[Sheldon L. Hitchcock]
[HSE Coordinator]

APPROVED
By Olivia Yu at 2:24 pm, Jan 02, 2018

NMOCD approves of the delineation completed for 1RP-4811 and the proposed remediation with these clarifications: laboratory analyses (TPH extended and chlorides) of confirmation edge and bottom samples for the area represented by T-2.

December 21, 2017

Olivia Yu
Oil Conservation Division, District 1
1625 N. French Dr.
Hobbs, NM 88240

Shelly Tucker
Bureau of Land Management, CFO
620 E. Green Street
Carlsbad, NM 88220

Re: Work Plan
BC Federal #032
API #: 30-025-38829
RP#: 1RP-4811
Unit Letter G Section 20, Township 17S, Range 32E
Lea County, NM

Ms. Yu/Ms. Tucker,

COG Operating, LLC (COG) is pleased to submit for your consideration the following remediation work plan for the BC Federal #032. This plan is in response to an oil and produced water release that occurred on September 10, 2017. Subsequent to the release a C-141 initial report was submitted to the New Mexico Oil Conservation Division (NMOCD) on September 15, 2017.

BACKGROUND

The BC Federal #032 release is located in Unit Letter G, Section 20, Township 17 South, and Range 32 East in Lea County, New Mexico. More specifically the latitude and longitude for this release are 32.8208771 North and -103.7854462 West.

On September 10, 2017, a ¼-inch nipple on a gauge failed due to corrosion resulting in the release of approximately three (3) barrels (bbls) of oil and four (4) bbls of produced water. A vacuum truck was utilized to recover free standing fluids. Approximately two (2) bbls of oil and three (3) bbls of produced water were recovered.

On October 16, 2017, a site assessment and soil sampling were conducted in order to vertically and horizontally define the impacted area. A site diagram is included in Appendix I. The analytical results from the soil sampling activities are summarized in the table below.

GROUNDWATER AND SITE RANKING

According to the New Mexico Office of the State Engineer (NMOSE) groundwater in the project vicinity is approximately eighty-one (81) feet below ground surface (BGS) (Appendix II). No water well or surface water was observed within 1,000-feet of the release site. Therefore the site ranking for this release is zero (10) based on the following:

Depth to ground water	50-100-feet
Distance to surface water body	>1000-feet
Wellhead Protection Area	>1000-feet

Analytical Results

Sample ID	Depth (feet)	Benzene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)	Total TPH (mg/kg)
T-1	0	<0.003	<0.003	301	600
T-1	1	<0.002	<0.002	230	<25.0
T-1	2	<0.002	<0.002	480	<25.0
T-1	3	<0.002	<0.002	82.9	<25.0
T-1	4	0.003	<0.002	40.7	<25.0
T-1	9	--	--	82.2	--
T-2	0	0.103	2.63	1,060	2920
T-2	1	<0.002	<0.002	128	26.1
T-2	2	<0.002	<0.002	15.3	<25.0
T-2	3	<0.002	<0.002	15.9	<25.0
T-2	4	<0.002	<0.002	<4.95	<25.0
T-2	9	--	--	<4.94	--
T-3	0	<0.002	<0.002	158	<25.0
T-3	1	<0.002	<0.002	252	<25.0
T-3	2	<0.002	<0.002	19.2	<25.0
T-3	3	<0.002	<0.002	<4.90	<25.0
T-3	8	--	--	65.1	--
NORTH	0	<0.002	<0.002	<4.90	<25.0
NORTH	1	<0.002	<0.002	5.80	<25.0
SOUTH	0	<0.002	<0.002	19.9	<25.0
SOUTH	1	<0.002	<0.002	56.8	<25.0
EAST	0	<0.002	<0.002	<4.98	140
EAST	1	<0.002	<0.002	35.5	<25.0
WEST	0	<0.002	<0.002	<5.00	<25.0
WEST	1	<0.002	<0.002	<5.00	<25.0

PROPOSED REMEDIAL ACTIONS

- The impacted area in the vicinity of sample location T-2 will be excavated to a depth of one (1) foot BGS.
- The impacted area in the vicinity of sample locations T-1 and T-3 will be scraped to a depth of one-half (0.5) foot BGS to remove surface staining.
- All of the excavated material will be hauled to an NMOCD approved solid waste disposal facility.
- The excavation will be backfilled with caliche and contoured to match the surrounding location.

Should you have any questions or concerns please do not hesitate to contact me.

