

# *Basin Environmental Service Technologies, LLC*

3100 Plains Highway  
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Lovington, New Mexico 88260

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## **REMEDIATION SUMMARY & RISK-BASED SITE CLOSURE PROPOSAL**

**BOPCO, LP  
BASS 3 FEDERAL #4  
Eddy County, New Mexico  
Unit Letter "I" (NE/SE), Section 3, Township 22 South, Range 28 East  
Latitude 32.420218° North, Longitude 104.067417° West  
NMOCD Reference #: 2RP-2371**

Prepared For:

**BOPCO, LP  
522 W. Mermod, Suite 704  
Carlsbad, New Mexico 88220**

Prepared By:

**Basin Environmental Service Technologies, LLC  
3100 Plains Highway  
Lovington, New Mexico 88260**

**September 2014**



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**Ben J. Arguijo  
Project Manager**

## TABLE OF CONTENTS

1.0 INTRODUCTION AND BACKGROUND INFORMATION.....	1
2.0 NMOC SITE CLASSIFICATION.....	1
3.0 SUMMARY OF SOIL REMEDIATION ACTIVITIES.....	2
4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROCEDURES.....	3
4.1 Soil Sampling.....	3
4.2 Decontamination of Equipment.....	4
4.3 Laboratory Protocol.....	4
5.0 PROPOSED ACTIVITIES.....	4
6.0 REPORTING.....	5
7.0 LIMITATIONS.....	5
8.0 DISTRIBUTION.....	6

## FIGURES

Figure 1 – Site Location Map

Figure 2 – Site & Sample Location Map

## TABLES

Table 1 – Concentrations of Benzene, BTEX, TPH & Chloride in Soil

Table 2 – Field-Test Results

## APPENDICES

Appendix A – Release Notification and Corrective Action (Form C-141)

Appendix B – Photographs

Appendix C – Laboratory Analytical Reports

## 1.0 INTRODUCTION & BACKGROUND INFORMATION

Basin Environmental Service Technologies, LLC (Basin), on behalf of BOPCO, LP (BOPCO), has prepared this *Remediation Summary & Risk-Based Site Closure Proposal* for the release site known as Bass 3 Federal #4. The legal description of the release site is Unit Letter "I" (NE/SE), Section 3, Township 22 South, Range 28 East, in Eddy County, New Mexico. The geographic coordinates of the release site are 32.420218° North latitude and 104.067417° West longitude. The property affected by the release is owned by The United States Department of the Interior - Bureau of Land Management (BLM). Please reference Figure 1 for a "Site Location Map".

On June 22, 2014, BOPCO discovered a release had occurred at the Bass 3 Federal #4 well site. The packing in the stuffing box on the pump jack failed, resulting in a release of crude oil and produced water. The pump jack was equipped with an E-Pot system designed to contain fluid and shut down the pumping unit in the event of a release. However, the E-Pot system had been damaged at some point prior to the release and failed to operate as expected. During initial response activities, both the stuffing box packing and the E-Pot system were replaced.

The release was immediately reported to the New Mexico Oil Conservation Division (NMOCD) Artesia District Office. The "Release Notification and Corrective Action" (Form C-141) indicated approximately one barrel (1 bbl) of crude oil and approximately eight barrels (8 bbls) of produced water were released, with no recovery. The release affected an area of the caliche well pad measuring approximately one thousand, one hundred square feet (1,100 ft<sup>2</sup>). The Form C-141 is provided as Appendix A. General photographs of the release site are provided as Appendix B.

## 2.0 NMOCD SITE CLASSIFICATION

A search of the New Mexico Water Rights Reporting System (NMWRRS) database maintained by the New Mexico Office of the State Engineer (NMOSE) indicated information was unavailable for Section 3, Township 22 South, Range 28 East. A depth to groundwater reference map utilized by the NMOCD indicates groundwater should be encountered at approximately one hundred and fifteen feet (115') to one hundred and twenty feet (120') below ground surface (bgs). Based on the NMOCD ranking system, zero (0) points will be assigned to the site as a result of this criterion.

A search of the NMWRRS database indicated there are no water wells within one thousand feet (1,000') of the release. Based on the NMOCD ranking system, zero (0) points will be assigned to the site as a result of this criterion.

There are no surface water bodies within one thousand feet (1,000') of the release. Based on the NMOCD ranking system, zero (0) points will be assigned to the site as a result of this criterion.

NMOCD guidelines indicate the Bass 3 Federal #4 release site has an initial ranking score of zero (0) points. The soil remediation levels for a site with a ranking score of zero (0) points are as follows:

- Benzene – 10 mg/Kg (ppm)
- Benzene, ethylbenzene, toluene, and xylenes (BTEX) – 50 mg/Kg (ppm)
- Total petroleum hydrocarbons (TPH) – 5,000 mg/Kg (ppm)

The New Mexico Administrative Code (NMAC) does not currently specify a remediation level for chloride concentrations in soil. Chloride remediation levels are set by the NMOCD on a site-specific basis.

### **3.0 SUMMARY OF SOIL REMEDIATION ACTIVITIES**

On August 11, 2014, with NMOCD and BLM approval, remediation of the release site commenced. To date, approximately one thousand, six hundred and eighty cubic yards (1,680 yd<sup>3</sup>) of impacted soil has been excavated and hauled to Lea Land, Inc. (NMOCD Permit # WM-01-035), for disposal.

On August 19, 2014, nine (9) soil samples (Floor #1, Floor #2, Floor #3, Floor #4, N. Wall #1, S. Wall #1, S. Wall #2, S. Wall #3, and E. Wall #1) were collected from the floor and sidewalls of the excavation and submitted to Cardinal Laboratories in Hobbs, New Mexico, for analysis of chloride, TPH, and/or BTEX concentrations using Environmental Protection Agency (EPA) methods 4500 Cl-B, SW-846 8015M, and SW-846 8021b, respectively. Laboratory analytical results indicated chloride concentrations ranged from 128 mg/kg in soil sample S. Wall #3 to 1,010 mg/kg in soil sample N. Wall #1. TPH concentrations were less than the laboratory method detection limit (MDL) in all submitted soil samples, with the exceptions of samples S. Wall #2 and E. Wall #1, which exhibited TPH concentrations of 33.1 mg/kg and 10.9 mg/kg, respectively. BTEX constituent concentrations were less than the appropriate laboratory MDL in all submitted soil samples.

