054	0.00040	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0021	0.00023	mg/kg	
75-25-2	Bromoform	ND	0.0021	0.0021	mg/kg	
74-83-9	Bromomethane	ND	0.0021	0.00056	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0054	0.0013	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0054	0.00020	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0054	0.00025	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0054	0.00094	mg/kg	
75-15-0	Carbon disulfide	ND	0.0054	0.00018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0021	0.00078	mg/kg	
108-90-7	Chlorobenzene	ND	0.0021	0.00029	mg/kg	
75-00-3	Chloroethane	ND	0.0054	0.0013	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0054	0.0021	mg/kg	
67-66-3	Chloroform	ND	0.0021	0.00055	mg/kg	
74-87-3	Chloromethane	ND	0.0054	0.00050	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0054	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0054	0.00024	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0021	0.00032	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0021	0.00023	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0021	0.00024	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0021	0.00023	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0021	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0021	0.00029	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0021	0.00031	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0021	0.00039	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0021	0.00032	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0021	0.00031	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:	VMP-53-15	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-12	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	94.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0021	0.00040	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0054	0.00025	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0054	0.00093	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0054	0.00028	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0021	0.00018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0021	0.00053	mg/kg	
123-91-1	1,4-Dioxane	ND	0.027	0.027	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0054	0.00073	mg/kg	
100-41-4	Ethylbenzene	0.0022	0.0021	0.00026	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0054	0.00050	mg/kg	
591-78-6	2-Hexanone	ND	0.0054	0.00054	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0054	0.00024	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0054	0.00019	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0021	0.00031	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0054	0.00054	mg/kg	
74-95-3	Methylene bromide	ND	0.0054	0.00053	mg/kg	
75-09-2	Methylene chloride	ND	0.0021	0.0012	mg/kg	
91-20-3	Naphthalene	ND	0.0054	0.0013	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0054	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0054	0.00025	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0054	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0021	0.00046	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0021	0.00025	mg/kg	
108-88-3	Toluene	0.0033	0.0054	0.00091	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0054	0.00025	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0054	0.00025	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0021	0.00034	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0021	0.00079	mg/kg	
79-01-6	Trichloroethene	ND	0.0021	0.00023	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0021	0.00033	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0054	0.00031	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0054	0.00024	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0054	0.00023	mg/kg	
108-05-4	Vinyl Acetate <sup>a</sup>	ND	0.0054	0.00060	mg/kg	
75-01-4	Vinyl chloride	ND	0.0021	0.00029	mg/kg	
	m,p-Xylene	ND	0.0021	0.00085	mg/kg	
95-47-6	o-Xylene	ND	0.0021	0.00026	mg/kg	
1330-20-7	Xylene (total)	0.00063	0.0021	0.00026	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

<b>Client Sample ID:</b> VMP-53-15	<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-12	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.4
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	81%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-53-15	<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-12	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 94.4
<b>Method:</b> SW846 8011 SW846 8011	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45014.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	120%		61-167%
460-00-4	Bromofluorobenzene (S)	110%		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

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## Report of Analysis

Client Sample ID:	VMP-53-27	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-13	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	95.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53114.D	1	12/26/12	AMY	n/a	n/a	MSM1803
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.99 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	0.0773	0.0052	0.0013	mg/kg	
107-02-8	Acrolein	ND	0.026	0.010	mg/kg	
107-13-1	Acrylonitrile	ND	0.026	0.0013	mg/kg	
71-43-2	Benzene	0.00070	0.00052	0.00031	mg/kg	
108-86-1	Bromobenzene	ND	0.0052	0.00023	mg/kg	
74-97-5	Bromochloromethane	ND	0.0052	0.00039	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0021	0.00022	mg/kg	
75-25-2	Bromoform	ND	0.0021	0.0021	mg/kg	
74-83-9	Bromomethane	ND	0.0021	0.00054	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0052	0.0013	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0052	0.00019	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0052	0.00024	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0052	0.00092	mg/kg	
75-15-0	Carbon disulfide	ND	0.0052	0.00017	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0021	0.00076	mg/kg	
108-90-7	Chlorobenzene	ND	0.0021	0.00029	mg/kg	
75-00-3	Chloroethane	ND	0.0052	0.0013	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0052	0.0021	mg/kg	
67-66-3	Chloroform	ND	0.0021	0.00054	mg/kg	
74-87-3	Chloromethane	ND	0.0052	0.00049	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0052	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0052	0.00024	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0021	0.00031	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0021	0.00023	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0021	0.00024	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0021	0.00022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0021	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0021	0.00028	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0021	0.00030	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0021	0.00039	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0021	0.00032	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0021	0.00030	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:	VMP-53-27	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-13	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	95.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0021	0.00039	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0052	0.00024	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0052	0.00091	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0052	0.00028	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0021	0.00018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0021	0.00052	mg/kg	
123-91-1	1,4-Dioxane	ND	0.026	0.026	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0052	0.00071	mg/kg	
100-41-4	Ethylbenzene	0.0018	0.0021	0.00025	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.0052	0.00049	mg/kg	
591-78-6	2-Hexanone	ND	0.0052	0.00052	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0052	0.00024	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0052	0.00019	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0021	0.00030	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0052	0.00052	mg/kg	
74-95-3	Methylene bromide	ND	0.0052	0.00052	mg/kg	
75-09-2	Methylene chloride	ND	0.0021	0.0012	mg/kg	
91-20-3	Naphthalene	ND	0.0052	0.0013	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0052	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0052	0.00025	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0052	0.0010	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0021	0.00045	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0021	0.00024	mg/kg	
108-88-3	Toluene	0.0020	0.0052	0.00089	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0052	0.00025	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0052	0.00024	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0021	0.00033	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0021	0.00077	mg/kg	
79-01-6	Trichloroethene	ND	0.0021	0.00022	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0021	0.00032	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0052	0.00031	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0052	0.00023	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0052	0.00022	mg/kg	
108-05-4	Vinyl Acetate <sup>a</sup>	ND	0.0052	0.00059	mg/kg	
75-01-4	Vinyl chloride	ND	0.0021	0.00029	mg/kg	
	m,p-Xylene	ND	0.0021	0.00083	mg/kg	
95-47-6	o-Xylene	ND	0.0021	0.00025	mg/kg	
1330-20-7	Xylene (total)	0.00046	0.0021	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

<b>Client Sample ID:</b> VMP-53-27		<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-13		<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil		<b>Percent Solids:</b> 95.6
<b>Method:</b> SW846 8260B		
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL		

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	83%		70-130%
2037-26-5	Toluene-D8	87%		70-130%
460-00-4	4-Bromofluorobenzene	81%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-53-27 <b>Lab Sample ID:</b> MC16889-13 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 8011 <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 12/13/12 <b>Date Received:</b> 12/14/12 <b>Percent Solids:</b> 95.6
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45015.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.3 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	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	128%		61-167%
460-00-4	Bromofluorobenzene (S)	118%		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

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## Report of Analysis

Client Sample ID:	VMP-53-31	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-14	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	79.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53134.D	1	12/27/12	AMY	n/a	n/a	MSM1804
Run #2							

Run #	Initial Weight	Final Volume
Run #1	6.18 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0051	0.0013	mg/kg	
107-02-8	Acrolein	ND	0.026	0.010	mg/kg	
107-13-1	Acrylonitrile	ND	0.026	0.0013	mg/kg	
71-43-2	Benzene	0.0012	0.00051	0.00030	mg/kg	
108-86-1	Bromobenzene	ND	0.0051	0.00023	mg/kg	
74-97-5	Bromochloromethane	ND	0.0051	0.00038	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0020	0.00022	mg/kg	
75-25-2	Bromoform	ND	0.0020	0.0020	mg/kg	
74-83-9	Bromomethane	ND	0.0020	0.00053	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0051	0.0013	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0051	0.00019	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0051	0.00023	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0051	0.00090	mg/kg	
75-15-0	Carbon disulfide	ND	0.0051	0.00017	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0020	0.00074	mg/kg	
108-90-7	Chlorobenzene	ND	0.0020	0.00028	mg/kg	
75-00-3	Chloroethane	ND	0.0051	0.0013	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0051	0.0020	mg/kg	
67-66-3	Chloroform	ND	0.0020	0.00053	mg/kg	
74-87-3	Chloromethane	ND	0.0051	0.00047	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0051	0.0011	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0051	0.00023	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0020	0.00030	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0020	0.00022	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0020	0.00023	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0020	0.00022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0020	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0020	0.00028	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0020	0.00029	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0020	0.00037	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0020	0.00031	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0020	0.00029	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:	VMP-53-31	Date Sampled:	12/13/12
Lab Sample ID:	MC16889-14	Date Received:	12/14/12
Matrix:	SO - Soil	Percent Solids:	79.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0020	0.00038	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0051	0.00024	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0051	0.00089	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0051	0.00027	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0020	0.00017	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0020	0.00051	mg/kg	
123-91-1	1,4-Dioxane	ND	0.026	0.026	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0051	0.00069	mg/kg	
100-41-4	Ethylbenzene	0.0019	0.0020	0.00025	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.0051	0.00047	mg/kg	
591-78-6	2-Hexanone	ND	0.0051	0.00051	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0051	0.00023	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0051	0.00018	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0020	0.00029	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0051	0.00051	mg/kg	
74-95-3	Methylene bromide	ND	0.0051	0.00050	mg/kg	
75-09-2	Methylene chloride	ND	0.0020	0.0012	mg/kg	
91-20-3	Naphthalene	ND	0.0051	0.0013	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0051	0.0010	mg/kg	
100-42-5	Styrene	ND	0.0051	0.00024	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0051	0.0010	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0020	0.00043	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0020	0.00023	mg/kg	
108-88-3	Toluene	0.0027	0.0051	0.00087	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0051	0.00024	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0051	0.00023	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0020	0.00032	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0020	0.00075	mg/kg	
79-01-6	Trichloroethene	ND	0.0020	0.00022	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0020	0.00031	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0051	0.00030	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0051	0.00023	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0051	0.00022	mg/kg	
108-05-4	Vinyl Acetate <sup>a</sup>	ND	0.0051	0.00057	mg/kg	
75-01-4	Vinyl chloride	ND	0.0020	0.00028	mg/kg	
	m,p-Xylene	ND	0.0020	0.00080	mg/kg	
95-47-6	o-Xylene	ND	0.0020	0.00024	mg/kg	
1330-20-7	Xylene (total)	0.00071	0.0020	0.00024	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

<b>Client Sample ID:</b> VMP-53-31	<b>Date Sampled:</b> 12/13/12
<b>Lab Sample ID:</b> MC16889-14	<b>Date Received:</b> 12/14/12
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 79.3
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	85%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	82%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

<b>Client Sample ID:</b> VMP-53-31 <b>Lab Sample ID:</b> MC16889-14 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 8011 <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 12/13/12 <b>Date Received:</b> 12/14/12 <b>Percent Solids:</b> 79.3
---	--

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45016.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 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	0.0031	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0031	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	122%		61-167%
460-00-4	Bromofluorobenzene (S)	118%		61-167%

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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

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## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

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

FED-EX Tracking # \_\_\_\_\_ Bottle Order Control # \_\_\_\_\_  
Accutest Quote # \_\_\_\_\_ Accutest Job # MC16889

Client / Reporting Information		Project Information				Requested Analysis ( see TEST CODE sheet)														Matrix Codes
Company Name <u>URS</u>		Project Name <u>Roxana Drilling</u>				<div style="display: flex; justify-content: space-between;"> <span>VOC 8260</span> <span>VOC 8011</span> </div>														DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank
Street Address		Street: <u>Roxana, IL</u>																		
City State Zip		City, State Zip <u>Roxana, IL</u>																		
Project Contact <u>E. Kunkel</u>		Project # <u>21562850.15000</u>																		
Phone #		Client PO#																		
Sampler(s) Name(s) <u>Wendy Pennington Jason Straeter</u>		Project Manager <u>D. Palmer</u>																		
Accutest Sample #	Field ID / Point of Collection	MECHDI Viol #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NO3	HNO3	H2SO4	NONE	DI Water	MEDI	ENCODE	Brutale	LAB USE ONLY			
-1	VMP-49-11		12/12/12	1035	WPS	SO	4					X	X	X	X	X				
-13	VMP-49-11 MS			1035								X	X	X	X	X				
-15	VMP-49-11 MSD			1035								X	X	X	X	X				
-2	VMP-49-21			1040								X	X	X	X	X				
-3	VMP-49-31			1045								X	X	X	X	X				
-4	VMP-51-14			1315								X	X	X	X	X				
-5	VMP-51-21			1325								X	X	X	X	X				
-6	VMP-51-31			1330								X	X	X	X	X				
-7	Trip Blank															X	X			
-8	VMP-52-13		12/13/12	1015	WPS	SO	4					X	X	X	X	X	YES, IOE,			
-9	VMP-52-25			1020								X	X	X	X	X	IOK6			
-10	VMP-52-25 Dup			1020								X	X	X	X	X				
Turnaround Time ( Business days)		Approved By (Accutest PM): / Date:		Data Deliverable Information				Comments / Special Instructions												
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush T/A data available VIA Lablink		<input type="checkbox"/> Commercial "A" ( Level 1) <input type="checkbox"/> Commercial "B" ( Level 2) <input checked="" type="checkbox"/> FULLT1 ( Level 3+4) <input type="checkbox"/> CT RCP <input type="checkbox"/> MA MCP Commercial "A" = Results Only Commercial "B" = Results + QC Summary		<input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input checked="" type="checkbox"/> EDD Format <input type="checkbox"/> Other _____																
Sample Custody must be documented below each time samples change possession, including courier delivery.																				
Relinquished by Sampler: 1 <u>Wendy Pennington</u>	Date Time: <u>12/13/12 1400</u>	Received By: 1 <u>Fed Ex</u>	Relinquished By: 2 <u>Fed Ex</u>	Date Time: <u>9:30</u>	Received By: 2 <u>Waymond</u>															
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4															
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	<input type="checkbox"/> Intact <input type="checkbox"/> Not Intact		<input type="checkbox"/> Preserved where applicable		<input checked="" type="checkbox"/> On Ice <input type="checkbox"/> Cooler Temp. <u>1.3</u>												

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## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC16889      Client: URS      Immediate Client Services Action Required: No  
 Date / Time Received: 12/14/2012      Delivery Method: \_\_\_\_\_      Client Service Action Required at Login: No  
 Project: ROXANA DRILLING      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

## Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16889

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562850.15000

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Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16889-1 Collected: 12-DEC-12 10:35 By: WPJS Received: 14-DEC-12 By: VMP-49-11						
MC16889-1	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-1	SW846 8011	19-DEC-12 23:19	CZ	18-DEC-12	NK	V8011SL
MC16889-1	SW846 8260B	21-DEC-12 20:03	AMY			V8260SL+
MC16889-1	SW846 8260B	26-DEC-12 10:03	AMY			V8260SL+
MC16889-2 Collected: 12-DEC-12 10:40 By: WPJS Received: 14-DEC-12 By: VMP-49-21						
MC16889-2	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-2	SW846 8011	19-DEC-12 23:45	CZ	18-DEC-12	NK	V8011SL
MC16889-2	SW846 8260B	21-DEC-12 20:33	AMY			V8260SL+
MC16889-3 Collected: 12-DEC-12 10:45 By: WPJS Received: 14-DEC-12 By: VMP-49-31						
MC16889-3	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-3	SW846 8011	20-DEC-12 00:12	CZ	18-DEC-12	NK	V8011SL
MC16889-3	SW846 8260B	21-DEC-12 21:03	AMY			V8260SL+
MC16889-4 Collected: 12-DEC-12 13:15 By: WPJS Received: 14-DEC-12 By: VMP-51-14						
MC16889-4	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-4	SW846 8011	20-DEC-12 00:39	CZ	18-DEC-12	NK	V8011SL
MC16889-4	SW846 8260B	21-DEC-12 21:33	AMY			V8260SL+
MC16889-5 Collected: 12-DEC-12 13:25 By: WPJS Received: 14-DEC-12 By: VMP-51-21						
MC16889-5	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-5	SW846 8011	20-DEC-12 01:32	CZ	18-DEC-12	NK	V8011SL
MC16889-5	SW846 8260B	26-DEC-12 10:34	AMY			V8260SL+
MC16889-6 Collected: 12-DEC-12 13:30 By: WPJS Received: 14-DEC-12 By: VMP-51-31						
MC16889-6	SM21 2540 B MOD.	17-DEC-12	MA			%SOL

## Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16889

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562850.15000

5.2  
5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16889-6	SW846 8011	20-DEC-12 01:59	CZ	18-DEC-12	NK	V8011SL
MC16889-6	SW846 8260B	26-DEC-12 11:04	AMY			V8260SL+
MC16889-7 Collected: 12-DEC-12 00:00 By: WPJS Received: 14-DEC-12 By: TRIP BLANK						
MC16889-7	SW846 8011	21-DEC-12 22:10	CZ	21-DEC-12	BJ	V8011SL
MC16889-7	SW846 8260B	24-DEC-12 11:40	KD			V8260SL+
MC16889-8 Collected: 13-DEC-12 10:15 By: WPJS Received: 14-DEC-12 By: VMP-52-13						
MC16889-8	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-8	SW846 8011	20-DEC-12 02:26	CZ	18-DEC-12	NK	V8011SL
MC16889-8	SW846 8260B	26-DEC-12 17:09	AMY			V8260SL+
MC16889-8	SW846 8011	28-DEC-12 15:28	AP	20-DEC-12	AJ	V8011SL
MC16889-9 Collected: 13-DEC-12 10:20 By: WPJS Received: 14-DEC-12 By: VMP-52-25						
MC16889-9	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-9	SW846 8011	20-DEC-12 02:52	CZ	18-DEC-12	NK	V8011SL
MC16889-9	SW846 8260B	26-DEC-12 17:40	AMY			V8260SL+
MC16889-9	SW846 8011	28-DEC-12 15:52	AP	20-DEC-12	AJ	V8011SL
MC16889-10 Collected: 13-DEC-12 10:20 By: WPJS Received: 14-DEC-12 By: VMP-52-25 DUP						
MC16889-10	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-10	SW846 8011	20-DEC-12 03:19	CZ	18-DEC-12	NK	V8011SL
MC16889-10	SW846 8260B	26-DEC-12 18:10	AMY			V8260SL+
MC16889-11 Collected: 13-DEC-12 10:25 By: WPJS Received: 14-DEC-12 By: VMP-52-29						
MC16889-11	SM21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-11	SW846 8011	20-DEC-12 03:46	CZ	18-DEC-12	NK	V8011SL
MC16889-11	SW846 8260B	26-DEC-12 18:41	AMY			V8260SL+

### Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16889

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562850.15000

5.2  
5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
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MC16889-12 Collected: 13-DEC-12 13:25 By: WPJS Received: 14-DEC-12 By: VMP-53-15

MC16889-12	M21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-12	SW846 8011	20-DEC-12 04:13	CZ	18-DEC-12	NK	V8011SL
MC16889-12	SW846 8260B	26-DEC-12 15:08	AMY			V8260SL +

MC16889-13 Collected: 13-DEC-12 13:40 By: WPJS Received: 14-DEC-12 By: VMP-53-27

MC16889-13	M21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-13	SW846 8011	20-DEC-12 04:40	CZ	18-DEC-12	NK	V8011SL
MC16889-13	SW846 8260B	26-DEC-12 19:11	AMY			V8260SL +

MC16889-14 Collected: 13-DEC-12 13:45 By: WPJS Received: 14-DEC-12 By: VMP-53-31

MC16889-14	M21 2540 B MOD.	17-DEC-12	MA			%SOL
MC16889-14	SW846 8011	20-DEC-12 05:07	CZ	18-DEC-12	NK	V8011SL
MC16889-14	SW846 8260B	27-DEC-12 18:10	AMY			V8260SL +

# SGS Accutest Internal Chain of Custody

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/14/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16889-1.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-1.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-1.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-1.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-1.1	Scott Parsick		02/13/13 11:51	Disposed
MC16889-1.2	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-1.2	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-1.2	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-1.2	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-1.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-1.3	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-1.3	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-1.3	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-1.3	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-1.3	Scott Parsick		02/13/13 11:51	Disposed
MC16889-1.6	VOC Ref #10	Amy Min Yang	12/26/12 09:39	Retrieve from Storage
MC16889-1.6	Amy Min Yang	GCMSM	12/26/12 09:39	Load on Instrument
MC16889-1.6	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-1.6	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-1.6	Scott Parsick		02/13/13 11:51	Disposed
MC16889-1.7	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16889-1.7	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16889-1.7	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-1.7	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-1.7	Scott Parsick		02/13/13 11:51	Disposed
MC16889-1.8	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16889-1.8	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16889-1.8	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-1.8	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-1.8	Scott Parsick		02/13/13 11:51	Disposed
MC16889-1.9	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16889-1.9	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16889-1.9	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-1.9	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-1.9	Scott Parsick		02/13/13 11:51	Disposed
MC16889-1.11	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-1.11	Gary Krasinski	VOC Ref #10	12/17/12 09:42	Return to Storage

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# SGS Accutest Internal Chain of Custody

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/14/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16889-1.11	Scott Parsick		02/13/13 11:51	Disposed
MC16889-1.12	VOC Ref #10	Gary Krasinski	12/17/12 09:45	Retrieve from Storage
MC16889-1.12	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-1.12	Scott Parsick		02/13/13 11:51	Disposed
MC16889-2.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-2.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-2.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-2.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-2.1	Scott Parsick		02/13/13 11:51	Disposed
MC16889-2.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16889-2.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16889-2.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-2.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-2.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-2.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-2.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-2.4	Scott Parsick		02/13/13 11:51	Disposed
MC16889-3.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-3.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-3.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-3.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-3.1	Scott Parsick		02/13/13 11:51	Disposed
MC16889-3.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16889-3.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16889-3.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-3.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-3.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-3.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-3.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-3.4	Scott Parsick		02/13/13 11:51	Disposed
MC16889-4.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-4.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-4.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-4.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-4.1	Scott Parsick		02/13/13 11:51	Disposed

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# SGS Accutest Internal Chain of Custody

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/14/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16889-4.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16889-4.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16889-4.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-4.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-4.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-4.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-4.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-4.4	Scott Parsick		02/13/13 11:51	Disposed
MC16889-5.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-5.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-5.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-5.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-5.1	Scott Parsick		02/13/13 11:51	Disposed
MC16889-5.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16889-5.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16889-5.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-5.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-5.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-5.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-5.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-5.4	Scott Parsick		02/13/13 11:51	Disposed
MC16889-6.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-6.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-6.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-6.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-6.1	Scott Parsick		02/13/13 11:51	Disposed
MC16889-6.2	VOC Ref #10	Amy Min Yang	12/21/12 12:37	Retrieve from Storage
MC16889-6.2	Amy Min Yang	GCMSM	12/21/12 12:37	Load on Instrument
MC16889-6.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-6.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-6.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-6.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-6.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-6.4	Scott Parsick		02/13/13 11:51	Disposed
MC16889-7.2	VOC Ref #2	Krysten Dufort	12/24/12 09:37	Retrieve from Storage
MC16889-7.2	Krysten Dufort	GCMSN	12/24/12 09:37	Load on Instrument

# SGS Accutest Internal Chain of Custody

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/14/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16889-7.2	GCMSN	Krysten Dufort	12/27/12 11:19	Unload from Instrument
MC16889-7.2	Krysten Dufort	VOC Ref #2	12/27/12 13:11	Return to Storage
MC16889-7.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-7.4	VOC Ref #4	Nick Krasinski	12/21/12 13:02	Retrieve from Storage
MC16889-7.4	Nick Krasinski		12/21/12 14:24	Depleted
MC16889-8.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-8.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-8.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-8.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-8.1	Scott Parsick		02/13/13 11:51	Disposed
MC16889-8.3	VOC Ref #10	Amy Min Yang	12/26/12 09:39	Retrieve from Storage
MC16889-8.3	Amy Min Yang	GCMSM	12/26/12 09:39	Load on Instrument
MC16889-8.3	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-8.3	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-8.3	Scott Parsick		02/13/13 11:51	Disposed
MC16889-8.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-8.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-8.4	Scott Parsick		02/13/13 11:51	Disposed
MC16889-9.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-9.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-9.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-9.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-9.1	Scott Parsick		02/13/13 11:51	Disposed
MC16889-9.2	VOC Ref #10	Amy Min Yang	12/26/12 09:39	Retrieve from Storage
MC16889-9.2	Amy Min Yang	GCMSM	12/26/12 09:39	Load on Instrument
MC16889-9.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-9.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-9.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-9.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-9.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-9.4	Scott Parsick		02/13/13 11:51	Disposed
MC16889-10.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-10.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-10.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-10.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-10.1	Scott Parsick		02/13/13 11:51	Disposed

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# SGS Accutest Internal Chain of Custody

