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Midland, TX 79703

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**APPROVED**

**By Olivia Yu at 10:17 am, Aug 31, 2017**

August 15, 2017

Olivia Yu  
New Mexico Energy, Minerals and Natural Resources Department  
Oil Conservation Division, District 1  
1625 French Drive  
Hobbs, NM 88240

Henryetta Price  
Carlsbad Field Office  
United States Department of the Interior  
Bureau of Land Management  
620 E. Greene Street  
Carlsbad, New Mexico 88220

Re: Soil Investigation Summary and Proposed Remediation Workplan  
Blue Jay Federal #001H Battery (1RP-4610)  
GPS: N 32.5664367366954° W 103.495571226436°  
Unit Letter "O", Section 18, Township 20 South, Range 35 East  
Lea County, New Mexico

NMOCD approves of the delineation for 1RP-4610. For remediation:  
1) Laboratory analyses (BTEX, TPH, and chlorides) of bottom and sidewall confirmation samples for each of the 3 proposed excavated areas are required.  
2) Minimum of 2 surface (0-6") confirmation samples in the impacted pasture area.  
3) Blended excavated soil is not permitted.

Dear Ms. Yu and Ms. Price,

TRC Environmental Corporation (TRC), on behalf of COG Operating, LLC (COG) has prepared this Soil Investigation Summary and Proposed Remediation Workplan (Workplan) for the Blue Jay Federal #001H Release Site (Release Site). The purpose of this Workplan is to propose remediation activities designed to advance the Blue Jay Federal #001H Release Site toward an NMOCD approved Site Closure Status. The legal description of the Release Site is Unit Letter "O", Section 18, Township 20 South, Range 35 East, in Lea County, New Mexico. The GPS coordinates for the site are N 32.5664367366954° W 103.495571226436°. The subject property is administered by the United States Bureau of Land Management (BLM). A Site Location Map and Site Map are provided as Figure 1 and Figure 2, respectively.

On January 25, 2017, COG discovered a crude oil release at the flare stack. Due to the presence of crude oil in the flare stack, a fire started, but was immediately extinguished due to the limited amount of fluid which escaped the flare stack. The release impacted an area which measured approximately 49,809 square feet. On January 25, 2017, a COG representative verbally notified the NMOCD and BLM and submitted a Release Notification and Corrective Action (Form C-141) to the NMOCD on February 15, 2017. During initial response activities, COG dispatched a vacuum truck to remove all freestanding fluids. Approximately ten

(10) barrels of fluid was released from the flare stack, with nine (9) barrels recovered. The Form C-141 is attached to this report.

A groundwater database maintained by The New Mexico Office of the State Engineer (NMOSE) did not identify any registered water wells in Section 18, Township 20 South, Range 35 East. A reference map utilized by the New Mexico Oil Conservation Division (NMOCD) Hobbs District Office indicates groundwater should be encountered at approximately fifty (50) feet below ground surface (bgs). Based on the NMOCD site classification system, twenty (20) points will be assigned to the subject area ranking as a result of this criterion.

No water wells were observed within one-thousand (1,000) feet of the Release Site. Based on the NMOCD site classification system, zero (0) points will be assigned to the subject area ranking as a result of this criterion.

No surface water was observed within one-thousand (1,000) feet of the release. Based on the NMOCD site classification system, zero (0) points will be assigned to the subject area ranking as a result of this criterion.

Based on the NMOCD Site Classification criteria, the Release Site soil remediation levels are 10 mg/Kg for benzene, 50 mg/Kg for benzene, toluene, ethylbenzene and xylenes (BTEX), and one hundred (100) mg/Kg for total petroleum hydrocarbons (TPH). Per NMOCD request, chloride remediation levels for the Release Site will be 250 mg/Kg.