Review of laboratory analytical results indicated additional excavation would be required in the area represented by soil sample N. Wall #1.

Soil sample locations are depicted in Figure #2, "Site & Sample Location Map". Laboratory analytical results are summarized in Table 1, "Concentrations of Benzene, BTEX, TPH & Chloride in Soil".

On August 20, 2014, a delineation trench (DT-1) was advanced adjacent to the Bass 3 Federal #4 wellhead to further investigate the vertical extent of impacted soil. Trench DT-1 was advanced to a total depth of approximately twenty feet (20') bgs. Soil samples were collected at two- (2) to three-foot (3') intervals and field-screened with a chloride test kit. Five (5) confirmation soil samples (DT-1 @ 11', DT-1 @ 13', DT-1 @ 15', DT-1 @ 18', and DT-1 @ 20') were submitted to the laboratory for analysis of chloride concentrations. Soil sample DT-1 @ 20' was also submitted for analysis of TPH and BTEX concentrations. Laboratory analytical results indicated chloride concentrations ranged from 320 mg/kg in soil sample DT-1 @ 18' to 1,920 mg/kg in soil sample DT-1 @ 11'. TPH and BTEX constituent concentrations in soil sample DT-1 @ 18' were less than the appropriate laboratory MDL.

During the course of remediation activities, it was discovered that the release had impacted a backfilled trench associated with the drilling of the Bass 3 Federal #4 well. The trench measured approximately eighty feet (80') in length, approximately twelve feet (12') in width, and ranged in depth from approximately two and one-half feet (2.5') bgs in the easternmost section of the trench to four feet (4') bgs in the westernmost section. The floor of the trench had been lined with an impermeable, polyurethane plastic liner in an attempt to encapsulate contaminated material from the drilling pit. The liner ran the length of the encapsulation trench and extended partway up the

north and south walls. The east and west walls of the encapsulation trench were left unlined. The pit was later covered with a thin layer of caliche during construction of the well pad.

As remediation activities progressed, the encapsulation trench area was excavated to approximately two and one-half feet (2.5') bgs. The liner was left in-situ with NMOCD and BLM approval.

On August 26, 2014, a second delineation trench (DT-2) was advanced in the floor of the excavation in the westernmost corner of the encapsulation trench. Trench DT-2 was advanced to a total depth of approximately twenty-one feet (21') bgs. Soil samples were collected at one- (1) to three-foot (3') intervals and field-screened with a chloride test kit. Seven (7) confirmation soil samples (DT-2 @ 6', DT-2 @ 8', DT-2 @ 13', DT-2 @ 15', DT-2 @ 17', DT-2 @ 20', and DT-2 @ 21') were submitted to the laboratory for analysis of chloride concentrations. Soil sample DT-2 @ 21' was also submitted for analysis of TPH and BTEX concentrations. Laboratory analytical results indicated chloride concentrations ranged from 352 mg/kg in soil sample DT-2 @ 21' to 19,000 mg/kg in soil sample DT-2 @ 8'. TPH and BTEX constituent concentrations in soil sample DT-2 @ 21' were less than the appropriate laboratory MDL.

Field-screen and laboratory analytical results indicate vertical delineation of both the release and the encapsulation trench area has been achieved. Results of field-screens are provided in Table 2, "Field-Test Results".

On August 27, 2014, two (2) soil samples (N. Wall #2 and N. Wall #3) were collected from the sidewall of the excavation and submitted to the laboratory for analysis of chloride concentrations. Laboratory analytical results indicated chloride concentrations ranged from 592 mg/kg in soil sample N. Wall #2 to 720 mg/kg in soil sample N. Wall #3.

On September 2, 2014, the excavation was advanced in the area represented by soil sample N. Wall #1. A confirmation soil sample (N. Wall #1a) was collected from the sidewall of the excavation and submitted to the laboratory for analysis of chloride concentrations. Laboratory analytical results are forthcoming; however, field-screens indicate the area represented by soil samples N. Wall #1 and N. Wall #1a has been adequately remediated.

At present, the dimensions of the excavation are approximately one hundred and fifty feet (150') in length, approximately twelve feet (12') to approximately fifty feet (50') in width, and varying in depth from approximately two and one-half feet (2.5') bgs in the area of the encapsulation trench to approximately four feet (4') bgs in the eastern portion of the main excavation.

#### **4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROCEDURES**

##### **4.1 Soil Sampling**

Soil samples were delivered to Cardinal Laboratories, Inc., in Hobbs, New Mexico, for BTEX, TPH, and/or chloride analyses using the methods described below:

- BTEX concentrations in accordance with EPA Method SW-846 8021b
- TPH concentrations in accordance with EPA Method SW-846 8015M
- Chloride concentrations in accordance with EPA Method 4500 Cl-B

## **4.2 Decontamination of Equipment**

Cleaning of the sampling equipment was the responsibility of the environmental technician. Prior to use, and between each sample, the sampling equipment was cleaned with Liqui-Nox® detergent and rinsed with distilled water.

## **4.3 Laboratory Protocol**

The laboratory was responsible for proper QA/QC procedures after signing the chain-of-custody form(s). These procedures were either transmitted with the laboratory reports or are on file at the laboratory.

## **5.0 PROPOSED ACTIVITIES**

BOPCO proposes to conduct the following activities to progress the Bass 3 Federal #4 release site to an NMOCD-approved, risk-based closure:

- The excavation will be advanced to the west until field-screens and laboratory analytical results indicate chloride concentrations are below the NMOCD recommended remediation action level (RRAL) established for the site.
- The excavation will be advanced to the extent practicable to the north of the on-site pump jack and wellhead and to the east of the two-inch (2") steel flow line to the Bass Federal #1 Tank Battery.
- The main excavation will be backfilled with clean material to approximately two and one-half feet (2.5') bgs, contoured, and leveled to match the elevation of the encapsulation trench excavation. The floor of the excavation and encapsulation trench area will then be fitted with a twenty-millimeter (20mm) impermeable, polyurethane plastic liner. A cushion of sand will be installed approximately six inches (6") below the liner to protect it during installation and backfilling activities. Following liner installation, approximately eighteen inches (18") of backfill material will be placed atop the liner and covered with an additional six inches (6") of compacted caliche. This engineered control will help mitigate future releases and effectively inhibit vertical migration of contaminants to groundwater.
- Following remediation activities, the earthen berm surrounding the site will be rebuilt to mitigate future releases.
- Disturbed areas in the pastureland adjacent to the Bass 3 Federal #4 well pad will be seeded with a BLM-approved seed mix.