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/14/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16889-10.3	VOC Ref #10	Amy Min Yang	12/26/12 09:39	Retrieve from Storage
MC16889-10.3	Amy Min Yang	GCMSM	12/26/12 09:39	Load on Instrument
MC16889-10.3	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-10.3	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-10.3	Scott Parsick		02/13/13 11:51	Disposed
MC16889-10.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-10.4	Gary Krasinski	VOC Ref #10	12/17/12 09:42	Return to Storage
MC16889-10.4	Scott Parsick		02/13/13 11:51	Disposed
MC16889-11.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-11.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-11.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-11.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-11.1	Scott Parsick		02/13/13 11:51	Disposed
MC16889-11.2	VOC Ref #10	Amy Min Yang	12/26/12 09:39	Retrieve from Storage
MC16889-11.2	Amy Min Yang	GCMSM	12/26/12 09:39	Load on Instrument
MC16889-11.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-11.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-11.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-11.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-11.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-11.4	Scott Parsick		02/13/13 11:51	Disposed
MC16889-12.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-12.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-12.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-12.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-12.1	Scott Parsick		02/13/13 11:51	Disposed
MC16889-12.2	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-12.2	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-12.2	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-12.2	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-12.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-12.3	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-12.3	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-12.3	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-12.3	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-12.3	Scott Parsick		02/13/13 11:51	Disposed

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# SGS Accutest Internal Chain of Custody

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Received: 12/14/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16889-12.7	VOC Ref #10	Amy Min Yang	12/26/12 09:39	Retrieve from Storage
MC16889-12.7	Amy Min Yang	GCMSM	12/26/12 09:39	Load on Instrument
MC16889-12.7	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-12.7	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-12.7	Scott Parsick		02/13/13 11:51	Disposed
MC16889-12.8	VOC Ref #10	Amy Min Yang	12/26/12 09:39	Retrieve from Storage
MC16889-12.8	Amy Min Yang	GCMSM	12/26/12 09:39	Load on Instrument
MC16889-12.8	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-12.8	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-12.8	Scott Parsick		02/13/13 11:51	Disposed
MC16889-12.9	VOC Ref #10	Amy Min Yang	12/26/12 09:39	Retrieve from Storage
MC16889-12.9	Amy Min Yang	GCMSM	12/26/12 09:39	Load on Instrument
MC16889-12.9	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-12.9	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-12.9	Scott Parsick		02/13/13 11:51	Disposed
MC16889-12.11	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-12.11	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-12.11	Scott Parsick		02/13/13 11:51	Disposed
MC16889-13.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-13.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-13.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-13.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-13.1	Scott Parsick		02/13/13 11:51	Disposed
MC16889-13.2	VOC Ref #10	Amy Min Yang	12/26/12 09:39	Retrieve from Storage
MC16889-13.2	Amy Min Yang	GCMSM	12/26/12 09:39	Load on Instrument
MC16889-13.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-13.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-13.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-13.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-13.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-13.4	Scott Parsick		02/13/13 11:51	Disposed
MC16889-14.1	Walk In Ref #9	Nick Krasinski	12/17/12 11:42	Retrieve from Storage
MC16889-14.1	Nick Krasinski	Walk In Ref #9	12/17/12 21:22	Return to Storage
MC16889-14.1	Walk In Ref #9	Nick Krasinski	12/18/12 21:45	Retrieve from Storage
MC16889-14.1	Nick Krasinski	Walk In Ref #9	12/18/12 21:45	Return to Storage
MC16889-14.1	Scott Parsick		02/13/13 11:51	Disposed

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# SGS Accutest Internal Chain of Custody

**Job Number:** MC16889  
**Account:** SHELLWIC Shell Oil  
**Project:** URSMOSTL: Roxana Drilling, Roxana, IL  
**Received:** 12/14/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16889-14.2	VOC Ref #10	Amy Min Yang	12/27/12 16:57	Retrieve from Storage
MC16889-14.2	Amy Min Yang	GCMSM	12/27/12 16:57	Load on Instrument
MC16889-14.2	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-14.2	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-14.2	Scott Parsick		02/13/13 11:51	Disposed
MC16889-14.3	VOC Ref #10	Amy Min Yang	12/26/12 09:39	Retrieve from Storage
MC16889-14.3	Amy Min Yang	GCMSM	12/26/12 09:39	Load on Instrument
MC16889-14.3	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC16889-14.3	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC16889-14.3	Scott Parsick		02/13/13 11:51	Disposed
MC16889-14.4	VOC Ref #10	Gary Krasinski	12/17/12 09:17	Retrieve from Storage
MC16889-14.4	Gary Krasinski	VOC Ref #10	12/18/12 09:46	Return to Storage
MC16889-14.4	Scott Parsick		02/13/13 11:51	Disposed

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## GC/MS Volatiles

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## QC Data Summaries

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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: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-MB	M53045.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-1, MC16889-2, MC16889-3, MC16889-4

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

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# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-MB	M53045.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-1, MC16889-2, MC16889-3, MC16889-4

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

6.1.1  
6

# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-MB	M53045.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-1, MC16889-2, MC16889-3, MC16889-4

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	82% 70-130%
2037-26-5	Toluene-D8	88% 70-130%
460-00-4	4-Bromofluorobenzene	80% 70-130%

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

6.1.1  
6

# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2685-MB	N71414.D	1	12/24/12	KD	n/a	n/a	MSN2685

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-7

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	

6.1.2  
6

# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2685-MB	N71414.D	1	12/24/12	KD	n/a	n/a	MSN2685

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-7

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	ug/l	

# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2685-MB	N71414.D	1	12/24/12	KD	n/a	n/a	MSN2685

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-7

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	98% 70-130%
2037-26-5	Toluene-D8	102% 70-130%
460-00-4	4-Bromofluorobenzene	115% 70-130%

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

# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1803-MB	M53095.D	1	12/26/12	AMY	n/a	n/a	MSM1803

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1803-MB	M53095.D	1	12/26/12	AMY	n/a	n/a	MSM1803

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1803-MB	M53095.D	1	12/26/12	AMY	n/a	n/a	MSM1803

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	82%	70-130%
2037-26-5	Toluene-D8	88%	70-130%
460-00-4	4-Bromofluorobenzene	80%	70-130%

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

6.1.3  
6

# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1804-MB	M53121.D	1	12/27/12	AMY	n/a	n/a	MSM1804

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-14

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1804-MB	M53121.D	1	12/27/12	AMY	n/a	n/a	MSM1804

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-14

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

# Method Blank Summary

Job Number: MC16889  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1804-MB	M53121.D	1	12/27/12	AMY	n/a	n/a	MSM1804

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-14

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	81% 70-130%
2037-26-5	Toluene-D8	87% 70-130%
460-00-4	4-Bromofluorobenzene	79% 70-130%

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

# Blank Spike Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-BS	M53043.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-1, MC16889-2, MC16889-3, MC16889-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	50	37.5	75	70-130
107-02-8	Acrolein	250	118	47* a	70-130
107-13-1	Acrylonitrile	50	55.1	110	70-130
71-43-2	Benzene	50	50.9	102	70-130
108-86-1	Bromobenzene	50	47.4	95	70-130
74-97-5	Bromochloromethane	50	49.0	98	70-130
75-27-4	Bromodichloromethane	50	47.4	95	70-130
75-25-2	Bromoform	50	46.9	94	70-130
74-83-9	Bromomethane	50	55.4	111	70-130
78-93-3	2-Butanone (MEK)	50	52.0	104	70-130
104-51-8	n-Butylbenzene	50	54.1	108	70-130
135-98-8	sec-Butylbenzene	50	51.0	102	70-130
98-06-6	tert-Butylbenzene	50	49.7	99	70-130
75-15-0	Carbon disulfide	50	61.1	122	70-130
56-23-5	Carbon tetrachloride	50	56.9	114	70-130
108-90-7	Chlorobenzene	50	46.4	93	70-130
75-00-3	Chloroethane	50	58.4	117	70-130
110-75-8	2-Chloroethyl vinyl ether	50	50.3	101	10-160
67-66-3	Chloroform	50	50.2	100	70-130
74-87-3	Chloromethane	50	62.6	125	70-130
95-49-8	o-Chlorotoluene	50	46.9	94	70-130
106-43-4	p-Chlorotoluene	50	48.2	96	70-130
124-48-1	Dibromochloromethane	50	46.1	92	70-130
95-50-1	1,2-Dichlorobenzene	50	44.6	89	70-130
541-73-1	1,3-Dichlorobenzene	50	46.5	93	70-130
106-46-7	1,4-Dichlorobenzene	50	46.8	94	70-130
75-71-8	Dichlorodifluoromethane	50	63.6	127	70-130
75-34-3	1,1-Dichloroethane	50	53.7	107	70-130
107-06-2	1,2-Dichloroethane	50	48.7	97	70-130
75-35-4	1,1-Dichloroethene	50	59.9	120	70-130
156-59-2	cis-1,2-Dichloroethene	50	49.5	99	70-130
156-60-5	trans-1,2-Dichloroethene	50	54.4	109	70-130
78-87-5	1,2-Dichloropropane	50	47.7	95	70-130
142-28-9	1,3-Dichloropropane	50	47.9	96	70-130
594-20-7	2,2-Dichloropropane	50	56.0	112	70-130
563-58-6	1,1-Dichloropropene	50	57.1	114	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-BS	M53043.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-1, MC16889-2, MC16889-3, MC16889-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	47.2	94	70-130
10061-02-6	trans-1,3-Dichloropropene	50	50.3	101	70-130
123-91-1	1,4-Dioxane	250	291	116	70-130
97-63-2	Ethyl methacrylate	50	54.8	110	76-141
100-41-4	Ethylbenzene	50	51.0	102	70-130
87-68-3	Hexachlorobutadiene	50	54.0	108	70-130
591-78-6	2-Hexanone	50	65.7	131* a	70-130
98-82-8	Isopropylbenzene	50	49.8	100	70-130
99-87-6	p-Isopropyltoluene	50	54.8	110	70-130
1634-04-4	Methyl Tert Butyl Ether	50	46.7	93	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	60.8	122	70-130
74-95-3	Methylene bromide	50	49.2	98	70-130
75-09-2	Methylene chloride	50	46.5	93	70-130
91-20-3	Naphthalene	50	61.1	122	70-130
103-65-1	n-Propylbenzene	50	49.6	99	70-130
100-42-5	Styrene	50	47.4	95	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	47.1	94	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	50.1	100	70-130
127-18-4	Tetrachloroethene	50	55.3	111	70-130
108-88-3	Toluene	50	53.3	107	70-130
87-61-6	1,2,3-Trichlorobenzene	50	49.9	100	70-130
120-82-1	1,2,4-Trichlorobenzene	50	50.3	101	70-130
71-55-6	1,1,1-Trichloroethane	50	55.5	111	70-130
79-00-5	1,1,2-Trichloroethane	50	48.1	96	70-130
79-01-6	Trichloroethene	50	53.7	107	70-130
75-69-4	Trichlorofluoromethane	50	62.8	126	70-130
96-18-4	1,2,3-Trichloropropane	50	53.3	107	70-130
95-63-6	1,2,4-Trimethylbenzene	50	49.6	99	70-130
108-67-8	1,3,5-Trimethylbenzene	50	50.3	101	70-130
108-05-4	Vinyl Acetate	50	41.8	84	70-130
75-01-4	Vinyl chloride	50	58.7	117	70-130
	m,p-Xylene	100	101	101	70-130
95-47-6	o-Xylene	50	48.4	97	70-130
1330-20-7	Xylene (total)	150	149	99	70-130

\* = Outside of Control Limits.

## Blank Spike Summary

Job Number: MC16889  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1801-BS	M53043.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-1, MC16889-2, MC16889-3, MC16889-4

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	85%	70-130%
2037-26-5	Toluene-D8	89%	70-130%
460-00-4	4-Bromofluorobenzene	82%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2685-BS	N71412.D	1	12/24/12	KD	n/a	n/a	MSN2685

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	50	44.3	89	70-130
107-02-8	Acrolein	250	114	46* a	70-130
107-13-1	Acrylonitrile	50	232	464* b	70-130
71-43-2	Benzene	50	48.6	97	70-130
108-86-1	Bromobenzene	50	49.1	98	70-130
74-97-5	Bromochloromethane	50	49.6	99	70-130
75-27-4	Bromodichloromethane	50	50.9	102	70-130
75-25-2	Bromoform	50	51.1	102	70-130
74-83-9	Bromomethane	50	45.7	91	70-130
78-93-3	2-Butanone (MEK)	50	45.9	92	70-130
104-51-8	n-Butylbenzene	50	46.1	92	70-130
135-98-8	sec-Butylbenzene	50	46.3	93	70-130
98-06-6	tert-Butylbenzene	50	45.8	92	70-130
75-15-0	Carbon disulfide	50	47.2	94	70-130
56-23-5	Carbon tetrachloride	50	42.8	86	70-130
108-90-7	Chlorobenzene	50	48.0	96	70-130
75-00-3	Chloroethane	50	49.1	98	70-130
110-75-8	2-Chloroethyl vinyl ether	50	49.5	99	70-130
67-66-3	Chloroform	50	48.7	97	70-130
74-87-3	Chloromethane	50	48.5	97	70-130
95-49-8	o-Chlorotoluene	50	44.2	88	70-130
106-43-4	p-Chlorotoluene	50	46.4	93	70-130
124-48-1	Dibromochloromethane	50	54.3	109	70-130
95-50-1	1,2-Dichlorobenzene	50	45.2	90	70-130
541-73-1	1,3-Dichlorobenzene	50	45.0	90	70-130
106-46-7	1,4-Dichlorobenzene	50	47.1	94	70-130
75-71-8	Dichlorodifluoromethane	50	34.7	69* a	70-130
75-34-3	1,1-Dichloroethane	50	49.7	99	70-130
107-06-2	1,2-Dichloroethane	50	48.1	96	70-130
75-35-4	1,1-Dichloroethene	50	48.2	96	70-130
156-59-2	cis-1,2-Dichloroethene	50	48.0	96	70-130
156-60-5	trans-1,2-Dichloroethene	50	47.4	95	70-130
78-87-5	1,2-Dichloropropane	50	49.5	99	70-130
142-28-9	1,3-Dichloropropane	50	48.7	97	70-130
594-20-7	2,2-Dichloropropane	50	40.2	80	70-130
563-58-6	1,1-Dichloropropene	50	47.2	94	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2685-BS	N71412.D	1	12/24/12	KD	n/a	n/a	MSN2685

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	43.6	87	70-130
10061-02-6	trans-1,3-Dichloropropene	50	45.3	91	70-130
123-91-1	1,4-Dioxane	250	265	106	70-130
97-63-2	Ethyl methacrylate	50	43.9	88	77-137
100-41-4	Ethylbenzene	50	50.0	100	70-130
87-68-3	Hexachlorobutadiene	50	46.8	94	70-130
591-78-6	2-Hexanone	50	51.2	102	70-130
98-82-8	Isopropylbenzene	50	46.0	92	70-130
99-87-6	p-Isopropyltoluene	50	49.6	99	70-130
1634-04-4	Methyl Tert Butyl Ether	50	41.1	82	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	46.5	93	70-130
74-95-3	Methylene bromide	50	50.1	100	70-130
75-09-2	Methylene chloride	50	48.6	97	70-130
91-20-3	Naphthalene	50	46.7	93	70-130
103-65-1	n-Propylbenzene	50	46.0	92	70-130
100-42-5	Styrene	50	48.1	96	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	52.8	106	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	47.4	95	70-130
127-18-4	Tetrachloroethene	50	53.5	107	70-130
108-88-3	Toluene	50	48.4	97	70-130
87-61-6	1,2,3-Trichlorobenzene	50	46.8	94	70-130
120-82-1	1,2,4-Trichlorobenzene	50	47.2	94	70-130
71-55-6	1,1,1-Trichloroethane	50	43.8	88	70-130
79-00-5	1,1,2-Trichloroethane	50	49.4	99	70-130
79-01-6	Trichloroethene	50	46.7	93	70-130
75-69-4	Trichlorofluoromethane	50	48.8	98	70-130
96-18-4	1,2,3-Trichloropropane	50	48.1	96	70-130
95-63-6	1,2,4-Trimethylbenzene	50	47.2	94	70-130
108-67-8	1,3,5-Trimethylbenzene	50	46.5	93	70-130
108-05-4	Vinyl Acetate	50	47.2	94	70-130
75-01-4	Vinyl chloride	50	40.2	80	70-130
	m,p-Xylene	100	96.9	97	70-130
95-47-6	o-Xylene	50	48.1	96	70-130
1330-20-7	Xylene (total)	150	145	97	70-130

\* = Outside of Control Limits.

## Blank Spike Summary

Job Number: MC16889  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSN2685-BS	N71412.D	1	12/24/12	KD	n/a	n/a	MSN2685

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-7

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

- (a) Outside control limits. Blank Spike meets program technical requirements.
- (b) Outside control limits. Associated samples are non-detect for this compound.

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1803-BS	M53092.D	1	12/26/12	AMY	n/a	n/a	MSM1803
MSM1803-BSD	M53093.D	1	12/26/12	AMY	n/a	n/a	MSM1803

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	33.5	67* a	36.8	74	9	70-130/25
107-02-8	Acrolein	250	157	63* a	135	54* a	15	70-130/25
107-13-1	Acrylonitrile	50	40.1	80	42.9	86	7	70-130/25
71-43-2	Benzene	50	46.5	93	47.0	94	1	70-130/25
108-86-1	Bromobenzene	50	46.7	93	45.7	91	2	70-130/25
74-97-5	Bromochloromethane	50	45.7	91	47.7	95	4	70-130/25
75-27-4	Bromodichloromethane	50	45.7	91	46.5	93	2	70-130/25
75-25-2	Bromoform	50	45.8	92	46.7	93	2	70-130/25
74-83-9	Bromomethane	50	46.9	94	50.4	101	7	70-130/25
78-93-3	2-Butanone (MEK)	50	47.3	95	45.8	92	3	70-130/25
104-51-8	n-Butylbenzene	50	50.8	102	50.5	101	1	70-130/25
135-98-8	sec-Butylbenzene	50	48.5	97	47.4	95	2	70-130/25
98-06-6	tert-Butylbenzene	50	48.0	96	47.1	94	2	70-130/25
75-15-0	Carbon disulfide	50	51.8	104	56.2	112	8	70-130/25
56-23-5	Carbon tetrachloride	50	52.3	105	53.1	106	2	70-130/25
108-90-7	Chlorobenzene	50	45.6	91	45.1	90	1	70-130/25
75-00-3	Chloroethane	50	48.4	97	51.8	104	7	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	44.1	88	43.9	88	0	10-160/25
67-66-3	Chloroform	50	46.2	92	48.1	96	4	70-130/25
74-87-3	Chloromethane	50	47.1	94	49.7	99	5	70-130/25
95-49-8	o-Chlorotoluene	50	45.0	90	44.1	88	2	70-130/25
106-43-4	p-Chlorotoluene	50	46.6	93	45.6	91	2	70-130/25
124-48-1	Dibromochloromethane	50	45.0	90	46.0	92	2	70-130/25
95-50-1	1,2-Dichlorobenzene	50	44.7	89	43.4	87	3	70-130/25
541-73-1	1,3-Dichlorobenzene	50	46.2	92	44.5	89	4	70-130/25
106-46-7	1,4-Dichlorobenzene	50	46.2	92	45.4	91	2	70-130/25
75-71-8	Dichlorodifluoromethane	50	42.1	84	40.9	82	3	70-130/25
75-34-3	1,1-Dichloroethane	50	47.3	95	49.3	99	4	70-130/25
107-06-2	1,2-Dichloroethane	50	44.3	89	46.2	92	4	70-130/25
75-35-4	1,1-Dichloroethene	50	52.6	105	55.6	111	6	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	45.2	90	46.9	94	4	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	48.7	97	51.4	103	5	70-130/25
78-87-5	1,2-Dichloropropane	50	43.3	87	44.4	89	3	70-130/25
142-28-9	1,3-Dichloropropane	50	44.0	88	45.3	91	3	70-130/25
594-20-7	2,2-Dichloropropane	50	51.2	102	52.4	105	2	70-130/25
563-58-6	1,1-Dichloropropene	50	52.3	105	52.5	105	0	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1803-BS	M53092.D	1	12/26/12	AMY	n/a	n/a	MSM1803
MSM1803-BSD	M53093.D	1	12/26/12	AMY	n/a	n/a	MSM1803

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	50	44.2	88	44.7	89	1	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	47.2	94	48.3	97	2	70-130/25
123-91-1	1,4-Dioxane	250	253	101	293	117	15	70-130/25
97-63-2	Ethyl methacrylate	50	50.4	101	50.8	102	1	76-141/25
100-41-4	Ethylbenzene	50	49.2	98	48.9	98	1	70-130/25
87-68-3	Hexachlorobutadiene	50	53.1	106	52.2	104	2	70-130/25
591-78-6	2-Hexanone	50	55.4	111	59.3	119	7	70-130/25
98-82-8	Isopropylbenzene	50	47.3	95	46.5	93	2	70-130/25
99-87-6	p-Isopropyltoluene	50	52.2	104	51.5	103	1	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	43.2	86	44.7	89	3	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	51.1	102	54.4	109	6	70-130/25
74-95-3	Methylene bromide	50	45.4	91	47.4	95	4	70-130/25
75-09-2	Methylene chloride	50	41.4	83	43.6	87	5	70-130/25
91-20-3	Naphthalene	50	57.8	116	55.5	111	4	70-130/25
103-65-1	n-Propylbenzene	50	47.4	95	46.6	93	2	70-130/25
100-42-5	Styrene	50	46.6	93	46.4	93	0	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	45.8	92	45.9	92	0	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	45.4	91	46.8	94	3	70-130/25
127-18-4	Tetrachloroethene	50	53.7	107	54.1	108	1	70-130/25
108-88-3	Toluene	50	49.8	100	50.0	100	0	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	50.0	100	48.3	97	3	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	49.9	100	49.1	98	2	70-130/25
71-55-6	1,1,1-Trichloroethane	50	50.5	101	52.2	104	3	70-130/25
79-00-5	1,1,2-Trichloroethane	50	44.0	88	45.6	91	4	70-130/25
79-01-6	Trichloroethene	50	50.2	100	49.6	99	1	70-130/25
75-69-4	Trichlorofluoromethane	50	54.8	110	57.3	115	4	70-130/25
96-18-4	1,2,3-Trichloropropane	50	47.9	96	49.4	99	3	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	48.3	97	47.2	94	2	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	48.3	97	47.8	96	1	70-130/25
108-05-4	Vinyl Acetate	50	45.7	91	45.7	91	0	70-130/25
75-01-4	Vinyl chloride	50	47.2	94	48.4	97	3	70-130/25
	m,p-Xylene	100	97.1	97	97.4	97	0	70-130/25
95-47-6	o-Xylene	50	46.9	94	46.2	92	2	70-130/25
1330-20-7	Xylene (total)	150	144	96	144	96	0	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1803-BS	M53092.D	1	12/26/12	AMY	n/a	n/a	MSM1803
MSM1803-BSD	M53093.D	1	12/26/12	AMY	n/a	n/a	MSM1803

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	85%	86%	70-130%
2037-26-5	Toluene-D8	88%	88%	70-130%
460-00-4	4-Bromofluorobenzene	82%	80%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1804-BS	M53118.D	1	12/27/12	AMY	n/a	n/a	MSM1804
MSM1804-BSD	M53119.D	1	12/27/12	AMY	n/a	n/a	MSM1804

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-14

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	36.1	72	34.9	70	3	70-130/25
107-02-8	Acrolein	250	140	56* a	115	46* a	20	70-130/25
107-13-1	Acrylonitrile	50	44.4	89	46.7	93	5	70-130/25
71-43-2	Benzene	50	46.0	92	48.1	96	4	70-130/25
108-86-1	Bromobenzene	50	44.3	89	46.3	93	4	70-130/25
74-97-5	Bromochloromethane	50	45.0	90	47.4	95	5	70-130/25
75-27-4	Bromodichloromethane	50	44.4	89	46.8	94	5	70-130/25
75-25-2	Bromoform	50	44.6	89	45.7	91	2	70-130/25
74-83-9	Bromomethane	50	45.9	92	49.2	98	7	70-130/25
78-93-3	2-Butanone (MEK)	50	48.1	96	43.4	87	10	70-130/25
104-51-8	n-Butylbenzene	50	50.9	102	51.9	104	2	70-130/25
135-98-8	sec-Butylbenzene	50	48.6	97	49.9	100	3	70-130/25
98-06-6	tert-Butylbenzene	50	47.1	94	49.1	98	4	70-130/25
75-15-0	Carbon disulfide	50	51.3	103	54.9	110	7	70-130/25
56-23-5	Carbon tetrachloride	50	52.2	104	55.6	111	6	70-130/25
108-90-7	Chlorobenzene	50	44.5	89	45.5	91	2	70-130/25
75-00-3	Chloroethane	50	48.1	96	51.6	103	7	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	49.0	98	47.3	95	4	10-160/25
67-66-3	Chloroform	50	45.7	91	48.3	97	6	70-130/25
74-87-3	Chloromethane	50	44.4	89	48.4	97	9	70-130/25
95-49-8	o-Chlorotoluene	50	43.9	88	45.2	90	3	70-130/25
106-43-4	p-Chlorotoluene	50	45.0	90	46.4	93	3	70-130/25
124-48-1	Dibromochloromethane	50	43.9	88	45.4	91	3	70-130/25
95-50-1	1,2-Dichlorobenzene	50	43.0	86	44.1	88	3	70-130/25
541-73-1	1,3-Dichlorobenzene	50	44.7	89	45.4	91	2	70-130/25
106-46-7	1,4-Dichlorobenzene	50	44.7	89	46.5	93	4	70-130/25
75-71-8	Dichlorodifluoromethane	50	37.6	75	38.6	77	3	70-130/25
75-34-3	1,1-Dichloroethane	50	47.0	94	49.4	99	5	70-130/25
107-06-2	1,2-Dichloroethane	50	44.0	88	45.9	92	4	70-130/25
75-35-4	1,1-Dichloroethene	50	52.3	105	55.4	111	6	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	44.9	90	47.0	94	5	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	48.7	97	51.5	103	6	70-130/25
78-87-5	1,2-Dichloropropane	50	42.7	85	44.9	90	5	70-130/25
142-28-9	1,3-Dichloropropane	50	42.6	85	44.5	89	4	70-130/25
594-20-7	2,2-Dichloropropane	50	51.0	102	53.8	108	5	70-130/25
563-58-6	1,1-Dichloropropene	50	51.7	103	54.6	109	5	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1804-BS	M53118.D	1	12/27/12	AMY	n/a	n/a	MSM1804
MSM1804-BSD	M53119.D	1	12/27/12	AMY	n/a	n/a	MSM1804