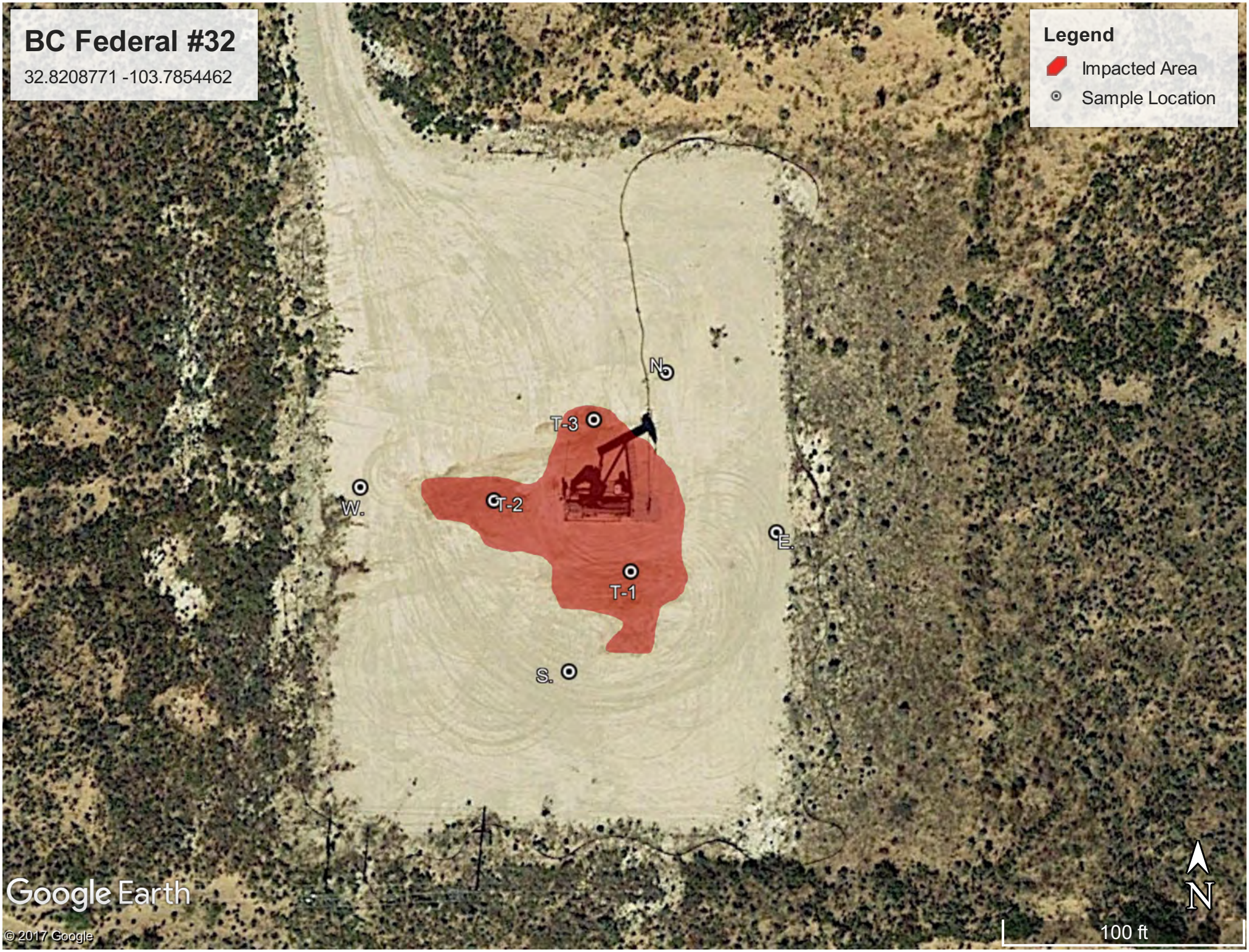
Sincerely,

Sheldon L. Hitchcock
HSE Coordinator
slhitchcock@concho.com

Enclosed:

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

APPENDIX I


BC Federal #32
32.8208771 -103.7854462
Legend
Impacted Area
Sample Location
N
T-3
W.
T-2
E.
T-1
S.
Google Earth
© 2017 Google
N
100 ft

APPENDIX II

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-basin Code	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
RA 12042 POD1		LE	2	2	1	28	17S	32E	614891	3631181	1359	400		
RA 10175		LE		2	1	28	17S	32E	614814	3631005*	1452	158		
RA 12020 POD1		LE	2	2	1	28	17S	32E	614828	3630954	1501	120	81	39
RA 08855		LE	4	1	1	10	17S	32E	616061	3635742*	4097	158		
RA 09505		LE	2	2	1	10	17S	32E	616462	3635944	4481	147		
L 13050 POD1	L	LE	2	2	1	10	17S	32E	616463	3635945*	4481	156	132	24
RA 09505 S		LE	2	2	1	10	17S	32E	616463	3635945*	4481	144		
RA 11734 POD1		LE	2	2	1	10	17S	32E	616556	3635929	4520	165		
L 04021 POD3	L	LE		3	4	03	17S	32E	616761	3636252*	4902	247		

Average Depth to Water: **106 feet**

Minimum Depth: **81 feet**

Maximum Depth: **132 feet**

Record Count: 9

Basin/County Search:

County: Lea

UTMNAD83 Radius Search (in meters):

Easting (X): 613995 **Northing (Y):** 3632204 **Radius:** 5000

***UTM location was derived from PLSS - see Help**

APPENDIX III

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 August 8, 2011

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: BC Federal #032	Facility Type: Wellhead

Surface Owner: Federal	Mineral Owner: Federal	API No. 30-025-38829

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
G	20	17S	32E	2,360	North	1,650	East	Lea

Latitude 32.8208771 **Longitude** -103.7854462

NATURE OF RELEASE

Type of Release: Oil and Produced Water	Volume of Release: 3 bbl. Oil & 4 bbl. PW	Volume Recovered: 2 bbl. Oil & 3 bbl. PW
Source of Release: Wellhead	Date and Hour of Occurrence: September 10, 2017 3:00 pm	Date and Hour of Discovery: September 10, 2017 3:00 pm
Was Immediate Notice Given? ☐ Yes ☒ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

RECEIVED
By Olivia Yu at 10:20 am, Sep 18, 2017

Describe Cause of Problem and Remedial Action Taken.*

The release was due to corrosion on a one-fourth inch nipple on the gauge. The nipple was removed and the gauge was installed directly into the valve.

Describe Area Affected and Cleanup Action Taken.*

The release occurred remained on location. A vacuum truck was dispatched to remove all freestanding fluids. 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: Rebecca Haskell	OIL CONSERVATION DIVISION
Printed Name: Rebecca Haskell	Approved by Environmental Specialist:
Title: Senior HSE Coordinator	Approval Date: 9/18/2017 Expiration Date:
E-mail Address: rhaskell@concho.com	Conditions of Approval: see attached directive Attached ☑
Date: September 15, 2017 Phone: 432-683-7443	

* Attach Additional Sheets If Necessary

1RP-4811 nOY1726137462 pOY1726137714

Operator/Responsible Party,

The OCD has received the form C-141 you provided on _9/15/2017_ regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number _1RP-4811__ 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 _1_ office in __Hobbs____ on or before _10/18/2017_. 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; C_6 thru C_{36}), 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; C_6 thru C_{36}), 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

APPENDIX IV

Analytical Report 566213

for

COG Operating, LLC

Project Manager: Sheldon Hitchcock

BC Federal #32

30-OCT-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)

30-OCT-17

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

Reference: XENCO Report No(s): **566213**
BC Federal #32
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) 566213. 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. 566213 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 566213

COG Operating, LLC, Midland, TX

BC Federal #32

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T-1 Surface	S	10-16-17 09:00	0	566213-001
T-1 1'	S	10-16-17 09:00	1	566213-002
T-1 2'	S	10-16-17 09:00	2	566213-003
T-1 3'	S	10-16-17 09:00	3	566213-004
T-1 4'	S	10-16-17 09:00	4	566213-005
T-1 9'	S	10-16-17 09:00	9	566213-006
T-2 Surface	S	10-16-17 10:00	0	566213-007
T-2 1'	S	10-16-17 10:00	1	566213-008
T-2 2'	S	10-16-17 10:00	2	566213-009
T-2 3'	S	10-16-17 10:00	3	566213-010
T-2 4'	S	10-16-17 10:00	4	566213-011
T-2 9'	S	10-16-17 10:00	9	566213-012
T-3 Surface	S	10-16-17 10:30	0	566213-013
T-3 1'	S	10-16-17 10:30	1	566213-014
T-3 2'	S	10-16-17 10:30	2	566213-015
T-3 3'	S	10-16-17 10:30	3	566213-016
T-3 8'	S	10-16-17 10:30	8	566213-017

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3031638 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3031655 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3031729 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 566213

COG Operating, LLC, Midland, TX

Project Name: BC Federal #32

Project Id:
Contact: Sheldon Hitchcock
Project Location:

Date Received in Lab: Thu Oct-19-17 11:45 am
Report Date: 30-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566213-001		566213-002		566213-003		566213-004		566213-005		566213-006	
	Field Id:	T-1 Surface		T-1 1'		T-1 2'		T-1 3'		T-1 4'		T-1 9'	
	Depth:	0-		1-		2-		3-		4-		9-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17 09:00		Oct-16-17 09:00		Oct-16-17 09:00		Oct-16-17 09:00		Oct-16-17 09:00		Oct-16-17 09:00	
BTEX by EPA 8021B	***Extracted:***	Oct-26-17 10:30		Oct-25-17 14:00		Oct-25-17 14:00		Oct-25-17 14:00		Oct-25-17 14:00			
	Analyzed:	Oct-26-17 14:35		Oct-25-17 23:46		Oct-26-17 00:48		Oct-26-17 01:08		Oct-26-17 01:26			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
Benzene		<0.00338	0.00338	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	<0.00200	0.00200		
Toluene		<0.00338	0.00338	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	0.00277	0.00200		
Ethylbenzene		<0.00338	0.00338	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	<0.00200	0.00200		
m,p-Xylenes		<0.00676	0.00676	<0.00399	0.00399	<0.00404	0.00404	<0.00402	0.00402	<0.00399	0.00399		
o-Xylene		<0.00338	0.00338	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	<0.00200	0.00200		
Total Xylenes		<0.00338	0.00338	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	<0.00200	0.00200		
Total BTEX		<0.00338	0.00338	<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201	0.00277	0.00200		
Chloride by EPA 300	***Extracted:***	Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00	
	Analyzed:	Oct-25-17 19:47		Oct-25-17 19:53		Oct-25-17 20:00		Oct-25-17 20:07		Oct-25-17 20:14		Oct-25-17 20:20	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		301	4.99	230	4.95	480	4.91	82.9	4.90	40.7	4.90	82.2	4.94
TPH by Texas1005	***Extracted:***	Oct-26-17 08:00		Oct-26-17 08:00		Oct-26-17 08:00		Oct-26-17 08:00		Oct-26-17 08:00			
	Analyzed:	Oct-26-17 14:02		Oct-26-17 14:21		Oct-26-17 15:20		Oct-26-17 15:40		Oct-26-17 16:02			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
C6-C12 Range Hydrocarbons		<25.0	25.0	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0		
C12-C28 Range Hydrocarbons		545	25.0	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0		
C28-C35 Range Hydrocarbons		54.5	25.0	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0		
Total TPH		600	25.0	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0		

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 566213

COG Operating, LLC, Midland, TX

Project Name: BC Federal #32

Project Id:
Contact: Sheldon Hitchcock
Project Location:

Date Received in Lab: Thu Oct-19-17 11:45 am
Report Date: 30-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566213-007		566213-008		566213-009		566213-010		566213-011		566213-012	
	Field Id:	T-2 Surface		T-2 1'		T-2 2'		T-2 3'		T-2 4'		T-2 9'	
	Depth:	0-		1-		2-		3-		4-		9-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17 10:00		Oct-16-17 10:00		Oct-16-17 10:00		Oct-16-17 10:00		Oct-16-17 10:00		Oct-16-17 10:00	
BTEX by EPA 8021B	***Extracted:***	Oct-26-17 10:30		Oct-25-17 14:00		Oct-25-17 14:00		Oct-25-17 14:00		Oct-26-17 11:00			
	Analyzed:	Oct-26-17 18:25		Oct-26-17 01:45		Oct-26-17 02:04		Oct-26-17 02:22		Oct-26-17 21:55			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
Benzene		<0.0201	0.0201	<0.00199	0.00199	<0.00200	0.00200	<0.00199	0.00199	<0.00202	0.00202		
Toluene		0.103	0.0201	<0.00199	0.00199	<0.00200	0.00200	<0.00199	0.00199	0.00240	0.00202		
Ethylbenzene		0.595	0.0201	<0.00199	0.00199	<0.00200	0.00200	<0.00199	0.00199	<0.00202	0.00202		
m,p-Xylenes		1.23	0.0402	<0.00398	0.00398	<0.00401	0.00401	<0.00398	0.00398	<0.00404	0.00404		
o-Xylene		0.703	0.0201	<0.00199	0.00199	<0.00200	0.00200	<0.00199	0.00199	<0.00202	0.00202		
Total Xylenes		1.93	0.0201	<0.00199	0.00199	<0.00200	0.00200	<0.00199	0.00199	<0.00202	0.00202		
Total BTEX		2.63	0.0201	<0.00199	0.00199	<0.00200	0.00200	<0.00199	0.00199	0.00240	0.00202		
Chloride by EPA 300	***Extracted:***	Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00	
	Analyzed:	Oct-25-17 20:27		Oct-25-17 20:34		Oct-25-17 20:41		Oct-25-17 21:15		Oct-25-17 21:22		Oct-25-17 21:28	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1060	24.6	128	4.93	15.3	4.94	15.9	4.98	<4.95	4.95	<4.94	4.94
TPH by Texas1005	***Extracted:***	Oct-26-17 08:00		Oct-26-17 08:00		Oct-26-17 08:00		Oct-26-17 08:00		Oct-26-17 08:00			
	Analyzed:	Oct-26-17 16:22		Oct-26-17 16:42		Oct-26-17 17:02		Oct-26-17 17:22		Oct-26-17 17:42			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
C6-C12 Range Hydrocarbons		488	125	<24.9	24.9	<24.9	24.9	<25.0	25.0	<24.9	24.9		
C12-C28 Range Hydrocarbons		2220	125	26.1	24.9	<24.9	24.9	<25.0	25.0	<24.9	24.9		
C28-C35 Range Hydrocarbons		212	125	<24.9	24.9	<24.9	24.9	<25.0	25.0	<24.9	24.9		
Total TPH		2920	125	26.1	24.9	<24.9	24.9	<25.0	25.0	<24.9	24.9		

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 566213

COG Operating, LLC, Midland, TX

Project Name: BC Federal #32

Project Id:
Contact: Sheldon Hitchcock
Project Location:

Date Received in Lab: Thu Oct-19-17 11:45 am
Report Date: 30-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested											
	Lab Id:	566213-013		566213-014		566213-015		566213-016		566213-017	
	Field Id:	T-3 Surface		T-3 1'		T-3 2'		T-3 3'		T-3 8'	
	Depth:	0-		1-		2-		3-		8-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17 10:30		Oct-16-17 10:30		Oct-16-17 10:30		Oct-16-17 10:30		Oct-16-17 10:30	
BTEX by EPA 8021B	***Extracted:***	Oct-25-17 14:00		Oct-25-17 14:00		Oct-26-17 11:00		Oct-26-17 11:00			
	Analyzed:	Oct-26-17 03:02		Oct-26-17 03:22		Oct-26-17 21:37		Oct-26-17 22:14			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
Benzene		<0.00202	0.00202	<0.00200	0.00200	<0.00201	0.00201	<0.00199	0.00199		
Toluene		<0.00202	0.00202	<0.00200	0.00200	<0.00201	0.00201	<0.00199	0.00199		
Ethylbenzene		<0.00202	0.00202	<0.00200	0.00200	<0.00201	0.00201	<0.00199	0.00199		
m,p-Xylenes		<0.00403	0.00403	<0.00401	0.00401	<0.00402	0.00402	<0.00398	0.00398		
o-Xylene		<0.00202	0.00202	<0.00200	0.00200	<0.00201	0.00201	<0.00199	0.00199		
Total Xylenes		<0.00202	0.00202	<0.00200	0.00200	<0.00201	0.00201	<0.00199	0.00199		
Total BTEX		<0.00202	0.00202	<0.00200	0.00200	<0.00201	0.00201	<0.00199	0.00199		
Chloride by EPA 300	***Extracted:***	Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00		Oct-25-17 09:00	
	Analyzed:	Oct-25-17 21:35		Oct-25-17 21:42		Oct-25-17 21:49		Oct-25-17 21:55		Oct-25-17 22:02	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		158	4.90	252	4.95	19.2	4.99	<4.90	4.90	65.1	4.94
TPH by Texas1005	***Extracted:***	Oct-26-17 08:00		Oct-26-17 08:00		Oct-26-17 08:00		Oct-26-17 08:00			
	Analyzed:	Oct-26-17 18:45		Oct-26-17 19:05		Oct-26-17 19:26		Oct-26-17 19:47			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
C6-C12 Range Hydrocarbons		<24.9	24.9	<24.9	24.9	<25.0	25.0	<25.0	25.0		
C12-C28 Range Hydrocarbons		<24.9	24.9	<24.9	24.9	<25.0	25.0	<25.0	25.0		
C28-C35 Range Hydrocarbons		<24.9	24.9	<24.9	24.9	<25.0	25.0	<25.0	25.0		
Total TPH		<24.9	24.9	<24.9	24.9	<25.0	25.0	<25.0	25.0		

