



Dakota Neel
HSE Coordinator

June 11, 2018

Mike Bratcher
Oil Conservation Division
District 2 – Artesia
811 S. First St.
Artesia, NM 88210

Henryetta Price
Bureau of Land Management
620 E. Greene St.
Carlsbad, NM 88220

Re: Closure Request
RJU Central Tank Battery (2RP-4479)
Unit Letter C, Section 35, Township 17S, Range 29E
Eddy County, NM

Mr. Bratcher/Ms. Price,

COG Operating, LLC (COG) is pleased to submit for your consideration the following closure report for the RJU Central Tank Battery. This closure report is in response to a produced water release that occurred on November 4, 2017. A workplan was submitted to the New Mexico Oil Conservation Division (NMOCD) and the Bureau of Land Management (BLM) on March 8th 2018 and was approved on April 18, 2018.

BACKGROUND

On November 4, 2017, a steel flow line developed a hole resulting in the release of approximately eight (8) bbls of produced water in the unlined facility. Approximately six (6) bbls of produced water were recovered. The RP number NMOCD assigned to this release was 2RP-4479.

NMOCD
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REMDIAL ACTIONS

- The area of T1 was excavated to a depth of two (2) foot bgs
- The area of T2 was excavated to a depth six (6) inches bgs
- All of the excavated material was hauled to an NMOCD approved solid waste disposal facility
- The excavation was backfilled with like material and contoured to match the surrounding location.

Based on the information provided, COG Operating LLC, would like to request closure of the RP number 2RP-4479 associated with this release. Please feel free to contact me with any questions or concerns at (432) 215-2783.

Sincerely,



Dakota Neel
HSE Coordinator

Enclosed:

- C-141 Final
- C-141 Initial Copy
- Approved Work Plan

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised April 3, 2017
Submit 1 Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company: COG Operating, LLC (OGRID# 229137)	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No.: 432-683-7443
Facility Name: RJU- Central Tank Battery	Facility Type: Battery
Surface Owner: Federal	Mineral Owner: Federal
API No.:	

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	35	17S	29E	1280	North	1345	West	Eddy

Latitude: 32.794375 Longitude: -104.050066 NAD83

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 8 bbls of PW	Volume Recovered: 6 bbls of PW
Source of Release: Flowline	Date and Hour of Occurrence: 11-04-17	Date and Hour of Discovery: 11-04-17 8:00am
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*



Describe Cause of Problem and Remedial Action Taken.*

This release was due to a hole in a steel pipe caused by corrosion. The damaged portion of the steel pipe has been replaced.

Describe Area Affected and Cleanup Action Taken.*

The release remained within the unlined facility. A vacuum truck was dispatched to recover all freestanding fluids. This release has been remediated according to the workplan approved by the NMOCD and the BLM.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: 		OIL CONSERVATION DIVISION	
Printed Name: Dakota Neel		Approved by Environmental Specialist: 	
Title: HSE Coordinator	Approval Date: 11/18/2022	Expiration Date:	
E-mail Address: dneel2@concho.com	Conditions of Approval:	Attached <input type="checkbox"/>	
Date: June 11, 2018 Phone: 575-746-2010	none		

* Attach Additional Sheets If Necessary

NM OIL CONSERVATION

ARTESIA DISTRICT

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Energy Minerals and Natural Resources

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1220 South St. Francis Dr.
Santa Fe, NM 87505

NOV 07 2017

Form C-141
Revised April 3, 2017

Submit Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

RECEIVED

FAB1731258135

Release Notification and Corrective Action

NAB1731258240

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: COG Operating LLC (OGRID #229137)	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-683-7443
Facility Name: RJU-Central Tank Battery	Facility Type: Battery

Surface Owner: Federal	Mineral Owner: Federal	API No.
------------------------	------------------------	---------

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
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Latitude: 32.794375 Longitude: -104.050066 NAD83

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 8bbls	Volume Recovered: 6bbls
Source of Release: Piping	Date and Hour of Occurrence: 11-04-2017	Date and Hour of Discovery: 11-04-2017 8:00am
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*


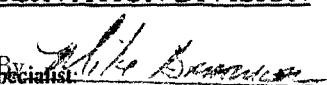
Describe Cause of Problem and Remedial Action Taken.*

This release was due to a hole in a steel pipe caused by corrosion. A clamp was placed on the pipe to control the release. The bad section of piping will be replaced.

Describe Area Affected and Cleanup Action Taken.*

The release occurred within the unlined facility. Vacuum trucks were dispatched to recover all standing fluid. Concho will have the spill area evaluated for any possible impact from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation activities.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Aaron Lieb	Approved by Environmental Specialist: 	
Title: Senior HSE Coordinator	Approval Date: 11/8/17	Expiration Date: N/A
E-mail Address: alieb@concho.com	Conditions of Approval: See Attached	Attached: 20P-4479
Date: 11-07-2017	Phone: 575-748-1553	

* Attach Additional Sheets If Necessary

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 11/7/2017 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number 2RP-4479 has been assigned. **Please refer to this case number in all future correspondence.**

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC. [emphasis added]

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. **As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District 2 office in ARTESIA on or before 12/7/2017. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.**

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

- Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C₆ thru C₃₆), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.
- Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C₆ thru C₃₆), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.
- Nominal detection limits for field and laboratory analyses must be provided.
- Composite sampling is not generally allowed.
- Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

- Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

- If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

- Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.