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-14

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	50	43.0	86	44.7	89	4	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	45.7	91	47.8	96	4	70-130/25
123-91-1	1,4-Dioxane	250	248	99	262	105	5	70-130/25
97-63-2	Ethyl methacrylate	50	49.5	99	50.1	100	1	76-141/25
100-41-4	Ethylbenzene	50	48.1	96	49.6	99	3	70-130/25
87-68-3	Hexachlorobutadiene	50	53.0	106	54.4	109	3	70-130/25
591-78-6	2-Hexanone	50	51.9	104	54.4	109	5	70-130/25
98-82-8	Isopropylbenzene	50	46.7	93	48.3	97	3	70-130/25
99-87-6	p-Isopropyltoluene	50	52.0	104	53.8	108	3	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	41.1	82	43.3	87	5	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	49.6	99	50.5	101	2	70-130/25
74-95-3	Methylene bromide	50	44.6	89	46.4	93	4	70-130/25
75-09-2	Methylene chloride	50	40.8	82	43.0	86	5	70-130/25
91-20-3	Naphthalene	50	54.9	110	54.4	109	1	70-130/25
103-65-1	n-Propylbenzene	50	46.5	93	48.6	97	4	70-130/25
100-42-5	Styrene	50	45.1	90	46.7	93	3	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	45.6	91	46.6	93	2	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	44.0	88	46.3	93	5	70-130/25
127-18-4	Tetrachloroethene	50	53.2	106	55.6	111	4	70-130/25
108-88-3	Toluene	50	49.0	98	51.7	103	5	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	47.4	95	47.8	96	1	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	48.2	96	48.3	97	0	70-130/25
71-55-6	1,1,1-Trichloroethane	50	51.2	102	54.0	108	5	70-130/25
79-00-5	1,1,2-Trichloroethane	50	43.7	87	45.1	90	3	70-130/25
79-01-6	Trichloroethene	50	49.6	99	52.1	104	5	70-130/25
75-69-4	Trichlorofluoromethane	50	54.7	109	58.6	117	7	70-130/25
96-18-4	1,2,3-Trichloropropane	50	46.5	93	47.7	95	3	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	47.2	94	49.2	98	4	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	47.5	95	49.6	99	4	70-130/25
108-05-4	Vinyl Acetate	50	42.0	84	39.9	80	5	70-130/25
75-01-4	Vinyl chloride	50	45.8	92	48.7	97	6	70-130/25
	m,p-Xylene	100	95.9	96	99.0	99	3	70-130/25
95-47-6	o-Xylene	50	45.7	91	47.5	95	4	70-130/25
1330-20-7	Xylene (total)	150	142	95	146	97	3	70-130/25

\* = Outside of Control Limits.

6.3.2  
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# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1804-BS	M53118.D	1	12/27/12	AMY	n/a	n/a	MSM1804
MSM1804-BSD	M53119.D	1	12/27/12	AMY	n/a	n/a	MSM1804

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-14

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	86%	84%	70-130%
2037-26-5	Toluene-D8	88%	87%	70-130%
460-00-4	4-Bromofluorobenzene	81%	80%	70-130%

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

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16889-1MS	M53064.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1MSD	M53065.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1	M53059.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-1, MC16889-2, MC16889-3, MC16889-4

CAS No.	Compound	MC16889-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	52.8	40.1	76	50.9	78.5	154* a	65* b	70-130/30
107-02-8	Acrolein	ND	264	52.8	20* a	254	59.6	23* a	12	70-130/30
107-13-1	Acrylonitrile	ND	52.8	22.2	42* a	50.9	41.5	82	61* b	70-130/30
71-43-2	Benzene	ND	52.8	13.5	26* a	50.9	34.9	69* a	88* b	70-130/30
108-86-1	Bromobenzene	ND	52.8	7.5	14* a	50.9	26.9	53* a	113* b	70-130/30
74-97-5	Bromochloromethane	ND	52.8	20.1	38* a	50.9	37.3	73	60* b	70-130/30
75-27-4	Bromodichloromethane	ND	52.8	15.4	29* a	50.9	34.8	68* a	77* b	70-130/30
75-25-2	Bromoform	ND	52.8	15.4	29* a	50.9	33.1	65* a	73* b	70-130/30
74-83-9	Bromomethane	ND	52.8	21.6	41* a	50.9	44.4	87	69* b	70-130/30
78-93-3	2-Butanone (MEK)	ND	52.8	22.3	42* a	50.9	45.0	88	67* b	70-130/30
104-51-8	n-Butylbenzene	ND	52.8	2.7	5* a	50.9	24.0	47* a	160* b	70-130/30
135-98-8	sec-Butylbenzene	ND	52.8	2.8	5* a	50.9	23.7	47* a	158* b	70-130/30
98-06-6	tert-Butylbenzene	ND	52.8	2.9	5* a	50.9	23.0	45* a	155* b	70-130/30
75-15-0	Carbon disulfide	ND	52.8	19.5	37* a	50.9	44.4	87	78* b	70-130/30
56-23-5	Carbon tetrachloride	ND	52.8	10	19* a	50.9	35.6	70	112* b	70-130/30
108-90-7	Chlorobenzene	ND	52.8	8.7	16* a	50.9	28.4	56* a	106* b	70-130/30
75-00-3	Chloroethane	ND	52.8	20.5	39* a	50.9	45.4	89	76* b	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	52.8	ND	0* a	50.9	ND	0* a	nc	10-160/30
67-66-3	Chloroform	ND	52.8	16.1	31* a	50.9	35.6	70	75* b	70-130/30
74-87-3	Chloromethane	ND	52.8	23.4	44* a	50.9	47.7	94	68* b	70-130/30
95-49-8	o-Chlorotoluene	ND	52.8	4.5	9* a	50.9	23.4	46* a	135* b	70-130/30
106-43-4	p-Chlorotoluene	ND	52.8	4.6	9* a	50.9	24.1	47* a	136* b	70-130/30
124-48-1	Dibromochloromethane	ND	52.8	15.7	30* a	50.9	33.3	65* a	72* b	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	52.8	4.8	9* a	50.9	22.7	45* a	130* b	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	52.8	4.5	9* a	50.9	23.3	46* a	135* b	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	52.8	4.7	9* a	50.9	23.5	46* a	133* b	70-130/30
75-71-8	Dichlorodifluoromethane	ND	52.8	15.0	28* a	50.9	43.2	85	97* b	70-130/30
75-34-3	1,1-Dichloroethane	ND	52.8	16.5	31* a	50.9	37.5	74	78* b	70-130/30
107-06-2	1,2-Dichloroethane	ND	52.8	18.8	36* a	50.9	36.1	71	63* b	70-130/30
75-35-4	1,1-Dichloroethene	ND	52.8	17.8	34* a	50.9	44.0	86	85* b	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	52.8	16.6	31* a	50.9	35.5	70	73* b	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	52.8	17.4	33* a	50.9	39.6	78	78* b	70-130/30
78-87-5	1,2-Dichloropropane	ND	52.8	13.9	26* a	50.9	33.0	65* a	81* b	70-130/30
142-28-9	1,3-Dichloropropane	ND	52.8	15.6	30* a	50.9	33.2	65* a	72* b	70-130/30
594-20-7	2,2-Dichloropropane	ND	52.8	11.9	23* a	50.9	37.1	73	103* b	70-130/30
563-58-6	1,1-Dichloropropene	ND	52.8	11.6	22* a	50.9	36.4	72	103* b	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16889-1MS	M53064.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1MSD	M53065.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1	M53059.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-1, MC16889-2, MC16889-3, MC16889-4

CAS No.	Compound	MC16889-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
10061-01-5	cis-1,3-Dichloropropene	ND		52.8	14.0	27* a	50.9	31.5	62* a	77* b	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		52.8	15.9	30* a	50.9	34.0	67* a	73* b	70-130/30
123-91-1	1,4-Dioxane	ND		264	90.9	34* a	254	290	114	105* b	70-130/30
97-63-2	Ethyl methacrylate	ND		52.8	14.8	28* a	50.9	33.3	65	77* b	41-160/30
100-41-4	Ethylbenzene	ND		52.8	5.8	11* a	50.9	28.2	55* a	132* b	70-130/30
87-68-3	Hexachlorobutadiene	ND		52.8	2.6	5* a	50.9	24.4	48* a	161* b	70-130/30
591-78-6	2-Hexanone	ND		52.8	18.7	35* a	50.9	40.2	79	73* b	70-130/30
98-82-8	Isopropylbenzene	ND		52.8	3.6	7* a	50.9	23.6	46* a	147* b	70-130/30
99-87-6	p-Isopropyltoluene	ND		52.8	2.9	5* a	50.9	25.4	50* a	159* b	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		52.8	15.4	29* a	50.9	29.3	58* a	62* b	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		52.8	19.5	37* a	50.9	40.7	80	70* b	70-130/30
74-95-3	Methylene bromide	ND		52.8	19.7	37* a	50.9	37.2	73	62* b	70-130/30
75-09-2	Methylene chloride	ND		52.8	18.8	36* a	50.9	36.2	71	63* b	70-130/30
91-20-3	Naphthalene	16.5		52.8	3.9	-24* a	50.9	17.4	2* a	127* b	70-130/30
103-65-1	n-Propylbenzene	ND		52.8	3.4	6* a	50.9	23.9	47* a	150* b	70-130/30
100-42-5	Styrene	ND		52.8	ND	0* a	50.9	3.1	6* a	200* b	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		52.8	9.5	18* a	50.9	30.1	59* a	104* b	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		52.8	14.7	28* a	50.9	34.5	68* a	80* b	70-130/30
127-18-4	Tetrachloroethene	ND		52.8	6.6	13* a	50.9	31.1	61* a	130* b	70-130/30
108-88-3	Toluene	1.3	J	52.8	10.3	17* a	50.9	33.4	63* a	106* b	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		52.8	3.1	6* a	50.9	19.6	39* a	145* b	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		52.8	3.1	6* a	50.9	19.1	38* a	144* b	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		52.8	11.7	22* a	50.9	35.9	71	102* b	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		52.8	16.1	31* a	50.9	33.9	67* a	71* b	70-130/30
79-01-6	Trichloroethene	ND		52.8	12.3	23* a	50.9	34.6	68* a	95* b	70-130/30
75-69-4	Trichlorofluoromethane	ND		52.8	14.1	27* a	50.9	42.1	83	100* b	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		52.8	14.9	28* a	50.9	34.5	68* a	79* b	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND		52.8	2.7	5* a	50.9	21.7	43* a	156* b	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		52.8	4.0	8* a	50.9	25.8	51* a	146* b	70-130/30
108-05-4	Vinyl Acetate	ND		52.8	6.7	13* a	50.9	16.6	33* a	85* b	70-130/30
75-01-4	Vinyl chloride	ND		52.8	21.0	40* a	50.9	42.9	84	69* b	70-130/30
	m,p-Xylene	2.3	J	106	11.3	9* a	102	54.0	51* a	131* b	70-130/30
95-47-6	o-Xylene	ND		52.8	5.7	11* a	50.9	26.0	51* a	128* b	70-130/30
1330-20-7	Xylene (total)	2.3	J	158	17.0	9* a	153	80.0	51* a	130* b	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16889-1MS	M53064.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1MSD	M53065.D	1	12/21/12	AMY	n/a	n/a	MSM1801
MC16889-1	M53059.D	1	12/21/12	AMY	n/a	n/a	MSM1801

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-1, MC16889-2, MC16889-3, MC16889-4

CAS No.	Surrogate Recoveries	MS	MSD	MC16889-1	Limits
1868-53-7	Dibromofluoromethane	85%	83%	79%	70-130%
2037-26-5	Toluene-D8	88%	88%	90%	70-130%
460-00-4	4-Bromofluorobenzene	80%	82%	83%	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.

6.4.1  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16880-6MS	N71433.D	1	12/24/12	KD	n/a	n/a	MSN2685
MC16880-6MSD	N71434.D	1	12/24/12	KD	n/a	n/a	MSN2685
MC16880-6	N71421.D	1	12/24/12	KD	n/a	n/a	MSN2685

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-7

CAS No.	Compound	MC16880-6 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	50	46.1	92	50	44.1	88	4	70-130/30
107-02-8	Acrolein	ND	250	95.5	38* a	250	102	41* a	7	70-130/30
107-13-1	Acrylonitrile	ND	50	208	416* b	50	212	424* b	2	70-130/30
71-43-2	Benzene	ND	50	47.8	96	50	47.1	94	1	70-130/30
108-86-1	Bromobenzene	ND	50	46.1	92	50	45.6	91	1	70-130/30
74-97-5	Bromochloromethane	ND	50	48.8	98	50	48.2	96	1	70-130/30
75-27-4	Bromodichloromethane	ND	50	48.9	98	50	48.3	97	1	70-130/30
75-25-2	Bromoform	ND	50	46.1	92	50	45.2	90	2	70-130/30
74-83-9	Bromomethane	ND	50	41.8	84	50	53.2	106	24	70-130/30
78-93-3	2-Butanone (MEK)	ND	50	39.3	79	50	38.8	78	1	70-130/30
104-51-8	n-Butylbenzene	ND	50	42.2	84	50	42.2	84	0	70-130/30
135-98-8	sec-Butylbenzene	ND	50	43.8	88	50	43.5	87	1	70-130/30
98-06-6	tert-Butylbenzene	ND	50	44.1	88	50	43.7	87	1	70-130/30
75-15-0	Carbon disulfide	ND	50	47.8	96	50	46.7	93	2	70-130/30
56-23-5	Carbon tetrachloride	ND	50	41.0	82	50	41.5	83	1	70-130/30
108-90-7	Chlorobenzene	ND	50	45.7	91	50	46.1	92	1	70-130/30
75-00-3	Chloroethane	ND	50	49.9	100	50	49.8	100	0	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	50	48.6	97	50	48.1	96	1	70-130/30
67-66-3	Chloroform	ND	50	48.7	97	50	48.3	97	1	70-130/30
74-87-3	Chloromethane	ND	50	42.6	85	50	42.0	84	1	70-130/30
95-49-8	o-Chlorotoluene	ND	50	42.0	84	50	41.7	83	1	70-130/30
106-43-4	p-Chlorotoluene	ND	50	43.8	88	50	43.8	88	0	70-130/30
124-48-1	Dibromochloromethane	ND	50	50.2	100	50	50.5	101	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	50	42.7	85	50	43.2	86	1	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	50	42.8	86	50	42.6	85	0	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	50	44.1	88	50	44.5	89	1	70-130/30
75-71-8	Dichlorodifluoromethane	ND	50	33.2	66* a	50	33.0	66* a	1	70-130/30
75-34-3	1,1-Dichloroethane	ND	50	49.0	98	50	48.9	98	0	70-130/30
107-06-2	1,2-Dichloroethane	ND	50	46.6	93	50	46.5	93	0	70-130/30
75-35-4	1,1-Dichloroethene	ND	50	48.3	97	50	47.1	94	3	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	50	46.6	93	50	46.1	92	1	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	50	47.4	95	50	46.4	93	2	70-130/30
78-87-5	1,2-Dichloropropane	ND	50	48.6	97	50	48.1	96	1	70-130/30
142-28-9	1,3-Dichloropropane	ND	50	45.3	91	50	45.6	91	1	70-130/30
594-20-7	2,2-Dichloropropane	ND	50	35.7	71	50	35.5	71	1	70-130/30
563-58-6	1,1-Dichloropropene	ND	50	47.1	94	50	48.3	97	3	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16880-6MS	N71433.D	1	12/24/12	KD	n/a	n/a	MSN2685
MC16880-6MSD	N71434.D	1	12/24/12	KD	n/a	n/a	MSN2685
MC16880-6	N71421.D	1	12/24/12	KD	n/a	n/a	MSN2685

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-7

CAS No.	Compound	MC16880-6 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	50	40.4	81	50	40.0	80	1	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	50	42.0	84	50	42.3	85	1	70-130/30
123-91-1	1,4-Dioxane	ND	250	206	82	250	223	89	8	70-130/30
97-63-2	Ethyl methacrylate	ND	50	41.2	82	50	40.5	81	2	72-139/30
100-41-4	Ethylbenzene	ND	50	48.6	97	50	48.5	97	0	70-130/30
87-68-3	Hexachlorobutadiene	ND	50	40.6	81	50	42.5	85	5	70-130/30
591-78-6	2-Hexanone	ND	50	45.3	91	50	44.1	88	3	70-130/30
98-82-8	Isopropylbenzene	ND	50	44.2	88	50	43.7	87	1	70-130/30
99-87-6	p-Isopropyltoluene	ND	50	46.9	94	50	46.5	93	1	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	50	39.3	79	50	38.4	77	2	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	50	41.7	83	50	40.9	82	2	70-130/30
74-95-3	Methylene bromide	ND	50	49.1	98	50	47.0	94	4	70-130/30
75-09-2	Methylene chloride	ND	50	48.0	96	50	47.5	95	1	70-130/30
91-20-3	Naphthalene	ND	50	39.7	79	50	42.1	84	6	70-130/30
103-65-1	n-Propylbenzene	ND	50	43.9	88	50	43.7	87	0	70-130/30
100-42-5	Styrene	ND	50	44.7	89	50	45.7	91	2	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	50.2	100	50	50.5	101	1	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	42.9	86	50	42.8	86	0	70-130/30
127-18-4	Tetrachloroethene	ND	50	51.2	102	50	51.2	102	0	70-130/30
108-88-3	Toluene	ND	50	48.3	97	50	47.7	95	1	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	50	41.3	83	50	42.5	85	3	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	50	42.9	86	50	42.9	86	0	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	50	43.1	86	50	42.3	85	2	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	50	47.1	94	50	46.2	92	2	70-130/30
79-01-6	Trichloroethene	ND	50	46.0	92	50	45.8	92	0	70-130/30
75-69-4	Trichlorofluoromethane	ND	50	47.8	96	50	47.2	94	1	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	50	42.8	86	50	41.4	83	3	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	50	44.3	89	50	43.9	88	1	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	50	44.4	89	50	44.2	88	0	70-130/30
108-05-4	Vinyl Acetate	ND	50	40.0	80	50	39.4	79	2	70-130/30
75-01-4	Vinyl chloride	ND	50	41.0	82	50	40.7	81	1	70-130/30
	m,p-Xylene	ND	100	92.9	93	100	93.1	93	0	70-130/30
95-47-6	o-Xylene	ND	50	46.6	93	50	46.0	92	1	70-130/30
1330-20-7	Xylene (total)	ND	150	140	93	150	139	93	1	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16880-6MS	N71433.D	1	12/24/12	KD	n/a	n/a	MSN2685
MC16880-6MSD	N71434.D	1	12/24/12	KD	n/a	n/a	MSN2685
MC16880-6	N71421.D	1	12/24/12	KD	n/a	n/a	MSN2685

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-7

CAS No.	Surrogate Recoveries	MS	MSD	MC16880-6	Limits
1868-53-7	Dibromofluoromethane	101%	103%	100%	70-130%
2037-26-5	Toluene-D8	104%	103%	103%	70-130%
460-00-4	4-Bromofluorobenzene	103%	100%	119%	70-130%

- (a) Outside control limits due to possible matrix interference. Refer to Blank Spike.
- (b) Outside control limits. Associated samples are non-detect for this compound.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16889-12MS	M53107.D	1	12/26/12	AMY	n/a	n/a	MSM1803
MC16889-12MSD	M53108.D	1	12/26/12	AMY	n/a	n/a	MSM1803
MC16889-12	M53106.D	1	12/26/12	AMY	n/a	n/a	MSM1803

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13

CAS No.	Compound	MC16889-12 Spike		MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q							
67-64-1	Acetone	158	54.5	170	22* a	54.3	155	-6* a	9	70-130/30
107-02-8	Acrolein	ND	272	72.9	27* b	271	92.3	34* b	23	70-130/30
107-13-1	Acrylonitrile	ND	54.5	28.0	51* b	54.3	29.5	54* b	5	70-130/30
71-43-2	Benzene	1.4	54.5	15.6	26* b	54.3	19.8	34* b	24	70-130/30
108-86-1	Bromobenzene	ND	54.5	6.4	12* b	54.3	16.2	30* b	87* c	70-130/30
74-97-5	Bromochloromethane	ND	54.5	21.8	40* b	54.3	25.7	47* b	16	70-130/30
75-27-4	Bromodichloromethane	ND	54.5	16.8	31* b	54.3	20.8	38* b	21	70-130/30
75-25-2	Bromoform	ND	54.5	16.3	30* b	54.3	22.6	42* b	32* c	70-130/30
74-83-9	Bromomethane	ND	54.5	23.8	44* b	54.3	26.3	48* b	10	70-130/30
78-93-3	2-Butanone (MEK)	ND	54.5	42.2	77	54.3	15.2	28* b	94* c	70-130/30
104-51-8	n-Butylbenzene	ND	54.5	1.1	2* b	54.3	26.6	49* b	184* c	70-130/30
135-98-8	sec-Butylbenzene	ND	54.5	1.2	2* b	54.3	25.6	47* b	182* c	70-130/30
98-06-6	tert-Butylbenzene	ND	54.5	1.3	2* b	54.3	23.9	44* b	179* c	70-130/30
75-15-0	Carbon disulfide	ND	54.5	17.8	33* b	54.3	21.7	40* b	20	70-130/30
56-23-5	Carbon tetrachloride	ND	54.5	8.4	15* b	54.3	22.2	41* b	90* c	70-130/30
108-90-7	Chlorobenzene	ND	54.5	8.5	16* b	54.3	16.2	30* b	62* c	70-130/30
75-00-3	Chloroethane	ND	54.5	20.2	37* b	54.3	24.3	45* b	18	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	54.5	ND	0* b	54.3	ND	0* b	nc	10-160/30
67-66-3	Chloroform	ND	54.5	16.9	31* b	54.3	20.6	38* b	20	70-130/30
74-87-3	Chloromethane	ND	54.5	24.2	44* b	54.3	28.7	53* b	17	70-130/30
95-49-8	o-Chlorotoluene	ND	54.5	2.8	5* b	54.3	17.6	32* b	145* c	70-130/30
106-43-4	p-Chlorotoluene	ND	54.5	3.0	6* b	54.3	17.9	33* b	143* c	70-130/30
124-48-1	Dibromochloromethane	ND	54.5	16.9	31* b	54.3	21.8	40* b	25	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	54.5	3.0	6* b	54.3	16.6	31* b	139* c	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	54.5	2.7	5* b	54.3	18.1	33* b	148* c	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	54.5	3.1	6* b	54.3	18.8	35* b	143* c	70-130/30
75-71-8	Dichlorodifluoromethane	ND	54.5	2.6	5* b	54.3	31.0	57* b	169* c	70-130/30
75-34-3	1,1-Dichloroethane	ND	54.5	16.9	31* b	54.3	21.0	39* b	22	70-130/30
107-06-2	1,2-Dichloroethane	ND	54.5	20.7	38* b	54.3	24.3	45* b	16	70-130/30
75-35-4	1,1-Dichloroethene	ND	54.5	15.3	28* b	54.3	22.4	41* b	38* c	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	54.5	18.1	33* b	54.3	20.9	39* b	14	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	54.5	17.5	32* b	54.3	19.9	37* b	13	70-130/30
78-87-5	1,2-Dichloropropane	ND	54.5	14.5	27* b	54.3	18.9	35* b	26	70-130/30
142-28-9	1,3-Dichloropropane	ND	54.5	17.1	31* b	54.3	21.7	40* b	24	70-130/30
594-20-7	2,2-Dichloropropane	ND	54.5	11.6	21* b	54.3	18.9	35* b	48* c	70-130/30
563-58-6	1,1-Dichloropropene	ND	54.5	9.8	18* b	54.3	19.8	36* b	68* c	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16889-12MS	M53107.D	1	12/26/12	AMY	n/a	n/a	MSM1803
MC16889-12MSD	M53108.D	1	12/26/12	AMY	n/a	n/a	MSM1803
MC16889-12	M53106.D	1	12/26/12	AMY	n/a	n/a	MSM1803