Kelsey Brooks
Project 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

Form 2 - Surrogate Recoveries

Project Name: BC Federal #32

Work Orders : 566213,

Project ID:

Lab Batch #: 3031729 **Sample:** 566213-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 23:46

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0338	0.0300	113	80-120	

Lab Batch #: 3031729 **Sample:** 566213-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 00:48

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0299	0.0300	100	80-120	
4-Bromofluorobenzene	0.0336	0.0300	112	80-120	

Lab Batch #: 3031729 **Sample:** 566213-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 01:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0295	0.0300	98	80-120	
4-Bromofluorobenzene	0.0341	0.0300	114	80-120	

Lab Batch #: 3031729 **Sample:** 566213-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 01:26

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	0.0321	0.0300	107	80-120	

Lab Batch #: 3031729 **Sample:** 566213-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 01:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0355	0.0300	118	80-120	
4-Bromofluorobenzene	0.0355	0.0300	118	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: BC Federal #32

Work Orders : 566213,

Project ID:

Lab Batch #: 3031729 **Sample:** 566213-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 02:04

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 3031729 **Sample:** 566213-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 02:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0298	0.0300	99	80-120	
4-Bromofluorobenzene	0.0345	0.0300	115	80-120	

Lab Batch #: 3031729 **Sample:** 566213-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 03:02

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	0.0356	0.0300	119	80-120	

Lab Batch #: 3031729 **Sample:** 566213-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 03:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0299	0.0300	100	80-120	
4-Bromofluorobenzene	0.0347	0.0300	116	80-120	

Lab Batch #: 3031677 **Sample:** 566213-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 14:02

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.4	50.0	101	70-130	
1-Chlorooctane	110	100	110	70-130	

* 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: BC Federal #32

Work Orders : 566213,

Project ID:

Lab Batch #: 3031677 **Sample:** 566213-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 14:21

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	51.4	49.9	103	70-130	
1-Chlorooctane	107	99.8	107	70-130	

Lab Batch #: 3031638 **Sample:** 566213-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 14:35

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0309	0.0300	103	80-120	
4-Bromofluorobenzene	0.0354	0.0300	118	80-120	

Lab Batch #: 3031677 **Sample:** 566213-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 15:20

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.0	49.8	100	70-130	
1-Chlorooctane	107	99.6	107	70-130	

Lab Batch #: 3031677 **Sample:** 566213-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 15:40

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.7	49.9	102	70-130	
1-Chlorooctane	105	99.8	105	70-130	

Lab Batch #: 3031677 **Sample:** 566213-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 16:02

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.5	49.9	99	70-130	
1-Chlorooctane	101	99.8	101	70-130	

* 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: BC Federal #32

Work Orders : 566213,

Project ID:

Lab Batch #: 3031677 **Sample:** 566213-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 16:22

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.2	50.0	100	70-130	
1-Chlorooctane	103	99.9	103	70-130	

Lab Batch #: 3031677 **Sample:** 566213-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 16:42

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	51.7	49.9	104	70-130	
1-Chlorooctane	109	99.7	109	70-130	

Lab Batch #: 3031677 **Sample:** 566213-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 17:02

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.0	49.9	98	70-130	
1-Chlorooctane	105	99.7	105	70-130	

Lab Batch #: 3031677 **Sample:** 566213-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 17:22

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.4	50.0	99	70-130	
1-Chlorooctane	106	99.9	106	70-130	

Lab Batch #: 3031677 **Sample:** 566213-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 17:42

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.9	49.8	102	70-130	
1-Chlorooctane	106	99.6	106	70-130	

* 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: BC Federal #32

Work Orders : 566213,

Project ID:

Lab Batch #: 3031638 **Sample:** 566213-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 18:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0306	0.0300	102	80-120	
4-Bromofluorobenzene	0.0337	0.0300	112	80-120	

Lab Batch #: 3031677 **Sample:** 566213-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 18:45

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.3	49.9	99	70-130	
1-Chlorooctane	106	99.7	106	70-130	

Lab Batch #: 3031677 **Sample:** 566213-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 19:05

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	48.7	49.8	98	70-130	
1-Chlorooctane	104	99.6	104	70-130	

Lab Batch #: 3031677 **Sample:** 566213-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 19:26

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	46.7	50.0	93	70-130	
1-Chlorooctane	94.2	99.9	94	70-130	

Lab Batch #: 3031677 **Sample:** 566213-016 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 19:47

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.1	50.0	100	70-130	
1-Chlorooctane	104	99.9	104	70-130	

* 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: BC Federal #32

Work Orders : 566213,

Project ID:

Lab Batch #: 3031655 **Sample:** 566213-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 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	0.0266	0.0300	89	80-120	
4-Bromofluorobenzene	0.0275	0.0300	92	80-120	

Lab Batch #: 3031655 **Sample:** 566213-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 21:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0254	0.0300	85	80-120	
4-Bromofluorobenzene	0.0254	0.0300	85	80-120	

Lab Batch #: 3031655 **Sample:** 566213-016 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 22:14

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	0.0265	0.0300	88	80-120	

Lab Batch #: 3031729 **Sample:** 7633243-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/25/17 20:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0348	0.0300	116	80-120	

Lab Batch #: 3031638 **Sample:** 7633352-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 11:18

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0311	0.0300	104	80-120	
4-Bromofluorobenzene	0.0346	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.