Jim Griswold
OCD Environmental Bureau Chief
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3465
jim.griswold@state.nm.us

Bratcher, Mike, EMNRD

From: Aaron Lieb <ALieb@concho.com>
Sent: Tuesday, November 7, 2017 3:12 PM
To: Bratcher, Mike, EMNRD; 'stucker@blm.gov'
Cc: 'jamos@blm.gov'; Weaver, Crystal, EMNRD; Robert McNeill; Rebecca Haskell; Sheldon Hitchcock; Christopher Gray; Dakota Neel
Subject: (C-141 Initial) RJU-Central Tank Battery 11-04-2017
Attachments: (C-141 Initial) RJU-Central Tank Battery 11-04-2017.pdf

Mr. Bratcher/Ms. Tucker,

Attached is a C-141 for your consideration. If you have any additional questions or concerns please feel free to contact me.

Thank you,

Aaron Lieb

Senior HSE Coordinator
COG Operating LLC
Cell: 432.557.5355
Office: 575.748.1553
alieb@concho.com
2407 Pecos Avenue
Artesia, NM 88210



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Dakota Neel
HSE Coordinator

March 8, 2018

Mike Bratcher
Oil Conservation Division
District 2 – Artesia
811 S. First St.
Artesia, NM 88210

Shelly Tucker
Bureau of Land Management
620 E. Greene St.
Carlsbad, NM 88220

Re: Work Plan
RJU Central Tank Battery (2RP-4479)
Unit Letter C, Section 35, Township 17S, Range 29E
Eddy County, NM

Mr. Bratcher/Ms. Tucker,

COG Operating LLC is pleased to submit for your consideration the following work plan for the RJU Central Tank Battery. The work plan is in response to a produced water release that occurred on November 4, 2017. Subsequent to the release a C-141 Initial Report was submitted to the New Mexico Oil Conservation Division (NMOCD) and the Bureau of Land Management (BLM) on November 7, 2017.

BACKGROUND

On November 4, 2017, a steel flow line developed a hole resulting in the release of approximately eight (8) bbls of produced water in the unlined facility. Approximately six (6) bbls of produced water were recovered. The RP number NMOCD assigned to this release was 2RP-4479.

SITE RANKING

According to the 2005 Chevron Texaco groundwater trend map, groundwater in the project vicinity is approximately one-hundred and eighty (180) feet below ground surface (BGS). No water well or surface water was observed within one-thousand (1,000) feet of the release site. Therefore the site ranking for this release is zero (0).

CORPORATE ADDRESS
One Concho Center | 600 West Illinois Avenue | Midland, Texas 79701
PHONE 432.683.7443 | FAX 432.683.7441

LOCAL ADDRESS
Concho West | 2208 Main Street | Artesia, New Mexico 88210
PHONE 575.748.6940 | FAX 575.746.2096

NMOCD
March 8, 2018
Page 2

Analytical Results

On December 4, 2017, a site assessment and soil sampling were conducted in order to vertically and horizontally define the area impacted by the release. A site diagram is included in Appendix I. The analytical results from the soil sampling activities are summarized in the table below.

RJ Unit South Tank Battery November 4, 2017					
C-35-17S-29E					
Sample ID	Date	Chloride mg/Kg	Benzene mg/Kg	BTEX mg/Kg	TPH mg/Kg
S-1 0'	12/4/2017	10,500	<0.00199	<0.00199	2,930
S-1 1'	12/4/2017	591	<0.00200	<0.00200	1,970
S-1 2'	12/4/2017	1,330	<0.00198	<0.00198	318
S-1 3'	12/4/2017	79.6	<0.00201	<0.00201	<15.0
S-1 4'	12/4/2017	83.8	<0.00200	<0.00200	<15.0
S-1 5'	12/4/2017	90.5	<0.00200	<0.00200	25.4
S-2 0'	12/4/2017	3,730	<0.00201	<0.00201	8,170
S-2 1'	12/4/2017	132	<0.00199	<0.00199	2,460
S-2 2'	12/4/2017	32.4	<0.00200	<0.00200	48.6
S-2 3'	12/4/2017	42.8	<0.00199	<0.00199	509
S-2 4'	12/4/2017	60.8	<0.00198	<0.00198	81.4

Work Plan

Based on the analytical results of soil samples, COG proposes the excavation of two (2) foot of material in the area of T1 and six (6) inches of material in the area of T2. The excavated soil will be transported to a NMOCD approved disposal facility and non-impacted soil will be utilized to backfill the excavated area. If there are no objections or further stipulations, COG Operating

NMOCD
March 8, 2018
Page 3

LLC, would like to begin remediation at this time. Please feel free to contact me with any questions or concerns at (432) 215-2783.

Sincerely,

A handwritten signature in black ink, appearing to read "Dakota Neel".

Dakota Neel
HSE Coordinator

Enclosed:

Appendix I: Site Diagram
Appendix II: Initial C-141 (Copy)
Appendix III: Analytical Reports and Chain-of-Custody Forms

APPENDIX I

RJU Central Tank Battery



APPENDIX II

NM OIL CONSERVATION

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NOV 07 2017

Form C-141
Revised April 3, 2017

Submit Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

RECEIVED

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Release Notification and Corrective Action

NAB1731258240

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: COG Operating LLC (OGRID #229137)	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-683-7443
Facility Name: RJU-Central Tank Battery	Facility Type: Battery

Surface Owner: Federal	Mineral Owner: Federal	API No.
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Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	35	17S	29E	1280	North	1345	West	Eddy

Latitude: 32.794375 Longitude: -104.050066 NAD83

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 8bbls	Volume Recovered: 6bbls
Source of Release: Piping	Date and Hour of Occurrence: 11-04-2017	Date and Hour of Discovery: 11-04-2017 8:00am
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
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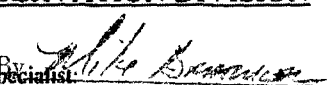
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Describe Area Affected and Cleanup Action Taken.*

The release occurred within the unlined facility. Vacuum trucks were dispatched to recover all standing fluid. Concho will have the spill area evaluated for any possible impact from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation activities.