## **6.0     REPORTING**

On review and approval of this proposal by the NMOCD and BLM, BOPCO is prepared to perform the corrective actions summarized in this *Remediation Summary & Risk-Based Site Closure Proposal*. Upon completion of the corrective actions, BOPCO will submit a *Remediation Summary & Risk-Based Site Closure Request* to the NMOCD and BLM, documenting remediation activities and results of confirmation soil samples.

## **7.0     LIMITATIONS**

Basin Environmental Service Technologies, LLC, has prepared this *Remediation Summary & Risk-Based Site Closure Proposal* to the best of its ability. No other warranty, expressed or implied, is made or intended. Basin has examined and relied upon documents referenced in the report and on oral statements made by certain individuals. Basin has not conducted an independent examination of the facts contained in referenced materials and statements. Basin has presumed the genuineness of these documents and statements and that the information provided therein is true and accurate. Basin has prepared this report in a professional manner, using the degree of skill and care exercised by similar environmental consultants. Basin notes that the facts and conditions referenced in this report may change over time, and the conclusions and recommendations set forth herein are applicable only to the facts and conditions as described at the time of this report.

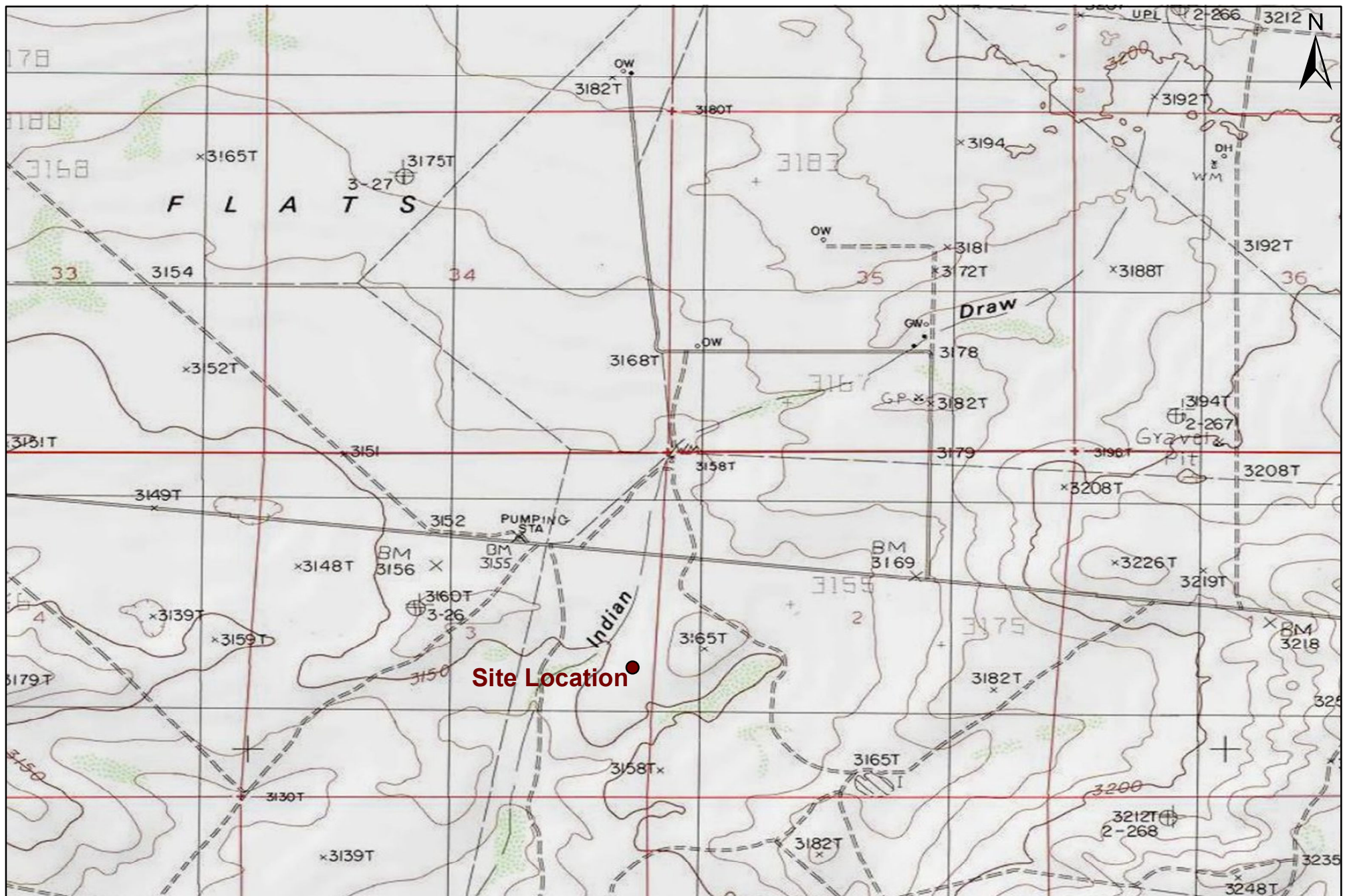
This report has been prepared for the benefit of BOPCO, LP. The information contained in this report, including all exhibits and attachments, may not be used by any other party without the express consent of Basin Environmental Service Technologies, LLC, and/or BOPCO, LP.