Form 2 - Surrogate Recoveries

Project Name: BC Federal #32

Work Orders : 566213,

Project ID:

Lab Batch #: 3031677 **Sample:** 7633286-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 13:01

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	53.3	50.0	107	70-130	
1-Chlorooctane	107	100	107	70-130	

Lab Batch #: 3031655 **Sample:** 7633345-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 15:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0264	0.0300	88	80-120	

Lab Batch #: 3031729 **Sample:** 7633243-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/25/17 18:53

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0320	0.0300	107	80-120	
4-Bromofluorobenzene	0.0333	0.0300	111	80-120	

Lab Batch #: 3031638 **Sample:** 7633352-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 09:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0295	0.0300	98	80-120	
4-Bromofluorobenzene	0.0351	0.0300	117	80-120	

Lab Batch #: 3031655 **Sample:** 7633345-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 13:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0312	0.0300	104	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: BC Federal #32

Work Orders : 566213,

Project ID:

Lab Batch #: 3031677 **Sample:** 7633286-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 13:22

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	51.9	50.0	104	70-130	
1-Chlorooctane	102	100	102	70-130	

Lab Batch #: 3031729 **Sample:** 7633243-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/25/17 19:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	80-120	
4-Bromofluorobenzene	0.0348	0.0300	116	80-120	

Lab Batch #: 3031638 **Sample:** 7633352-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 10:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0302	0.0300	101	80-120	
4-Bromofluorobenzene	0.0354	0.0300	118	80-120	

Lab Batch #: 3031655 **Sample:** 7633345-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 13:36

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0294	0.0300	98	80-120	

Lab Batch #: 3031677 **Sample:** 7633286-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 13:42

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.1	50.0	100	70-130	
1-Chlorooctane	108	100	108	70-130	

* 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: BC Federal #32

Work Orders : 566213,

Project ID:

Lab Batch #: 3031729 **Sample:** 566215-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 19:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0319	0.0300	106	80-120	
4-Bromofluorobenzene	0.0350	0.0300	117	80-120	

Lab Batch #: 3031638 **Sample:** 566321-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 10:19

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0352	0.0300	117	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 3031655 **Sample:** 566321-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 13:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0318	0.0300	106	80-120	

Lab Batch #: 3031677 **Sample:** 566213-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 14:41

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.3	50.0	99	70-130	
1-Chlorooctane	95.1	99.9	95	70-130	

Lab Batch #: 3031729 **Sample:** 566215-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 19:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0351	0.0300	117	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: BC Federal #32

Work Orders : 566213,

Project ID:

Lab Batch #: 3031638 **Sample:** 566321-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 10:37

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0336	0.0300	112	80-120	
4-Bromofluorobenzene	0.0356	0.0300	119	80-120	

Lab Batch #: 3031655 **Sample:** 566321-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 14:13

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0337	0.0300	112	80-120	
4-Bromofluorobenzene	0.0355	0.0300	118	80-120	

Lab Batch #: 3031677 **Sample:** 566213-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 15:01

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
o-Terphenyl	49.0	50.0	98	70-130	
1-Chlorooctane	107	99.9	107	70-130	

* 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: BC Federal #32

Work Order #: 566213 **Project ID:**

Analyst: ALJ **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/25/2017

Lab Batch ID: 3031729 **Sample:** 7633243-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B 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
Benzene	<0.00201	0.101	0.0851	84	0.100	0.0900	90	6	70-130	35	
Toluene	<0.00201	0.101	0.0939	93	0.100	0.0954	95	2	70-130	35	
Ethylbenzene	<0.00201	0.101	0.0952	94	0.100	0.0971	97	2	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.187	93	0.200	0.190	95	2	70-135	35	
o-Xylene	<0.00201	0.101	0.0926	92	0.100	0.0946	95	2	71-133	35	

Analyst: ALJ **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031655 **Sample:** 7633345-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B 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
Benzene	<0.00200	0.100	0.0958	96	0.0998	0.0867	87	10	70-130	35	
Toluene	<0.00200	0.100	0.101	101	0.0998	0.0908	91	11	70-130	35	
Ethylbenzene	<0.00200	0.100	0.110	110	0.0998	0.0997	100	10	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.216	108	0.200	0.196	98	10	70-135	35	
o-Xylene	<0.00200	0.100	0.108	108	0.0998	0.0977	98	10	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: BC Federal #32

Work Order #: 566213 **Project ID:**

Analyst: ALJ **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031638 **Sample:** 7633352-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B 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
Benzene	<0.00202	0.101	0.0831	82	0.100	0.0804	80	3	70-130	35	
Toluene	<0.00202	0.101	0.0941	93	0.100	0.0894	89	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0997	99	0.100	0.0943	94	6	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.196	97	0.200	0.185	93	6	70-135	35	
o-Xylene	<0.00202	0.101	0.0958	95	0.100	0.0907	91	5	71-133	35	

Analyst: MNV **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/25/2017

Lab Batch ID: 3031397 **Sample:** 7633169-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 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
Chloride	<5.00	250	244	98	250	243	97	0	90-110	20	

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: BC Federal #32

Work Order #: 566213 **Project ID:**

Analyst: ARM **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031677 **Sample:** 7633286-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	<25.0	1000	956	96	1000	974	97	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1010	101	1000	1020	102	1	75-125	25	

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: BC Federal #32

Work Order # : 566213 **Project ID:**

Lab Batch ID: 3031638 **QC- Sample ID:** 566321-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/26/2017 **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	<0.00199	0.0996	0.118	118	0.0992	0.117	118	1	70-130	35	
Toluene	0.00315	0.0996	0.112	109	0.0992	0.103	101	8	70-130	35	
Ethylbenzene	<0.00199	0.0996	0.0959	96	0.0992	0.0847	85	12	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.190	95	0.198	0.167	84	13	70-135	35	
o-Xylene	<0.00199	0.0996	0.0904	91	0.0992	0.0786	79	14	71-133	35	

Lab Batch ID: 3031655 **QC- Sample ID:** 566321-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/26/2017 **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	0.00211	0.100	0.111	109	0.101	0.113	110	2	70-130	35	
Toluene	0.00542	0.100	0.0991	94	0.101	0.0928	87	7	70-130	35	
Ethylbenzene	<0.00201	0.100	0.0881	88	0.101	0.0768	76	14	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.176	88	0.202	0.152	75	15	70-135	35	
o-Xylene	<0.00201	0.100	0.0847	85	0.101	0.0753	75	12	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: BC Federal #32

Work Order # : 566213 **Project ID:**

Lab Batch ID: 3031729 **QC- Sample ID:** 566215-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/25/2017 **Date Prepared:** 10/25/2017 **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	<0.00202	0.101	0.112	111	0.100	0.113	113	1	70-130	35	
Toluene	<0.00202	0.101	0.109	108	0.100	0.111	111	2	70-130	35	
Ethylbenzene	<0.00202	0.101	0.102	101	0.100	0.102	102	0	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.202	100	0.201	0.203	101	0	70-135	35	
o-Xylene	<0.00202	0.101	0.0950	94	0.100	0.0959	96	1	71-133	35	

Lab Batch ID: 3031397 **QC- Sample ID:** 565635-008 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/25/2017 **Date Prepared:** 10/25/2017 **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	5650	245	5680	12	245	5660	4	0	90-110	20	X

Lab Batch ID: 3031397 **QC- Sample ID:** 566213-009 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/25/2017 **Date Prepared:** 10/25/2017 **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	15.3	247	267	102	247	268	102	0	90-110	20	

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: BC Federal #32

Work Order # : 566213 **Project ID:**

Lab Batch ID: 3031677 **QC- Sample ID:** 566213-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/26/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	<25.0	999	917	92	999	970	97	6	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	999	998	100	999	1040	104	4	75-125	25	

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.