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Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Aaron Lieb	Approved by Environmental Specialist: 	
Title: Senior HSE Coordinator	Approval Date: 11/8/17	Expiration Date: N/A
E-mail Address: alieb@concho.com	Conditions of Approval: See Attached	Attached: 2017-4479
Date: 11-07-2017	Phone: 575-748-1553	

* Attach Additional Sheets If Necessary

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 11/7/2017 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number 2RP-4479 has been assigned. **Please refer to this case number in all future correspondence.**

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for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

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Jim Griswold
OCD Environmental Bureau Chief
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3465
jim.griswold@state.nm.us

Bratcher, Mike, EMNRD

From: Aaron Lieb <ALieb@concho.com>
Sent: Tuesday, November 7, 2017 3:12 PM
To: Bratcher, Mike, EMNRD; 'stucker@blm.gov'
Cc: 'jamos@blm.gov'; Weaver, Crystal, EMNRD; Robert McNeill; Rebecca Haskell; Sheldon Hitchcock; Christopher Gray; Dakota Neel
Subject: (C-141 Initial) RJU-Central Tank Battery 11-04-2017
Attachments: (C-141 Initial) RJU-Central Tank Battery 11-04-2017.pdf

Mr. Bratcher/Ms. Tucker,

Attached is a C-141 for your consideration. If you have any additional questions or concerns please feel free to contact me.

Thank you,

Aaron Lieb

Senior HSE Coordinator
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APPENDIX III

Analytical Report 570434

for
COG Operating, LLC

Project Manager: Sheldon Hitchcock

RJU CTB

15-DEC-17

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):

Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)

Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)

Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



15-DEC-17

Project Manager: **Sheldon Hitchcock**
COG Operating, LLC
600 W Illinois
Midland, TX 79701

Reference: XENCO Report No(s): **570434**
RJU CTB
Project Address:

Sheldon Hitchcock:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 570434. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 570434 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

A handwritten signature in black ink, appearing to read 'Mike Kimmel', written over a light blue horizontal line.

Mike Kimmel

Client Services Manager

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**Sample Cross Reference 570434****COG Operating, LLC, Midland, TX****RJU CTB**

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
S-1 0'	S	12-04-17 11:30	0	570434-001
S-1 1'	S	12-04-17 11:32	1	570434-002
S-1 2'	S	12-04-17 11:34	2	570434-003
S-1 3'	S	12-04-17 11:36	3	570434-004
S-1 4'	S	12-04-17 11:38	4	570434-005
S-1 5'	S	12-04-17 11:40	5	570434-006
S-2 0'	S	12-04-17 12:00	0	570434-007
S-2 1'	S	12-04-17 12:02	1	570434-008
S-2 2'	S	12-04-17 12:04	2	570434-009
S-2 3'	S	12-04-17 12:06	3	570434-010
S-2 4'	S	12-04-17 12:08	4	570434-011



CASE NARRATIVE

Client Name: COG Operating, LLC

Project Name: RJU CTB

Project ID:

Work Order Number(s): 570434

Report Date: 15-DEC-17

Date Received: 12/07/2017

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3035735 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3035740 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.



Certificate of Analysis Summary 570434

COG Operating, LLC, Midland, TX

Project Name: RJU CTB



Project Id:

Contact: Sheldon Hitchcock

Project Location:

Date Received in Lab: Thu Dec-07-17 11:15 am

Report Date: 15-DEC-17

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	570434-001	570434-002	570434-003	570434-004	570434-005	570434-006
	<i>Field Id:</i>	S-1 0'	S-1 1'	S-1 2'	S-1 3'	S-1 4'	S-1 5'
	<i>Depth:</i>	0-	1-	2-	3-	4-	5-
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Dec-04-17 11:30	Dec-04-17 11:32	Dec-04-17 11:34	Dec-04-17 11:36	Dec-04-17 11:38	Dec-04-17 11:40
BTEX by EPA 8021B	<i>Extracted:</i>	Dec-10-17 09:30	Dec-10-17 09:30	Dec-10-17 09:30	Dec-10-17 09:30	Dec-10-17 09:30	Dec-10-17 09:30
	<i>Analyzed:</i>	Dec-12-17 02:53	Dec-12-17 04:27	Dec-12-17 03:12	Dec-12-17 03:30	Dec-12-17 04:08	Dec-12-17 03:49
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200
Toluene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200
Ethylbenzene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200
m,p-Xylenes		<0.00398 0.00398	<0.00399 0.00399	<0.00397 0.00397	<0.00402 0.00402	<0.00401 0.00401	<0.00401 0.00401
o-Xylene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200
Total Xylenes		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200
Total BTEX		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200
Chloride by EPA 300	<i>Extracted:</i>	Dec-08-17 12:30	Dec-08-17 12:30	Dec-08-17 12:30	Dec-08-17 12:30	Dec-08-17 12:30	Dec-08-17 16:00
	<i>Analyzed:</i>	Dec-08-17 18:53	Dec-08-17 18:11	Dec-08-17 18:59	Dec-08-17 19:05	Dec-08-17 19:11	Dec-09-17 02:00
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		10500 99.0	591 4.95	1330 4.95	79.6 4.99	83.8 4.97	90.5 4.95
TPH by SW8015 Mod	<i>Extracted:</i>	Dec-08-17 17:00	Dec-08-17 17:00	Dec-08-17 17:00	Dec-08-17 17:00	Dec-08-17 17:00	Dec-08-17 17:00
	<i>Analyzed:</i>	Dec-09-17 13:38	Dec-09-17 13:59	Dec-09-17 14:19	Dec-09-17 00:44	Dec-09-17 01:46	Dec-09-17 02:06
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		19.4 15.0	19.7 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0
Diesel Range Organics (DRO)		2080 15.0	1480 15.0	221 15.0	<15.0 15.0	<15.0 15.0	25.4 15.0
Oil Range Hydrocarbons (ORO)		833 15.0	469 15.0	96.7 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0
Total TPH		2930 15.0	1970 15.0	318 15.0	<15.0 15.0	<15.0 15.0	25.4 15.0