On February 7, 2017, a Concho Representative collected twelve (12) delineation soil samples (T1-Surface, T1-1', T1-2', T1-3', T2-Surface, T2-1', T2-2', T2-3', T3-Surface, T3-1', T3-2', T3-3') from the impacted area. The soil samples were submitted to Cardinal Laboratories in Hobbs, New Mexico for determination of concentrations of BTEX using Method SW 846-8021B, TPH using Method SW 846-8015M, and chloride using Method SM 4500 Cl-B. The analytical results indicated benzene and BTEX concentrations were less than the applicable laboratory Method Detection Limit (MDL) and NMOCD regulatory guidelines for the submitted soil samples. The laboratory results indicated TPH concentrations were less than the applicable laboratory MDL and NMOCD regulatory guidelines for the submitted soil samples, with the exception of soil samples T2-Surface (4,396.9 mg/Kg), T2-1' (178 mg/Kg), and T3-Surface (2,240 mg/Kg), which were above NMOCD regulatory guidelines. Chloride concentrations ranged from 16 mg/Kg for soil samples T1-Surface, T2-1', and T3-1' to 80 mg/Kg for soil samples T3-Surface. A review of laboratory analytical results indicated chloride concentrations were below NMOCD regulatory guidelines for all of the collected samples. The laboratory analytical results are attached to this report.

Based on the analytical results of the soil samples collected on February 7, 2017, COG proposes the following field activities designed to remediate the Blue Jay Federal #001H Release:

- Utilizing a backhoe, excavate the Release Site to a depth of approximately three (3) inches bgs in the area represented by soil samples T1, excavate to a depth of approximately one and one half (1.5) feet bgs in the area represented by soil samples T2, and excavate to a depth of approximately six (6) inches bgs in the area represented by soil samples T3. Excavated soil will be temporarily stockpiled on a plastic liner adjacent to the excavation.
- Collect an appropriate number of excavation floor soil samples, spaced at approximately every fifty (50) feet, and submit the soil samples to the laboratory for determination of concentrations

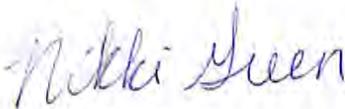
of BTEX, TPH, and chloride. In addition, a minimum of four (4) soil samples will be collected to the north, south, east, and west of the excavated area to confirm horizontal delineation of the impacted soil. In addition, a minimum of one (1) composite soil sample will be collected for each 500 cubic yards of excavated material.

- On receipt of favorable analytical results (below the regulatory guidelines referenced above), the excavation will be backfilled with “like” non-impacted soil and the excavated impacted soil will be transported under manifest to an NMOCD approved disposal facility.
- Prepare and submit a “Remediation Summary and Site Closure Request” to the NMOCD and BLM.

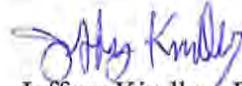
COG is prepared to begin the activities outlined in this Proposed Remediation Workplan on NMOCD and BLM approval.

If you have any questions, or if additional information is required, please feel free to call me at 432-520-7720 (office) or 432-664-6699 (cell).