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13

CAS No.	Compound	MC16889-12 Spike		MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
		ug/kg	Q								
10061-01-5	cis-1,3-Dichloropropene	ND		54.5	15.0	28* b	54.3	18.5	34* b	21	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		54.5	17.0	31* b	54.3	21.0	39* b	21	70-130/30
123-91-1	1,4-Dioxane	ND		272	106	39* b	271	151	56* b	35* c	70-130/30
97-63-2	Ethyl methacrylate	ND		54.5	13.4	25* b	54.3	17.7	33* b	28	41-160/30
100-41-4	Ethylbenzene	2.2		54.5	5.8	7* b	54.3	20.5	34* b	112* c	70-130/30
87-68-3	Hexachlorobutadiene	ND		54.5	1.0	2* b	54.3	25.4	47* b	185* c	70-130/30
591-78-6	2-Hexanone	ND		54.5	20.8	38* b	54.3	17.2	32* b	19	70-130/30
98-82-8	Isopropylbenzene	ND		54.5	1.9	3* b	54.3	21.9	40* b	168* c	70-130/30
99-87-6	p-Isopropyltoluene	ND		54.5	1.3	2* b	54.3	27.7	51* b	182* c	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		54.5	15.3	28* b	54.3	18.4	34* b	18	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		54.5	18.0	33* b	54.3	23.0	42* b	24	70-130/30
74-95-3	Methylene bromide	ND		54.5	22.1	41* b	54.3	26.5	49* b	18	70-130/30
75-09-2	Methylene chloride	ND		54.5	20.2	37* b	54.3	23.9	44* b	17	70-130/30
91-20-3	Naphthalene	ND		54.5	2.9	5* b	54.3	23.6	43* b	156* c	70-130/30
103-65-1	n-Propylbenzene	ND		54.5	1.8	3* b	54.3	22.9	42* b	171* c	70-130/30
100-42-5	Styrene	ND		54.5	1.8	3* b	54.3	9.1	17* b	134* c	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		54.5	9.2	17* b	54.3	17.8	33* b	64* c	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		54.5	14.7	27* b	54.3	21.9	40* b	39* c	70-130/30
127-18-4	Tetrachloroethene	ND		54.5	4.7	9* b	54.3	21.2	39* b	127* c	70-130/30
108-88-3	Toluene	3.3	J	54.5	11.6	15* b	54.3	20.1	31* b	54* c	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		54.5	1.5	3* b	54.3	26.1	48* b	178* c	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		54.5	1.3	2* b	54.3	27.2	50* b	182* c	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		54.5	10.9	20* b	54.3	20.7	38* b	62* c	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		54.5	17.0	31* b	54.3	22.4	41* b	27	70-130/30
79-01-6	Trichloroethene	ND		54.5	11.3	21* b	54.3	17.1	32* b	41* c	70-130/30
75-69-4	Trichlorofluoromethane	ND		54.5	8.1	15* b	54.3	29.5	54* b	114* c	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		54.5	15.3	28* b	54.3	22.1	41* b	36* c	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND		54.5	1.8	3* b	54.3	21.9	40* b	170* c	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		54.5	4.5	8* b	54.3	24.8	46* b	139* c	70-130/30
108-05-4	Vinyl Acetate	ND		54.5	14.3	26* b	54.3	20.9	39* b	38* c	70-130/30
75-01-4	Vinyl chloride	ND		54.5	17.9	33* b	54.3	23.8	44* b	28	70-130/30
	m,p-Xylene	ND		109	8.3	8* b	109	38.6	36* b	129* c	70-130/30
95-47-6	o-Xylene	ND		54.5	4.4	8* b	54.3	17.6	32* b	120* c	70-130/30
1330-20-7	Xylene (total)	0.63	J	163	12.7	7* b	163	56.2	34* b	126* c	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16889-12MS	M53107.D	1	12/26/12	AMY	n/a	n/a	MSM1803
MC16889-12MSD	M53108.D	1	12/26/12	AMY	n/a	n/a	MSM1803
MC16889-12	M53106.D	1	12/26/12	AMY	n/a	n/a	MSM1803

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13

CAS No.	Surrogate Recoveries	MS	MSD	MC16889-12 Limits	
1868-53-7	Dibromofluoromethane	82%	84%	82%	70-130%
2037-26-5	Toluene-D8	88%	87%	88%	70-130%
460-00-4	4-Bromofluorobenzene	82%	82%	81%	70-130%

- (a) Outside control limits due to high level in sample relative to spike amount.
- (b) Outside control limits due to possible matrix interference. Refer to Blank Spike.
- (c) High RPD due to possible matrix interference and/or sample non-homogeneity.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16931-1MS	M53139.D	1	12/27/12	AMY	n/a	n/a	MSM1804
MC16931-1MSD	M53140.D	1	12/27/12	AMY	n/a	n/a	MSM1804
MC16931-1	M53124.D	1	12/27/12	AMY	n/a	n/a	MSM1804

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-14

CAS No.	Compound	MC16931-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND		87.8	77.6	88	91.5	84.8	93	70-130/30
107-02-8	Acrolein	ND		439	201	46* a	458	209	46* a	70-130/30
107-13-1	Acrylonitrile	ND		87.8	97.6	111	91.5	103	113	70-130/30
71-43-2	Benzene	ND		87.8	85.5	97	91.5	90.4	99	70-130/30
108-86-1	Bromobenzene	ND		87.8	85.6	98	91.5	88.7	97	70-130/30
74-97-5	Bromochloromethane	ND		87.8	91.4	104	91.5	96.2	105	70-130/30
75-27-4	Bromodichloromethane	ND		87.8	89.5	102	91.5	92.6	101	70-130/30
75-25-2	Bromoform	ND		87.8	95.3	109	91.5	98.6	108	70-130/30
74-83-9	Bromomethane	ND		87.8	86.8	99	91.5	93.4	102	70-130/30
78-93-3	2-Butanone (MEK)	ND		87.8	99.9	114	91.5	108	118	70-130/30
104-51-8	n-Butylbenzene	ND		87.8	80.0	91	91.5	92.6	101	70-130/30
135-98-8	sec-Butylbenzene	ND		87.8	78.7	90	91.5	90.1	98	70-130/30
98-06-6	tert-Butylbenzene	ND		87.8	78.5	89	91.5	87.8	96	70-130/30
75-15-0	Carbon disulfide	ND		87.8	92.8	106	91.5	102	111	70-130/30
56-23-5	Carbon tetrachloride	ND		87.8	94.6	108	91.5	102	111	70-130/30
108-90-7	Chlorobenzene	ND		87.8	80.8	92	91.5	87.0	95	70-130/30
75-00-3	Chloroethane	ND		87.8	88.9	101	91.5	95.3	104	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND		87.8	72.4	82	91.5	90.0	98	10-160/30
67-66-3	Chloroform	ND		87.8	86.4	98	91.5	92.8	101	70-130/30
74-87-3	Chloromethane	ND		87.8	81.5	93	91.5	88.5	97	70-130/30
95-49-8	o-Chlorotoluene	ND		87.8	77.7	89	91.5	83.4	91	70-130/30
106-43-4	p-Chlorotoluene	ND		87.8	80.0	91	91.5	86.9	95	70-130/30
124-48-1	Dibromochloromethane	ND		87.8	91.3	104	91.5	94.9	104	70-130/30
95-50-1	1,2-Dichlorobenzene	ND		87.8	79.7	91	91.5	85.9	94	70-130/30
541-73-1	1,3-Dichlorobenzene	ND		87.8	79.9	91	91.5	85.8	94	70-130/30
106-46-7	1,4-Dichlorobenzene	ND		87.8	81.3	93	91.5	87.6	96	70-130/30
75-71-8	Dichlorodifluoromethane	ND		87.8	57.9	66* a	91.5	62.8	69* a	70-130/30
75-34-3	1,1-Dichloroethane	ND		87.8	86.8	99	91.5	93.6	102	70-130/30
107-06-2	1,2-Dichloroethane	ND		87.8	90.9	104	91.5	94.4	103	70-130/30
75-35-4	1,1-Dichloroethene	ND		87.8	94.1	107	91.5	103	113	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND		87.8	84.3	96	91.5	89.8	98	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND		87.8	88.9	101	91.5	95.3	104	70-130/30
78-87-5	1,2-Dichloropropane	ND		87.8	82.6	94	91.5	85.9	94	70-130/30
142-28-9	1,3-Dichloropropane	ND		87.8	88.4	101	91.5	92.2	101	70-130/30
594-20-7	2,2-Dichloropropane	ND		87.8	90.3	103	91.5	99.0	108	70-130/30
563-58-6	1,1-Dichloropropene	ND		87.8	94.4	108	91.5	98.7	108	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16931-1MS	M53139.D	1	12/27/12	AMY	n/a	n/a	MSM1804
MC16931-1MSD	M53140.D	1	12/27/12	AMY	n/a	n/a	MSM1804
MC16931-1	M53124.D	1	12/27/12	AMY	n/a	n/a	MSM1804

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-14

CAS No.	Compound	MC16931-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
10061-01-5	cis-1,3-Dichloropropene	ND		87.8	84.1	96	91.5	87.1	95	4	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		87.8	95.6	109	91.5	96.5	105	1	70-130/30
123-91-1	1,4-Dioxane	ND		439	539	123	458	588	128	9	70-130/30
97-63-2	Ethyl methacrylate	ND		87.8	103	117	91.5	105	115	2	41-160/30
100-41-4	Ethylbenzene	ND		87.8	84.5	96	91.5	91.8	100	8	70-130/30
87-68-3	Hexachlorobutadiene	ND		87.8	78.2	89	91.5	96.3	105	21	70-130/30
591-78-6	2-Hexanone	ND		87.8	114	130	91.5	116	127	2	70-130/30
98-82-8	Isopropylbenzene	ND		87.8	79.6	91	91.5	87.6	96	10	70-130/30
99-87-6	p-Isopropyltoluene	ND		87.8	84.7	96	91.5	97.1	106	14	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		87.8	86.2	98	91.5	90.9	99	5	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		87.8	110	125	91.5	114	125	4	70-130/30
74-95-3	Methylene bromide	ND		87.8	96.3	110	91.5	97.6	107	1	70-130/30
75-09-2	Methylene chloride	1.5	J	87.8	80.6	90	91.5	85.9	92	6	70-130/30
91-20-3	Naphthalene	ND		87.8	88.4	101	91.5	105	115	17	70-130/30
103-65-1	n-Propylbenzene	ND		87.8	78.4	89	91.5	87.2	95	11	70-130/30
100-42-5	Styrene	ND		87.8	61.3	70	91.5	69.0	75	12	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		87.8	85.8	98	91.5	91.4	100	6	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		87.8	96.6	110	91.5	100	109	3	70-130/30
127-18-4	Tetrachloroethene	ND		87.8	93.8	107	91.5	101	110	7	70-130/30
108-88-3	Toluene	ND		87.8	90.9	104	91.5	96.3	105	6	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		87.8	82.7	94	91.5	93.7	102	12	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		87.8	80.9	92	91.5	92.4	101	13	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		87.8	91.3	104	91.5	99.6	109	9	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		87.8	92.0	105	91.5	93.2	102	1	70-130/30
79-01-6	Trichloroethene	ND		87.8	91.1	104	91.5	95.8	105	5	70-130/30
75-69-4	Trichlorofluoromethane	ND		87.8	98.6	112	91.5	107	117	8	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		87.8	101	115	91.5	104	114	3	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND		87.8	78.9	90	91.5	87.6	96	10	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		87.8	81.0	92	91.5	90.6	99	11	70-130/30
108-05-4	Vinyl Acetate	ND		87.8	79.1	90	91.5	75.0	82	5	70-130/30
75-01-4	Vinyl chloride	ND		87.8	80.9	92	91.5	87.9	96	8	70-130/30
	m,p-Xylene	ND		176	169	96	183	183	100	8	70-130/30
95-47-6	o-Xylene	ND		87.8	81.2	92	91.5	88.7	97	9	70-130/30
1330-20-7	Xylene (total)	ND		263	250	95	275	272	99	8	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16931-1MS	M53139.D	1	12/27/12	AMY	n/a	n/a	MSM1804
MC16931-1MSD	M53140.D	1	12/27/12	AMY	n/a	n/a	MSM1804
MC16931-1	M53124.D	1	12/27/12	AMY	n/a	n/a	MSM1804

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16889-14

CAS No.	Surrogate Recoveries	MS	MSD	MC16931-1	Limits
1868-53-7	Dibromofluoromethane	84%	84%	85%	70-130%
2037-26-5	Toluene-D8	89%	87%	87%	70-130%
460-00-4	4-Bromofluorobenzene	81%	80%	80%	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: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1801-CC1800	Injection Date:	12/21/12
Lab File ID:	M53043.D	Injection Time:	11:58
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	181618	9.36	253844	10.24	128665	13.52	146551	16.08	99307	6.86
Upper Limit <sup>a</sup>	363236	9.86	507688	10.74	257330	14.02	293102	16.58	198614	7.36
Lower Limit <sup>b</sup>	90809	8.86	126922	9.74	64333	13.02	73276	15.58	49654	6.36

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSM1801-BS	181618	9.36	253844	10.24	128665	13.52	146551	16.08	99307	6.86
MSM1801-MB	194908	9.36	266632	10.24	128589	13.52	151743	16.09	49991	6.86
ZZZZZZ	194294	9.36	267691	10.24	129377	13.52	151188	16.09	91038	6.86
ZZZZZZ	190628	9.36	261158	10.24	127423	13.52	147811	16.08	80958	6.85
ZZZZZZ	185568	9.36	253135	10.24	123892	13.52	143566	16.09	79703	6.85
ZZZZZZ	187170	9.36	258983	10.24	126389	13.52	150640	16.09	84223	6.85
ZZZZZZ	196284	9.36	268861	10.24	129804	13.52	157775	16.09	89360	6.86
ZZZZZZ	194273	9.36	268581	10.24	129253	13.52	156324	16.09	80746	6.86
ZZZZZZ	183563	9.36	252072	10.24	117978	13.52	122212	16.09	85614	6.85
ZZZZZZ	192938	9.36	261549	10.24	122456	13.52	128865	16.09	95380	6.86
ZZZZZZ	185650	9.36	253092	10.24	122823	13.52	142623	16.08	83649	6.86
ZZZZZZ	172892	9.36	233303	10.24	116066	13.52	131517	16.09	76745	6.85
ZZZZZZ	176885	9.36	241780	10.24	117110	13.52	137019	16.09	86646	6.86
ZZZZZZ	172805	9.36	238765	10.24	117819	13.52	134295	16.09	69790	6.86
MC16889-1	41026 <sup>c</sup>	9.36	53912 <sup>c</sup>	10.24	26823 <sup>c</sup>	13.52	31127 <sup>c</sup>	16.09	13531 <sup>c</sup>	6.86
MC16889-2	170809	9.36	231956	10.24	111955	13.52	129024	16.08	59943	6.85
MC16889-3	181721	9.36	248542	10.24	122962	13.52	141525	16.08	68958	6.86
MC16889-4	184822	9.36	253011	10.24	124220	13.52	142639	16.08	78363	6.86
ZZZZZZ	169863	9.36	233433	10.24	112955	13.52	131826	16.08	68539	6.85
MC16889-1MS	178686	9.36	244443	10.24	120161	13.52	145251	16.08	76253	6.86
MC16889-1MSD	87005 <sup>c</sup>	9.36	118165 <sup>c</sup>	10.24	58978 <sup>c</sup>	13.52	69356 <sup>c</sup>	16.08	33238 <sup>c</sup>	6.86

- 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.
- (c) Outside control limits due to possible matrix interference. Confirmed by MS/MSD.

6.5.1

6

# Volatile Internal Standard Area Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1803-CC1800	Injection Date:	12/26/12
Lab File ID:	M53091.D	Injection Time:	07:31
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	183946	9.36	254289	10.24	126305	13.52	142217	16.08	42636	6.86
Upper Limit <sup>a</sup>	367892	9.86	508578	10.74	252610	14.02	284434	16.58	85272	7.36
Lower Limit <sup>b</sup>	91973	8.86	127145	9.74	63153	13.02	71109	15.58	21318	6.36

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSM1803-BS	168837	9.36	232264	10.24	115336	13.52	133226	16.08	88412 <sup>c</sup>	6.86
MSM1803-BSD	171175	9.36	240254	10.24	119472	13.52	138997	16.08	97287 <sup>c</sup>	6.85
MSM1803-MB	174347	9.36	235755	10.24	112894	13.52	137372	16.08	43775	6.86
MC16889-1 <sup>d</sup>	46055 <sup>e</sup>	9.36	61913 <sup>e</sup>	10.24	30642 <sup>e</sup>	13.52	37472 <sup>e</sup>	16.08	11790 <sup>c</sup>	6.85
MC16889-5	175585	9.36	242014	10.24	118948	13.52	141642	16.08	76100	6.85
MC16889-6	165650	9.36	224359	10.24	109358	13.52	130796	16.08	71480	6.86
ZZZZZZ	166843	9.35	231566	10.24	108249	13.52	120567	16.08	55773	6.85
ZZZZZZ	166268	9.36	230402	10.24	109182	13.52	120563	16.08	55983	6.86
ZZZZZZ	171716	9.36	237080	10.24	114893	13.52	140425	16.08	73226	6.85
ZZZZZZ	166467	9.36	225249	10.24	111016	13.52	138748	16.08	74273	6.85
ZZZZZZ	169597	9.36	229467	10.24	112016	13.52	137060	16.08	68847	6.85
ZZZZZZ	166689	9.36	225966	10.24	108371	13.52	133333	16.08	71059	6.85
ZZZZZZ	165971	9.36	225518	10.24	109581	13.52	134161	16.08	71712	6.85
MC16889-12	168993	9.36	229334	10.24	111675	13.52	132679	16.08	67064	6.86
MC16889-12MS	167716	9.36	227698	10.24	110635	13.52	132218	16.08	72761	6.86
MC16889-12MSD	167504	9.36	230159	10.24	114705	13.52	134479	16.08	69378	6.86
MC16889-8	176350	9.36	239253	10.24	116193	13.52	143002	16.08	69928	6.85
MC16889-9	172987	9.36	233797	10.24	113839	13.52	139216	16.08	68174	6.86
MC16889-10	176008	9.36	241048	10.24	116511	13.52	144010	16.08	65193	6.85
MC16889-11	170606	9.36	231719	10.24	111736	13.52	137065	16.08	58545	6.86
MC16889-13	175976	9.36	236457	10.24	115508	13.52	137377	16.08	66442	6.86

- 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.
- (c) Outside control limits. Target analytes not associated with this internal standard.
- (d) Confirmation run.
- (e) Outside control limits due to possible matrix interference. Confirmed by reanalysis.

6.5.2  
6

# Volatile Internal Standard Area Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1804-CC1800	Injection Date:	12/27/12
Lab File ID:	M53117.D	Injection Time:	09:29
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	180953	9.36	249177	10.24	125697	13.52	143873	16.08	41987	6.86
Upper Limit <sup>a</sup>	361906	9.86	498354	10.74	251394	14.02	287746	16.58	83974	7.36
Lower Limit <sup>b</sup>	90477	8.86	124589	9.74	62849	13.02	71937	15.58	20994	6.36

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSM1804-BS	165956	9.36	231215	10.24	116167	13.52	135462	16.08	86522 <sup>c</sup>	6.86
MSM1804-BSD	159568	9.36	221915	10.24	112127	13.52	129219	16.08	82403	6.86
MSM1804-MB	167750	9.36	227098	10.24	107818	13.52	131684	16.08	39001	6.86
ZZZZZZ	176788	9.36	239941	10.24	116961	13.52	141990	16.08	81691	6.86
ZZZZZZ	171921	9.36	233256	10.24	110523	13.52	129467	16.08	29420	6.86
MC16931-1	173355	9.36	234255	10.24	113283	13.52	139095	16.08	68227	6.85
ZZZZZZ	165986	9.36	225926	10.24	110220	13.52	137043	16.09	57397	6.86
ZZZZZZ	173567	9.36	233811	10.24	113973	13.52	135012	16.09	70000	6.85
ZZZZZZ	172216	9.36	231603	10.24	112475	13.52	135807	16.09	64674	6.86
ZZZZZZ	161352	9.36	220727	10.24	106277	13.52	124550	16.09	74396	6.85
ZZZZZZ	158063	9.36	212010	10.24	96281	13.52	97794	16.08	67733	6.86
ZZZZZZ	168054	9.36	225545	10.24	103854	13.52	111521	16.09	66759	6.86
ZZZZZZ	177084	9.36	240613	10.24	116492	13.52	143940	16.08	68746	6.86
MC16889-14	150425	9.36	207559	10.24	101282	13.52	119116	16.08	42432	6.86
ZZZZZZ	171355	9.36	230735	10.24	111487	13.52	135090	16.08	65507	6.86
ZZZZZZ	174550	9.36	237270	10.24	114737	13.52	139052	16.08	64301	6.86
ZZZZZZ	143650	9.36	191424	10.24	72129	13.52	43065 <sup>d</sup>	16.09	41871	6.86
ZZZZZZ	153448	9.36	205619	10.24	82908	13.52	60325 <sup>d</sup>	16.09	45746	6.86
MC16931-1MS	167774	9.36	229024	10.24	117245	13.52	135696	16.08	73309	6.86
MC16931-1MSD	159576	9.36	222745	10.24	111870	13.52	130524	16.08	77650	6.85

- 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.
- (c) Outside control limits. Target analytes not associated with this internal standard.
- (d) Outside control limits due to possible matrix interference. Confirmed by reanalysis.

6.5.3

6

# Volatile Internal Standard Area Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSN2685-CC2675	Injection Date:	12/24/12
Lab File ID:	N71411.D	Injection Time:	08:51
Instrument ID:	GCMSN	Method:	SW846 8260B

	IS 1	IS 2	IS 3	IS 4	IS 5
	AREA	RT	AREA	RT	AREA
Check Std	560022	9.01	744906	9.88	378504
Upper Limit <sup>a</sup>	1120044	9.51	1489812	10.38	757008
Lower Limit <sup>b</sup>	280011	8.51	372453	9.38	189252

Lab	IS 1	IS 2	IS 3	IS 4	IS 5
Sample ID	AREA	RT	AREA	RT	AREA
MSN2685-BS	562587	9.01	753616	9.88	373773
MSN2685-MB	538169	9.01	709447	9.88	328924
ZZZZZZ	535505	9.01	716936	9.88	331342
ZZZZZZ	538490	9.01	710088	9.88	329670
MC16889-7	481773	9.01	639312	9.88	300872
ZZZZZZ	490504	9.01	656332	9.88	303216
ZZZZZZ	519211	9.01	690694	9.88	319892
ZZZZZZ	474484	9.01	630709	9.88	289246
MC16880-6	513830	9.01	678950	9.88	317193
ZZZZZZ	523170	9.01	678226	9.88	323479
ZZZZZZ	495027	9.01	662268	9.88	309189
ZZZZZZ	468938	9.01	623166	9.88	289147
ZZZZZZ	471671	9.01	616462	9.88	286991
ZZZZZZ	507063	9.01	670347	9.88	311826
ZZZZZZ	504078	9.01	675684	9.88	317121
ZZZZZZ	505759	9.01	661233	9.88	314859
ZZZZZZ	501332	9.01	673783	9.88	318244
ZZZZZZ	504025	9.01	671588	9.88	312927
ZZZZZZ	502698	9.01	663030	9.88	318624
ZZZZZZ	500459	9.01	673320	9.88	321083
MC16880-6MS	519616	9.01	696993	9.88	356462
MC16880-6MSD	527694	9.01	709517	9.88	357957
ZZZZZZ	535056	9.01	706616	9.87	340855

- 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.