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Mike Kimmel
Client Services Manager



Certificate of Analysis Summary 570434

COG Operating, LLC, Midland, TX

Project Name: RJU CTB



Project Id:

Contact: Sheldon Hitchcock

Project Location:

Date Received in Lab: Thu Dec-07-17 11:15 am

Report Date: 15-DEC-17

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	570434-007	570434-008	570434-009	570434-010	570434-011	
	<i>Field Id:</i>	S-2 0'	S-2 1'	S-2 2'	S-2 3'	S-2 4'	
	<i>Depth:</i>	0-	1-	2-	3-	4-	
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	
	<i>Sampled:</i>	Dec-04-17 12:00	Dec-04-17 12:02	Dec-04-17 12:04	Dec-04-17 12:06	Dec-04-17 12:08	
BTEX by EPA 8021B	<i>Extracted:</i>	Dec-12-17 08:30	Dec-12-17 08:30	Dec-12-17 08:30	Dec-12-17 08:30	Dec-12-17 08:30	
	<i>Analyzed:</i>	Dec-12-17 16:33	Dec-12-17 14:58	Dec-12-17 15:17	Dec-12-17 15:36	Dec-12-17 15:55	
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Benzene		<0.00201 0.00201	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	
Toluene		<0.00201 0.00201	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	
Ethylbenzene		<0.00201 0.00201	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	
m,p-Xylenes		<0.00402 0.00402	<0.00398 0.00398	<0.00401 0.00401	<0.00398 0.00398	<0.00397 0.00397	
o-Xylene		<0.00201 0.00201	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	
Total Xylenes		<0.00201 0.00201	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	
Total BTEX		<0.00201 0.00201	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	
Chloride by EPA 300	<i>Extracted:</i>	Dec-08-17 16:00	Dec-08-17 16:00	Dec-08-17 16:00	Dec-08-17 16:00	Dec-08-17 16:00	
	<i>Analyzed:</i>	Dec-09-17 02:05	Dec-09-17 02:11	Dec-09-17 02:29	Dec-09-17 02:35	Dec-09-17 02:53	
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Chloride		3730 24.8	132 4.95	32.4 4.99	42.8 4.98	60.8 4.97	
TPH by SW8015 Mod	<i>Extracted:</i>	Dec-08-17 17:00	Dec-08-17 17:00	Dec-08-17 17:00	Dec-08-17 17:00	Dec-08-17 11:00	
	<i>Analyzed:</i>	Dec-09-17 14:39	Dec-09-17 15:00	Dec-09-17 03:05	Dec-09-17 15:21	Dec-08-17 22:02	
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Gasoline Range Hydrocarbons (GRO)		26.1 15.0	25.4 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	
Diesel Range Organics (DRO)		6290 15.0	1830 15.0	32.8 15.0	281 15.0	63.1 15.0	
Oil Range Hydrocarbons (ORO)		1850 15.0	607 15.0	15.8 15.0	228 15.0	18.3 15.0	
Total TPH		8170 15.0	2460 15.0	48.6 15.0	509 15.0	81.4 15.0	

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Mike Kimmel
Client Services Manager



Flagging Criteria



- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

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(214) 902 0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



Form 2 - Surrogate Recoveries

Project Name: RJU CTB

Work Orders : 570434,

Lab Batch #: 3035462

Sample: 570434-011 / SMP

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/08/17 22:02

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	76.3	99.9	76	70-135	
o-Terphenyl	40.4	50.0	81	70-135	

Lab Batch #: 3035464

Sample: 570434-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 00:44

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.1	99.9	94	70-135	
o-Terphenyl	49.0	50.0	98	70-135	

Lab Batch #: 3035464

Sample: 570434-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 01:46

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	74.4	100	74	70-135	
o-Terphenyl	40.3	50.0	81	70-135	

Lab Batch #: 3035464

Sample: 570434-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 02:06

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.9	99.7	92	70-135	
o-Terphenyl	48.4	49.9	97	70-135	

Lab Batch #: 3035464

Sample: 570434-007 / DL

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 02:26

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	80.6	99.9	81	70-135	
o-Terphenyl	46.2	50.0	92	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: RJU CTB

Work Orders : 570434,

Lab Batch #: 3035464

Sample: 570434-009 / SMP

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 03:05

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	76.3	99.8	76	70-135	
o-Terphenyl	38.8	49.9	78	70-135	

Lab Batch #: 3035464

Sample: 570434-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 13:38

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	87.3	99.9	87	70-135	
o-Terphenyl	44.0	50.0	88	70-135	

Lab Batch #: 3035464

Sample: 570434-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 13:59

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	84.8	99.9	85	70-135	
o-Terphenyl	45.3	50.0	91	70-135	

Lab Batch #: 3035464

Sample: 570434-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 14:19

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	89.0	99.7	89	70-135	
o-Terphenyl	44.3	49.9	89	70-135	

Lab Batch #: 3035464

Sample: 570434-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 14:39

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	85.0	99.9	85	70-135	
o-Terphenyl	38.1	50.0	76	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: RJU CTB