Thank you,



Nikki Green  
Project Manager  
TRC Environmental Corporation



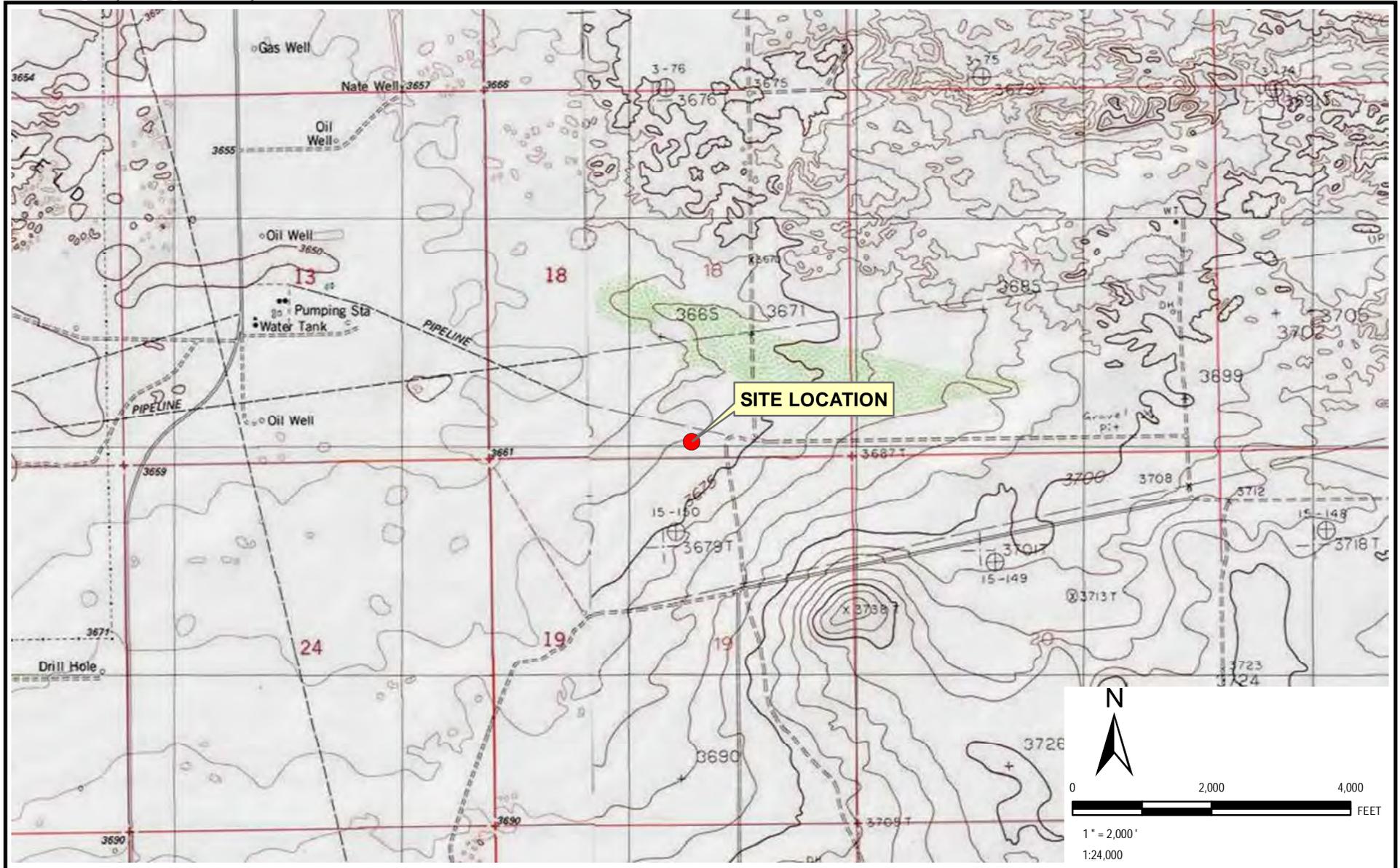
Jeffrey Kindley, PG  
Senior Project Manager  
TRC Environmental Corporation

**Attachments:**

- Figure 1 - Site Location Map
- Figure 2 - Site Map
- Table 1 - Concentrations of Benzene, BTEX, TPH and Chloride in Soil Laboratory Analytical Results
- Release Notification and Corrective Action (Form C-141)

cc: Rebecca Haskell  
COG Operating, LLC  
600 W. Illinois Avenue  
Midland, Texas 79701

File



2075 Commerce Drive  
Midland, TX 79703  
Phone: 432.520.770

TRC - GIS

TITLE:

**FIGURE 1  
SITE LOCATION MAP**

PROJECT:

**BLUE JAY FEDERAL #001H  
LEA COUNTY, NEW MEXICO  
COG OPERATING, LLC**

DRAWN BY: MLOVELACE

CHECKED BY: NGREEN

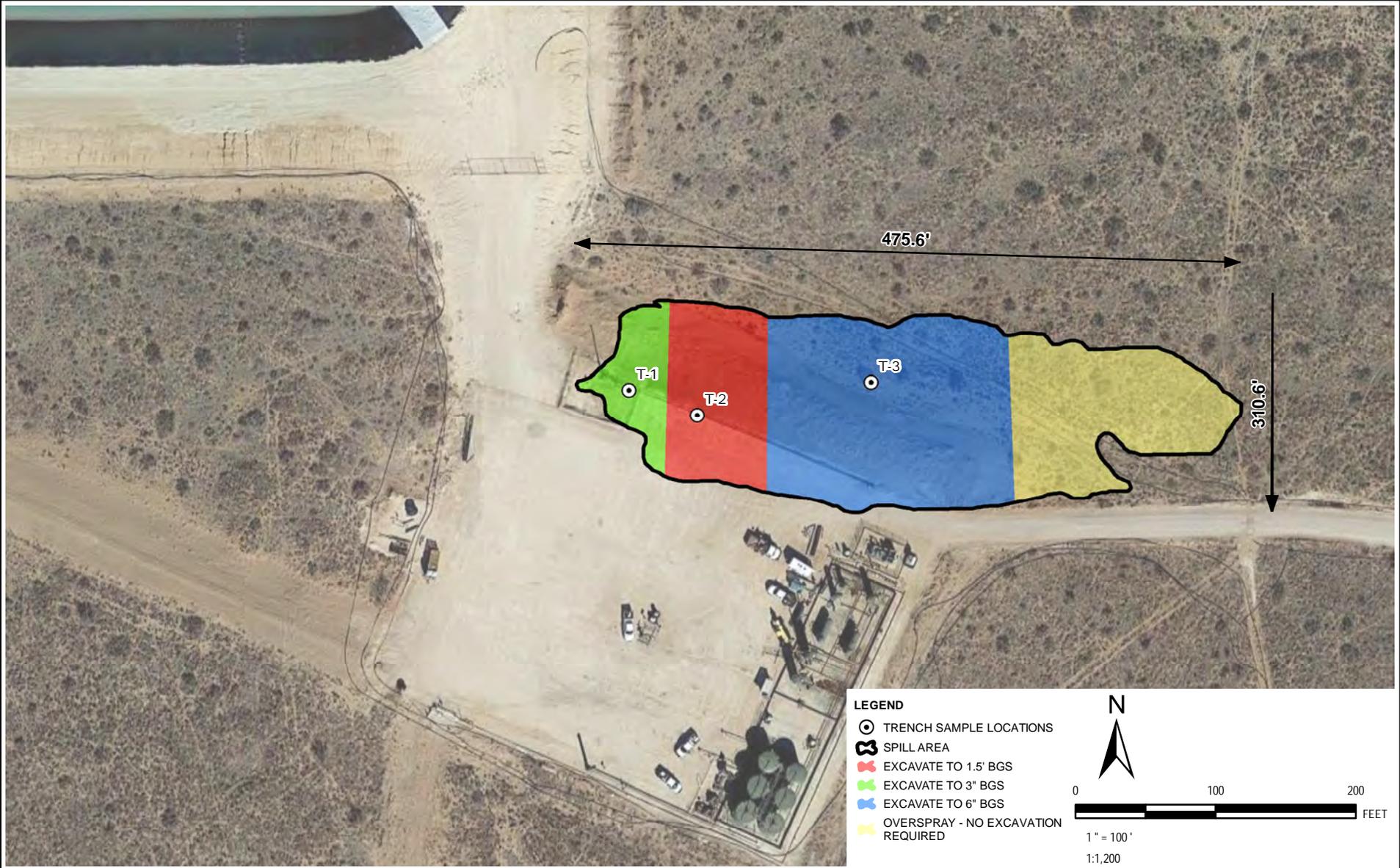
APPROVED BY: NGREEN

DATE: JULY 2017

PROJ. NO.: 279776

GPS: LAT. N 32.5664367°, LONG. W 103.4955712°

**SW1/4 SW1/4 SEC 18 T20S R35E**



2075 Commerce Drive  
Midland, TX 79703  
Phone: 432.520.770

TRC - GIS

TITLE:

**FIGURE 2  
SITE MAP**

PROJECT:

**BLUE JAY FEDERAL #001  
LEA COUNTY, NEW MEXICO  
COG OPERATING, LLC.**

DRAWN BY:

MLOVELACE

CHECKED BY:

NGREEN

APPROVED BY:

NGREEN

DATE:

AUGUST 2017

PROJ. NO.:

279776

GPS: LAT. N 32.5664367°, LONG. W 103.4955712°

**SW1/4 SW1/4 SEC 18 T20S R35E**

TABLE 1

CONCENTRATIONS OF BENZENE, BTEX, TPH AND CHLORIDE IN SOIL

COG Operating LLC  
 Blue Jay Federal #001H Battery (1RP-4610)  
 LEA COUNTY, NEW MEXICO

All concentrations are reported in mg/Kg

SAMPLE LOCATION	SAMPLE DATE	SOIL STATUS	METHODS: SW 846-8021b					METHOD: SW 8015M			SM4500Cl-B
			BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES	TOTAL BTEX	TPH GRO C <sub>6</sub> -C <sub>10</sub>	TPH DRO C <sub>10</sub> -C <sub>28</sub>	TOTAL TPH C <sub>6</sub> -C <sub>28</sub>	CHLORIDE
<b>NMOCD Site Classification Criteria</b>			<b>10</b>				<b>50</b>			<b>100</b>	<b>250</b>
T1-Surface	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	<10.0	<10.0	16.0
T1-1'	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	<10.0	<10.0	32.0
T1-2'	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	<10.0	<10.0	64.0
T1-3'	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	<10.0	<10.0	64.0
T2-Surface	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	16.9	4,380	<b>4,396.9</b>	64.0
T2-1'	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	178	<b>178</b>	16.0
T2-2'	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	<10.0	<10.0	32.0
T2-3'	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	<10.0	<10.0	64.0
T3-Surface	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	2,240	<b>2,240</b>	80.0
T3-1'	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	<10.0	<10.0	16.0
T3-2'	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	<10.0	<10.0	48.0
T3-3'	02/07/17	Trench	<0.050	<0.050	<0.050	<0.150	<0.150	<10.0	<10.0	<10.0	32.0



February 22, 2017

AARON LIEB  
COG OPERATING  
P. O. BOX 1630  
ARTESIA, NM 88210

RE: BLUE JAY FEDERAL #001H

Enclosed are the results of analyses for samples received by the laboratory on 02/15/17 12:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene  
Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T 1 - SURFACE (H700396-01)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

*Surrogate: 4-Bromofluorobenzene (PID) 98.5 % 73.6-140*

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>16.0</b>	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/16/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331		

*Surrogate: 1-Chlorooctane 78.6 % 35-147*
*Surrogate: 1-Chlorooctadecane 90.6 % 28-171*

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T 1 - 1' (H700396-02)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.7 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/16/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 87.4 % 35-147

Surrogate: 1-Chlorooctadecane 92.9 % 28-171

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T 1 - 2' (H700396-03)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.2 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>64.0</b>	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/16/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 79.1 % 35-147

Surrogate: 1-Chlorooctadecane 88.9 % 28-171

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T 1 - 3' (H700396-04)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.4 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>64.0</b>	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/16/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 82.2 % 35-147

Surrogate: 1-Chlorooctadecane 90.2 % 28-171

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T 2 - SURFACE (H700396-05)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>64.0</b>	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>GRO C6-C10</b>	<b>16.9</b>	10.0	02/16/2017	ND	187	93.3	200	0.843		
<b>DRO &gt;C10-C28</b>	<b>4380</b>	10.0	02/16/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 84.7 % 35-147