6.5.4  
6

# Volatile Surrogate Recovery Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16889-7	N71417.D	98	103	120
MC16880-6MS	N71433.D	101	104	103
MC16880-6MSD	N71434.D	103	103	100
MSN2685-BS	N71412.D	104	104	103
MSN2685-MB	N71414.D	98	102	115

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: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16889-1	M53096.D	84	91	82
MC16889-1	M53059.D	79	90	83
MC16889-2	M53060.D	82	88	84
MC16889-3	M53061.D	83	88	88
MC16889-4	M53062.D	83	88	83
MC16889-5	M53097.D	84	87	80
MC16889-6	M53098.D	82	88	82
MC16889-8	M53110.D	85	87	80
MC16889-9	M53111.D	84	88	80
MC16889-10	M53112.D	85	88	79
MC16889-11	M53113.D	85	88	80
MC16889-12	M53106.D	82	88	81
MC16889-13	M53114.D	83	87	81
MC16889-14	M53134.D	85	88	82
MC16889-12MS	M53107.D	82	88	82
MC16889-12MSD	M53108.D	84	87	82
MC16889-1MS	M53064.D	85	88	80
MC16889-1MSD	M53065.D	83	88	82
MC16931-1MS	M53139.D	84	89	81
MC16931-1MSD	M53140.D	84	87	80
MSM1801-BS	M53043.D	85	89	82
MSM1801-MB	M53045.D	82	88	80
MSM1803-BS	M53092.D	85	88	82
MSM1803-BSD	M53093.D	86	88	80
MSM1803-MB	M53095.D	82	88	80
MSM1804-BS	M53118.D	86	88	81
MSM1804-BSD	M53119.D	84	87	80
MSM1804-MB	M53121.D	81	87	79

**Surrogate Compounds**                      **Recovery Limits**

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

6.6.2  
6

**GC Volatiles**

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**QC Data Summaries****7**

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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: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31480-MB	BB44997.D	1	12/19/12	CZ	12/18/12	OP31480	GBB2725

The QC reported here applies to the following samples:

Method: SW846 8011

MC16889-1, MC16889-2, MC16889-3, MC16889-4, MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13, MC16889-14

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.5	0.96	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	118% 61-167%
460-00-4	Bromofluorobenzene (S)	114% 61-167%

7.1.1  
7

# Method Blank Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31513-MB	BB45031A.D	1	12/21/12	CZ	12/21/12	OP31513	GBB2726

The QC reported here applies to the following samples:

Method: SW846 8011

MC16889-7

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Limits	
460-00-4	Bromofluorobenzene (S)	94%	36-173%
460-00-4	Bromofluorobenzene (S)	101%	36-173%

7.1.2  
7

# Blank Spike Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31480-BS	BB44998.D	1	12/19/12	CZ	12/18/12	OP31480	GBB2725

The QC reported here applies to the following samples:

Method: SW846 8011

MC16889-1, MC16889-2, MC16889-3, MC16889-4, MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-12, MC16889-13, MC16889-14

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	33.3	38.9	117	59-142
106-93-4	1,2-Dibromoethane	33.3	41.9	126	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	116%	61-167%
460-00-4	Bromofluorobenzene (S)	110%	61-167%

7.2.1  
7

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31513-BS	BB45032A.D	1	12/21/12	CZ	12/21/12	OP31513	GBB2726

The QC reported here applies to the following samples:

Method: SW846 8011

MC16889-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.061	86	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)	96%	36-173%
460-00-4	Bromofluorobenzene (S)	103%	36-173%

7.2.2  
7

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31480-MS	BB44999.D	1	12/19/12	CZ	12/18/12	OP31480	GBB2725
OP31480-MSD	BB45000.D	1	12/19/12	CZ	12/18/12	OP31480	GBB2725
MC16889-1	BB45003.D	1	12/19/12	CZ	12/18/12	OP31480	GBB2725

The QC reported here applies to the following samples:

Method: SW846 8011

MC16889-1, MC16889-2, MC16889-3, MC16889-4, MC16889-5, MC16889-6, MC16889-8, MC16889-9, MC16889-10, MC16889-11, MC16889-13, MC16889-14

7.3.1  
7

CAS No.	Compound	MC16889-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
96-12-8	1,2-Dibromo-3-chloropropane	ND		74.7	85.1	114	74.3	86.5	116	2	40-156/27
106-93-4	1,2-Dibromoethane	ND		74.7	96.4	129	74.3	97.5	131	1	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16889-1	Limits
460-00-4	Bromofluorobenzene (S)	114%	123%	115%	61-167%
460-00-4	Bromofluorobenzene (S)	99%	105%	101%	61-167%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31480-MS2	BB45001.D	1	12/19/12	CZ	12/18/12	OP31480	GBB2725
OP31480-MSD2	BB45002.D	1	12/19/12	CZ	12/18/12	OP31480	GBB2725
MC16889-12	BB45014.D	1	12/20/12	CZ	12/18/12	OP31480	GBB2725

The QC reported here applies to the following samples:

Method: SW846 8011

MC16889-12

CAS No.	Compound	MC16889-12 Spike		MS	MS	Spike	MSD	MSD	RPD	Limits
		ug/kg	Q ug/kg	ug/kg	%	ug/kg	ug/kg	%		Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	70.3	80.4	114	69.4	79.1	114	2	40-156/27
106-93-4	1,2-Dibromoethane	ND	70.3	92.0	130	69.4	93.3	134	1	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16889-12 Limits	
460-00-4	Bromofluorobenzene (S)	116%	118%	120%	61-167%
460-00-4	Bromofluorobenzene (S)	104%	98%	110%	61-167%

\* = Outside of Control Limits.

7.3.2  
7

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31513-MS	BB45033A.D	1	12/21/12	CZ	12/21/12	OP31513	GBB2726
OP31513-MSD	BB45034A.D	1	12/21/12	CZ	12/21/12	OP31513	GBB2726
MC17000-5	BB45035A.D	1	12/21/12	CZ	12/21/12	OP31513	GBB2726

The QC reported here applies to the following samples:

Method: SW846 8011

MC16889-7

CAS No.	Compound	MC17000-5 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0698	0.059	85	0.0698	0.063	90	7	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.0698	0.063	90	0.0698	0.065	93	3	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC17000-5	Limits
460-00-4	Bromofluorobenzene (S)	95%	100%	95%	36-173%
460-00-4	Bromofluorobenzene (S)	99%	104%	99%	36-173%

\* = Outside of Control Limits.

7.3.3  
7

# Volatile Surrogate Recovery Summary

Job Number: MC16889  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16889-7	BB45036.D	90	97
OP31513-BS	BB45032A.D	96	103
OP31513-MB	BB45031A.D	94	101
OP31513-MS	BB45033A.D	95	99
OP31513-MSD	BB45034A.D	100	104

Surrogate Compounds	Recovery Limits
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S1 = Bromofluorobenzene (S)	36-173%
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- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

# Volatile Surrogate Recovery Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC16889-1	BB45003.D	115	101
MC16889-2	BB45004.D	121	118
MC16889-3	BB45005.D	127	115
MC16889-4	BB45006.D	121	114
MC16889-5	BB45008.D	121	114
MC16889-6	BB45009.D	124	119
MC16889-8	BK20276.D	97	133
MC16889-8	BB45010.D	0* c	0* c
MC16889-9	BK20277.D	104	132
MC16889-9	BB45011.D	0* c	0* c
MC16889-10	BB45012.D	130	126
MC16889-11	BB45013.D	129	124
MC16889-12	BB45014.D	120	110
MC16889-13	BB45015.D	128	118
MC16889-14	BB45016.D	122	118
OP31480-BS	BB44998.D	116	110
OP31480-MB	BB44997.D	118	114
OP31480-MS	BB44999.D	114	99
OP31480-MS2	BB45001.D	116	104
OP31480-MSD	BB45000.D	123	105
OP31480-MSD2	BB45002.D	118	98

Surrogate Compounds	Recovery Limits
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S1 = Bromofluorobenzene (S)	61-167%
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- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1
- (c) Surrogate standard not added. Results confirmed by re-extraction/reanalysis.

7.4.2  
7

# GC Surrogate Retention Time Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBB2726-ICC2726	Injection Date:	12/21/12
Lab File ID:	BB45025.D	Injection Time:	17:14
Instrument ID:	GCBB	Method:	SW846 8011

	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
Check Std	3.62	3.38

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
ZZZZZZ	BB45029B.D	12/21/12	19:02	3.62	3.38
ZZZZZZ	BB45029A.D	12/21/12	19:02	3.62	3.38
OP31512-MB	BB45031.D	12/21/12	19:56	3.62	3.38
OP31513-MB	BB45031A.D	12/21/12	19:56	3.62	3.38
OP31512-BS	BB45032.D	12/21/12	20:23	3.62	3.38
OP31513-BS	BB45032A.D	12/21/12	20:23	3.62	3.38
OP31512-MS	BB45033.D	12/21/12	20:50	3.62	3.38
OP31513-MS	BB45033A.D	12/21/12	20:50	3.62	3.38
OP31512-MSD	BB45034.D	12/21/12	21:17	3.62	3.38
OP31513-MSD	BB45034A.D	12/21/12	21:17	3.62	3.38
MC16984-9	BB45035.D	12/21/12	21:44	3.62	3.38
MC17000-5	BB45035A.D	12/21/12	21:44	3.62	3.38
MC16889-7	BB45036.D	12/21/12	22:10	3.62	3.38
ZZZZZZ	BB45037.D	12/21/12	22:37	3.62	3.38
ZZZZZZ	BB45038.D	12/21/12	23:04	3.62	3.38
GBB2726-ECC2726	BB45039.D	12/22/12	06:22	3.61	3.38

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.1  
7

# GC Surrogate Retention Time Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBB2725-ICC2725	Injection Date:	12/19/12
Lab File ID:	BB44991.D	Injection Time:	17:58
Instrument ID:	GCBB	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	3.70	3.47
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP31480-MB	BB44997.D	12/19/12	20:38	3.71	3.47
OP31480-BS	BB44998.D	12/19/12	21:05	3.70	3.47
OP31480-MS	BB44999.D	12/19/12	21:32	3.71	3.47
OP31480-MSD	BB45000.D	12/19/12	21:58	3.71	3.47
OP31480-MS2	BB45001.D	12/19/12	22:25	3.71	3.47
OP31480-MSD2	BB45002.D	12/19/12	22:52	3.71	3.47
MC16889-1	BB45003.D	12/19/12	23:19	3.71	3.47
MC16889-2	BB45004.D	12/19/12	23:45	3.71	3.47
MC16889-3	BB45005.D	12/20/12	00:12	3.71	3.47
MC16889-4	BB45006.D	12/20/12	00:39	3.71	3.47

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.2  
7

# GC Surrogate Retention Time Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBB2725-CC2725	Injection Date:	12/20/12
Lab File ID:	BB45007.D	Injection Time:	01:06
Instrument ID:	GCBB	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	3.70	3.47
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
MC16889-5	BB45008.D	12/20/12	01:32	3.71	3.47
MC16889-6	BB45009.D	12/20/12	01:59	3.71	3.47
MC16889-8	BB45010.D	12/20/12	02:26	0.00	0.00
MC16889-9	BB45011.D	12/20/12	02:52	0.00	0.00
MC16889-10	BB45012.D	12/20/12	03:19	3.71	3.47
MC16889-11	BB45013.D	12/20/12	03:46	3.71	3.47
MC16889-12	BB45014.D	12/20/12	04:13	3.71	3.47
MC16889-13	BB45015.D	12/20/12	04:40	3.71	3.47
MC16889-14	BB45016.D	12/20/12	05:07	3.71	3.47
ZZZZZZ	BB45017.D	12/20/12	05:33	3.71	3.47

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

7.5.3  
7

# GC Surrogate Retention Time Summary

Job Number: MC16889  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK733-CC720	Injection Date:	12/28/12
Lab File ID:	BK20273.D	Injection Time:	14:13
Instrument ID:	GCBK	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT     RT

Check Std	4.45	4.78
-----------	------	------

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP31493-MB	BK20274.D	12/28/12	14:39	4.45	4.78
OP31493-BS	BK20275.D	12/28/12	15:03	4.45	4.78
MC16889-8	BK20276.D	12/28/12	15:28	4.45	4.78
MC16889-9	BK20277.D	12/28/12	15:52	4.45	4.78
ZZZZZZ	BK20278.D	12/28/12	16:16	4.45	4.78
ZZZZZZ	BK20279.D	12/28/12	16:40	4.45	4.78
ZZZZZZ	BK20280.D	12/28/12	17:04	4.45	4.78
ZZZZZZ	BK20281.D	12/28/12	17:29	4.45	4.78
ZZZZZZ	BK20282.D	12/28/12	17:53	4.45	4.78
ZZZZZZ	BK20283.D	12/28/12	18:17	4.45	4.78

## Surrogate Compounds

S1 = Bromofluorobenzene (S)

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

## General Chemistry

---

### QC Data Summaries



---

Includes the following where applicable:

- Percent Solids Raw Data Summary

# Percent Solids Raw Data Summary

Job Number: MC16889  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

---

Sample: MC16889-1 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-49-11

Wet Weight (Total)	31.362	g
Tare Weight	22.292	g
Dry Weight (Total)	30.193	g
Solids, Percent	87.1	%

---

Sample: MC16889-2 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-49-21

Wet Weight (Total)	33.004	g
Tare Weight	21.434	g
Dry Weight (Total)	29.786	g
Solids, Percent	72.2	%

---

Sample: MC16889-3 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-49-31

Wet Weight (Total)	31.497	g
Tare Weight	20.806	g
Dry Weight (Total)	29.701	g
Solids, Percent	83.2	%

---

Sample: MC16889-4 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-51-14

Wet Weight (Total)	35.929	g
Tare Weight	25.022	g
Dry Weight (Total)	35.501	g
Solids, Percent	96.1	%

---

Sample: MC16889-5 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-51-21

Wet Weight (Total)	37.633	g
Tare Weight	26.434	g
Dry Weight (Total)	37.189	g
Solids, Percent	96	%

---

Sample: MC16889-6 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-51-31

Wet Weight (Total)	42.815	g
Tare Weight	30.776	g
Dry Weight (Total)	42.424	g
Solids, Percent	96.8	%

---

8.1  
8

# Percent Solids Raw Data Summary

Job Number: MC16889  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

---

Sample: MC16889-8 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-52-13

Wet Weight (Total)	32.96	g
Tare Weight	20.013	g
Dry Weight (Total)	32.324	g
Solids, Percent	95.1	%

---

Sample: MC16889-9 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-52-25

Wet Weight (Total)	30.585	g
Tare Weight	18.823	g
Dry Weight (Total)	30.09	g
Solids, Percent	95.8	%

---

Sample: MC16889-10 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-52-25 DUP

Wet Weight (Total)	33.282	g
Tare Weight	21.284	g
Dry Weight (Total)	32.862	g
Solids, Percent	96.5	%

---

Sample: MC16889-11 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-52-29

Wet Weight (Total)	29.394	g
Tare Weight	21.161	g
Dry Weight (Total)	29.048	g
Solids, Percent	95.8	%

---

Sample: MC16889-12 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-53-15

Wet Weight (Total)	38.335	g
Tare Weight	28.495	g
Dry Weight (Total)	37.783	g
Solids, Percent	94.4	%

---

Sample: MC16889-13 Analyzed: 17-DEC-12 by MA Method: SM21 2540 B MOD.  
ClientID: VMP-53-27

Wet Weight (Total)	26.436	g
Tare Weight	18.444	g
Dry Weight (Total)	26.082	g
Solids, Percent	95.6	%

---

8.1  
8

# Percent Solids Raw Data Summary

Job Number: MC16889  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

---

Sample: MC16889-14      Analyzed: 17-DEC-12 by MA      Method: SM21 2540 B MOD.  
ClientID: VMP-53-31

Wet Weight (Total)	32.587	g
Tare Weight	23.381	g
Dry Weight (Total)	30.683	g
Solids, Percent	79.3	%

---

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*e-Hardcopy 2.0*  
*Automated Report*

### Technical Report for

### Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562850.15000

SGS Accutest Job Number: MC17501

Sampling Date: 01/10/13

### Report to:

AECOM, INC.

Melissa.mansker@aecom.com

ATTN: Melissa Mansker

Total number of pages in report: 65



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

*H. (Brad) Madadian*  
H. (Brad) Madadian  
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

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

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ACCUTEST

October 20, 2016

AECOM  
1001 Highlands Plaza Drive West Suite 300  
St. Louis, MO 63110

RE: SGS Accutest Job # MC17501

Dear Elizabeth Kunkel

As you are aware, SGS Accutest Inc. - Marlborough has been conducting an extensive review of data associated with some historical Gas Chromatography-Mass Spectroscopy volatiles analyses. As a result of this review it was determined that some revisions of the original test report for this job were needed. These corrections have been incorporated into the revised report.

Please be assured that corrective actions have been put in place to address this matter and prevent a recurrence.

We apologize for any inconvenience that this issue may have caused. Please don't hesitate to contact us if we can be of further assistance.

Sincerely,

**H. (Brad) Madadian**

Regional Laboratory Director  
SGS Accutest Inc. - Marlborough

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TESTING AND CERTIFICATION COMPANY.

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## Sample Summary

Shell Oil

Job No: MC17501

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562850.15000

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
MC17501-1	01/10/13	13:05 WPJS	01/12/13	SO	Soil	P-55R-43
MC17501-2	01/10/13	13:10 WPJS	01/12/13	SO	Soil	P-55R-51
MC17501-3	01/10/13	00:00 WPJS	01/12/13	AQ	Trip Blank Water	TRIP BLANK

---

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

## SAMPLE DELIVERY GROUP CASE NARRATIVE

2

**Client:** She O

**Job No** MC 750

**Site:** URSMOSTL: Roxana Dr ng, Roxana, IL

**Report Date** 0/24/20 6 3:00:42 P

2 Samp e(s), Tr p B ank(s) and 0 F e d B ank(s) were co ected on 0 / 0/20 3 and were rece ved at SGS Accutest New Eng and on 0 / 2/20 3 properly preserved, at 2 Deg C and ntact These Samp es rece ved a job number of MC 750 A st ng of the Laboratory Samp e ID, C ent Samp e ID and dates of co ect on are presented n the Resu ts Summary Sect on of th s repo t -Ch orohexane was searched n the brary search and reported on y f detect ons were found

Except as noted be ow, a method spec f ed ca brat ons and qua ty contro performance cr ter a were met for th s job For more nformat on, p ease refer to QC summary pages

### Volatiles by GCMS By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** MSK2 85

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 7426-3MS, MC 7426-3MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for 2-Ch oroethy v ny ether are outs de contro m ts
- Matr x Sp ke Recovery(s) for 2-Ch oroethy v ny ether, Acro e n, Styrene are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference
- Matr x Sp ke Dup cate Recovery(s) for 2-Ch oroethy v ny ether, Styrene are outs de contro m ts Probab e cause due to matr x nterference
- RPD(s) for MSD for Acro e n are outs de contro m ts for samp e MC 7426-3MSD H gh RPD due to poss b e matr x nterference and/or samp e non-homogene ty
- MC 750 -3 for 2-Ch oroethy v ny ether: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow
- MC 750 -3 for Acro e n: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow
- Cont nu ng ca brat on check standard MSK2 85-CC2 77 for ACro e n exceeds 50% D fference(boased h gh) Assoc ated samp e s non-detect for th s compound

**Matrix:** SO

**Batch ID:** MSG49

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 7550- MS, MC 7550- MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for Acetone, Acro e n are outs de contro m ts
- Matr x Sp ke Recovery(s) for Acro e n are outs de contro m ts Outs de contro m ts due to poss b e matr x nte ference
- Matr x Sp ke Dup cate Recovery(s) for Acro e n are outs de contro m ts Probab e cause due to matr x nterference
- RPD(s) for MSD for V ny ch or de are outs de contro m ts for samp e MC 7550- MSD H gh RPD due to poss b e matr x nterference and/or samp e non-homogene ty
- MC 750 - : V ny Ch or de (CCC's) do not meet the reference method acceptance cr ter a n nstrument QC and resu ts may be b ased ow
- 2-Hexanone: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased h gh
- D ch orod f uoromethane, 2-Ch oroethy v ny ether, Acro e n: In t a Ca brat on Ver f cat on outs de of acceptance cr ter a Samp e resu t may be b ased ow

**Matrix:** SO

**Batch ID:** MSM 8 7

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC 7443- MS, MC 7443- MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recove y(s) for Ch oromethane, D ch orod f uoromethane are outs de contro m ts

Monday, October 24, 2016

Page 1 of 2

## Volatiles by GCMS By Method SW846 8260B

**Matrix:** SO

**Batch ID:** MSM 8 7

- Matr x Sp ke Recovery(s) for Acetone, , , ,2-Tetrach oroethane, , ,2,2-Tetrach oroethane, ,2,3-Tr ch orobenzene, ,2,3-Tr ch oropropane, ,2,4-Tr ch orobenzene, ,2,4-Tr methy benzene, ,2-D ch orobenzene, ,3,5-Tr methy benzene, ,3-D ch orobenzene, ,3-D ch oropropane, ,4-D ch orobenzene, 2-Butanone (MEK), Bromobenzene, Bromoform, Ch orobenzene, D bromoch oromethane, Ethy benzene, Hexach orobutad ene, Isopropy benzene, m,p-Xy ene, n-Buty benzene, n-Propy benzene, Naphtha ene, o-Ch oroto uene, o-Xy ene, p-Ch oroto uene, p-Isopropy to uene, sec-Buty benzene, Styrene, tert-Buty benzene, Xy ene (tota ) are outs de contro m ts Outs de contro m ts due to h gh eve n samp e re at ve to sp ke amount
- Matr x Sp ke Dup cate Recovery(s) for , , ,2-Tetrach oroethane, , ,2,2-Tetrach oroethane, ,2,3-Tr ch orobenzene, ,2,3-Tr ch oropropane, ,2,4-Tr ch orobenzene, ,2,4-Tr methy benzene, ,2-D ch orobenzene, ,3,5-Tr methy benzene, ,3-D ch orobenzene, ,4-D ch orobenzene, 2-Butanone (MEK), Acetone, Bromobenzene, Bromoform, Ch orobenzene, Hexach orobutad ene, Isopropy benzene, m,p-Xy ene, n-Buty benzene, n-Propy benzene, Naphtha ene, o-Ch oroto uene, o-Xy ene, p-Ch oroto uene, p-Isopropy to uene, sec-Buty benzene, Styrene, tert-Buty benzene, Xy ene (tota ) are outs de contro m ts Probab e cause due to matr x nterference

## Volatiles by GC By Method SW846 8011

**Matrix:** SO

**Batch ID:** OP3 778

- A samp es were extracted w th n the recommended method ho d ng t me
- A samp es were ana yzed w th n the recommended method ho d ng t me
- A method b anks for th s batch meet method spec f c cr ter a
- Samp e(s) MC 750 -2MS, MC 750 -2MSD were used as the QC samp es nd cated
- Samp e(s) OP3 778-BS, OP3 778-MB, MC 750 - , MC 750 -2, OP3 778-MS, OP3 778-MSD have surrogates outs de contro m ts Probab e cause due to matr x nte ference
- OP3 778-MB for Bromof uorobenzene (S): Outs de contro m ts Assoc ated samp es are non-detect for target ana ytes
- OP3 778-BS for Bromof uorobenzene (S): Outs de contro m ts Assoc ated samp es are non-detect for target ana ytes
- OP3 778-MS for Bromof uorobenzene (S): Outs de contro m ts Samp e s non-detect for target ana ytes
- OP3 778-MSD for Bromof uorobenzene (S): Outs de contro m ts Samp e s non-detect for target ana ytes
- MC 750 -2 for Bromof uorobenzene (S): Outs de contro m ts Samp e s non-detect for target ana ytes
- MC 750 - for Bromof uorobenzene (S): Outs de contro m ts Samp e s non-detect for target ana ytes

## Wet Chemistry By Method SM21 2540 B MOD.

**Matrix:** SO

**Batch ID:** GN4 532

- Samp e(s) MC 7550- DUP were used as the QC samp es for So ds, Percent

SGS Accutest New Eng and ce t f es that a ana ys s were performed w th n method spec f cat on It s further recommended that th s report to be used n ts ent rety The Laborato y D rector for SGS Accutest New Eng and or ass gnee as ver f ed by the s gnature on the cover page has author zed the re ease of th s report(MC 750 )

## Summary of Hits

Job Number: MC17501  
 Account: Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL  
 Collected: 01/10/13



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

MC17501-1 P-55R-43

Benzene <sup>a</sup>	4.25	0.093	0.055	mg/kg	SW846 8260B
n-Butylbenzene <sup>a</sup>	2.65	0.93	0.034	mg/kg	SW846 8260B
sec-Butylbenzene <sup>a</sup>	0.996	0.93	0.043	mg/kg	SW846 8260B
Ethylbenzene <sup>a</sup>	22.8	0.37	0.045	mg/kg	SW846 8260B
Isopropylbenzene <sup>a</sup>	2.59	0.93	0.042	mg/kg	SW846 8260B
p-Isopropyltoluene <sup>a</sup>	0.679 J	0.93	0.033	mg/kg	SW846 8260B
Naphthalene <sup>a</sup>	11.3	0.93	0.23	mg/kg	SW846 8260B
n-Propylbenzene <sup>a</sup>	5.70	0.93	0.19	mg/kg	SW846 8260B
Toluene <sup>a</sup>	10.8	0.93	0.16	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene <sup>a</sup>	30.1	0.93	0.042	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene <sup>a</sup>	7.68	0.93	0.040	mg/kg	SW846 8260B
m,p-Xylene <sup>a</sup>	58.5	0.37	0.15	mg/kg	SW846 8260B
o-Xylene <sup>a</sup>	24.8	0.37	0.045	mg/kg	SW846 8260B
Xylene (total) <sup>a</sup>	83.3	0.37	0.045	mg/kg	SW846 8260B

MC17501-2 P-55R-51

Benzene	0.0019	0.00054	0.00032	mg/kg	SW846 8260B
n-Butylbenzene	0.0087	0.0054	0.00020	mg/kg	SW846 8260B
sec-Butylbenzene	0.0040 J	0.0054	0.00025	mg/kg	SW846 8260B
Carbon disulfide	0.0046 J	0.0054	0.00018	mg/kg	SW846 8260B
Ethylbenzene	0.0098	0.0022	0.00026	mg/kg	SW846 8260B
Isopropylbenzene	0.0043 J	0.0054	0.00025	mg/kg	SW846 8260B
p-Isopropyltoluene	0.0017 J	0.0054	0.00019	mg/kg	SW846 8260B
Naphthalene	0.0125	0.0054	0.0014	mg/kg	SW846 8260B
n-Propylbenzene	0.0119	0.0054	0.0011	mg/kg	SW846 8260B
Toluene	0.0055	0.0054	0.00092	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	0.0144	0.0054	0.00024	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	0.0051 J	0.0054	0.00023	mg/kg	SW846 8260B
Vinyl Acetate	0.0245	0.0054	0.00060	mg/kg	SW846 8260B
m,p-Xylene	0.0154	0.0022	0.00085	mg/kg	SW846 8260B
o-Xylene	0.0082	0.0022	0.00026	mg/kg	SW846 8260B
Xylene (total)	0.0236	0.0022	0.00026	mg/kg	SW846 8260B

MC17501-3 TRIP BLANK

No hits reported in this sample.