Work Orders : 570434,

Lab Batch #: 3035464

Sample: 570434-008 / SMP

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 15:00

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	84.0	99.7	84	70-135	
o-Terphenyl	41.0	49.9	82	70-135	

Lab Batch #: 3035464

Sample: 570434-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 15:21

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.0	100	88	70-135	
o-Terphenyl	43.3	50.0	87	70-135	

Lab Batch #: 3035735

Sample: 570434-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 02:53

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0273	0.0300	91	80-120	

Lab Batch #: 3035735

Sample: 570434-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 03:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0291	0.0300	97	80-120	

Lab Batch #: 3035735

Sample: 570434-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 03:30

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0271	0.0300	90	80-120	
4-Bromofluorobenzene	0.0269	0.0300	90	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: RJU CTB

Work Orders : 570434,

Lab Batch #: 3035735

Sample: 570434-006 / SMP

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 03:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	80-120	

Lab Batch #: 3035735

Sample: 570434-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 04:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0286	0.0300	95	80-120	

Lab Batch #: 3035735

Sample: 570434-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 04:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	80-120	
4-Bromofluorobenzene	0.0249	0.0300	83	80-120	

Lab Batch #: 3035740

Sample: 570434-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 14:58

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0266	0.0300	89	80-120	
4-Bromofluorobenzene	0.0259	0.0300	86	80-120	

Lab Batch #: 3035740

Sample: 570434-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 15:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0264	0.0300	88	80-120	
4-Bromofluorobenzene	0.0274	0.0300	91	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: RJU CTB

Work Orders : 570434,

Lab Batch #: 3035740

Sample: 570434-010 / SMP

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 15:36

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	80-120	
4-Bromofluorobenzene	0.0272	0.0300	91	80-120	

Lab Batch #: 3035740

Sample: 570434-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 15:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0289	0.0300	96	80-120	
4-Bromofluorobenzene	0.0270	0.0300	90	80-120	

Lab Batch #: 3035740

Sample: 570434-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 16:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0297	0.0300	99	80-120	

Lab Batch #: 3035462

Sample: 7635721-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/08/17 13:14

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.8	100	94	70-135	
o-Terphenyl	52.2	50.0	104	70-135	

Lab Batch #: 3035462

Sample: 7635722-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/08/17 22:41

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.1	100	88	70-135	
o-Terphenyl	47.8	50.0	96	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: RJU CTB

Work Orders : 570434,

Lab Batch #: 3035735

Sample: 7635894-1-BLK / BLK

Project ID:

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/11/17 21:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0265	0.0300	88	80-120	

Lab Batch #: 3035740

Sample: 7635895-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/12/17 09:36

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0281	0.0300	94	80-120	

Lab Batch #: 3035462

Sample: 7635721-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/08/17 13:36

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	98.4	100	98	70-135	
o-Terphenyl	52.9	50.0	106	70-135	

Lab Batch #: 3035464

Sample: 7635722-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/08/17 23:01

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.9	100	89	70-135	
o-Terphenyl	46.8	50.0	94	70-135	

Lab Batch #: 3035735

Sample: 7635894-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/11/17 19:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0293	0.0300	98	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: RJU CTB

Work Orders : 570434,

Lab Batch #: 3035740

Sample: 7635895-1-BKS / BKS

Project ID:

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/12/17 07:42

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0251	0.0300	84	80-120	
4-Bromofluorobenzene	0.0250	0.0300	83	80-120	

Lab Batch #: 3035462

Sample: 7635721-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/08/17 13:56

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	92.6	100	93	70-135	
o-Terphenyl	49.6	50.0	99	70-135	

Lab Batch #: 3035464

Sample: 7635722-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/08/17 23:21

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.5	100	94	70-135	
o-Terphenyl	49.8	50.0	100	70-135	

Lab Batch #: 3035735

Sample: 7635894-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/11/17 20:04

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0278	0.0300	93	80-120	
4-Bromofluorobenzene	0.0288	0.0300	96	80-120	

Lab Batch #: 3035740

Sample: 7635895-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/12/17 08:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0285	0.0300	95	80-120	
4-Bromofluorobenzene	0.0290	0.0300	97	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: RJU CTB

Work Orders : 570434,

Lab Batch #: 3035462

Sample: 570433-002 S / MS

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/08/17 14:57

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.3	99.9	90	70-135	
o-Terphenyl	45.6	50.0	91	70-135	

Lab Batch #: 3035462

Sample: 570434-004 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 01:04

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	89.5	99.8	90	70-135	
o-Terphenyl	48.3	49.9	97	70-135	

Lab Batch #: 3035735

Sample: 570433-006 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/11/17 20:23

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0285	0.0300	95	80-120	
4-Bromofluorobenzene	0.0300	0.0300	100	80-120	

Lab Batch #: 3035740

Sample: 570435-002 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 08:20

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	80-120	
4-Bromofluorobenzene	0.0324	0.0300	108	80-120	

Lab Batch #: 3035462

Sample: 570433-002 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/08/17 15:17

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	79.7	99.9	80	70-135	
o-Terphenyl	42.1	50.0	84	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: RJU CTB

Work Orders : 570434,

Lab Batch #: 3035464

Sample: 570434-004 SD / MSD

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/09/17 01:26

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	78.4	99.8	79	70-135	
o-Terphenyl	41.7	49.9	84	70-135	

Lab Batch #: 3035735

Sample: 570433-006 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/11/17 20:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0292	0.0300	97	80-120	

Lab Batch #: 3035740

Sample: 570435-002 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/12/17 08:39

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0337	0.0300	112	80-120	
4-Bromofluorobenzene	0.0344	0.0300	115	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: RJU CTB

Work Order #: 570434

Project ID:

Analyst: ALJ

Date Prepared: 12/10/2017

Date Analyzed: 12/11/2017

Lab Batch ID: 3035735

Sample: 7635894-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00202	0.101	0.110	109	0.100	0.106	106	4	70-130	35	
Toluene	<0.00202	0.101	0.106	105	0.100	0.101	101	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.106	105	0.100	0.102	102	4	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.204	101	0.200	0.196	98	4	70-135	35	
o-Xylene	<0.00202	0.101	0.100	99	0.100	0.0960	96	4	71-133	35	

Analyst: ALJ

Date Prepared: 12/12/2017

Date Analyzed: 12/12/2017

Lab Batch ID: 3035740

Sample: 7635895-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00201	0.100	0.107	107	0.0998	0.111	111	4	70-130	35	
Toluene	<0.00201	0.100	0.103	103	0.0998	0.106	106	3	70-130	35	
Ethylbenzene	<0.00201	0.100	0.105	105	0.0998	0.108	108	3	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.200	100	0.200	0.208	104	4	70-135	35	
o-Xylene	<0.00201	0.100	0.0992	99	0.0998	0.102	102	3	71-133	35	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100 * (C)/[B]$ Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: RJU CTB

Work Order #: 570434

Project ID:

Analyst: MNV

Date Prepared: 12/08/2017

Date Analyzed: 12/08/2017

Lab Batch ID: 3035517

Sample: 7635642-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	200	208	104	200	211	106	1	90-110	20	

Analyst: MNV

Date Prepared: 12/08/2017

Date Analyzed: 12/09/2017

Lab Batch ID: 3035752

Sample: 7635709-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	255	102	250	259	104	2	90-110	20	

Analyst: ARM

Date Prepared: 12/08/2017

Date Analyzed: 12/08/2017

Lab Batch ID: 3035462

Sample: 7635721-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1040	104	1000	972	97	7	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	1060	106	1000	1030	103	3	70-135	35	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100 * (C)/[B]$ Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: RJU CTB

Work Order #: 570434

Project ID:

Analyst: ARM

Date Prepared: 12/08/2017

Date Analyzed: 12/08/2017

Lab Batch ID: 3035464

Sample: 7635722-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	922	92	1000	928	93	1	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	994	99	1000	1010	101	2	70-135	35	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100 * (C)/[B]$ Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: RJU CTB

Work Order #: 570434

Project ID:

Lab Batch ID: 3035735

QC- Sample ID: 570433-006 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/11/2017

Date Prepared: 12/10/2017

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.0998	0.0895	90	0.100	0.0944	94	5	70-130	35	
Toluene	0.00202	0.0998	0.0826	81	0.100	0.0851	83	3	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0776	78	0.100	0.0795	80	2	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.148	74	0.201	0.152	76	3	70-135	35	
o-Xylene	<0.00200	0.0998	0.0735	74	0.100	0.0745	75	1	71-133	35	

Lab Batch ID: 3035740

QC- Sample ID: 570435-002 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/12/2017

Date Prepared: 12/12/2017

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.0959	96	0.0996	0.102	102	6	70-130	35	
Toluene	<0.00200	0.100	0.0885	89	0.0996	0.0889	89	0	70-130	35	
Ethylbenzene	<0.00200	0.100	0.0849	85	0.0996	0.0827	83	3	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.163	82	0.199	0.159	80	2	70-135	35	
o-Xylene	<0.00200	0.100	0.0811	81	0.0996	0.0798	80	2	71-133	35	

Matrix Spike Percent Recovery $[D] = 100 * (C - A) / B$
 Relative Percent Difference $RPD = 200 * |(C - F) / (C + F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 * (F - A) / E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: RJU CTB

Work Order #: 570434

Project ID:

Lab Batch ID: 3035517

QC- Sample ID: 570434-002 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/08/2017

Date Prepared: 12/08/2017

Analyst: MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	591	248	816	91	248	817	91	0	90-110	20	

Lab Batch ID: 3035517

QC- Sample ID: 570435-018 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/08/2017

Date Prepared: 12/08/2017

Analyst: MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.93	247	272	110	247	270	109	1	90-110	20	

Lab Batch ID: 3035752

QC- Sample ID: 570433-012 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/09/2017

Date Prepared: 12/08/2017

Analyst: MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	672	248	886	86	248	902	93	2	90-110	20	X

Matrix Spike Percent Recovery $[D] = 100 * (C - A) / B$
 Relative Percent Difference $RPD = 200 * |(C - F) / (C + F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 * (F - A) / E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: RJU CTB

Work Order #: 570434

Project ID:

Lab Batch ID: 3035752

QC- Sample ID: 570434-008 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/09/2017

Date Prepared: 12/08/2017

Analyst: MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	132	248	372	97	248	375	98	1	90-110	20	

Lab Batch ID: 3035462

QC- Sample ID: 570433-002 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/08/2017

Date Prepared: 12/08/2017

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	1010	101	999	888	89	13	70-135	35	
Diesel Range Organics (DRO)	<15.0	999	1080	108	999	988	99	9	70-135	35	

Lab Batch ID: 3035464

QC- Sample ID: 570434-004 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/09/2017

Date Prepared: 12/08/2017

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	998	997	100	998	869	87	14	70-135	35	
Diesel Range Organics (DRO)	<15.0	998	1080	108	998	940	94	14	70-135	35	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
 Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Dallas Texas (214-902-0300)

Phoenix, Arizona (480-355-0900)