Surrogate: 1-Chlorooctadecane 155 % 28-171

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T 2 - 1' (H700396-06)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.5 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>16.0</b>	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.3	200	0.843		
<b>DRO &gt;C10-C28</b>	<b>178</b>	10.0	02/17/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 90.9 % 35-147

Surrogate: 1-Chlorooctadecane 94.6 % 28-171

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T 2 - 2' (H700396-07)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.3 % 73.6-140

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>32.0</b>	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 76.6 % 35-147

Surrogate: 1-Chlorooctadecane 88.2 % 28-171

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T2 - 3' (H700396-08)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.6 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<b>64.0</b>	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 81.5 % 35-147

Surrogate: 1-Chlorooctadecane 91.3 % 28-171

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T 3 - SURFACE (H700396-09)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.0 % 73.6-140

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>80.0</b>	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.3	200	0.843		
<b>DRO &gt;C10-C28</b>	<b>2240</b>	10.0	02/17/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 92.2 % 35-147

Surrogate: 1-Chlorooctadecane 142 % 28-171

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T3 - 1' (H700396-10)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.7 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	16.0	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 86.4 % 35-147

Surrogate: 1-Chlorooctadecane 99.4 % 28-171

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T3 - 2' (H700396-11)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 97.8 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	48.0	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 79.9 % 35-147

Surrogate: 1-Chlorooctadecane 96.9 % 28-171

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 COG OPERATING  
 AARON LIEB  
 P. O. BOX 1630  
 ARTESIA NM, 88210  
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	BLUE JAY FEDERAL #001H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: T3 - 3' (H700396-12)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.9 % 73.6-140

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 83.0 % 35-147

Surrogate: 1-Chlorooctadecane 96.7 % 28-171

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

- QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- \*\* Samples not received at proper temperature of 6°C or below.
- \*\*\* Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported on an as received basis (wet) unless otherwise noted on report



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Celey D. Keene, Lab Director/Quality Manager



101 East Marland, Hobbs, NM 88240  
 (575) 393-2326 FAX (575) 393-2476

**CHAIN-OF-CUSTODY AND ANALYSIS REQUEST**

<b>Company Name:</b> COG Operating LLC <b>Project Manager:</b> Aaron Lieb <b>Address:</b> 2407 Pecos Avenue <b>City:</b> Artesia <b>State:</b> NM <b>Zip:</b> 88210 <b>Phone #:</b> 575-748-1553 <b>Fax #:</b> <b>Project #:</b> <b>Project Name:</b> Blue Jay Federal #001H <b>Project Location:</b> <b>Sampler Name:</b> Aaron Lieb <small>FOR LAB USE ONLY</small>		<b>P.O. #:</b> <b>Company:</b> COG Operating LLC <b>Attn:</b> Robert McNeill <b>Address:</b> 600 W Illinois <b>City:</b> Midland <b>State:</b> TX <b>Zip:</b> 79701 <b>Phone #:</b> (432) 221-0388 <b>Fax #:</b>	
<b>Lab I.D.</b> H1003916		<b>Sample I.D.</b> T1-Surface T1-1' T1-2' T1-3' T2-Surface T2-1' T2-2' T2-3'	
(G)RAB OR (C)OMP. # CONTAINERS GROUNDWATER WASTEWATER MATRIX SOIL OIL SLUDGE OTHER : ACID/BASE: ICE / COOL OTHER :		PRESERV SAMPLING DATE TIME BTEX TPH Chloride	
Relinquished By: <i>[Signature]</i> Date: 2-15-17 Time: 11:00 Received By: <i>[Signature]</i> Date: 2/17/17 Time: 1:30 PM		Relinquished By: <i>[Signature]</i> Date: 2-15-17 Time: 11:00 Received By: <i>[Signature]</i> Date: 2/17/17 Time: 1:30 PM	
Delivered By: (Circle One) Sampler - UPS - Bus - Other: #75 2.5c		Sample Condition Cool <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No CHECKED BY: <i>[Signature]</i>	