(a) Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.

**Sample Results**

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**Report of Analysis**

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## Report of Analysis

Client Sample ID:	P-55R-43	Date Sampled:	01/10/13
Lab Sample ID:	MC17501-1	Date Received:	01/12/13
Matrix:	SO - Soil	Percent Solids:	63.9
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	G123694.D	1	01/16/13	JM	n/a	n/a	MSG4911
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.97 g	10.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.93	0.23	mg/kg	
107-02-8	Acrolein <sup>b</sup>	ND	4.6	1.9	mg/kg	
107-13-1	Acrylonitrile	ND	4.6	0.23	mg/kg	
71-43-2	Benzene	4.25	0.093	0.055	mg/kg	
108-86-1	Bromobenzene	ND	0.93	0.041	mg/kg	
74-97-5	Bromochloromethane	ND	0.93	0.069	mg/kg	
75-27-4	Bromodichloromethane	ND	0.37	0.039	mg/kg	
75-25-2	Bromoform	ND	0.37	0.37	mg/kg	
74-83-9	Bromomethane	ND	0.37	0.096	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.93	0.23	mg/kg	
104-51-8	n-Butylbenzene	2.65	0.93	0.034	mg/kg	
135-98-8	sec-Butylbenzene	0.996	0.93	0.043	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.93	0.16	mg/kg	
75-15-0	Carbon disulfide	ND	0.93	0.031	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.37	0.13	mg/kg	
108-90-7	Chlorobenzene	ND	0.37	0.051	mg/kg	
75-00-3	Chloroethane	ND	0.93	0.23	mg/kg	
110-75-8	2-Chloroethyl vinyl ether <sup>b</sup>	ND	0.93	0.37	mg/kg	
67-66-3	Chloroform	ND	0.37	0.096	mg/kg	
74-87-3	Chloromethane	ND	0.93	0.086	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.93	0.20	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.93	0.042	mg/kg	
124-48-1	Dibromochloromethane	ND	0.37	0.055	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.37	0.040	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.37	0.042	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.37	0.039	mg/kg	
75-71-8	Dichlorodifluoromethane <sup>b</sup>	ND	0.37	0.21	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.37	0.050	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.37	0.053	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.37	0.068	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.37	0.056	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.37	0.053	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:	P-55R-43	Date Sampled:	01/10/13
Lab Sample ID:	MC17501-1	Date Received:	01/12/13
Matrix:	SO - Soil	Percent Solids:	63.9
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.37	0.069	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.93	0.043	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.93	0.16	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.93	0.049	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.37	0.032	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.37	0.092	mg/kg	
123-91-1	1,4-Dioxane	ND	4.6	4.6	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.93	0.13	mg/kg	
100-41-4	Ethylbenzene	22.8	0.37	0.045	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.93	0.086	mg/kg	
591-78-6	2-Hexanone <sup>c</sup>	ND	0.93	0.093	mg/kg	
98-82-8	Isopropylbenzene	2.59	0.93	0.042	mg/kg	
99-87-6	p-Isopropyltoluene	0.679	0.93	0.033	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.37	0.053	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.93	0.093	mg/kg	
74-95-3	Methylene bromide	ND	0.93	0.092	mg/kg	
75-09-2	Methylene chloride	ND	0.37	0.22	mg/kg	
91-20-3	Naphthalene	11.3	0.93	0.23	mg/kg	
103-65-1	n-Propylbenzene	5.70	0.93	0.19	mg/kg	
100-42-5	Styrene	ND	0.93	0.043	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.93	0.19	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.37	0.079	mg/kg	
127-18-4	Tetrachloroethene	ND	0.37	0.043	mg/kg	
108-88-3	Toluene	10.8	0.93	0.16	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.93	0.044	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.93	0.043	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.37	0.058	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.37	0.14	mg/kg	
79-01-6	Trichloroethene	ND	0.37	0.039	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.37	0.056	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.93	0.054	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	30.1	0.93	0.042	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	7.68	0.93	0.040	mg/kg	
108-05-4	Vinyl Acetate	ND	0.93	0.10	mg/kg	
75-01-4	Vinyl chloride	ND	0.37	0.051	mg/kg	
	m,p-Xylene	58.5	0.37	0.15	mg/kg	
95-47-6	o-Xylene	24.8	0.37	0.045	mg/kg	
1330-20-7	Xylene (total)	83.3	0.37	0.045	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

<b>Client Sample ID:</b> P-55R-43	<b>Date Sampled:</b> 01/10/13
<b>Lab Sample ID:</b> MC17501-1	<b>Date Received:</b> 01/12/13
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 63.9
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	87%		70-130%
2037-26-5	Toluene-D8	85%		70-130%
460-00-4	4-Bromofluorobenzene	80%		70-130%

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

- (a) Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.
- (b) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.
- (c) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased high.

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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

<b>Client Sample ID:</b> P-55R-43 <b>Lab Sample ID:</b> MC17501-1 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8011 SW846 3550B <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 01/10/13 <b>Date Received:</b> 01/12/13 <b>Percent Solids:</b> 63.9
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ78064.D	1	01/24/13	CZ	01/23/13	OP31778	GYZ7026
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 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	0.0039	0.0017	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0039	0.0015	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	298% <sup>a</sup>		61-167%
460-00-4	Bromofluorobenzene (S)	142%		61-167%

(a) Outside control limits. Sample is non-detect for target analytes.

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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

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## Report of Analysis

Client Sample ID:	P-55R-51	Date Sampled:	01/10/13
Lab Sample ID:	MC17501-2	Date Received:	01/12/13
Matrix:	SO - Soil	Percent Solids:	85.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53471.D	1	01/16/13	AMY	n/a	n/a	MSM1817
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.40 g	5.0 ml
Run #2		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0054	0.0014	mg/kg	
107-02-8	Acrolein	ND	0.027	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.027	0.0014	mg/kg	
71-43-2	Benzene	0.0019	0.00054	0.00032	mg/kg	
108-86-1	Bromobenzene	ND	0.0054	0.00024	mg/kg	
74-97-5	Bromochloromethane	ND	0.0054	0.00040	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0022	0.00023	mg/kg	
75-25-2	Bromoform	ND	0.0022	0.0022	mg/kg	
74-83-9	Bromomethane	ND	0.0022	0.00056	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0054	0.0014	mg/kg	
104-51-8	n-Butylbenzene	0.0087	0.0054	0.00020	mg/kg	
135-98-8	sec-Butylbenzene	0.0040	0.0054	0.00025	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.0054	0.00095	mg/kg	
75-15-0	Carbon disulfide	0.0046	0.0054	0.00018	mg/kg	J
56-23-5	Carbon tetrachloride	ND	0.0022	0.00079	mg/kg	
108-90-7	Chlorobenzene	ND	0.0022	0.00030	mg/kg	
75-00-3	Chloroethane	ND	0.0054	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0054	0.0022	mg/kg	
67-66-3	Chloroform	ND	0.0022	0.00056	mg/kg	
74-87-3	Chloromethane	ND	0.0054	0.00050	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0054	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0054	0.00025	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0022	0.00032	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0022	0.00023	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0022	0.00024	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0022	0.00023	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0022	0.0012	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0022	0.00029	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0022	0.00031	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0022	0.00040	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0022	0.00033	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0022	0.00031	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:	P-55R-51	Date Sampled:	01/10/13
Lab Sample ID:	MC17501-2	Date Received:	01/12/13
Matrix:	SO - Soil	Percent Solids:	85.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0022	0.00040	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0054	0.00025	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0054	0.00094	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0054	0.00028	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0022	0.00018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0022	0.00054	mg/kg	
123-91-1	1,4-Dioxane	ND	0.027	0.027	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0054	0.00074	mg/kg	
100-41-4	Ethylbenzene	0.0098	0.0022	0.00026	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0054	0.00050	mg/kg	
591-78-6	2-Hexanone	ND	0.0054	0.00054	mg/kg	
98-82-8	Isopropylbenzene	0.0043	0.0054	0.00025	mg/kg	J
99-87-6	p-Isopropyltoluene	0.0017	0.0054	0.00019	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.0022	0.00031	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0054	0.00054	mg/kg	
74-95-3	Methylene bromide	ND	0.0054	0.00053	mg/kg	
75-09-2	Methylene chloride	ND	0.0022	0.0013	mg/kg	
91-20-3	Naphthalene	0.0125	0.0054	0.0014	mg/kg	
103-65-1	n-Propylbenzene	0.0119	0.0054	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0054	0.00025	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0054	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0022	0.00046	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0022	0.00025	mg/kg	
108-88-3	Toluene	0.0055	0.0054	0.00092	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0054	0.00026	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0054	0.00025	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0022	0.00034	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0022	0.00079	mg/kg	
79-01-6	Trichloroethene	ND	0.0022	0.00023	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0022	0.00033	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0054	0.00032	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.0144	0.0054	0.00024	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	0.0051	0.0054	0.00023	mg/kg	J
108-05-4	Vinyl Acetate	0.0245	0.0054	0.00060	mg/kg	
75-01-4	Vinyl chloride	ND	0.0022	0.00029	mg/kg	
	m,p-Xylene	0.0154	0.0022	0.00085	mg/kg	
95-47-6	o-Xylene	0.0082	0.0022	0.00026	mg/kg	
1330-20-7	Xylene (total)	0.0236	0.0022	0.00026	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

<b>Client Sample ID:</b> P-55R-51 <b>Lab Sample ID:</b> MC17501-2 <b>Matrix:</b> SO - Soil <b>Method:</b> SW846 8260B <b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	<b>Date Sampled:</b> 01/10/13 <b>Date Received:</b> 01/12/13 <b>Percent Solids:</b> 85.6
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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		70-130%
2037-26-5	Toluene-D8	108%		70-130%
460-00-4	4-Bromofluorobenzene	98%		70-130%

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

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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

<b>Client Sample ID:</b> P-55R-51	<b>Date Sampled:</b> 01/10/13
<b>Lab Sample ID:</b> MC17501-2	<b>Date Received:</b> 01/12/13
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.6
<b>Method:</b> SW846 8011 SW846 3550B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ78063.D	1	01/24/13	CZ	01/23/13	OP31778	GYZ7026
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.8 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	0.0028	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	625% <sup>a</sup>		61-167%
460-00-4	Bromofluorobenzene (S)	154%		61-167%

(a) Outside control limits. Sample is non-detect for target analytes.

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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

4.2  
4

## Report of Analysis

Client Sample ID:	TRIP BLANK	Date Sampled:	01/10/13
Lab Sample ID:	MC17501-3	Date Received:	01/12/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K66565.D	1	01/18/13	GK	n/a	n/a	MSK2185
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	5.0	3.0	ug/l	
107-02-8	Acrolein <sup>a</sup>	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
110-75-8	2-Chloroethyl vinyl ether <sup>a</sup>	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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:	TRIP BLANK	Date Sampled:	01/10/13
Lab Sample ID:	MC17501-3	Date Received:	01/12/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

## VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 01/10/13
<b>Lab Sample ID:</b> MC17501-3	<b>Date Received:</b> 01/12/13
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> URSMOSTL: Roxana Drilling, Roxana, IL	

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**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	114%		70-130%
2037-26-5	Toluene-D8	107%		70-130%
460-00-4	4-Bromofluorobenzene	113%		70-130%

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

(a) Initial Calibration Verification outside of acceptance criteria. Sample result may be biased low.

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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

## Misc. Forms

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### Custody Documents and Other Forms

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Includes the following where applicable:

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



## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC17501      Client: URS      Immediate Client Services Action Required: No  
 Date / Time Received: 1/12/2013      Delivery Method: \_\_\_\_\_      Client Service Action Required at Login: No  
 Project: ROX DRILLING      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

## Internal Sample Tracking Chronicle

Shell Oil

Job No: MC17501

URSMOSTL: Roxana Drilling, Roxana, IL  
 Project No: 21562850.15000

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Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC17501-1 Collected: 10-JAN-13 13:05 By: WPJS Received: 12-JAN-13 By: P-55R-43						
MC17501-1	SM21 2540 B MOD.	16-JAN-13	HS			%SOL
MC17501-1	SW846 8260B	16-JAN-13 14:55	JM			V8260SL +
MC17501-1	SW846 8011	24-JAN-13 12:10	CZ	23-JAN-13	BJ	V8011SL
MC17501-2 Collected: 10-JAN-13 13:10 By: WPJS Received: 12-JAN-13 By: P-55R-51						
MC17501-2	SM21 2540 B MOD.	16-JAN-13	HS			%SOL
MC17501-2	SW846 8260B	16-JAN-13 17:55	AMY			V8260SL +
MC17501-2	SW846 8011	24-JAN-13 11:45	CZ	23-JAN-13	BJ	V8011SL
MC17501-3 Collected: 10-JAN-13 00:00 By: WPJS Received: 12-JAN-13 By: TRIP BLANK						
MC17501-3	SW846 8260B	18-JAN-13 11:26	GK			V8260SL +

# SGS Accutest Internal Chain of Custody

**Job Number:** MC17501  
**Account:** SHELLWIC Shell Oil  
**Project:** URSMOSTL: Roxana Drilling, Roxana, IL  
**Received:** 01/12/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC17501-1.1	Walk In Ref #9	Hamid Siamak	01/16/13 08:44	Retrieve from Storage
MC17501-1.1	Hamid Siamak	Walk In Ref #9	01/16/13 11:25	Return to Storage
MC17501-1.1	Walk In Ref #9	Bijan Jafari	01/23/13 19:19	Retrieve from Storage
MC17501-1.1	Bijan Jafari		02/02/13 13:41	Depleted
MC17501-1.4	VOC Ref #10	Jaime Maslowski	01/15/13 15:33	Retrieve from Storage
MC17501-1.4	Jaime Maslowski	VOC Ref #10	01/16/13 09:46	Return to Storage
MC17501-1.4	VOC Ref #10	Jaime Maslowski	01/16/13 09:47	Retrieve from Storage
MC17501-1.4	Jaime Maslowski	VOC Ref #10	01/17/13 09:54	Return to Storage
MC17501-1.4	Scott Parsick		03/13/13 14:25	Disposed
MC17501-2.1	Walk In Ref #9	Hamid Siamak	01/16/13 08:44	Retrieve from Storage
MC17501-2.1	Hamid Siamak	Walk In Ref #9	01/16/13 11:25	Return to Storage
MC17501-2.1	Walk In Ref #9	Bijan Jafari	01/23/13 19:19	Retrieve from Storage
MC17501-2.1	Bijan Jafari		02/02/13 13:41	Depleted
MC17501-2.2	VOC Ref #10	Amy Min Yang	01/16/13 12:14	Retrieve from Storage
MC17501-2.2	Amy Min Yang	GCMSM	01/16/13 12:15	Load on Instrument
MC17501-2.2	GCMSM	Amy Min Yang	01/22/13 09:57	Unload from Instrument
MC17501-2.2	Amy Min Yang	VOC Ref #10	01/22/13 09:59	Return to Storage
MC17501-2.2	Scott Parsick		03/13/13 14:25	Disposed
MC17501-2.4	VOC Ref #10	Jaime Maslowski	01/15/13 15:33	Retrieve from Storage
MC17501-2.4	Jaime Maslowski	VOC Ref #10	01/16/13 09:46	Return to Storage
MC17501-2.4	Scott Parsick		03/13/13 14:25	Disposed
MC17501-3.2	VOC Ref #1	Gary Krasinski	01/18/13 09:56	Retrieve from Storage
MC17501-3.2	Gary Krasinski	VOC Ref #1	01/21/13 08:33	Return to Storage
MC17501-3.2	Scott Parsick		03/13/13 14:25	Disposed

**GC/MS Volatiles**

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**QC Data Summaries**

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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: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4911-MB	G123685.D	1	01/16/13	JM	n/a	n/a	MSG4911

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-1

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

6.1.1  
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# Method Blank Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4911-MB	G123685.D	1	01/16/13	JM	n/a	n/a	MSG4911

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-1

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.1  
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# Method Blank Summary

Job Number: MC17501  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4911-MB	G123685.D	1	01/16/13	JM	n/a	n/a	MSG4911

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-1

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	87% 70-130%
2037-26-5	Toluene-D8	84% 70-130%
460-00-4	4-Bromofluorobenzene	78% 70-130%

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

# Method Blank Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1817-MB	M53457.D	1	01/16/13	AMY	n/a	n/a	MSM1817

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-2

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

# Method Blank Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1817-MB	M53457.D	1	01/16/13	AMY	n/a	n/a	MSM1817

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-2

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	2.1	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

# Method Blank Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1817-MB	M53457.D	1	01/16/13	AMY	n/a	n/a	MSM1817

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-2

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	99% 70-130%
2037-26-5	Toluene-D8	108% 70-130%
460-00-4	4-Bromofluorobenzene	95% 70-130%

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

6.1.2  
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# Method Blank Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2185-MB	K66562.D	1	01/18/13	GK	n/a	n/a	MSK2185

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	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	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	

# Method Blank Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2185-MB	K66562.D	1	01/18/13	GK	n/a	n/a	MSK2185

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	ug/l	

# Method Blank Summary

Job Number: MC17501  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2185-MB	K66562.D	1	01/18/13	GK	n/a	n/a	MSK2185

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-3

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	107% 70-130%
2037-26-5	Toluene-D8	109% 70-130%
460-00-4	4-Bromofluorobenzene	108% 70-130%

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

# Blank Spike Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1817-BS	M53455.D	1	01/16/13	AMY	n/a	n/a	MSM1817

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	50	38.3	77	70-130
107-02-8	Acrolein	250	224	90	70-130
107-13-1	Acrylonitrile	50	59.0	118	70-130
71-43-2	Benzene	50	52.1	104	70-130
108-86-1	Bromobenzene	50	42.4	85	70-130
74-97-5	Bromochloromethane	50	53.3	107	70-130
75-27-4	Bromodichloromethane	50	49.4	99	70-130
75-25-2	Bromoform	50	43.1	86	70-130
74-83-9	Bromomethane	50	59.0	118	70-130
78-93-3	2-Butanone (MEK)	50	47.8	96	70-130
104-51-8	n-Butylbenzene	50	48.1	96	70-130
135-98-8	sec-Butylbenzene	50	46.4	93	70-130
98-06-6	tert-Butylbenzene	50	44.9	90	70-130
75-15-0	Carbon disulfide	50	62.9	126	70-130
56-23-5	Carbon tetrachloride	50	56.4	113	70-130
108-90-7	Chlorobenzene	50	43.1	86	70-130
75-00-3	Chloroethane	50	61.2	122	70-130
110-75-8	2-Chloroethyl vinyl ether	50	42.8	86	10-160
67-66-3	Chloroform	50	55.4	111	70-130
74-87-3	Chloromethane	50	68.8	138* a	70-130
95-49-8	o-Chlorotoluene	50	42.6	85	70-130
106-43-4	p-Chlorotoluene	50	43.6	87	70-130
124-48-1	Dibromochloromethane	50	43.5	87	70-130
95-50-1	1,2-Dichlorobenzene	50	40.5	81	70-130
541-73-1	1,3-Dichlorobenzene	50	42.0	84	70-130
106-46-7	1,4-Dichlorobenzene	50	42.3	85	70-130
75-71-8	Dichlorodifluoromethane	50	77.6	155* a	70-130
75-34-3	1,1-Dichloroethane	50	57.6	115	70-130
107-06-2	1,2-Dichloroethane	50	48.8	98	70-130
75-35-4	1,1-Dichloroethene	50	62.9	126	70-130
156-59-2	cis-1,2-Dichloroethene	50	55.7	111	70-130
156-60-5	trans-1,2-Dichloroethene	50	57.1	114	70-130
78-87-5	1,2-Dichloropropane	50	49.8	100	70-130
142-28-9	1,3-Dichloropropane	50	42.7	85	70-130
594-20-7	2,2-Dichloropropane	50	61.4	123	70-130
563-58-6	1,1-Dichloropropene	50	56.8	114	70-130

\* = Outside of Control Limits.

6.2.1  
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# Blank Spike Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1817-BS	M53455.D	1	01/16/13	AMY	n/a	n/a	MSM1817

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	48.6	97	70-130
10061-02-6	trans-1,3-Dichloropropene	50	50.4	101	70-130
123-91-1	1,4-Dioxane	250	279	112	70-130
97-63-2	Ethyl methacrylate	50	55.1	110	76-141
100-41-4	Ethylbenzene	50	47.6	95	70-130
87-68-3	Hexachlorobutadiene	50	48.3	97	70-130
591-78-6	2-Hexanone	50	53.6	107	70-130
98-82-8	Isopropylbenzene	50	46.2	92	70-130
99-87-6	p-Isopropyltoluene	50	48.9	98	70-130
1634-04-4	Methyl Tert Butyl Ether	50	51.3	103	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	58.5	117	70-130
74-95-3	Methylene bromide	50	49.2	98	70-130
75-09-2	Methylene chloride	50	52.4	105	70-130
91-20-3	Naphthalene	50	51.6	103	70-130
103-65-1	n-Propylbenzene	50	45.5	91	70-130
100-42-5	Styrene	50	44.0	88	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	44.4	89	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	44.1	88	70-130
127-18-4	Tetrachloroethene	50	49.3	99	70-130
108-88-3	Toluene	50	54.4	109	70-130
87-61-6	1,2,3-Trichlorobenzene	50	44.9	90	70-130
120-82-1	1,2,4-Trichlorobenzene	50	45.9	92	70-130
71-55-6	1,1,1-Trichloroethane	50	61.4	123	70-130
79-00-5	1,1,2-Trichloroethane	50	50.1	100	70-130
79-01-6	Trichloroethene	50	54.6	109	70-130
75-69-4	Trichlorofluoromethane	50	65.0	130	70-130
96-18-4	1,2,3-Trichloropropane	50	46.0	92	70-130
95-63-6	1,2,4-Trimethylbenzene	50	45.2	90	70-130
108-67-8	1,3,5-Trimethylbenzene	50	45.3	91	70-130
108-05-4	Vinyl Acetate	50	41.5	83	70-130
75-01-4	Vinyl chloride	50	60.5	121	70-130
	m,p-Xylene	100	94.0	94	70-130
95-47-6	o-Xylene	50	45.3	91	70-130
1330-20-7	Xylene (total)	150	139	93	70-130

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: MC17501  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1817-BS	M53455.D	1	01/16/13	AMY	n/a	n/a	MSM1817

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-2

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	102%	70-130%
2037-26-5	Toluene-D8	109%	70-130%
460-00-4	4-Bromofluorobenzene	95%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4911-BS	G123682.D	1	01/16/13	JM	n/a	n/a	MSG4911
MSG4911-BSD	G123683.D	1	01/16/13	JM	n/a	n/a	MSG4911

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	2500	3510	140* a	3100	124	12	70-130/25
107-02-8	Acrolein	12500	8010	64* a	8470	68* a	6	70-130/25
107-13-1	Acrylonitrile	2500	2410	96	2420	97	0	70-130/25
71-43-2	Benzene	2500	2400	96	2390	96	0	70-130/25
108-86-1	Bromobenzene	2500	2480	99	2500	100	1	70-130/25
74-97-5	Bromochloromethane	2500	2530	101	2530	101	0	70-130/25
75-27-4	Bromodichloromethane	2500	2500	100	2510	100	0	70-130/25
75-25-2	Bromoform	2500	2290	92	2280	91	0	70-130/25
74-83-9	Bromomethane	2500	2550	102	2520	101	1	70-130/25
78-93-3	2-Butanone (MEK)	2500	3010	120	2870	115	5	70-130/25
104-51-8	n-Butylbenzene	2500	2390	96	2350	94	2	70-130/25
135-98-8	sec-Butylbenzene	2500	2290	92	2280	91	0	70-130/25
98-06-6	tert-Butylbenzene	2500	2000	80	1950	78	3	70-130/25
75-15-0	Carbon disulfide	2500	2480	99	2440	98	2	70-130/25
56-23-5	Carbon tetrachloride	2500	2440	98	2400	96	2	70-130/25
108-90-7	Chlorobenzene	2500	2430	97	2380	95	2	70-130/25
75-00-3	Chloroethane	2500	2620	105	2570	103	2	70-130/25
110-75-8	2-Chloroethyl vinyl ether	2500	680	27	687	27	1	10-160/25
67-66-3	Chloroform	2500	2470	99	2440	98	1	70-130/25
74-87-3	Chloromethane	2500	2860	114	2750	110	4	70-130/25
95-49-8	o-Chlorotoluene	2500	2280	91	2240	90	2	70-130/25
106-43-4	p-Chlorotoluene	2500	2330	93	2360	94	1	70-130/25
124-48-1	Dibromochloromethane	2500	2520	101	2470	99	2	70-130/25
95-50-1	1,2-Dichlorobenzene	2500	2350	94	2340	94	0	70-130/25
541-73-1	1,3-Dichlorobenzene	2500	2360	94	2360	94	0	70-130/25
106-46-7	1,4-Dichlorobenzene	2500	2520	101	2500	100	1	70-130/25
75-71-8	Dichlorodifluoromethane	2500	2750	110	2720	109	1	70-130/25
75-34-3	1,1-Dichloroethane	2500	2480	99	2450	98	1	70-130/25
107-06-2	1,2-Dichloroethane	2500	2480	99	2500	100	1	70-130/25
75-35-4	1,1-Dichloroethene	2500	2680	107	2680	107	0	70-130/25
156-59-2	cis-1,2-Dichloroethene	2500	2430	97	2440	98	0	70-130/25
156-60-5	trans-1,2-Dichloroethene	2500	2510	100	2490	100	1	70-130/25
78-87-5	1,2-Dichloropropane	2500	2450	98	2470	99	1	70-130/25
142-28-9	1,3-Dichloropropane	2500	2470	99	2410	96	2	70-130/25
594-20-7	2,2-Dichloropropane	2500	2620	105	2510	100	4	70-130/25
563-58-6	1,1-Dichloropropene	2500	2460	98	2430	97	1	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4911-BS	G123682.D	1	01/16/13	JM	n/a	n/a	MSG4911
MSG4911-BSD	G123683.D	1	01/16/13	JM	n/a	n/a	MSG4911

