

# SITE CHARACTERIZATION AND REMEDATION WORK PLAN

BE-7-4 Loop  
Eddy County, New Mexico

Prepared for:



370 17<sup>th</sup> St., Suite 2500  
Denver, CO 80202

*Prepared by:*



6899 Pecos Street, Unit C  
Denver, Colorado 80221

**December 20, 2016**

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## 1. INTRODUCTION

Tasman Geosciences, Inc. (Tasman) has prepared this Site Characterization and Remediation Work Plan (SCRWP) on behalf of DCP Midstream, LP (DCP) to document the results of field activities that were conducted to characterize subsurface soil conditions at the BE-7-4 Loop (Site) located in Eddy County, New Mexico (Figure 1). The Site characterization activities discussed herein were completed on December 6 and 7, 2016, and recommendations for the Site have been included.

## 2. SITE CHARACTERIZATION

The Site is located in New Mexico Oil Conservation Division (OCD) District 2 within the northwest quarter of the northeast quarter of section 24, township 24 south, range 26 east of the Sixth Principal Meridian [Figure 1]). The facility coordinates are 32.205879 degrees north and -104.246771 degrees west.

Subsequent to surfacing of condensate material from an apparent subsurface leak, DCP mobilized to the Site and removed visually impacted soil and located and repaired the line leak. Backfilling of the excavation was conducted and the line was activated. In accordance with the New Mexico Oil and Gas Conservation Commission (NMOCD) *Guidelines for Remediation of Leaks, Spills, and Releases (GRLSR)*, DCP submitted a C-141 Release Notification and Corrective Action Form for the Site.

During the initial Site assessment, it was determined that a domestic groundwater well (C-03777-POD1) for the private residence adjacent to the Site was located approximately 200 feet south east of the release area. The water well is completed to 55 feet below ground surface (bgs) and the perforated screened interval is located between 35 feet bgs and 55 feet bgs. The static groundwater level is recorded at 28 feet bgs. On November 30, 2016, a grab sample was collected from the water well and submitted to Cardinal Laboratories (Cardinal) in Hobbs, New Mexico for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) using USEPA Method 8021B. The analytical results for the water sample were below laboratory detection limits and State Action Levels for all constituents. The laboratory analytical report is included in Appendix A.

On December 6 and 7, 2016, drilling activities at the Site were conducted using a combination of direct push and hand augur drilling methods. Major soil types were identified using the Unified Soil Classification System (USCS) and secondary characteristics such as grain size distribution, moisture content, density/plasticity, and visual/olfactory impacts were noted during borehole logging and soil sampling activities. Soil boring logs are included in Appendix B and the borehole global positioning system (GPS) coordinate locations were collected and are illustrated on Figure 2. Based on drilling and soil sampling, the Site subsurface typically consists of fine sand, silt, and some clay. Groundwater was not encountered within any of the borings that were conducted.

During direct push drilling activities, a one quart zip-lock bag was filled half full with an aliquot of soil from the boring. Traditional headspace sampling techniques approved by the NMOCD were applied and the samples were analyzed in the field for volatile organic compound (VOC) concentrations using a photoionization detector (PID). Soil samples were collected from select drilling locations as illustrated on Figure 3 and were appropriately packaged and submitted under chain of custody procedures to Cardinal Laboratories in Hobbs, New Mexico for analysis of BTEX using USEPA Method 8021B and total petroleum hydrocarbons gasoline range organics (TPH-GRO) and TPH diesel range organics (DRO) using USEPA Method 8015. Additionally, two samples that were observed to have high PID readings were collected for Chloride analysis using USEPA Method 8015M.

Soil impacts exceeding one or more of the NMOCD Action Levels for the Site were confirmed by PID readings and laboratory analysis in the vicinity of the source area at BH06 between five and 14 feet bgs. Soil sample BH06@14-15' was collected at that location and confirmed that petroleum hydrocarbon impacts above NMOCD Action Levels did not extend below 14 feet bgs. Additionally, elevated PID readings were observed at BH11 between just below the surface and seven feet bgs. Based on those observations, it is assumed that the soil within the vicinity of BH11 between the surface and seven feet bgs is above NMOCD Action Levels and soil samples for laboratory analysis were not collected. However, as presented in the boring log for BH11 and displayed on Figure 3, PID readings of 56.2 and 13.9 were observed at eight and nine feet bgs, respectively, indicating that the vertical extents of petroleum hydrocarbon impacts were delineated.