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Xenco Quote #
Xenco Job # 566213

Client / Reporting Information

Company Name / Branch: COG Operating, LLC
Company Address: 2407 Pecos Ave. Artesia NM 88210
Email: slhitchcock@concho.com Phone No: 575-703-6475
dneel2@concho.com; alieb@concho.com; rhaskell@concho.com
Project Contact: Sheldon Hitchcock
Samplers's Name: Sheldon Hitchcock

Project Information

Project Name/Number: BC Federal #32
Project Location:
Invoice To: COG Operating, LLC
Attn: Robert McNeill
600 W. Illnois Ave.
Midland Tx, 79701
PO Number:

Analytical Information

Matrix Codes

W = Water
S = Soil/Sed/Solid
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

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	None	TPH EXTENDED	BTEX	CHLORIDES	Field Comments
1	T-1 Surface	0	10/16/17	9:00	S	1								/	X	X	X	
2	T-1 1'	1			S	1								/	X	X	X	
3	T-1 2'	2			S	1								/	X	X	X	
4	T-1 3'	3			S	1								/	X	X	X	
5	T-1 4'	4			S	1								/	X	X	X	
6	T-1 9'	4			S	1								/			X	
7	T-2 Surface	0		10:00	S	1								/	X	X	X	
8	T-2 1'	1			S	1								/	X	X	X	
9	T-2 2'	2			S	1								/	X	X	X	
10	T-2 3'	3			S	1								/	X	X	X	

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☐ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☐ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☐ Contract TAT
- ☐ 3 Day EMERGENCY

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

Data Deliverable Information

- ☐ Level II Std QC
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

Notes:

Temp: 3.2 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 3

FED-EX / UPS: Tracking #

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:
1	Sheldon Hitchcock	10/20/17 10:00	Sid Butler 10-19-17 10A	Sid Butler	10-19-17 1145	Corrie Harris
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. 13C / Thermo. Corr. Factor

Notice: 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 loses 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.

CHAIN OF CUSTODY

Page 2 Of 2

XENCO LABORATORIES

Setting the Standard since 1990

Stafford,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

Xenco Quote #

Xenco Job # 566219 3

Client / Reporting Information

Company Name / Branch: COG Operating, LLC
Company Address: 2407 Pecos Ave. Artesia NM 88210
Email: slhitchcock@concho.com Phone No: 575-703-6475
dneel2@concho.com; alieb@concho.com; rhaskell@concho.com
Project Contact: Sheldon Hitchcock
Samplers's Name: Sheldon Hitchcock

Project Information

Project Name/Number: BC Federal #32
Project Location:
Invoice To: COG Operating, LLC
Attn: Robert McNeill
600 W. Illnois Ave.
Midland Tx, 79701
PO Number:

Analytical Information

Matrix Codes

W = Water
S = Soil/Sed/Solid
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

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	None	TPH EXTENDED	BTEX	CHLORIDES	Field Comments
1	T-2 4'	4	10/6/17	10:00	S	1								/	X	X	X	
2	T-2 9'	9			S	1								/			X	
3	T-3 Surface	0		10:30	S	1								/	X	X	X	
4	T-3 1'	1			S	1								/	X	X	X	
5	T-3 2'	2			S	1								/	X	X	X	
6	T-3 3'	3			S	1								/	X	X	X	
7	T-3 8'	8			S	1								/			/	
8					S	1												
9					S	1												
10					S	1												

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☐ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☐ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☐ Contract TAT
- ☐ 3 Day EMERGENCY

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

Data Deliverable Information

- ☐ Level II Std QC
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

FED-

Notes:

Temp: 3.2 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 3

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:
1	Sheldon Hitchcock	10/20/17 10:00	Sid Butler 10-19-17 10A	Sid Butler	10-19-17 1145 A	
2						
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
4						
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. / Thermo. Corr. Factor
						13 C

Notice: 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 loses 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: 10/19/2017 11:45:00 AM

Work Order #: 566213

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)?	13.2
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#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: Connie Hernandez Date: 10/23/2017

Checklist reviewed by: Kelsey Brooks Date: 10/23/2017

Analytical Report 566215

for

COG Operating, LLC

Project Manager: Sheldon Hitchcock

BC Federal #32

30-OCT-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)

30-OCT-17

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

Reference: XENCO Report No(s): **566215**
BC Federal #32
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) 566215. 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. 566215 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 566215

COG Operating, LLC, Midland, TX

BC Federal #32

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
N. Surface	S	10-16-17 11:00	0	566215-001
N. 1'	S	10-16-17 11:00	1	566215-002
S. Surface	S	10-16-17 11:00	0	566215-003
S. 1'	S	10-16-17 11:00	1	566215-004
E. Surface	S	10-16-17 11:00	0	566215-005
E. 1'	S	10-16-17 11:00	1	566215-006
W. Surface	S	10-16-17 11:00	0	566215-007
W. 1'	S	10-16-17 11:00	1	566215-008

CASE NARRATIVE

Client Name: COG Operating, LLC

Project Name: BC Federal #32

Project ID:
Work Order Number(s): *566215*

Report Date: *30-OCT-17*
Date Received: *10/19/2017*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3031729 BTEX by EPA 8021B

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

Certificate of Analysis Summary 566215

COG Operating, LLC, Midland, TX

Project Name: BC Federal #32

Project Id:

Contact: Sheldon Hitchcock

Project Location:

Date Received in Lab: Thu Oct-19-17 11:45 am

Report Date: 30-OCT-17

Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566215-001		566215-002		566215-003		566215-004		566215-005		566215-006	
	Field Id:	N. Surface		N. 1'		S. Surface		S. 1'		E. Surface		E. 1'	
	Depth:	0-		1-		0-		1-		0-		1-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17 11:00		Oct-16-17 11:00		Oct-16-17 11:00		Oct-16-17 11:00		Oct-16-17 11:00		Oct-16-17 11:00	
BTEX by EPA 8021B	***Extracted:***	Oct-25-17 14:00		Oct-25-17 14:00		Oct-25-17 14:00		Oct-25-17 14:00		Oct-25-17 14:00		Oct-25-17 14:00	
	Analyzed:	Oct-25-17 21:07		Oct-25-17 21:25		Oct-25-17 21:44		Oct-25-17 22:09		Oct-25-17 22:29		Oct-25-17 22:50	
	Units/RL:	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	<0.00200	0.00200	<0.00198	0.00198	<0.00201	0.00201	<0.00202	0.00202
Toluene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00198	0.00198	<0.00201	0.00201	<0.00202	0.00202
Ethylbenzene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00198	0.00198	<0.00201	0.00201	<0.00202	0.00202
m,p-Xylenes		<0.00398	0.00398	<0.00401	0.00401	<0.00399	0.00399	<0.00397	0.00397	<0.00402	0.00402	<0.00404	0.00404
o-Xylene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00198	0.00198	<0.00201	0.00201	<0.00202	0.00202
Total Xylenes		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00198	0.00198	<0.00201	0.00201	<0.00202	0.00202
Total BTEX		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00198	0.00198	<0.00201	0.00201	<0.00202	0.00202
Chloride by EPA 300	***Extracted:***	Oct-25-17 09:00		Oct-25-17 11:00		Oct-25-17 11:00		Oct-25-17 11:00		Oct-25-17 11:00		Oct-25-17 11:00	
	Analyzed:	Oct-25-17 22:09		Oct-25-17 22:50		Oct-25-17 23:10		Oct-26-17 00:45		Oct-26-17 00:52		Oct-26-17 01:12	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		<4.90	4.90	5.80	4.96	19.9	4.96	56.8	4.97	<4.98	4.98	35.5	4.92
TPH by Texas1005	***Extracted:***	Oct-24-17 16:00		Oct-24-17 16:00		Oct-24-17 16:00		Oct-24-17 16:00		Oct-24-17 16:00		Oct-24-17 16:00	
	Analyzed:	Oct-25-17 02:17		Oct-25-17 02:39		Oct-25-17 03:39		Oct-25-17 03:59		Oct-25-17 04:19		Oct-25-17 04:39	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
C6-C12 Range Hydrocarbons		<25.0	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0	<24.9	24.9	<25.0	25.0
C12-C28 Range Hydrocarbons		<25.0	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0	103	24.9	<25.0	25.0
C28-C35 Range Hydrocarbons		<25.0	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0	37.3	24.9	<25.0	25.0
Total TPH		<25.0	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0	140	24.9	<25.0	25.0