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	2500	2470	99	2460	98	0	70-130/25
10061-02-6	trans-1,3-Dichloropropene	2500	2600	104	2590	104	0	70-130/25
123-91-1	1,4-Dioxane	12500	10800	86	11200	90	4	70-130/25
97-63-2	Ethyl methacrylate	2500	2380	95	2420	97	2	76-141/25
100-41-4	Ethylbenzene	2500	2480	99	2410	96	3	70-130/25
87-68-3	Hexachlorobutadiene	2500	2350	94	2330	93	1	70-130/25
591-78-6	2-Hexanone	2500	2830	113	2540	102	11	70-130/25
98-82-8	Isopropylbenzene	2500	2300	92	2290	92	0	70-130/25
99-87-6	p-Isopropyltoluene	2500	2490	100	2480	99	0	70-130/25
1634-04-4	Methyl Tert Butyl Ether	2500	2530	101	2510	100	1	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	1770	71	1780	71	1	70-130/25
74-95-3	Methylene bromide	2500	2470	99	2480	99	0	70-130/25
75-09-2	Methylene chloride	2500	2590	104	2590	104	0	70-130/25
91-20-3	Naphthalene	2500	2130	85	2190	88	3	70-130/25
103-65-1	n-Propylbenzene	2500	2280	91	2270	91	0	70-130/25
100-42-5	Styrene	2500	2380	95	2390	96	0	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	2500	2440	98	2410	96	1	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	2500	2450	98	2450	98	0	70-130/25
127-18-4	Tetrachloroethene	2500	2530	101	2460	98	3	70-130/25
108-88-3	Toluene	2500	2460	98	2460	98	0	70-130/25
87-61-6	1,2,3-Trichlorobenzene	2500	2010	80	2060	82	2	70-130/25
120-82-1	1,2,4-Trichlorobenzene	2500	2210	88	2230	89	1	70-130/25
71-55-6	1,1,1-Trichloroethane	2500	2390	96	2270	91	5	70-130/25
79-00-5	1,1,2-Trichloroethane	2500	2490	100	2480	99	0	70-130/25
79-01-6	Trichloroethene	2500	2480	99	2450	98	1	70-130/25
75-69-4	Trichlorofluoromethane	2500	2500	100	2370	95	5	70-130/25
96-18-4	1,2,3-Trichloropropane	2500	2410	96	2430	97	1	70-130/25
95-63-6	1,2,4-Trimethylbenzene	2500	2370	95	2350	94	1	70-130/25
108-67-8	1,3,5-Trimethylbenzene	2500	2330	93	2310	92	1	70-130/25
108-05-4	Vinyl Acetate	2500	2690	108	2700	108	0	70-130/25
75-01-4	Vinyl chloride	2500	2760	110	2750	110	0	70-130/25
	m,p-Xylene	5000	4920	98	4820	96	2	70-130/25
95-47-6	o-Xylene	2500	2420	97	2390	96	1	70-130/25
1330-20-7	Xylene (total)	7500	7350	98	7210	96	2	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4911-BS	G123682.D	1	01/16/13	JM	n/a	n/a	MSG4911
MSG4911-BSD	G123683.D	1	01/16/13	JM	n/a	n/a	MSG4911

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-1

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	98%	97%	70-130%
2037-26-5	Toluene-D8	95%	94%	70-130%
460-00-4	4-Bromofluorobenzene	87%	87%	70-130%

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

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2185-BS	K66559.D	1	01/18/13	GK	n/a	n/a	MSK2185
MSK2185-BSD	K66560.D	1	01/18/13	GK	n/a	n/a	MSK2185

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	60.3	121	56.2	112	7	70-130/25
107-02-8	Acrolein	250	186	74	207	83	11	70-130/25
107-13-1	Acrylonitrile	50	58.9	118	58.4	117	1	70-130/25
71-43-2	Benzene	50	53.3	107	55.5	111	4	70-130/25
108-86-1	Bromobenzene	50	56.5	113	60.6	121	7	70-130/25
74-97-5	Bromochloromethane	50	52.1	104	53.2	106	2	70-130/25
75-27-4	Bromodichloromethane	50	52.5	105	53.7	107	2	70-130/25
75-25-2	Bromoform	50	48.7	97	51.4	103	5	70-130/25
74-83-9	Bromomethane	50	51.4	103	51.0	102	1	70-130/25
78-93-3	2-Butanone (MEK)	50	56.4	113	55.7	111	1	70-130/25
104-51-8	n-Butylbenzene	50	64.1	128	66.3	133* a	3	70-130/25
135-98-8	sec-Butylbenzene	50	59.2	118	61.2	122	3	70-130/25
98-06-6	tert-Butylbenzene	50	57.7	115	60.4	121	5	70-130/25
75-15-0	Carbon disulfide	50	55.5	111	57.4	115	3	70-130/25
56-23-5	Carbon tetrachloride	50	48.8	98	51.8	104	6	70-130/25
108-90-7	Chlorobenzene	50	48.1	96	52.4	105	9	70-130/25
75-00-3	Chloroethane	50	56.3	113	56.9	114	1	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	19.6	39* a	19.4	39* a	1	70-130/25
67-66-3	Chloroform	50	50.4	101	51.8	104	3	70-130/25
74-87-3	Chloromethane	50	62.3	125	54.8	110	13	70-130/25
95-49-8	o-Chlorotoluene	50	60.6	121	63.1	126	4	70-130/25
106-43-4	p-Chlorotoluene	50	60.3	121	63.1	126	5	70-130/25
124-48-1	Dibromochloromethane	50	53.4	107	57.4	115	7	70-130/25
95-50-1	1,2-Dichlorobenzene	50	52.7	105	55.1	110	4	70-130/25
541-73-1	1,3-Dichlorobenzene	50	52.4	105	55.3	111	5	70-130/25
106-46-7	1,4-Dichlorobenzene	50	52.1	104	55.0	110	5	70-130/25
75-71-8	Dichlorodifluoromethane	50	55.5	111	53.3	107	4	70-130/25
75-34-3	1,1-Dichloroethane	50	53.6	107	56.3	113	5	70-130/25
107-06-2	1,2-Dichloroethane	50	51.1	102	52.2	104	2	70-130/25
75-35-4	1,1-Dichloroethene	50	58.7	117	59.6	119	2	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	52.0	104	52.8	106	2	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	54.7	109	56.9	114	4	70-130/25
78-87-5	1,2-Dichloropropane	50	56.8	114	57.0	114	0	70-130/25
142-28-9	1,3-Dichloropropane	50	54.7	109	55.9	112	2	70-130/25
594-20-7	2,2-Dichloropropane	50	49.6	99	49.7	99	0	70-130/25
563-58-6	1,1-Dichloropropene	50	59.3	119	61.5	123	4	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2185-BS	K66559.D	1	01/18/13	GK	n/a	n/a	MSK2185
MSK2185-BSD	K66560.D	1	01/18/13	GK	n/a	n/a	MSK2185

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-3

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	56.8	114	58.5	117	3	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	61.6	123	62.0	124	1	70-130/25
123-91-1	1,4-Dioxane	250	271	108	299	120	10	70-130/25
97-63-2	Ethyl methacrylate	50	52.1	104	52.1	104	0	77-137/25
100-41-4	Ethylbenzene	50	59.0	118	62.9	126	6	70-130/25
87-68-3	Hexachlorobutadiene	50	51.0	102	55.1	110	8	70-130/25
591-78-6	2-Hexanone	50	57.7	115	52.3	105	10	70-130/25
98-82-8	Isopropylbenzene	50	58.3	117	60.9	122	4	70-130/25
99-87-6	p-Isopropyltoluene	50	59.9	120	62.6	125	4	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	57.0	114	57.4	115	1	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	53.2	106	52.7	105	1	70-130/25
74-95-3	Methylene bromide	50	53.1	106	53.7	107	1	70-130/25
75-09-2	Methylene chloride	50	54.9	110	55.0	110	0	70-130/25
91-20-3	Naphthalene	50	51.0	102	51.4	103	1	70-130/25
103-65-1	n-Propylbenzene	50	62.1	124	64.6	129	4	70-130/25
100-42-5	Styrene	50	55.3	111	58.7	117	6	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	50.7	101	55.2	110	8	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	60.5	121	60.5	121	0	70-130/25
127-18-4	Tetrachloroethene	50	52.0	104	57.9	116	11	70-130/25
108-88-3	Toluene	50	58.9	118	61.6	123	4	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	51.7	103	53.5	107	3	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	53.6	107	55.5	111	3	70-130/25
71-55-6	1,1,1-Trichloroethane	50	49.7	99	50.3	101	1	70-130/25
79-00-5	1,1,2-Trichloroethane	50	54.9	110	55.5	111	1	70-130/25
79-01-6	Trichloroethene	50	51.8	104	54.1	108	4	70-130/25
75-69-4	Trichlorofluoromethane	50	51.0	102	52.1	104	2	70-130/25
96-18-4	1,2,3-Trichloropropane	50	61.8	124	59.4	119	4	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	55.2	110	57.3	115	4	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	55.0	110	56.6	113	3	70-130/25
108-05-4	Vinyl Acetate	50	53.9	108	55.7	111	3	70-130/25
75-01-4	Vinyl chloride	50	52.6	105	48.7	97	8	70-130/25
	m,p-Xylene	100	120	120	128	128	6	70-130/25
95-47-6	o-Xylene	50	56.8	114	60.2	120	6	70-130/25
1330-20-7	Xylene (total)	150	176	117	188	125	7	70-130/25

\* = Outside of Control Limits.

# Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2185-BS	K66559.D	1	01/18/13	GK	n/a	n/a	MSK2185
MSK2185-BSD	K66560.D	1	01/18/13	GK	n/a	n/a	MSK2185

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-3

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	98%	95%	70-130%
2037-26-5	Toluene-D8	110%	110%	70-130%
460-00-4	4-Bromofluorobenzene	115%	115%	70-130%

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

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17550-1MS	G123696.D	1	01/16/13	JM	n/a	n/a	MSG4911
MC17550-1MSD	G123697.D	1	01/16/13	JM	n/a	n/a	MSG4911
MC17550-1 <sup>a</sup>	G123686.D	1	01/16/13	JM	n/a	n/a	MSG4911

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-1

CAS No.	Compound	MC17550-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	1310	1290	99	1310	1300	99	1	70-130/30
107-02-8	Acrolein	ND	6540	4400	67* b	6540	4510	69* b	2	70-130/30
107-13-1	Acrylonitrile	ND	1310	1260	96	1310	1300	99	3	70-130/30
71-43-2	Benzene	ND	1310	1240	95	1310	1230	94	1	70-130/30
108-86-1	Bromobenzene	ND	1310	1270	97	1310	1270	97	0	70-130/30
74-97-5	Bromochloromethane	ND	1310	1320	101	1310	1320	101	0	70-130/30
75-27-4	Bromodichloromethane	ND	1310	1280	98	1310	1300	99	2	70-130/30
75-25-2	Bromoform	ND	1310	1190	91	1310	1240	95	4	70-130/30
74-83-9	Bromomethane	ND	1310	1340	102	1310	1330	102	1	70-130/30
78-93-3	2-Butanone (MEK)	ND	1310	1400	107	1310	1400	107	0	70-130/30
104-51-8	n-Butylbenzene	ND	1310	1210	93	1310	1200	92	1	70-130/30
135-98-8	sec-Butylbenzene	ND	1310	1170	89	1310	1160	89	1	70-130/30
98-06-6	tert-Butylbenzene	ND	1310	1160	89	1310	1010	77	14	70-130/30
75-15-0	Carbon disulfide	ND	1310	1280	98	1310	1270	97	1	70-130/30
56-23-5	Carbon tetrachloride	ND	1310	1240	95	1310	1230	94	1	70-130/30
108-90-7	Chlorobenzene	ND	1310	1260	96	1310	1230	94	2	70-130/30
75-00-3	Chloroethane	ND	1310	1320	101	1310	1280	98	3	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	1310	361	28	1310	386	30	7	10-160/30
67-66-3	Chloroform	ND	1310	1280	98	1310	1260	96	2	70-130/30
74-87-3	Chloromethane	ND	1310	1470	112	1310	1450	111	1	70-130/30
95-49-8	o-Chlorotoluene	ND	1310	1150	88	1310	1140	87	1	70-130/30
106-43-4	p-Chlorotoluene	ND	1310	1220	93	1310	1200	92	2	70-130/30
124-48-1	Dibromochloromethane	ND	1310	1300	99	1310	1290	99	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	1310	1210	93	1310	1220	93	1	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	1310	1210	93	1310	1200	92	1	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	1310	1280	98	1310	1270	97	1	70-130/30
75-71-8	Dichlorodifluoromethane	ND	1310	1600	122	1310	1560	119	3	70-130/30
75-34-3	1,1-Dichloroethane	ND	1310	1310	100	1310	1290	99	2	70-130/30
107-06-2	1,2-Dichloroethane	ND	1310	1290	99	1310	1290	99	0	70-130/30
75-35-4	1,1-Dichloroethene	ND	1310	1430	109	1310	1410	108	1	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	1310	1280	98	1310	1270	97	1	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	1310	1310	100	1310	1290	99	2	70-130/30
78-87-5	1,2-Dichloropropane	ND	1310	1280	98	1310	1270	97	1	70-130/30
142-28-9	1,3-Dichloropropane	ND	1310	1280	98	1310	1280	98	0	70-130/30
594-20-7	2,2-Dichloropropane	ND	1310	1320	101	1310	1260	96	5	70-130/30
563-58-6	1,1-Dichloropropene	ND	1310	1250	96	1310	1260	96	1	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17550-1MS	G123696.D	1	01/16/13	JM	n/a	n/a	MSG4911
MC17550-1MSD	G123697.D	1	01/16/13	JM	n/a	n/a	MSG4911
MC17550-1 <sup>a</sup>	G123686.D	1	01/16/13	JM	n/a	n/a	MSG4911

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-1

CAS No.	Compound	MC17550-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	1310	1260	96	1310	1280	98	2	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	1310	1360	104	1310	1370	105	1	70-130/30
123-91-1	1,4-Dioxane	ND	6540	5070	78	6540	4820	74	5	70-130/30
97-63-2	Ethyl methacrylate	ND	1310	1290	99	1310	1310	100	2	41-160/30
100-41-4	Ethylbenzene	ND	1310	1290	99	1310	1250	96	3	70-130/30
87-68-3	Hexachlorobutadiene	ND	1310	1180	90	1310	1210	93	3	70-130/30
591-78-6	2-Hexanone	ND	1310	1260	96	1310	1270	97	1	70-130/30
98-82-8	Isopropylbenzene	ND	1310	1180	90	1310	1170	89	1	70-130/30
99-87-6	p-Isopropyltoluene	ND	1310	1270	97	1310	1270	97	0	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	1310	1340	102	1310	1360	104	1	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	1310	948	72	1310	983	75	4	70-130/30
74-95-3	Methylene bromide	ND	1310	1300	99	1310	1290	99	1	70-130/30
75-09-2	Methylene chloride	ND	1310	1340	102	1310	1360	104	1	70-130/30
91-20-3	Naphthalene	ND	1310	1130	86	1310	1210	93	7	70-130/30
103-65-1	n-Propylbenzene	ND	1310	1170	89	1310	1150	88	2	70-130/30
100-42-5	Styrene	ND	1310	1250	96	1310	1230	94	2	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	1310	1260	96	1310	1250	96	1	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	1310	1300	99	1310	1320	101	2	70-130/30
127-18-4	Tetrachloroethene	ND	1310	1300	99	1310	1270	97	2	70-130/30
108-88-3	Toluene	ND	1310	1270	97	1310	1270	97	0	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	1310	1030	79	1310	1120	86	8	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	1310	1140	87	1310	1200	92	5	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	1310	1240	95	1310	1190	91	4	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	1310	1310	100	1310	1320	101	1	70-130/30
79-01-6	Trichloroethene	ND	1310	1260	96	1310	1240	95	2	70-130/30
75-69-4	Trichlorofluoromethane	ND	1310	1310	100	1310	1300	99	1	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	1310	1270	97	1310	1320	101	4	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	1310	1200	92	1310	1180	90	2	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	1310	1200	92	1310	1200	92	0	70-130/30
108-05-4	Vinyl Acetate	ND	1310	1480	113	1310	1480	113	0	70-130/30
75-01-4	Vinyl chloride	ND	1310	1500	115	1310	1090	83	32* <sup>c</sup>	70-130/30
	m,p-Xylene	ND	2620	2530	97	2620	2480	95	2	70-130/30
95-47-6	o-Xylene	ND	1310	1260	96	1310	1230	94	2	70-130/30
1330-20-7	Xylene (total)	ND	3920	3800	97	3920	3710	95	2	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17550-1MS	G123696.D	1	01/16/13	JM	n/a	n/a	MSG4911
MC17550-1MSD	G123697.D	1	01/16/13	JM	n/a	n/a	MSG4911
MC17550-1 <sup>a</sup>	G123686.D	1	01/16/13	JM	n/a	n/a	MSG4911

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-1

CAS No.	Surrogate Recoveries	MS	MSD	MC17550-1	Limits
1868-53-7	Dibromofluoromethane	93%	94%	86%	70-130%
2037-26-5	Toluene-D8	90%	90%	85%	70-130%
460-00-4	4-Bromofluorobenzene	83%	82%	79%	70-130%

- (a) Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.
- (b) Outside control limits due to possible matrix interference. Refer to Blank Spike.
- (c) High RPD due to possible matrix interference and/or sample non-homogeneity.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17443-1MS	M53468.D	1	01/16/13	AMY	n/a	n/a	MSM1817
MC17443-1MSD	M53469.D	1	01/16/13	AMY	n/a	n/a	MSM1817
MC17443-1	M53461.D	1	01/16/13	AMY	n/a	n/a	MSM1817

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-2

CAS No.	Compound	MC17443-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	214	64.4	182	-50* a	67.4	192	-33* a	5	70-130/30
107-02-8	Acrolein	ND	322	278	86	337	246	73	12	70-130/30
107-13-1	Acrylonitrile	ND	64.4	66.3	103	67.4	68.5	102	3	70-130/30
71-43-2	Benzene	1.7	64.4	51.9	78	67.4	59.3	86	13	70-130/30
108-86-1	Bromobenzene	ND	64.4	34.2	53* b	67.4	39.3	58* b	14	70-130/30
74-97-5	Bromochloromethane	ND	64.4	57.7	90	67.4	64.9	96	12	70-130/30
75-27-4	Bromodichloromethane	ND	64.4	49.5	77	67.4	55.7	83	12	70-130/30
75-25-2	Bromoform	ND	64.4	37.4	58* b	67.4	41.4	61* b	10	70-130/30
74-83-9	Bromomethane	ND	64.4	61.6	96	67.4	68.8	102	11	70-130/30
78-93-3	2-Butanone (MEK)	30.3	64.4	65.6	55* b	67.4	75.6	67* b	14	70-130/30
104-51-8	n-Butylbenzene	ND	64.4	38.5	60* b	67.4	43.6	65* b	12	70-130/30
135-98-8	sec-Butylbenzene	ND	64.4	38.1	59* b	67.4	43.2	64* b	13	70-130/30
98-06-6	tert-Butylbenzene	ND	64.4	36.9	57* b	67.4	41.8	62* b	12	70-130/30
75-15-0	Carbon disulfide	1.1	64.4	61.2	93	67.4	70.5	103	14	70-130/30
56-23-5	Carbon tetrachloride	ND	64.4	53.1	82	67.4	61.7	92	15	70-130/30
108-90-7	Chlorobenzene	ND	64.4	37.5	58* b	67.4	43.4	64* b	15	70-130/30
75-00-3	Chloroethane	ND	64.4	61.1	95	67.4	70.8	105	15	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	64.4	45.6	71	67.4	45.2	67	1	10-160/30
67-66-3	Chloroform	ND	64.4	56.2	87	67.4	63.7	95	13	70-130/30
74-87-3	Chloromethane	ND	64.4	70.1	109	67.4	79.1	117	12	70-130/30
95-49-8	o-Chlorotoluene	ND	64.4	34.0	53* b	67.4	39.5	59* b	15	70-130/30
106-43-4	p-Chlorotoluene	ND	64.4	34.7	54* b	67.4	39.3	58* b	12	70-130/30
124-48-1	Dibromochloromethane	ND	64.4	42.8	66* b	67.4	47.4	70	10	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	64.4	26.7	41* b	67.4	30.1	45* b	12	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	64.4	30.3	47* b	67.4	34.2	51* b	12	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	64.4	30.3	47* b	67.4	33.9	50* b	11	70-130/30
75-71-8	Dichlorodifluoromethane	ND	64.4	74.8	116	67.4	84.8	126	13	70-130/30
75-34-3	1,1-Dichloroethane	ND	64.4	58.2	90	67.4	66.7	99	14	70-130/30
107-06-2	1,2-Dichloroethane	ND	64.4	51.6	80	67.4	57.6	86	11	70-130/30
75-35-4	1,1-Dichloroethene	ND	64.4	63.4	98	67.4	73.0	108	14	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	64.4	55.7	86	67.4	63.4	94	13	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	64.4	55.8	87	67.4	65.4	97	16	70-130/30
78-87-5	1,2-Dichloropropane	ND	64.4	49.8	77	67.4	56.6	84	13	70-130/30
142-28-9	1,3-Dichloropropane	ND	64.4	44.6	69* b	67.4	48.3	72	8	70-130/30
594-20-7	2,2-Dichloropropane	ND	64.4	60.2	93	67.4	69.4	103	14	70-130/30
563-58-6	1,1-Dichloropropene	ND	64.4	53.6	83	67.4	61.5	91	14	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17443-1MS	M53468.D	1	01/16/13	AMY	n/a	n/a	MSM1817
MC17443-1MSD	M53469.D	1	01/16/13	AMY	n/a	n/a	MSM1817
MC17443-1	M53461.D	1	01/16/13	AMY	n/a	n/a	MSM1817