## **8.0 DISTRIBUTION:**

- Copy 1:       Mike Bratcher  
New Mexico Energy, Minerals and Natural Resources Department  
Oil Conservation Division (District 2)  
1301 E. Grand Avenue  
Artesia, NM 88210
- Copy 2:       James Amos  
Bureau of Land Management  
602 E. Greene Street  
Carlsbad, NM 88220
- Copy 3:       Tony Savoie  
BOPCO, LP  
522 W. Mermod, Suite 704  
Carlsbad, NM 88220
- Copy 4:       Basin Environmental Service Technologies, LLC  
P.O. Box 301  
Lovington, NM 88260



# Figures



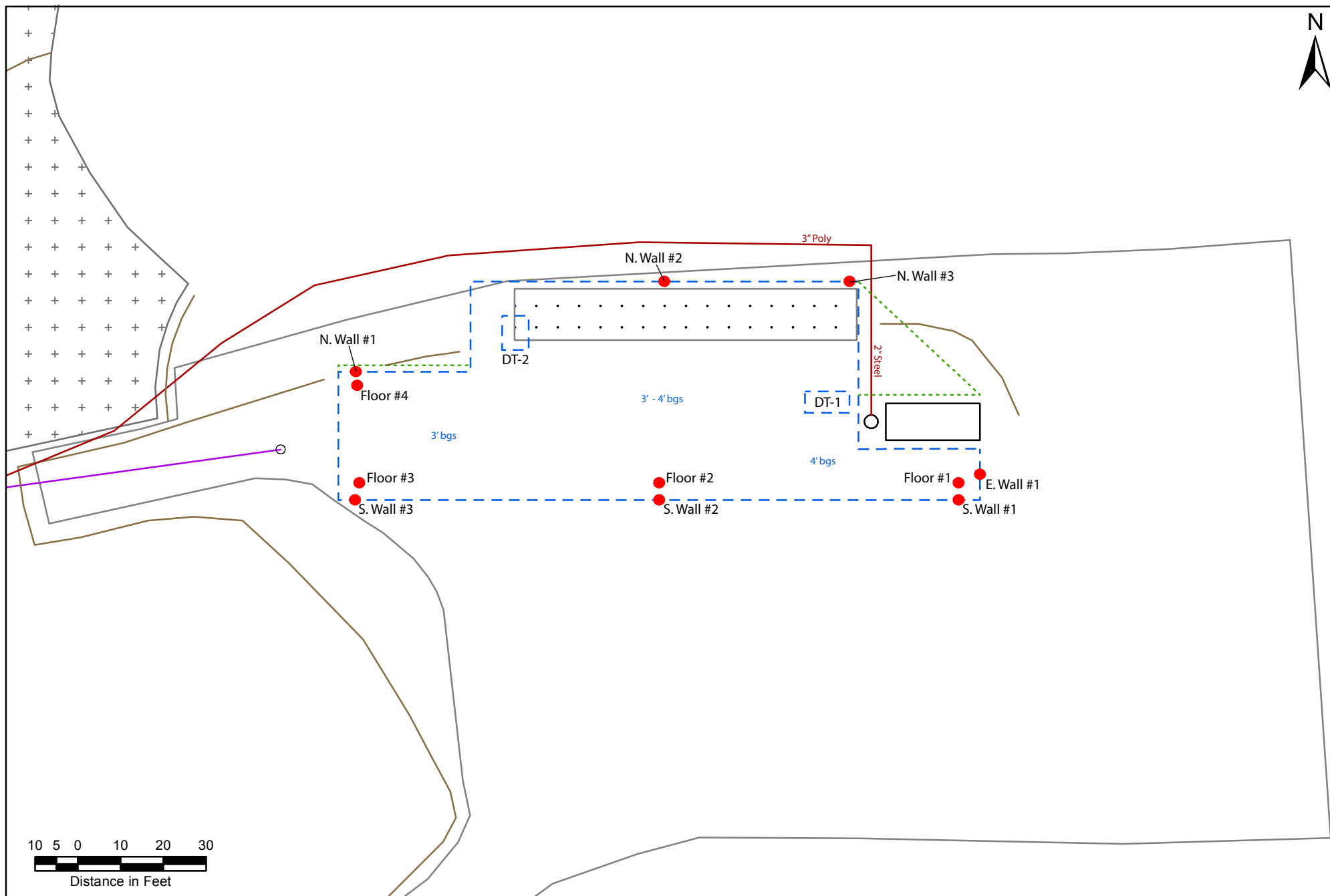
1,000 500 0 1,000 2,000  
 Distance in Feet

**Figure 1**  
**Site Location Map**  
**BOPCO, LP**  
**Bass 3 Federal Well #4**  
**Eddy County, New Mexico**  
**NMOCD Reference #: 2RP-2371**



Basin Environmental Service Technologies, LLC  
 3100 Plains Hwy.  
 Lovington, NM 88260

Drawn By: BJA	Checked By: BRB
August 6, 2014	Scale: 1" = 2,000'



Legend	
	Excavation Extent
	Planned Excavation
	Pipeline
	Caliche Road/Pad
	Earthen Berm
	Electrical Line
	Sample Location
	2007 Excavation Extent
	Work-Over Pit

**Figure 2**  
**Site & Sample Location Map**  
**BOPCO, LP**  
**Bass 3 Federal Well #4**  
**Eddy County, New Mexico**  
**NMOCD Reference #: 2RP-2371**



Basin Environmental Service Technologies, LLC 3100 Plains Hwy. Lovington, NM 88260	
Drawn By: BJA	Checked By: BRB
August 29, 2014	Scale: 1" = 30'