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 566215

COG Operating, LLC, Midland, TX

Project Name: BC Federal #32

Project Id:
Contact: Sheldon Hitchcock
Project Location:

Date Received in Lab: Thu Oct-19-17 11:45 am
Report Date: 30-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested									
	Lab Id:	566215-007		566215-008					
	Field Id:	W. Surface		W. 1'					
	Depth:	0-		1-					
	Matrix:	SOIL		SOIL					
	Sampled:	Oct-16-17 11:00		Oct-16-17 11:00					
BTEX by EPA 8021B	***Extracted:***	Oct-25-17 14:00		Oct-25-17 14:00					
	Analyzed:	Oct-25-17 23:09		Oct-25-17 23:28					
	Units/RL:	mg/kg	RL	mg/kg	RL				
Benzene		<0.00202	0.00202	<0.00199	0.00199				
Toluene		<0.00202	0.00202	<0.00199	0.00199				
Ethylbenzene		<0.00202	0.00202	<0.00199	0.00199				
m,p-Xylenes		<0.00403	0.00403	<0.00398	0.00398				
o-Xylene		<0.00202	0.00202	<0.00199	0.00199				
Total Xylenes		<0.00202	0.00202	<0.00199	0.00199				
Total BTEX		<0.00202	0.00202	<0.00199	0.00199				
Chloride by EPA 300	***Extracted:***	Oct-25-17 11:00		Oct-25-17 11:00					
	Analyzed:	Oct-26-17 01:19		Oct-26-17 01:26					
	Units/RL:	mg/kg	RL	mg/kg	RL				
Chloride		<4.98	4.98	<5.00	5.00				
TPH by Texas1005	***Extracted:***	Oct-26-17 08:00		Oct-26-17 08:00					
	Analyzed:	Oct-26-17 20:08		Oct-26-17 20:28					
	Units/RL:	mg/kg	RL	mg/kg	RL				
C6-C12 Range Hydrocarbons		<25.0	25.0	<24.9	24.9				
C12-C28 Range Hydrocarbons		<25.0	25.0	<24.9	24.9				
C28-C35 Range Hydrocarbons		<25.0	25.0	<24.9	24.9				
Total TPH		<25.0	25.0	<24.9	24.9				

Kelsey Brooks
Project 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

Form 2 - Surrogate Recoveries

Project Name: BC Federal #32

Work Orders : 566215,

Project ID:

Lab Batch #: 3031320 **Sample:** 566215-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 02:17

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.5	49.9	101	70-130	
1-Chlorooctane	109	99.8	109	70-130	

Lab Batch #: 3031320 **Sample:** 566215-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 02:39

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	45.0	49.9	90	70-130	
1-Chlorooctane	101	99.8	101	70-130	

Lab Batch #: 3031320 **Sample:** 566215-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 03:39

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	47.4	50.0	95	70-130	
1-Chlorooctane	97.8	100	98	70-130	

Lab Batch #: 3031320 **Sample:** 566215-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 03:59

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.8	50.0	102	70-130	
1-Chlorooctane	109	99.9	109	70-130	

Lab Batch #: 3031320 **Sample:** 566215-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 04:19

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	48.0	49.9	96	70-130	
1-Chlorooctane	103	99.7	103	70-130	

* 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: BC Federal #32

Work Orders : 566215,

Project ID:

Lab Batch #: 3031320 **Sample:** 566215-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 04:39

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	44.7	49.9	90	70-130	
1-Chlorooctane	95.1	99.8	95	70-130	

Lab Batch #: 3031729 **Sample:** 566215-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 21:07

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0321	0.0300	107	80-120	
4-Bromofluorobenzene	0.0359	0.0300	120	80-120	

Lab Batch #: 3031729 **Sample:** 566215-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 21:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0329	0.0300	110	80-120	
4-Bromofluorobenzene	0.0359	0.0300	120	80-120	

Lab Batch #: 3031729 **Sample:** 566215-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 21:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0296	0.0300	99	80-120	
4-Bromofluorobenzene	0.0356	0.0300	119	80-120	

Lab Batch #: 3031729 **Sample:** 566215-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 22:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0290	0.0300	97	80-120	
4-Bromofluorobenzene	0.0354	0.0300	118	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: BC Federal #32

Work Orders : 566215,

Project ID:

Lab Batch #: 3031729 **Sample:** 566215-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 22:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0355	0.0300	118	80-120	

Lab Batch #: 3031729 **Sample:** 566215-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 22:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0337	0.0300	112	80-120	

Lab Batch #: 3031729 **Sample:** 566215-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 23:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0316	0.0300	105	80-120	
4-Bromofluorobenzene	0.0348	0.0300	116	80-120	

Lab Batch #: 3031729 **Sample:** 566215-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 23:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0274	0.0300	91	80-120	
4-Bromofluorobenzene	0.0334	0.0300	111	80-120	

Lab Batch #: 3031677 **Sample:** 566215-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 20:08

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.1	50.0	100	70-130	
1-Chlorooctane	102	100	102	70-130	

* 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: BC Federal #32

Work Orders : 566215,

Project ID:

Lab Batch #: 3031677 **Sample:** 566215-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 20:28

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	45.6	49.9	91	70-130	
1-Chlorooctane	93.6	99.7	94	70-130	

Lab Batch #: 3031320 **Sample:** 7633149-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/24/17 21:50

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	55.6	50.0	111	70-130	
1-Chlorooctane	119	100	119	70-130	

Lab Batch #: 3031729 **Sample:** 7633243-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/25/17 20:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0348	0.0300	116	80-120	

Lab Batch #: 3031677 **Sample:** 7633286-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 13:01

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	53.3	50.0	107	70-130	
1-Chlorooctane	107	100	107	70-130	

Lab Batch #: 3031320 **Sample:** 7633149-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/24/17 22:11

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	48.9	50.0	98	70-130	
1-Chlorooctane	103	100	103	70-130	

* 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: BC Federal #32

Work Orders : 566215,

Project ID:

Lab Batch #: 3031729 **Sample:** 7633243-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/25/17 18:53

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0320	0.0300	107	80-120	
4-Bromofluorobenzene	0.0333	0.0300	111	80-120	

Lab Batch #: 3031677 **Sample:** 7633286-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 13:22

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	51.9	50.0	104	70-130	
1-Chlorooctane	102	100	102	70-130	