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-2

CAS No.	Compound	MC17443-1 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	64.4	48.2	75	67.4	53.3	79	10	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	64.4	49.4	77	67.4	55.0	82	11	70-130/30
123-91-1	1,4-Dioxane	ND	322	342	106	337	352	105	3	70-130/30
97-63-2	Ethyl methacrylate	ND	64.4	57.2	89	67.4	62.1	92	8	41-160/30
100-41-4	Ethylbenzene	0.29	64.4	42.3	65* b	67.4	48.4	71	13	70-130/30
87-68-3	Hexachlorobutadiene	ND	64.4	35.8	56* b	67.4	37.9	56* b	6	70-130/30
591-78-6	2-Hexanone	ND	64.4	54.3	84	67.4	60.4	90	11	70-130/30
98-82-8	Isopropylbenzene	ND	64.4	39.4	61* b	67.4	45.6	68* b	15	70-130/30
99-87-6	p-Isopropyltoluene	ND	64.4	39.8	62* b	67.4	45.1	67* b	12	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	64.4	57.7	90	67.4	64.1	95	11	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	64.4	63.4	98	67.4	67.4	100	6	70-130/30
74-95-3	Methylene bromide	ND	64.4	51.5	80	67.4	56.3	84	9	70-130/30
75-09-2	Methylene chloride	ND	64.4	61.3	95	67.4	67.9	101	10	70-130/30
91-20-3	Naphthalene	ND	64.4	16.2	25* b	67.4	17.6	26* b	8	70-130/30
103-65-1	n-Propylbenzene	ND	64.4	38.3	59* b	67.4	44.0	65* b	14	70-130/30
100-42-5	Styrene	ND	64.4	34.4	53* b	67.4	37.7	56* b	9	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	64.4	41.0	64* b	67.4	46.2	69* b	12	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	64.4	37.2	58* b	67.4	41.3	61* b	10	70-130/30
127-18-4	Tetrachloroethene	ND	64.4	44.8	70	67.4	51.6	77	14	70-130/30
108-88-3	Toluene	ND	64.4	50.0	78	67.4	57.4	85	14	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	64.4	18.3	28* b	67.4	18.5	27* b	1	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	64.4	23.1	36* b	67.4	23.4	35* b	1	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	64.4	58.5	91	67.4	67.7	101	15	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	64.4	49.7	77	67.4	54.0	80	8	70-130/30
79-01-6	Trichloroethene	ND	64.4	50.8	79	67.4	59.1	88	15	70-130/30
75-69-4	Trichlorofluoromethane	ND	64.4	62.8	97	67.4	73.4	109	16	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	64.4	40.7	63* b	67.4	44.4	66* b	9	70-130/30
95-63-6	1,2,4-Trimethylbenzene	1.3	64.4	36.5	55* b	67.4	41.8	60* b	14	70-130/30
108-67-8	1,3,5-Trimethylbenzene	0.53	64.4	37.4	57* b	67.4	42.4	62* b	13	70-130/30
108-05-4	Vinyl Acetate	ND	64.4	54.9	85	67.4	57.3	85	4	70-130/30
75-01-4	Vinyl chloride	ND	64.4	60.2	93	67.4	67.8	101	12	70-130/30
	m,p-Xylene	2.8	129	83.8	63* b	135	96.1	69* b	14	70-130/30
95-47-6	o-Xylene	0.83	64.4	38.7	59* b	67.4	45.0	66* b	15	70-130/30
1330-20-7	Xylene (total)	3.7	193	123	62* b	202	141	68* b	14	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17443-1MS	M53468.D	1	01/16/13	AMY	n/a	n/a	MSM1817
MC17443-1MSD	M53469.D	1	01/16/13	AMY	n/a	n/a	MSM1817
MC17443-1	M53461.D	1	01/16/13	AMY	n/a	n/a	MSM1817

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-2

CAS No.	Surrogate Recoveries	MS	MSD	MC17443-1	Limits
1868-53-7	Dibromofluoromethane	104%	101%	101%	70-130%
2037-26-5	Toluene-D8	108%	107%	108%	70-130%
460-00-4	4-Bromofluorobenzene	97%	98%	96%	70-130%

- (a) Outside control limits due to high level in sample relative to spike amount.
- (b) Outside control limits due to possible matrix interference. Refer to Blank Spike.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17426-3MS	K66580.D	1	01/18/13	GK	n/a	n/a	MSK2185
MC17426-3MSD	K66581.D	1	01/18/13	GK	n/a	n/a	MSK2185
MC17426-3	K66570.D	1	01/18/13	GK	n/a	n/a	MSK2185

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-3

CAS No.	Compound	MC17426-3 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	50	48.4	97	50	47.4	95	2	70-130/30
107-02-8	Acrolein	ND	250	1030	412* a	250	643	257* a	46* b	70-130/30
107-13-1	Acrylonitrile	ND	50	50.8	102	50	52.8	106	4	70-130/30
71-43-2	Benzene	ND	50	52.5	105	50	51.6	103	2	70-130/30
108-86-1	Bromobenzene	ND	50	52.7	105	50	52.1	104	1	70-130/30
74-97-5	Bromochloromethane	ND	50	48.8	98	50	49.6	99	2	70-130/30
75-27-4	Bromodichloromethane	ND	50	48.2	96	50	47.9	96	1	70-130/30
75-25-2	Bromoform	ND	50	40.4	81	50	40.2	80	0	70-130/30
74-83-9	Bromomethane	ND	50	46.4	93	50	49.5	99	6	70-130/30
78-93-3	2-Butanone (MEK)	ND	50	46.5	93	50	48.4	97	4	70-130/30
104-51-8	n-Butylbenzene	ND	50	53.6	107	50	55.0	110	3	70-130/30
135-98-8	sec-Butylbenzene	ND	50	52.3	105	50	53.0	106	1	70-130/30
98-06-6	tert-Butylbenzene	ND	50	52.6	105	50	52.7	105	0	70-130/30
75-15-0	Carbon disulfide	ND	50	50.3	101	50	51.7	103	3	70-130/30
56-23-5	Carbon tetrachloride	ND	50	45.6	91	50	46.8	94	3	70-130/30
108-90-7	Chlorobenzene	ND	50	46.6	93	50	46.2	92	1	70-130/30
75-00-3	Chloroethane	ND	50	53.3	107	50	56.5	113	6	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	50	ND	0* a	50	ND	0* a	nc	70-130/30
67-66-3	Chloroform	ND	50	47.9	96	50	49.0	98	2	70-130/30
74-87-3	Chloromethane	ND	50	48.1	96	50	53.8	108	11	70-130/30
95-49-8	o-Chlorotoluene	ND	50	54.6	109	50	54.5	109	0	70-130/30
106-43-4	p-Chlorotoluene	ND	50	53.8	108	50	53.8	108	0	70-130/30
124-48-1	Dibromochloromethane	ND	50	46.2	92	50	45.9	92	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	50	48.6	97	50	49.0	98	1	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	50	48.9	98	50	48.3	97	1	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	50	48.4	97	50	48.2	96	0	70-130/30
75-71-8	Dichlorodifluoromethane	ND	50	46.3	93	50	50.6	101	9	70-130/30
75-34-3	1,1-Dichloroethane	ND	50	52.5	105	50	52.9	106	1	70-130/30
107-06-2	1,2-Dichloroethane	ND	50	47.9	96	50	47.1	94	2	70-130/30
75-35-4	1,1-Dichloroethene	ND	50	55.8	112	50	56.1	112	1	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	50	50.6	101	50	51.1	102	1	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	50	51.9	104	50	52.0	104	0	70-130/30
78-87-5	1,2-Dichloropropane	ND	50	53.2	106	50	54.3	109	2	70-130/30
142-28-9	1,3-Dichloropropane	ND	50	50.4	101	50	49.8	100	1	70-130/30
594-20-7	2,2-Dichloropropane	ND	50	42.7	85	50	42.9	86	0	70-130/30
563-58-6	1,1-Dichloropropene	ND	50	56.9	114	50	55.2	110	3	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17426-3MS	K66580.D	1	01/18/13	GK	n/a	n/a	MSK2185
MC17426-3MSD	K66581.D	1	01/18/13	GK	n/a	n/a	MSK2185
MC17426-3	K66570.D	1	01/18/13	GK	n/a	n/a	MSK2185

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-3

CAS No.	Compound	MC17426-3 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	50	51.2	102	50	50.6	101	1	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	50	51.3	103	50	50.7	101	1	70-130/30
123-91-1	1,4-Dioxane	ND	250	254	102	250	225	90	12	70-130/30
97-63-2	Ethyl methacrylate	ND	50	41.7	83	50	41.0	82	2	72-139/30
100-41-4	Ethylbenzene	ND	50	52.8	106	50	53.0	106	0	70-130/30
87-68-3	Hexachlorobutadiene	ND	50	46.9	94	50	48.8	98	4	70-130/30
591-78-6	2-Hexanone	ND	50	46.3	93	50	47.5	95	3	70-130/30
98-82-8	Isopropylbenzene	ND	50	52.0	104	50	52.4	105	1	70-130/30
99-87-6	p-Isopropyltoluene	ND	50	50.0	100	50	50.5	101	1	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	50	51.3	103	50	52.9	106	3	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	50	47.7	95	50	46.9	94	2	70-130/30
74-95-3	Methylene bromide	ND	50	48.7	97	50	48.4	97	1	70-130/30
75-09-2	Methylene chloride	ND	50	51.5	103	50	52.9	106	3	70-130/30
91-20-3	Naphthalene	ND	50	44.3	89	50	44.9	90	1	70-130/30
103-65-1	n-Propylbenzene	ND	50	53.8	108	50	54.5	109	1	70-130/30
100-42-5	Styrene	ND	50	21.1	42* a	50	20.8	42* a	1	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	48.5	97	50	49.5	99	2	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	52.4	105	50	51.8	104	1	70-130/30
127-18-4	Tetrachloroethene	ND	50	49.5	99	50	48.8	98	1	70-130/30
108-88-3	Toluene	ND	50	54.5	109	50	53.8	108	1	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	50	45.2	90	50	48.1	96	6	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	50	48.1	96	50	50.6	101	5	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	50	47.6	95	50	48.4	97	2	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	50	49.8	100	50	49.9	100	0	70-130/30
79-01-6	Trichloroethene	ND	50	50.2	100	50	49.1	98	2	70-130/30
75-69-4	Trichlorofluoromethane	ND	50	48.4	97	50	49.2	98	2	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	50	51.0	102	50	50.4	101	1	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	50	35.8	72	50	36.2	72	1	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	50	36.2	72	50	36.2	72	0	70-130/30
108-05-4	Vinyl Acetate	ND	50	42.2	84	50	42.1	84	0	70-130/30
75-01-4	Vinyl chloride	ND	50	42.9	86	50	46.3	93	8	70-130/30
	m,p-Xylene	ND	100	98.4	98	100	97.6	98	1	70-130/30
95-47-6	o-Xylene	ND	50	47.2	94	50	47.1	94	0	70-130/30
1330-20-7	Xylene (total)	ND	150	146	97	150	145	97	1	70-130/30

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17426-3MS	K66580.D	1	01/18/13	GK	n/a	n/a	MSK2185
MC17426-3MSD	K66581.D	1	01/18/13	GK	n/a	n/a	MSK2185
MC17426-3	K66570.D	1	01/18/13	GK	n/a	n/a	MSK2185

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17501-3

CAS No.	Surrogate Recoveries	MS	MSD	MC17426-3	Limits
1868-53-7	Dibromofluoromethane	99%	100%	117%	70-130%
2037-26-5	Toluene-D8	109%	108%	107%	70-130%
460-00-4	4-Bromofluorobenzene	111%	111%	109%	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: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSG4911-CC4894	Injection Date:	01/16/13
Lab File ID:	G123681.D	Injection Time:	08:40
Instrument ID:	GCMSG	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	204174	5.13	278872	6.27	138756	9.62	145466	12.25	38370	3.10
Upper Limit <sup>a</sup>	408348	5.63	557744	6.77	277512	10.12	290932	12.75	76740	3.60
Lower Limit <sup>b</sup>	102087	4.63	139436	5.77	69378	9.12	72733	11.75	19185	2.60

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSG4911-BS	204969	5.13	277922	6.27	137661	9.62	145992	12.25	38916	3.10
MSG4911-BSD	205136	5.13	276932	6.27	139125	9.62	145048	12.25	38501	3.10
MSG4911-MB	201260	5.13	276257	6.27	137814	9.62	140495	12.25	37175	3.10
MC17550-1	202254	5.13	276256	6.27	138782	9.62	141038	12.25	37895	3.09
ZZZZZZ	194996	5.13	266221	6.27	135995	9.62	137743	12.25	40303	3.12
ZZZZZZ	197255	5.13	271453	6.27	138064	9.62	138383	12.25	39108	3.12
ZZZZZZ	198996	5.13	272354	6.27	136977	9.62	142475	12.25	41740	3.12
ZZZZZZ	199564	5.13	272876	6.27	138196	9.62	141282	12.25	41579	3.12
ZZZZZZ	199314	5.13	274665	6.27	138321	9.62	144127	12.25	44366	3.12
ZZZZZZ	199200	5.13	271298	6.27	143546	9.63	142947	12.25	40441	3.12
ZZZZZZ	202760	5.13	278826	6.27	145509	9.63	173066	12.27	43899	3.10
MC17501-1 <sup>c</sup>	204817	5.13	283360	6.27	144232	9.62	148833	12.25	40932	3.10
ZZZZZZ	201785	5.13	276943	6.27	137333	9.62	143681	12.25	45007	3.10
MC17550-1MS	208240	5.13	285163	6.27	141138	9.62	151352	12.25	39877	3.10
MC17550-1MSD	206113	5.13	280680	6.27	140878	9.62	149740	12.25	43484	3.10
ZZZZZZ	199339	5.13	272150	6.27	135904	9.62	140290	12.25	41682	3.12
ZZZZZZ	200851	5.13	273303	6.27	136074	9.62	140950	12.25	43600	3.12
ZZZZZZ	199888	5.13	275205	6.27	137981	9.62	142168	12.25	41677	3.11
ZZZZZZ	201123	5.13	277442	6.27	137982	9.62	142327	12.25	42559	3.11
ZZZZZZ	198921	5.13	275070	6.27	136479	9.62	140328	12.25	41153	3.11
ZZZZZZ	200667	5.13	274596	6.27	136645	9.62	139929	12.25	43428	3.12
ZZZZZZ	197555	5.13	273633	6.27	152222	9.63	145306	12.25	44997	3.12

- 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.
- (c) Vinyl Chloride (CCC's) do not meet the reference method acceptance criteria in instrument QC and results may be biased low.

6.5.1  
6

# Volatile Internal Standard Area Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSK2185-CC2177	Injection Date:	01/18/13
Lab File ID:	K66558.D	Injection Time:	08:14
Instrument ID:	GCMSK	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	137065	8.81	216460	9.66	101801	12.92	112679	15.48	24791	6.41
Upper Limit <sup>a</sup>	274130	9.31	432920	10.16	203602	13.42	225358	15.98	49582	6.91
Lower Limit <sup>b</sup>	68533	8.31	108230	9.16	50901	12.42	56340	14.98	12396	5.91

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSK2185-BS	147931	8.81	226531	9.66	106337	12.92	112907	15.48	27458	6.41
MSK2185-BSD	152682	8.82	226160	9.66	104335	12.92	113024	15.48	26033	6.40
MSK2185-MB	139125	8.81	216702	9.66	94343	12.92	105306	15.48	22749	6.40
ZZZZZZ	133050	8.81	209488	9.66	92172	12.92	101073	15.48	20263	6.40
ZZZZZZ	133518	8.81	211829	9.66	92432	12.92	100034	15.48	24513	6.40
MC17501-3	134134	8.82	217149	9.66	93378	12.92	99127	15.48	20983	6.40
ZZZZZZ	127032	8.82	203387	9.66	90163	12.92	94173	15.48	18547	6.40
ZZZZZZ	126200	8.81	200730	9.66	86330	12.92	94730	15.48	19795	6.40
ZZZZZZ	113366	8.82	181608	9.66	83092	12.92	89292	15.48	21657	6.40
ZZZZZZ	114113	8.82	182911	9.66	82818	12.92	88788	15.48	17714	6.40
MC17426-3	112353	8.81	184024	9.66	81710	12.92	87679	15.48	17972	6.40
ZZZZZZ	131010	8.82	201397	9.66	87909	12.92	97857	15.48	21365	6.41
MC17455-1	120354	8.82	196271	9.67	87937	12.92	90309	15.48	20784	6.40
ZZZZZZ	127273	8.82	201375	9.66	97075	12.92	102476	15.48	21261	6.41
ZZZZZZ	129531	8.81	205033	9.66	93102	12.92	101245	15.48	20221	6.40
ZZZZZZ	128016	8.81	196723	9.66	95138	12.92	102135	15.48	21948	6.41
ZZZZZZ	134180	8.82	210828	9.66	96789	12.92	109169	15.48	22355	6.40
ZZZZZZ	139428	8.81	223875	9.66	101383	12.92	113203	15.48	23839	6.40
ZZZZZZ	152190	8.81	233406	9.66	106935	12.92	118544	15.48	27702	6.41
ZZZZZZ	156163	8.82	246206	9.66	106371	12.92	118787	15.48	28720	6.40
MC17426-3MS	148401	8.81	227691	9.66	107444	12.92	116451	15.48	25151	6.40
MC17426-3MSD	143124	8.81	222873	9.66	104949	12.92	114352	15.48	23802	6.40
MC17455-1MS	145432	8.81	226179	9.66	105485	12.92	115026	15.48	26925	6.41
MC17455-1MSD	152102	8.81	235521	9.66	109425	12.92	118936	15.48	30432	6.41
ZZZZZZ	149849	8.81	234725	9.66	113598	12.92	121963	15.48	27884	6.40

- 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 Internal Standard Area Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1817-CC1815	Injection Date:	01/16/13
Lab File ID:	M53454.D	Injection Time:	09:09
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	454411	9.36	725588	10.24	404992	13.52	511263	16.08	338837	6.86
Upper Limit <sup>a</sup>	908822	9.86	1451176	10.74	809984	14.02	1022526	16.58	677674	7.36
Lower Limit <sup>b</sup>	227206	8.86	362794	9.74	202496	13.02	255632	15.58	169419	6.36

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSM1817-BS	470319	9.36	749524	10.24	426397	13.52	521342	16.08	352192	6.86
MSM1817-MB	482627	9.36	751598	10.24	407690	13.52	505298	16.08	166786 <sup>c</sup>	6.86
ZZZZZZ	492730	9.36	772644	10.24	423346	13.52	499932	16.08	295144	6.86
ZZZZZZ	476279	9.36	751015	10.24	415602	13.52	505810	16.08	326981	6.86
ZZZZZZ	497440	9.36	774211	10.24	419040	13.52	526505	16.08	293458	6.86
MC17443-1	498515	9.36	768827	10.24	418448	13.52	525984	16.08	276080	6.86
ZZZZZZ	478756	9.36	748964	10.24	408161	13.52	512878	16.08	283302	6.85
ZZZZZZ	503632	9.36	790524	10.24	433263	13.52	565631	16.08	261460	6.86
ZZZZZZ	406012	9.36	637108	10.24	348701	13.52	414585	16.08	237695	6.85
ZZZZZZ	508099	9.36	778317	10.24	424681	13.52	549064	16.08	244509	6.85
ZZZZZZ	485821	9.36	767795	10.24	430282	13.52	583505	16.08	273382	6.86
ZZZZZZ	277753	9.36	427897	10.24	228166	13.52	287907	16.08	97418 <sup>c</sup>	6.85
MC17443-1MS	493394	9.36	786390	10.24	437101	13.52	531386	16.08	324484	6.86
MC17443-1MSD	506242	9.36	804953	10.24	444754	13.52	527444	16.08	313455	6.86
MC17501-2	485590	9.36	763820	10.24	414265	13.52	521773	16.08	276604	6.85
ZZZZZZ	496081	9.35	776131	10.24	421718	13.52	534611	16.08	243017	6.86
ZZZZZZ	12689 <sup>d</sup>	9.36	17600 <sup>d</sup>	10.24	9365 <sup>d</sup>	13.52	13512 <sup>d</sup>	16.08	3204 <sup>d</sup>	6.93
ZZZZZZ	491689	9.36	770133	10.24	423795	13.52	545917	16.08	174756	6.91
ZZZZZZ	488181	9.36	756891	10.24	411402	13.52	509534	16.08	215169	6.85
ZZZZZZ	485138	9.36	753432	10.24	416963	13.52	528316	16.08	106282 <sup>c</sup>	6.86
ZZZZZZ	490459	9.36	757837	10.24	412027	13.52	531665	16.08	50371 <sup>d</sup>	6.86
ZZZZZZ	501445	9.36	783112	10.24	416348	13.52	528638	16.08	39571 <sup>d</sup>	6.86

- 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.
- (c) Outside control limits. Target analytes not associated with this internal standard.
- (d) Outside control limits due to possible matrix interference. Confirmed by reanalysis.

6.5.3  
6

# Volatile Surrogate Recovery Summary

Job Number: MC17501  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC17501-3	K66565.D	114	107	113
MC17426-3MS	K66580.D	99	109	111
MC17426-3MSD	K66581.D	100	108	111
MSK2185-BS	K66559.D	98	110	115
MSK2185-BSD	K66560.D	95	110	115
MSK2185-MB	K66562.D	107	109	108

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

# Volatile Surrogate Recovery Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC17501-1	G123694.D	87	85	80
MC17501-2	M53471.D	99	108	98
MC17443-1MS	M53468.D	104	108	97
MC17443-1MSD	M53469.D	101	107	98
MC17550-1MS	G123696.D	93	90	83
MC17550-1MSD	G123697.D	94	90	82
MSG4911-BS	G123682.D	98	95	87
MSG4911-BSD	G123683.D	97	94	87
MSG4911-MB	G123685.D	87	84	78
MSM1817-BS	M53455.D	102	109	95
MSM1817-MB	M53457.D	99	108	95

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

6.6.2  
6

**GC Volatiles**

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**QC Data Summaries****7**

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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: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31778-MB	YZ78059.D	1	01/24/13	CZ	01/23/13	OP31778	GYZ7026

The QC reported here applies to the following samples:

Method: SW846 8011

MC17501-1, MC17501-2

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.5	0.95	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	593%* a 61-167%
460-00-4	Bromofluorobenzene (S)	106% 61-167%

(a) Outside control limits. Associated samples are non-detect for target analytes.

7.1.1  
7

# Blank Spike Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31778-BS	YZ78060.D	1	01/24/13	CZ	01/23/13	OP31778	GYZ7026

The QC reported here applies to the following samples:

Method: SW846 8011

MC17501-1, MC17501-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	32.9	33.1	101	59-142
106-93-4	1,2-Dibromoethane	32.9	35.8	109	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	542%* a	61-167%
460-00-4	Bromofluorobenzene (S)	80%	61-167%

(a) Outside control limits. Associated samples are non-detect for target analytes.

7.2.1  
7

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31778-MS	YZ78061.D	1	01/24/13	CZ	01/23/13	OP31778	GYZ7026
OP31778-MSD	YZ78062.D	1	01/24/13	CZ	01/23/13	OP31778	GYZ7026
MC17501-2	YZ78063.D	1	01/24/13	CZ	01/23/13	OP31778	GYZ7026

The QC reported here applies to the following samples:

Method: SW846 8011

MC17501-1, MC17501-2

CAS No.	Compound	MC17501-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	37.9	38.4	101	38.5	46.8	122	20	40-156/27
106-93-4	1,2-Dibromoethane	ND	37.9	40.1	106	38.5	48.5	126	19	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC17501-2	Limits
460-00-4	Bromofluorobenzene (S)	479%* a	497%* a	625%* a	61-167%
460-00-4	Bromofluorobenzene (S)	126%	117%	154%	61-167%

(a) Outside control limits. Sample is non-detect for target analytes.

\* = Outside of Control Limits.

7.3.1  
7

# Volatile Surrogate Recovery Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 <sup>a</sup>	S1 <sup>b</sup>
MC17501-1	YZ78064.D	298* <sup>c</sup>	142
MC17501-2	YZ78063.D	625* <sup>c</sup>	154
OP31778-BS	YZ78060.D	542* <sup>d</sup>	80
OP31778-MB	YZ78059.D	593* <sup>d</sup>	106
OP31778-MS	YZ78061.D	479* <sup>c</sup>	126
OP31778-MSD	YZ78062.D	497* <sup>c</sup>	117

Surrogate Compounds                      Recovery Limits

S1 = Bromofluorobenzene (S)                      61-167%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1
- (c) Outside control limits. Sample is non-detect for target analytes.
- (d) Outside control limits. Associated samples are non-detect for target analytes.

7.4.1  
7

# GC Surrogate Retention Time Summary

Job Number: MC17501  
 Account: SHELLWIC Shell Oil  
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GYZ7026-CC7014	Injection Date:	01/24/13
Lab File ID:	YZ78058.D	Injection Time:	09:04
Instrument ID:	GCYZ	Method:	SW846 8011

S1<sup>a</sup>    S1<sup>b</sup>  
 RT      RT

Check Std	3.76	3.48
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 <sup>a</sup> RT	S1 <sup>b</sup> RT
OP31778-MB	YZ78059.D	01/24/13	10:05	3.76	3.49
OP31778-BS	YZ78060.D	01/24/13	10:30	3.76	3.49
OP31778-MS	YZ78061.D	01/24/13	10:55	3.76	3.48
OP31778-MSD	YZ78062.D	01/24/13	11:20	3.76	3.48
MC17501-2	YZ78063.D	01/24/13	11:45	3.76	3.48
MC17501-1	YZ78064.D	01/24/13	12:10	3.76	3.48
GYZ7026-ECC701	YZ78065.D	01/24/13	12:37	3.76	3.48

**Surrogate Compounds**

S1 = Bromofluorobenzene (S)

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

7.5.1  
7

## General Chemistry

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### QC Data Summaries



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Includes the following where applicable:

- Percent Solids Raw Data Summary

# Percent Solids Raw Data Summary

Job Number: MC17501  
Account: SHELLWIC Shell Oil  
Project: URSMOSTL: Roxana Drilling, Roxana, IL

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Sample: MC17501-1      Analyzed: 16-JAN-13 by HS      Method: SM21 2540 B MOD.  
ClientID: P-55R-43

Wet Weight (Total)	28.236	g
Tare Weight	23.203	g
Dry Weight (Total)	26.42	g
Solids, Percent	63.9	%

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Sample: MC17501-2      Analyzed: 16-JAN-13 by HS      Method: SM21 2540 B MOD.  
ClientID: P-55R-51

Wet Weight (Total)	34.514	g
Tare Weight	23.938	g
Dry Weight (Total)	32.995	g
Solids, Percent	85.6	%