Page 1 of 2

Xenco Quote #	Xenco Job #
	570434

	Client / Reporting Information		Project Information		
Company Name / Branch: COG Operating, LLC Company Address: 2407 Pecos Ave., Artesia NM 88210	Project Name/Number:			Analytical Information	Matrix Codes
Email: shilitchcock@concho.com Phone No.: 575-703-6475 dtheel2@concho.com; aliebb@concho.com; thaskell@concho.com	Invoiced To: COG Operating, LLC Attn: Robert McNeill 600 W. Illinois Ave. Midland TX, 79701				W = Water S = Soil/Sed/Solid GW = Ground Water DW = Drinking Water P = Product SW = Surface water SL = Sludge OW = Ocean/Sea Water WI = Waste O = Oil WW= Waste Water A = Air
Project Contact: Sheldon Hitchcock	Po Number:				
Sampler's Name: Sheldon Hitchcock	No.	Field ID / Point of Collection	Collection	# of bottles	HCI
		Sample Depth	Date	Time	Matrix
1	5-10'	0	12/4/17	11:36	S
2	5-11'	1		11:32	S
3	5-12'	2		11:34	S
4	5-13'	3		11:36	S
5	5-14'	4		11:38	S
6	5-15'	5		11:40	S
7	5-20'	0		12:00	S
8	5-21'	1		12:02	S
9	5-22'	2		12:04	S
10	5-23'	3		12:06	S
	Turnaround Time (Business days)			Data Deliverable Information	
<input type="checkbox"/> Same Day TAT	<input type="checkbox"/> 5 Day TAT			Level II Std QC	Level IV (Full Data Pkg raw data)
<input type="checkbox"/> Next Day EMERGENCY	<input type="checkbox"/> 7 Day TAT			Level III Std QC+ Forms	TRRP Level IV
<input type="checkbox"/> 2 Day EMERGENCY	<input checked="" type="checkbox"/> Contract TAT			Level 3 (CLP Forms)	UST / RG -411
<input type="checkbox"/> 3 Day EMERGENCY				TRRP Checklist	
TAT Starts Day received by Lab, if received by 5:00 pm				FED-EX / UPS Tracking #	
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1. Sheldon Hicin	12-6-17 0941	Sheldon Hicin			
Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
3		3		4	Custody Seal #
Relinquished by:	Date Time:	Received By:	Preserved where applicable	Og Ice*	Cooler Temp.
5		5		X	Thermo Corr Factor

Temp: 2.3°C IR ID: R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 2.1°C



Setting the Standard since 1990
 Stamford, Texas (281-240-4200)
 Dallas Texas (214-902-0300)

San Antonio, Texas (210-509-3334)
 Midland, Texas (432-704-5251)

Phoenix, Arizona (480-355-0900)

www.xenco.com

CHAIN OF CUSTODY

Page 2 of 2

Client / Reporting Information				Project Information				Xenco Quote #		Xenco Job #									
Company Name / Branch: COG Operating, LLC				Project Name/Number: R374 CTB															
Company Address: 2407 Pecos Ave. Artesia NM 88210				Project Location:															
Email: slhitchcock@concho.com Phone No: 575-703-6475 dneel2@concho.com; aliebb@concho.com; rhaskell@concho.com				Invoice To: COG Operating, LLC Attn: Robert McNeill 600 W. Illinois Ave. Midland TX, 79701															
Project Contact: Sheldon Hitchcock				PO Number:															
Sampler's Name: Sheldon Hitchcock																			
No.	Field ID / Point of Collection	Sample Depth	Date	Time	Matrix	# of bottles	HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	TPH EXTENDED	BTEX	CHLORIDES	Field Comments		
1	5-2-4'	4	12/4/17	12:08	S	1													
2					S	1													
3					S	1													
4					S	1													
5					S	1													
6					S	1													
7					S	1													
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9					S	1													
10					S	1													
Turnaround Time (Business days)																			
Data Deliverable Information																			
<input type="checkbox"/> Same Day TAT <input type="checkbox"/> 5 Day TAT <input type="checkbox"/> Level II Std QC <input type="checkbox"/> Level IV (Full Data Pkg /raw data) <input type="checkbox"/> Next Day EMERGENCY <input type="checkbox"/> 7 Day TAT <input type="checkbox"/> Level III Std QC+ Forms <input type="checkbox"/> TRRP Level IV <input type="checkbox"/> 2 Day EMERGENCY <input checked="" type="checkbox"/> Contract TAT <input type="checkbox"/> Level 3 (CLP Forms) <input type="checkbox"/> UST / RG-411 <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> TRRP Checklist																			
TAT Starts Day received by Lab, if received by 5:00 pm																			
SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY																			
Relinquished by Sampler:				Date Time:				Received By:				Date Time:				Relinquished By:			
1 Sheldon Hitchcock				12/4/17 12:08				1 Robert McNeill				12/4/17 12:08				1 Sheldon Hitchcock			
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Stafford, Texas (281-240-4200)
Dallas Texas (214-902-0300)

CHAIN OF CUSTODY

Page 1 of 2

San Antonio, Texas (210-509-3334)
Midland, Texas (432-704-5251)

Phoenix, Arizona (480-355-0900)