Lab Batch #: 3031320 **Sample:** 7633149-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/24/17 22:31

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	46.2	50.0	92	70-130	
1-Chlorooctane	101	100	101	70-130	

Lab Batch #: 3031729 **Sample:** 7633243-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/25/17 19:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	80-120	
4-Bromofluorobenzene	0.0348	0.0300	116	80-120	

Lab Batch #: 3031677 **Sample:** 7633286-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 13:42

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.1	50.0	100	70-130	
1-Chlorooctane	108	100	108	70-130	

* 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: BC Federal #32

Work Orders : 566215,

Project ID:

Lab Batch #: 3031320 **Sample:** 566212-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/24/17 23:15

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	48.0	50.0	96	70-130	
1-Chlorooctane	102	99.9	102	70-130	

Lab Batch #: 3031729 **Sample:** 566215-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 19:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0319	0.0300	106	80-120	
4-Bromofluorobenzene	0.0350	0.0300	117	80-120	

Lab Batch #: 3031677 **Sample:** 566213-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 14:41

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.3	50.0	99	70-130	
1-Chlorooctane	95.1	99.9	95	70-130	

Lab Batch #: 3031320 **Sample:** 566212-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/24/17 23:35

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	47.4	49.9	95	70-130	
1-Chlorooctane	99.5	99.8	100	70-130	

Lab Batch #: 3031729 **Sample:** 566215-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 19:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0351	0.0300	117	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: BC Federal #32

Work Orders : 566215,

Project ID:

Lab Batch #: 3031677 **Sample:** 566213-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 15:01

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.0	50.0	98	70-130	
1-Chlorooctane	107	99.9	107	70-130	

* 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: BC Federal #32

Work Order #: 566215 **Project ID:**

Analyst: ALJ **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/25/2017

Lab Batch ID: 3031729 **Sample:** 7633243-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B 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
Benzene	<0.00201	0.101	0.0851	84	0.100	0.0900	90	6	70-130	35	
Toluene	<0.00201	0.101	0.0939	93	0.100	0.0954	95	2	70-130	35	
Ethylbenzene	<0.00201	0.101	0.0952	94	0.100	0.0971	97	2	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.187	93	0.200	0.190	95	2	70-135	35	
o-Xylene	<0.00201	0.101	0.0926	92	0.100	0.0946	95	2	71-133	35	

Analyst: MNV **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/25/2017

Lab Batch ID: 3031397 **Sample:** 7633169-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 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
Chloride	<5.00	250	244	98	250	243	97	0	90-110	20	

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: BC Federal #32

Work Order #: 566215 **Project ID:**

Analyst: MNV **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/25/2017

Lab Batch ID: 3031539 **Sample:** 7633172-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 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
Chloride	<5.00	250	248	99	250	246	98	1	90-110	20	

Analyst: ARM **Date Prepared:** 10/24/2017 **Date Analyzed:** 10/24/2017

Lab Batch ID: 3031320 **Sample:** 7633149-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	<25.0	1000	939	94	1000	925	93	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1010	101	1000	1060	106	5	75-125	25	

Analyst: ARM **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031677 **Sample:** 7633286-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	<25.0	1000	956	96	1000	974	97	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1010	101	1000	1020	102	1	75-125	25	

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: BC Federal #32

Work Order # : 566215 **Project ID:**

Lab Batch ID: 3031729 **QC- Sample ID:** 566215-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/25/2017 **Date Prepared:** 10/25/2017 **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	<0.00202	0.101	0.112	111	0.100	0.113	113	1	70-130	35	
Toluene	<0.00202	0.101	0.109	108	0.100	0.111	111	2	70-130	35	
Ethylbenzene	<0.00202	0.101	0.102	101	0.100	0.102	102	0	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.202	100	0.201	0.203	101	0	70-135	35	
o-Xylene	<0.00202	0.101	0.0950	94	0.100	0.0959	96	1	71-133	35	

Lab Batch ID: 3031397 **QC- Sample ID:** 565635-008 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/25/2017 **Date Prepared:** 10/25/2017 **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	5650	245	5680	12	245	5660	4	0	90-110	20	X

Lab Batch ID: 3031397 **QC- Sample ID:** 566213-009 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/25/2017 **Date Prepared:** 10/25/2017 **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	15.3	247	267	102	247	268	102	0	90-110	20	

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: BC Federal #32

Work Order # : 566215 **Project ID:**

Lab Batch ID: 3031539 **QC- Sample ID:** 566212-008 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/25/2017 **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	47.3	249	310	106	249	310	106	0	90-110	20	

Lab Batch ID: 3031539 **QC- Sample ID:** 566215-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/25/2017 **Date Prepared:** 10/25/2017 **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	5.80	248	266	105	248	269	106	1	90-110	20	

Lab Batch ID: 3031320 **QC- Sample ID:** 566212-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/24/2017 **Date Prepared:** 10/24/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	<25.0	999	1040	104	998	1020	102	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	999	1050	105	998	1020	102	3	75-125	25	

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: BC Federal #32

Work Order # : 566215 **Project ID:**

Lab Batch ID: 3031677 **QC- Sample ID:** 566213-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/26/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	<25.0	999	917	92	999	970	97	6	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	999	998	100	999	1040	104	4	75-125	25	

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.

CHAIN OF CUSTODY

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Xenco Quote #

Xenco Job # 566215

Client / Reporting Information

Company Name / Branch: COG Operating, LLC

Company Address: 2407 Pecos Ave. Artesia NM 88210

Email: slhitchcock@concho.com Phone No: 575-703-6475

dneel2@concho.com; alieb@concho.com; rhaskell@concho.com

Project Contact: Sheldon Hitchcock

Samplers's Name: Sheldon Hitchcock

Project Information

Project Name/Number: BC Federal #32

Project Location:

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

PO Number:

Analytical Information

Matrix Codes

W = Water
S = Soil/Sed/Solid
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

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	None	TPH EXTENDED	BTEX	CHLORIDES	Field Comments
1	N. Surface	0	10/16/17	11:00	S	1									X	X	X	
2	N. 1'	1			S	1									X	X	X	
3	S. Surface	0			S	1									X	X	X	
4	S. 1'	1			S	1									X	X	X	
5	E. Surface	0			S	1									X	X	X	
6	E 1'	1			S	1									X	X	X	
7	W. Surface	0			S	1									X	X	X	
8	W. 1'	1			S	1									X	X	X	
9					S	1												
10					S	1												

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☐ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☐ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☐ Contract TAT
- ☐ 3 Day EMERGENCY
- TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- ☐ Level II Std QC
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

Notes:

Temp: 3.2 IR ID:R-8
CF.(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 3

FED-EX / UPS: Tracking #

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:
1	Sheldon Hitchcock	10/20/17 10:00am	Sid Butler 10-19-17 10A	Sid Butler	10-19-17 1145 A	
2						Corina Flores
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
4						
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. / Thermo. Corr. Factor
						13C

Notice: 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 loses 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: 10/19/2017 11:45:00 AM

Work Order #: 566215

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)?	13.2
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#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: Connie Hernandez Date: 10/23/2017

Checklist reviewed by: Kelsey Brooks Date: 10/23/2017