# Tables

**TABLE 1**  
**CONCENTRATIONS OF BENZENE, BTEX, TPH & CHLORIDE IN SOIL**

**BOPCO, LP**  
**BASS 3 FEDERAL #4**  
**EDDY COUNTY, NEW MEXICO**  
**NMOCD REFERENCE #: 2RP-2371**

SAMPLE LOCATION	SAMPLE DEPTH (BGS)	SAMPLE DATE	SOIL STATUS	METHOD: EPA SW 846-8021B, 5030					METHOD: 8015M			TOTAL TPH C <sub>6</sub> -C <sub>35</sub> (mg/Kg)	4500 CI-B CHLORIDE (mg/Kg)
				BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL-BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)	TOTAL BTEX (mg/Kg)	GRO C <sub>6</sub> -C <sub>12</sub> (mg/Kg)	DRO C <sub>12</sub> -C <sub>28</sub> (mg/Kg)	ORO C <sub>28</sub> -C <sub>35</sub> (mg/Kg)		
Floor #1	4'	8/19/2014	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<20.0	<20.0	<20.0	<20.0	400
Floor #2	4'	8/19/2014	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	192
Floor #3	3'	8/19/2014	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	304
Floor #4	3'	8/19/2014	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	960
N. Wall #1	2'	8/19/2014	In-Situ	-	-	-	-	-	-	-	-	-	1,010
S. Wall #1	3'	8/19/2014	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	720
S. Wall #2	3'	8/19/2014	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	22.3	10.8	33.1	352
S. Wall #3	2'	8/19/2014	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	128
E. Wall #1	3'	8/19/2014	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	10.9	<10.0	10.9	336
DT-1 @ 11'	11'	8/20/2014	In-Situ	-	-	-	-	-	-	-	-	-	1,920
DT-1 @ 13'	13'	8/20/2014	In-Situ	-	-	-	-	-	-	-	-	-	1,330
DT-1 @ 15'	15'	8/20/2014	In-Situ	-	-	-	-	-	-	-	-	-	1,100
DT-1 @ 18'	18'	8/20/2014	In-Situ	-	-	-	-	-	-	-	-	-	320
DT-1 @ 20'	20'	8/20/2014	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	10.6	<10.0	10.6	336
DT-2 @ 6'	6'	8/26/2014	In-Situ	-	-	-	-	-	-	-	-	-	11,900
DT-2 @ 8'	8'	8/26/2014	In-Situ	-	-	-	-	-	-	-	-	-	19,000
DT-2 @ 13'	13'	8/26/2014	In-Situ	-	-	-	-	-	-	-	-	-	8,800
DT-2 @ 15'	15'	8/26/2014	In-Situ	-	-	-	-	-	-	-	-	-	2,200
DT-2 @ 17'	17'	8/26/2014	In-Situ	-	-	-	-	-	-	-	-	-	1,170
DT-2 @ 20'	20'	8/26/2014	In-Situ	-	-	-	-	-	-	-	-	-	848
DT-2 @ 21'	21'	8/26/2014	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	352
N. Wall #2	3'	8/27/2014	In-Situ	-	-	-	-	-	-	-	-	-	592
N. Wall #3	3'	8/27/2014	In-Situ	-	-	-	-	-	-	-	-	-	720
<b>NMOCD Recommended Remediation Action Level</b>				<b>10</b>				<b>50</b>				<b>5,000</b>	<b>1,000</b>

- = Not analyzed.

**TABLE 2  
FIELD-TEST RESULTS**

**BOPCO, LP  
BASS 3 FEDERAL #4  
EDDY COUNTY, NEW MEXICO  
NMOCD REFERENCE #: 2RP-2371**

SAMPLE LOCATION	SAMPLE DEPTH (Below Ground Surface)	SAMPLE DATE	Hach Quantab
			CHLORIDE (mg/Kg)
DT-1 @ 5'	5'	8/20/2014	<b>3,664</b>
DT-1 @ 8'	8'	8/20/2014	<b>5,124</b>
DT-1 @ 11'	11'	8/20/2014	<b>1,796</b>
DT-1 @ 13'	13'	8/20/2014	<b>1,256</b>
DT-1 @ 15'	15'	8/20/2014	864
DT-1 @ 18'	18'	8/20/2014	312
DT-1 @ 20'	20'	8/20/2014	312
DT-2 @ 6'	6'	8/26/2014	<b>11,980</b>
DT-2 @ 8'	8'	8/26/2014	<b>17,844</b>
DT-2 @ 10'	10'	8/26/2014	<b>11,980</b>
DT-2 @ 13'	13'	8/26/2014	<b>9,168</b>
DT-2 @ 15'	15'	8/26/2014	<b>2,472</b>
DT-2 @ 17'	17'	8/26/2014	<b>1,008</b>
DT-2 @ 18'	18'	8/26/2014	<b>1,084</b>
DT-2 @ 20'	20'	8/26/2014	932
DT-2 @ 21'	21'	8/26/2014	392

# **Appendices**

**Appendix A**  
**Release Notification &**  
**Corrective Action (Form C-141)**



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**

*n HMP 14/9931221*

**OPERATOR**

☒ Initial Report ☐ Final Report

Name of Company: BOPCO, L.P. <i>260737</i>	Contact: Tony Savoie
Address: 522 W. Mermod, Suite 704 Carlsbad, N.M. 88220	Telephone No. 575-887-7329
Facility Name: Bass 3 Federal #4	Facility Type: Exploration and Production

Surface Owner: Federal	Mineral Owner: Federal	API No. 30-015-28736
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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
I	3	22S	28E	1980	South	330	East	Eddy

Latitude N 32.420218 Longitude W 104.067417

**NATURE OF RELEASE**

Type of Release: Crude oil and produced water	Volume of Release: 1 bbl oil and 8 bbls PW water	Volume Recovered: None
Source of Release: Pump Jack stuffing box packing	Date and Hour of Occurrence: 6/22/14 time unknown	Date and Hour of Discovery: 6/22/14 at approximately 11:20 a.m.
Was Immediate Notice Given? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

**NM OIL CONSERVATION**

If a Watercourse was Impacted, Describe Fully.\*

ARTESIA DISTRICT

JUL 10 2014

Describe Cause of Problem and Remedial Action Taken.\*

**RECEIVED**

The stuffing box packing failed releasing the fluid. The pump jack was equipped with an E-Pot designed to contain and shut down the pumping unit in the event of a release. The E-pot had been damaged and did not operate properly. The packing was replaced and the E-pot was replaced and tested on 6/23/14.

Describe Area Affected and Cleanup Action Taken.\*

The release impacted approximately 1100 sq.ft. of caliche well pad. All of the fluid soaked into the ground and has been left as is until the area can be cleaned up in accordance to the NMOCD and BLM remediation guidelines.

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>Tony Savoie</i>	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Tony Savoie	Approved by Environmental Specialist: <i>[Signature]</i>	
Title: Waste Management and Remediation Specialist	Approval Date: <i>7/18/14</i>	Expiration Date: <i>NA</i>
E-mail Address: <i>tasavoie@basspet.com</i>	Conditions of Approval: Remediation per OCD Rule & Guidelines, & like approval by BLM. <b>SUBMIT REMEDIATION</b>	Attached <input type="checkbox"/>
Date: 7/10/14	Phone: 432-556-8730	

\* Attach Additional Sheets If Necessary

**PROPOSAL NO LATER THAN:**

*8/18/14*

*2RP-2371*

# **Appendix B**

## **Photographs**



Bass 3 Federal #4 - Release Site (Looking West)



Bass 3 Federal #4 – Excavation (Looking North)





Bass 3 Federal #4 – Excavation (Looking Northeast)



Bass 3 Federal #4 – Delineation Trench DT-1



Bass 3 Federal #4 – Delineation Trench DT-2 (Looking North)

# **Appendix C**

## **Laboratory Analytical Reports**



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

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August 27, 2014

BEN J. ARGUIJO

Basin Environmental Service

P.O. Box 301

Lovington, NM 88260

RE: BASS 3 FEDERAL #4

Enclosed are the results of analyses for samples received by the laboratory on 08/20/14 10:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. 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:**

Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/20/2014  
Reported: 08/27/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/19/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: FLOOR #1 (H402548-01)**

BTEx 8021B		mg/kg		Analyzed By: ck					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/26/2014	ND	1.82	91.1	2.00	6.10	
Toluene*	<0.050	0.050	08/26/2014	ND	1.70	84.9	2.00	5.49	
Ethylbenzene*	<0.050	0.050	08/26/2014	ND	1.92	95.8	2.00	4.27	
Total Xylenes*	<0.150	0.150	08/26/2014	ND	5.67	94.5	6.00	4.97	
Total BTEx	<0.300	0.300	08/26/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 105 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	400	16.0	08/21/2014	ND	416	104	400	3.92		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<20.0	20.0	08/26/2014	ND	200	100	200	3.05	
DRO >C10-C28	<20.0	20.0	08/26/2014	ND	215	108	200	5.60	
EXT DRO >C28-C35	<20.0	20.0	08/26/2014	ND					

Surrogate: 1-Chlorooctane 127 % 65.2-140

Surrogate: 1-Chlorooctadecane 143 % 63.6-154

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/20/2014  
Reported: 08/27/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/19/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: FLOOR #2 (H402548-02)**

BTEX 8021B		mg/kg		Analyzed By: ck					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/26/2014	ND	1.82	91.1	2.00	6.10	
Toluene*	<0.050	0.050	08/26/2014	ND	1.70	84.9	2.00	5.49	
Ethylbenzene*	<0.050	0.050	08/26/2014	ND	1.92	95.8	2.00	4.27	
Total Xylenes*	<0.150	0.150	08/26/2014	ND	5.67	94.5	6.00	4.97	
Total BTEX	<0.300	0.300	08/26/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 103 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	192	16.0	08/21/2014	ND	416	104	400	3.92	

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	08/26/2014	ND	200	100	200	3.05	
DRO >C10-C28	<10.0	10.0	08/26/2014	ND	215	108	200	5.60	
EXT DRO >C28-C35	<10.0	10.0	08/26/2014	ND					

Surrogate: 1-Chlorooctane 131 % 65.2-140

Surrogate: 1-Chlorooctadecane 144 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

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BEN J. ARGUIJO  
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Fax To: (575) 396-1429

Received: 08/20/2014  
Reported: 08/27/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/19/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: FLOOR #3 (H402548-03)**

BTEx 8021B		mg/kg		Analyzed By: ck					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/26/2014	ND	1.82	91.1	2.00	6.10	
Toluene*	<0.050	0.050	08/26/2014	ND	1.70	84.9	2.00	5.49	
Ethylbenzene*	<0.050	0.050	08/26/2014	ND	1.92	95.8	2.00	4.27	
Total Xylenes*	<0.150	0.150	08/26/2014	ND	5.67	94.5	6.00	4.97	
Total BTEX	<0.300	0.300	08/26/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 104 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	304	16.0	08/21/2014	ND	416	104	400	3.92	

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	08/26/2014	ND	200	100	200	3.05	
DRO >C10-C28	<10.0	10.0	08/26/2014	ND	215	108	200	5.60	
EXT DRO >C28-C35	<10.0	10.0	08/26/2014	ND					

Surrogate: 1-Chlorooctane 123 % 65.2-140

Surrogate: 1-Chlorooctadecane 139 % 63.6-154

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BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/20/2014  
Reported: 08/27/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/19/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: FLOOR #4 (H402548-04)**

BTEx 8021B		mg/kg		Analyzed By: ck						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	08/26/2014	ND	1.82	91.1	2.00	6.10		
Toluene*	<0.050	0.050	08/26/2014	ND	1.70	84.9	2.00	5.49		
Ethylbenzene*	<0.050	0.050	08/26/2014	ND	1.92	95.8	2.00	4.27		
Total Xylenes*	<0.150	0.150	08/26/2014	ND	5.67	94.5	6.00	4.97		
Total BTEX	<0.300	0.300	08/26/2014	ND						

Surrogate: 4-Bromofluorobenzene (PID) 105 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	960	16.0	08/21/2014	ND	416	104	400	3.92	

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	08/26/2014	ND	200	100	200	3.05	
DRO >C10-C28	<10.0	10.0	08/26/2014	ND	215	108	200	5.60	
EXT DRO >C28-C35	<10.0	10.0	08/26/2014	ND					

Surrogate: 1-Chlorooctane 121 % 65.2-140

Surrogate: 1-Chlorooctadecane 139 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/20/2014  
Reported: 08/27/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/19/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: N. WALL #1 (H402548-05)****Chloride, SM4500Cl-B****mg/kg****Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>1010</b>	16.0	08/21/2014	ND	416	104	400	3.92	

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Celey D. Keene, Lab Director/Quality Manager

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Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/20/2014  
Reported: 08/27/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/19/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: S. WALL #1 (H402548-06)**

BTEx 8021B		mg/kg		Analyzed By: ck						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	08/26/2014	ND	1.82	91.1	2.00	6.10		
Toluene*	<0.050	0.050	08/26/2014	ND	1.70	84.9	2.00	5.49		
Ethylbenzene*	<0.050	0.050	08/26/2014	ND	1.92	95.8	2.00	4.27		
Total Xylenes*	<0.150	0.150	08/26/2014	ND	5.67	94.5	6.00	4.97		
Total BTEx	<0.300	0.300	08/26/2014	ND						

Surrogate: 4-Bromofluorobenzene (PID) 105 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	720	16.0	08/21/2014	ND	416	104	400	3.92	

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	08/26/2014	ND	200	100	200	3.05	
DRO >C10-C28	<10.0	10.0	08/26/2014	ND	215	108	200	5.60	
EXT DRO >C28-C35	<10.0	10.0	08/26/2014	ND					

Surrogate: 1-Chlorooctane 124 % 65.2-140

Surrogate: 1-Chlorooctadecane 138 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

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Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/20/2014  
Reported: 08/27/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/19/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: S. WALL #2 (H402548-07)**

BTX 8021B		mg/kg		Analyzed By: ck						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	08/26/2014	ND	1.82	91.1	2.00	6.10		
Toluene*	<0.050	0.050	08/26/2014	ND	1.70	84.9	2.00	5.49		
Ethylbenzene*	<0.050	0.050	08/26/2014	ND	1.92	95.8	2.00	4.27		
Total Xylenes*	<0.150	0.150	08/26/2014	ND	5.67	94.5	6.00	4.97		
Total BTX	<0.300	0.300	08/26/2014	ND						