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Xenco Quote #

Xenco Job #

570434

Client / Reporting Information				Project Information				Analytical Information				Matrix Codes					
Company Name / Branch: COG Operating, LLC				Project Name/Number:													
Company Address: 2407 Pecos Ave, Artesia NM 88210				Project Location:													
Email: shitchcock@concho.com Phone No: 575-703-6475 dneel2@concho.com, alieb@concho.com, thaskell@concho.com				Invoice To: COG Operating, LLC Attn: Robert McNeill 600 W. Illinois Ave. Midland TX, 79701													
Project Contact: Sheldon Hitchcock				PO Number:													
Sampler's Name: Sheldon Hitchcock																	
No.	Field ID / Point of Collection	Sample Depth	Date	Time	Matrix	# of bottles	HCI	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	TPH EXTENDED	BTEX	CHLORIDES	Field Comments
1	5-10'	0	12/11/17	11:30	S	1								X	X	X	
2	5-11'	1		11:32	S	1								X	X	X	
3	5-12'	2		11:34	S	1								X	X	X	
4	5-13'	3		11:36	S	1								X	X	X	
5	5-14'	4		11:38	S	1								X	X	X	
6	5-15'	5		11:40	S	1								X	X	X	
7	5-20'	0		12:00	S	1								X	X	X	
8	5-21'	1		12:02	S	1								X	X	X	
9	5-22'	2		12:04	S	1								X	X	X	
10	5-23'	3		12:06	S	1								X	X	X	
Turnaround Time (Business days)																	
Data Deliverable Information																	
Same Day TAT <input type="checkbox"/> 5 Day TAT <input type="checkbox"/> Level II Std QC <input type="checkbox"/> Level IV (Full Data Pkg / raw data) <input type="checkbox"/>																	
Next Day EMERGENCY <input type="checkbox"/> 7 Day TAT <input type="checkbox"/> Level III Std QC+ Forms <input type="checkbox"/> TRRP Level IV <input type="checkbox"/>																	
2 Day EMERGENCY <input checked="" type="checkbox"/> Contract TAT <input type="checkbox"/> Level 3 (CLP Forms) <input type="checkbox"/> UST / RG-411 <input type="checkbox"/>																	
3 Day EMERGENCY <input type="checkbox"/> TRRP Checklist <input type="checkbox"/>																	
TAT Starts Day received by Lab, if received by 5:00 pm																	
SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY																	
Relinquished by Sampler: <i>Sheldon Hitchcock</i> Date Time: <i>12-11-17 09:41</i> Received By: <i>Sheldon Hitchcock</i> Date Time: <i>12-11-17 11:15</i>																	
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FED-EX / UPS: Tracking # <i>570434</i>																	
Temp: <i>2.30C</i> IR ID: <i>R-8</i> CF: (0-6, -0.2°C) (6-23: +0.2°C) Corrected Temp: <i>2.10C</i>																	
On Ice <input checked="" type="checkbox"/> Cooler Temp. <i>5.6</i> Thermo, Corr. Factor <i>1.0</i>																	

W = Water
S = Soil/Sediment
GW = Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW = Ocean/Sea Water
WI = Waste
O = Oil
WW = Waste Water
A = Air



Setting the Standard since 1990
Stafford, Texas (281-240-4200)
Dallas Texas (214-902-0300)

CHAIN OF CUSTODY

Page 2 of 2

San Antonio, Texas (210-509-3334)
Midland, Texas (432-704-5251)

Phoenix, Arizona (480-355-0900)

www.xenco.com

Xenco Quote # 570434

Xenco Job #

Client / Reporting Information

Company Name / Branch:
COG Operating, LLC

Company Address:
2407 Pecos Ave. Aresia NM 88210

Email: shilichcock@concho.com
Phone No: 575-703-6475
dhee12@concho.com; aileb@concho.com; thaskell@concho.com

Project Contact: Sheldon Hitchcock

Sampler's Name: Sheldon Hitchcock

Project Information

Project Name/Number:
R274 CTB

Project Location:

Invoice To: COG Operating, LLC
Attn: Robert McNeill
600 W. Illinois Ave.
Midland TX, 79701

PO Number:

Analytical Information

Matrix Codes

W = Water
S = Soil/Sediment
GW = Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW = Ocean/Sea Water
WI = Wipe
O = Oil
WW = Waste Water
A = Air

Field Comments

No.	Field ID / Point of Collection	Sample Depth	Date	Time	Matrix	# of bottles	HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	TPH EXTENDED	BTEX	CHLORIDES
1	5-24'	4	12/11/22	12:08	S	1										
2					S	1										
3					S	1										
4					S	1										
5					S	1										
6					S	1										
7					S	1										
8					S	1										
9					S	1										
10					S	1										

Data Deliverable Information

Turnaround Time (Business days)

☐ Same Day TAT
☐ Next Day EMERGENCY
☐ 2 Day EMERGENCY
☐ 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

Relinquished by Sampler: Sheldon Hitchcock Date Time: 12/11/22 12:08 Received By: Sheldon Hitchcock Relinquished By: Sheldon Hitchcock Date Time: 12/11/22 12:08

Relinquished by: Sheldon Hitchcock Date Time: 12/11/22 12:08 Received By: Sheldon Hitchcock Relinquished By: Sheldon Hitchcock Date Time: 12/11/22 12:08

Relinquished by: Sheldon Hitchcock Date Time: 12/11/22 12:08 Received By: Sheldon Hitchcock Relinquished By: Sheldon Hitchcock Date Time: 12/11/22 12:08

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75 will be applied to each project. Xenco's liability will be limited to the cost of samples. Any samples received by Xenco but not analyzed will be invoiced at \$5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: COG Operating, LLC

Date/ Time Received: 12/07/2017 11:15:00 AM

Work Order #: 570434

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	2.1
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	No
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	No
#18 Water VOC samples have zero headspace?	N/A

* Must be completed for after-hours delivery of samples prior to placing in the refrigerator

Analyst:

PH Device/Lot#:

Checklist completed by:

Shawnee Smith

Date: 12/07/2017

Checklist reviewed by:

Mike Kimmel

Date: 12/15/2017

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 160025

CONDITIONS

Operator: COG OPERATING LLC 600 W Illinois Ave Midland, TX 79701	OGRID: 229137
	Action Number: 160025
	Action Type: [IM-SD] Incident File Support Doc (ENV) (IM-BNF)

CONDITIONS

Created By	Condition	Condition Date
bhall	None	11/18/2022