Due to the non-detect laboratory analytical results and corresponding PID readings that were collected from BH08 and BH12, soil samples from BH10, BH13, and BH14 were not collected for laboratory analysis. Based on the corresponding PID readings from BH10, BH13, and BH14 compared to those collected at BH08 and BH12 and the resulting laboratory analytical results, petroleum hydrocarbon impacts above NMOCD Action Levels are not present at those locations.

Chlorides were observed above the NMOCD guideline of 250 milligrams per kilogram within borehole BH06 at 5-feet bgs. The chloride sample that was collected from BH03 between one and four feet bgs was below the guideline with a detected concentration of 48 milligrams per kilogram (mg/kg). The soil sample laboratory analytical results are summarized in Table 1, displayed on Figure 3, and the laboratory analytical reports are included in Appendix C.

To assess the potential for impact to human, environmental, and cultural receptors, aerial photographs and online directories were consulted and a visual reconnaissance of the surrounding area was conducted. The Site is located south of Black River Village Road in a rural area surrounded by privately owned land. A private residence resides on the property approximately 100 feet south east of the release area. The nearest town of Carlsbad, New Mexico, is located approximately 12 miles north of the Site.

In accordance with Section IV of the *GRLSR*, soils which are contaminated by petroleum constituents are scored according to the ranking criteria summarized below to determine their relative threat to public health, fresh waters, and the environment. Based on the ranking criteria outlined in the *GRLSR*, the Site

has a maximum total ranking score of 40. Based on the ranking score, the soil action levels for the Site include:

- Benzene - 10 milligrams per kilogram (mg/kg).
- Total BTEX – 50 mg/kg; and,
- Total Petroleum Hydrocarbons (TPH) – 100 mg/kg.

Based on visual observations and a review of aerial photographs, surface water generally follows the Site topography to the south towards an unnamed intermittent riverine flood plain located approximately 1,060 feet south of the Site.

### **3. REMEDIATION WORK PLAN**

Physical and laboratory analysis confirm that soil impacts exceeding one or more of the NMOCD Cleanup Goals for the Site were exceeded. As summarized on Table 1 and presented on Figure 3, BTEX and TPH exceedances were observed between just below the surface to approximately 14 feet bgs in the vicinity of BH06 and to approximately seven feet bgs within the vicinity of BH11. However, the vertical extents of petroleum hydrocarbon impacts were confirmed through laboratory analysis and PID readings that were collected at those locations. Chlorides were observed above the NMOCD guideline of 250 mg/kg within borehole BH06 at 5-feet bgs but were below the guideline at BH03. Based on the information that has been gathered through the field activities described herein and the estimated extent of BTEX and TPH impacted soils, approximately 300 cubic yards (cy) of petroleum hydrocarbon impacted material is present at the Site.

Groundwater was not encountered during any of the field activities described herein. Based on the grab sample that was collected from the domestic well for the private residence which is screened within the shallow water bearing zone, groundwater below the Site is not impacted. Additionally, based on the soil sample laboratory analytical data and PID readings that were collected, the vertical extents of petroleum hydrocarbon impacted soil have been delineated and do not extend to the static groundwater interval below the Site.

Due to the relatively small amount of petroleum hydrocarbon impacted soil as well as the location and lateral and vertical extents of the impacts, mechanical excavation and subsequent disposal at an approved facility has been chosen as the preferred remedial alternative for this Site. Excavated soil will be transported under manifesting procedures to the Lea Land Inc. Landfill in Eddy County, NM. Excavated soil will be field screened using PID headspace sampling techniques and soil samples from the excavation sidewalls and base will be collected to verify that impacted soil is completely removed. Soil samples will be submitted to Cardinal for laboratory analysis of BTEX using USEPA Method 8021B and TPH-GRO/DRO using USEPA Method 8015. Once clean extents have been verified through laboratory analysis, clean backfill material will be backfilled and compacted within the open excavation in 1-foot lifts.