Surrogate: 4-Bromofluorobenzene (PID) 105 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	352	16.0	08/21/2014	ND	416	104	400	3.92	

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	08/27/2014	ND	200	100	200	3.05	
DRO >C10-C28	22.3	10.0	08/27/2014	ND	215	108	200	5.60	
EXT DRO >C28-C35	10.8	10.0	08/27/2014	ND					

Surrogate: 1-Chlorooctane 120 % 65.2-140

Surrogate: 1-Chlorooctadecane 129 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

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Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/20/2014  
Reported: 08/27/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/19/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: S. WALL #3 (H402548-08)**

BTEx 8021B		mg/kg		Analyzed By: ck						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	08/26/2014	ND	1.82	91.1	2.00	6.10		
Toluene*	<0.050	0.050	08/26/2014	ND	1.70	84.9	2.00	5.49		
Ethylbenzene*	<0.050	0.050	08/26/2014	ND	1.92	95.8	2.00	4.27		
Total Xylenes*	<0.150	0.150	08/26/2014	ND	5.67	94.5	6.00	4.97		
Total BTEx	<0.300	0.300	08/26/2014	ND						

Surrogate: 4-Bromofluorobenzene (PID) 105 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	128	16.0	08/21/2014	ND	416	104	400	3.92	

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	08/27/2014	ND	200	100	200	3.05	
DRO >C10-C28	<10.0	10.0	08/27/2014	ND	215	108	200	5.60	
EXT DRO >C28-C35	<10.0	10.0	08/27/2014	ND					

Surrogate: 1-Chlorooctane 124 % 65.2-140

Surrogate: 1-Chlorooctadecane 139 % 63.6-154

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BEN J. ARGUIJO  
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Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/20/2014  
Reported: 08/27/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/19/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: E. WALL #1 (H402548-09)**

BTX 8021B		mg/kg		Analyzed By: ck					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/26/2014	ND	1.82	91.1	2.00	6.10	
Toluene*	<0.050	0.050	08/26/2014	ND	1.70	84.9	2.00	5.49	
Ethylbenzene*	<0.050	0.050	08/26/2014	ND	1.92	95.8	2.00	4.27	
Total Xylenes*	<0.150	0.150	08/26/2014	ND	5.67	94.5	6.00	4.97	
Total BTX	<0.300	0.300	08/26/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 104 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	336	16.0	08/21/2014	ND	416	104	400	3.92	

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	08/27/2014	ND	200	100	200	3.05	
DRO >C10-C28	10.9	10.0	08/27/2014	ND	215	108	200	5.60	
EXT DRO >C28-C35	<10.0	10.0	08/27/2014	ND					

Surrogate: 1-Chlorooctane 117 % 65.2-140

Surrogate: 1-Chlorooctadecane 134 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager



**Notes and Definitions**

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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\*=Accredited Analyte

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 client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (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 arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



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Celey D. Keene, Lab Director/Quality Manager



**(575) 393-2326 FAX (575) 393-2476**

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

[illegible]

**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 analyses. 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 arising out of or related to 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: <i>Steve Taylor</i> Date: <i>8/19/14</i> Time: <i>1700</i>		Received By: <i>[Signature]</i> Date: <i>8/20/14</i> Time: <i>0900</i>		Phone Result: <input type="checkbox"/> Yes <input type="checkbox"/> No Fax Result: <input type="checkbox"/> Yes <input type="checkbox"/> No Add'l Phone #: Add'l Fax #: REMARKS:  ****Run TPH if Cl- is <= 1,000; Run BTEX if TPH is <= 5,000****  Please email results to Ben Arguijo, Tony Savoie, Amy Ruth, and Jody Walters	
Relinquished By: <i>[Signature]</i> Date: <i>8/20/14</i> Time: <i>0900</i>		Received By: <i>Linda Blackwood</i> Date: <i>8/20/14</i> Time: <i>0900</i>		REMARKS:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other: <i>Linda Blackwood</i>		Sample Condition Cool Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No		CHECKED BY: (Initials) <i>[Signature]</i>	

Revision 1.0

Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476

#54



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

---

August 28, 2014

BEN J. ARGUIJO

Basin Environmental Service

P.O. Box 301

Lovington, NM 88260

RE: BASS 3 FEDERAL #4

Enclosed are the results of analyses for samples received by the laboratory on 08/22/14 13:45.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. 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:**

Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/22/2014  
Reported: 08/28/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/20/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: DT-1 @ 11' (H402592-01)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1920	16.0	08/26/2014	ND	400	100	400	3.92	

**Sample ID: DT-1 @ 13' (H402592-02)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1330	16.0	08/26/2014	ND	400	100	400	3.92	

**Sample ID: DT-1 @ 15' (H402592-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1100	16.0	08/26/2014	ND	400	100	400	3.92	

**Sample ID: DT-1 @ 18' (H402592-04)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	320	16.0	08/26/2014	ND	400	100	400	3.92	

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/22/2014  
Reported: 08/28/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/20/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: DT-1 @ 20' (H402592-05)**

BTX 8021B		mg/kg		Analyzed By: ck					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/27/2014	ND	1.89	94.6	2.00	2.67	
Toluene*	<0.050	0.050	08/27/2014	ND	1.74	87.0	2.00	2.01	
Ethylbenzene*	<0.050	0.050	08/27/2014	ND	1.99	99.5	2.00	3.12	
Total Xylenes*	<0.150	0.150	08/27/2014	ND	5.95	99.2	6.00	3.35	
Total BTX	<0.300	0.300	08/27/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 105 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	336	16.0	08/26/2014	ND	400	100	400	3.92	

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	08/27/2014	ND	200	99.9	200	1.16	
DRO >C10-C28	10.6	10.0	08/27/2014	ND	205	103	200	0.134	
EXT DRO >C28-C35	<10.0	10.0	08/27/2014	ND					

Surrogate: 1-Chlorooctane 120 % 65.2-140

Surrogate: 1-Chlorooctadecane 137 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