101 East Marland, Hobbs, NM 88240  
 (575) 393-2326 FAX (575) 393-2476

**CHAIN-OF-CUSTODY AND ANALYSIS REQUEST**

**BILL TO**

**ANALYSIS REQUEST**

Company Name: COG Operating LLC  
 Project Manager: Aaron Lieb  
 Address: 2407 Pecos Avenue  
 City: Artesia State: NM Zip: 88210  
 Phone #: 575-748-1553 Fax #: Project Owner:  
 Project #: Project Name: Blue Jay Federal #001H  
 Project Location: State: TX Zip: 79701  
 Phone #: (432) 221-0388  
 Sampler Name: Aaron Lieb Fax #:

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						DATE	TIME	BTEX	TPH	Chloride
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :					
H1003910	T3-Surface													
9	T3-1'			X					27/17	2:00PM	X	X	X	
11	T3-2'			X					27/17	2:00PM	X	X	X	
12	T3-3'			X					27/17	2:00PM	X	X	X	

PLEASE NOTE: Liability and Damages, Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analysis. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors or any of them, or the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: [Signature] Date: 8-15-17  
 Received By: [Signature] Date: 8-15-17  
 Time: 7:00  
 Rejected By: [Signature] Received By: [Signature]

Delivered By: (Circle One) #75 2.50  
 Sampler - UPS - Bus - Other:  Cool  Intact  
 Yes  No  Yes  No  
 CHECKED BY: [Signature] (Initials)  
 FORM-0007-2.0

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

Form C-141  
Revised August 8, 2011

Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

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	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-683-7443
Facility Name: Blue Jay Federal #001H	Facility Type: Tank Battery

Surface Owner: Federal	Mineral Owner:	API No. 30-025-42338
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**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
O	18	20S	35E	190	South	2310	East	Lea

Latitude 32.5664367366954 Longitude -103.495571226436

**NATURE OF RELEASE**

Type of Release: Oil (Fire)	Volume of Release: 10 bbls	Volume Recovered: 9 bbls
Source of Release: Flare	Date and Hour of Occurrence: January 25, 2017 7:00 am	Date and Hour of Discovery: January 25, 2017 7:00 am
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Ms. Yu - NMOCD / Shelly Tucker BLM	
By Whom? Rebecca Haskell	Date and Hour: January 25, 2017 Time per this email	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

**RECEIVED**  
By Olivia Yu at 3:14 pm, Feb 15, 2017

If a Watercourse was Impacted, Describe Fully.\*

Describe Cause of Problem and Remedial Action Taken.\*

The release was caused by fluid going through the flare causing a fire. The fire quickly extinguished itself due to the limited amount of fluid that escaped the flare.

Describe Area Affected and Cleanup Action Taken.\*

The release was on location and adjacent pasture area. A vacuum truck was dispatched to remove all freestanding fluids. Concho will have the spill area sampled to delineate 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: <i>Rebecca Haskell</i>	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Rebecca Haskell	Approved by Environmental Specialist: <i>JY</i>	
Title: Senior HSE Coordinator	Approval Date: 2/15/2017	Expiration Date:
E-mail Address: rhaskell@concho.com	Conditions of Approval: see attached directive	Attached <input checked="" type="checkbox"/>
Date: January 25, 2017 Phone: 432-683-7443		

\* Attach Additional Sheets If Necessary

1RP-4610

nOY1704654982

pOY1704655733

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 1/25/2017 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number 1R-4610 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 3/15/2017. 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<sub>6</sub> thru C<sub>36</sub>), 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<sub>6</sub> thru C<sub>36</sub>), 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