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





# CARDINAL LABORATORIES

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

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

<b>Company Name:</b> Basin Environmental Service Technologies, LLC <b>Project Manager:</b> Ben Arguijo <b>Address:</b> P.O. Box 301 <b>City:</b> Lovington <b>State:</b> NM <b>Zip:</b> 88260 <b>Phone #:</b> (575)396-2378 <b>Fax #:</b> (575)396-1429 <b>Project #:</b> <b>Project Owner:</b> BOPCO <b>Project Name:</b> Bass 3 Federal #4 <b>Project Location:</b> Eddy Co., NM <b>Sampler Name:</b> Steve Taylor				<b>BILL TO</b> <b>P.O. #:</b> <b>Company:</b> BOPCO, LP <b>Attn:</b> Tony Savoie <b>Address:</b> 522 W. Marland <b>City:</b> Carlsbad <b>State:</b> NM <b>Zip:</b> 88220 <b>Phone #:</b> (432)556-8730 <b>Fax #:</b>				<b>ANALYSIS REQUEST</b>																	
<b>FOR LAB USE ONLY</b> <b>Lab I.D.</b> <b>Sample I.D.</b>				<b>(G)RAB OR (C)OMP.</b> <b># CONTAINERS</b>		<b>MATRIX</b> GROUNDWATER WASTEWATER SOIL OIL SLUDGE OTHER:				<b>PRESERV.</b> ACID/BASE: ICE / COOL OTHER:		<b>SAMPLING</b> <b>DATE</b> <b>TIME</b>		Chloride TPH (8015M) BTEX (8021B)											
HH02592				G 1		X				X		8/20/14 1230		X											
1 DT-1 DT @ 11'				G 1		X				X		8/20/14 1245		X											
2 DT-1 DT @ 13'				G 1		X				X		8/20/14 1320		X											
3 DT-1 DT @ 15'				G 1		X				X		8/20/14 1345		X											
4 DT-1 DT @ 18'				G 1		X				X		8/20/14 1410		X X X											
5 DT-1 DT @ 20'				G 1		X				X		8/20/14 1410		X X X											

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<b>Relinquished By:</b> Steve Taylor		<b>Date:</b> 8/20/14 <b>Time:</b> 1700		<b>Received By:</b> Jodi Henson		<b>Phone Result:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Add'l Phone #:</b> <b>Fax Result:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Add'l Fax #:</b> <b>REMARKS:</b> 8/27/14 changed name	
<b>Relinquished By:</b> [Signature]		<b>Date:</b> 8/27/14 <b>Time:</b> 1:45		<b>Received By:</b> Jodi Henson		Please email results to Ben Arguijo, Tony Savoie, Amy Ruth, and Jody Walters	
<b>Delivered By: (Circle One)</b> Sampler - UPS - Bus - Other:		Sample Condition Cool / Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		CHECKED BY: (Initials)		-40	



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

---

September 03, 2014

BEN J. ARGUIJO

Basin Environmental Service

P.O. Box 301

Lovington, NM 88260

RE: BASS 3 FEDERAL #4

Enclosed are the results of analyses for samples received by the laboratory on 08/28/14 11:30.

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Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

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Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive style with a large, stylized 'C' and 'K'.

Celey D. Keene

Lab Director/Quality Manager



**Analytical Results For:**

Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/28/2014  
Reported: 09/03/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/26/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: DT-2 @ 6' (H402650-01)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	11900	16.0	08/29/2014	ND	400	100	400	3.92	

**Sample ID: DT-2 @ 8' (H402650-02)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	19000	16.0	08/29/2014	ND	400	100	400	3.92	

**Sample ID: DT-2 @ 13' (H402650-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	8800	16.0	08/29/2014	ND	400	100	400	3.92	

**Sample ID: DT-2 @ 15' (H402650-04)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2200	16.0	08/29/2014	ND	400	100	400	3.92	

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/28/2014  
Reported: 09/03/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/26/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: DT-2 @ 17' (H402650-05)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1170	16.0	08/29/2014	ND	400	100	400	3.92	

**Sample ID: DT-2 @ 20' (H402650-06)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	848	16.0	08/29/2014	ND	400	100	400	3.92	

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 BEN J. ARGUIJO  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

 Received: 08/28/2014  
 Reported: 09/03/2014  
 Project Name: BASS 3 FEDERAL #4  
 Project Number: NONE GIVEN  
 Project Location: EDDY CO, NM

 Sampling Date: 08/26/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: DT-2 @ 21' (H402650-07)**

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	09/02/2014	ND	1.71	85.6	2.00	10.8	
Toluene*	<0.050	0.050	09/02/2014	ND	1.58	78.9	2.00	10.1	
Ethylbenzene*	<0.050	0.050	09/02/2014	ND	1.76	87.8	2.00	11.2	
Total Xylenes*	<0.150	0.150	09/02/2014	ND	5.24	87.3	6.00	11.1	
Total BTEx	<0.300	0.300	09/02/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 104 % 89.4-126

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	352	16.0	08/29/2014	ND	400	100	400	3.92		

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	08/30/2014	ND	177	88.7	200	9.49	
DRO >C10-C28	<10.0	10.0	08/30/2014	ND	180	90.0	200	14.2	
EXT DRO >C28-C35	<10.0	10.0	08/30/2014	ND					

Surrogate: 1-Chlorooctane 109 % 65.2-140

Surrogate: 1-Chlorooctadecane 133 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

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RPD	Relative Percent Difference
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---

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---

Celey D. Keene, Lab Director/Quality Manager



## Page 6 of 6

#54

September 03, 2014

BEN J. ARGUIJO

Basin Environmental Service

P.O. Box 301

Lovington, NM 88260

RE: BASS 3 FEDERAL #4

Enclosed are the results of analyses for samples received by the laboratory on 08/28/14 11:30.

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Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

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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,



Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

Basin Environmental Service  
BEN J. ARGUIJO  
P.O. Box 301  
Lovington NM, 88260  
Fax To: (575) 396-1429

Received: 08/28/2014  
Reported: 09/03/2014  
Project Name: BASS 3 FEDERAL #4  
Project Number: NONE GIVEN  
Project Location: EDDY CO, NM

Sampling Date: 08/27/2014  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: N. WALL #2 (H402649-01)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	592	16.0	08/29/2014	ND	400	100	400	3.92	

**Sample ID: N. WALL #3 (H402649-02)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	720	16.0	08/29/2014	ND	400	100	400	3.92	

Cardinal Laboratories

\*=Accredited Analyte

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 client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (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 arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

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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### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

[illegible]

† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476