## Tables

**TABLE 1**  
**DCP BE-7-4 LOOP**  
**SOIL ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Depth (Feet bgs)	PID Readings (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH - GRO (mg/kg)	TPH - DRO (mg/kg)	TPH <sup>(2)</sup> GRO/DRO (mg/kg)	Chloride (mg/kg)
BH01 @ 11-15'	12/6/2016	11-15	3.9	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH02 @ 12-15'	12/6/2016	12-15	2.8	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH03 @ 1-4'	12/6/2016	1-4	2,367.0	<0.050	0.207	0.125	0.748	1.08	<10.0	<10.0	<10.0	48
BH03 @ 11-13'	12/6/2016	11-13	234.2	0.055	0.322	0.205	0.906	1.49	<10.0	<10.0	<10.0	NA
BH04 @ 5-8'	12/6/2016	5-8	44.9	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH05 @ 5-6'	12/6/2016	5-6	222.3	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH05 @ 14-15'	12/6/2016	14-15	70.8	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH06 @ 5-10'	12/6/2016	5-10	2,298.0	<b>44.6</b>	179	37.3	174	<b>435</b>	<b>8,030</b>	<b>314</b>	<b>8,344</b>	NA
BH06 @ 14-15'	12/6/2016	14-15	24.7	0.520	0.876	0.071	0.300	1.77	17.7	<10.0	17.7	NA
BH06 @ 5'	12/7/2016	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<b>800</b>
BH07 @ 0-5'	12/6/2016	0-5	29.0	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH07 @ 12-15'	12/6/2016	12-15	16.8	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH08 @ 2'	12/6/2016	2	503.0	<0.050	0.066	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH09 @ 0-4'	12/7/2016	0-4	101.0	<0.050	0.092	<0.050	0.289	0.381	<10.0	<10.0	<10.0	NA
BH09 @ 14.5-16'	12/7/2016	14.5-16	19.4	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH12 @ 4-5'	12/7/2016	4-5	876.0	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH12 @ 9-12'	12/7/2016	9-12	1.7	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH15 @ 0-1'	12/7/2016	0-1	151.8	<0.050	0.077	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
BH15 @ 8-9'	12/7/2016	8-9	35.9	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	NA
<b>NMOCD Action Levels - Soil (mg/kg) <sup>(1)</sup></b>				<b>10</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>50</b>	<b>NA</b>	<b>NA</b>	<b>100</b>	<b>250</b>

Notes:

1). Standards for Soil are taken from NMOCD Guidelines for Remediation of Leaks, Spills and Releases, 1993, total ranking >19

2). TPH - Total volatile and extractable petroleum hydrocarbons. Value calculated by adding GRO and DRO concentrations.

**Bold** indicates concentration exceeds NMOCD Action Levels.

GRO - Gasoline range organics.

DRO - Diesel range organics.

mg/kg= Milligrams per kilogram.

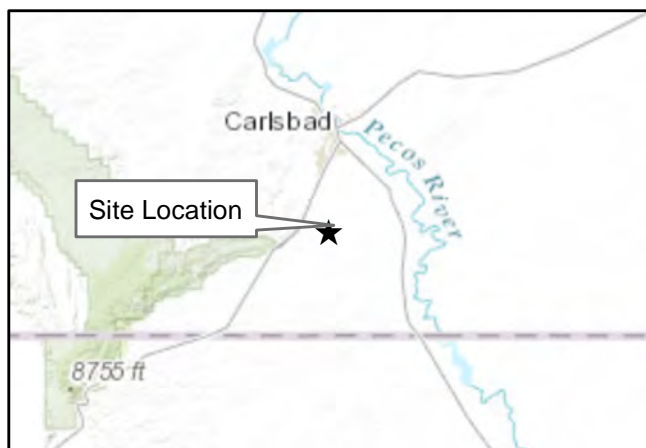
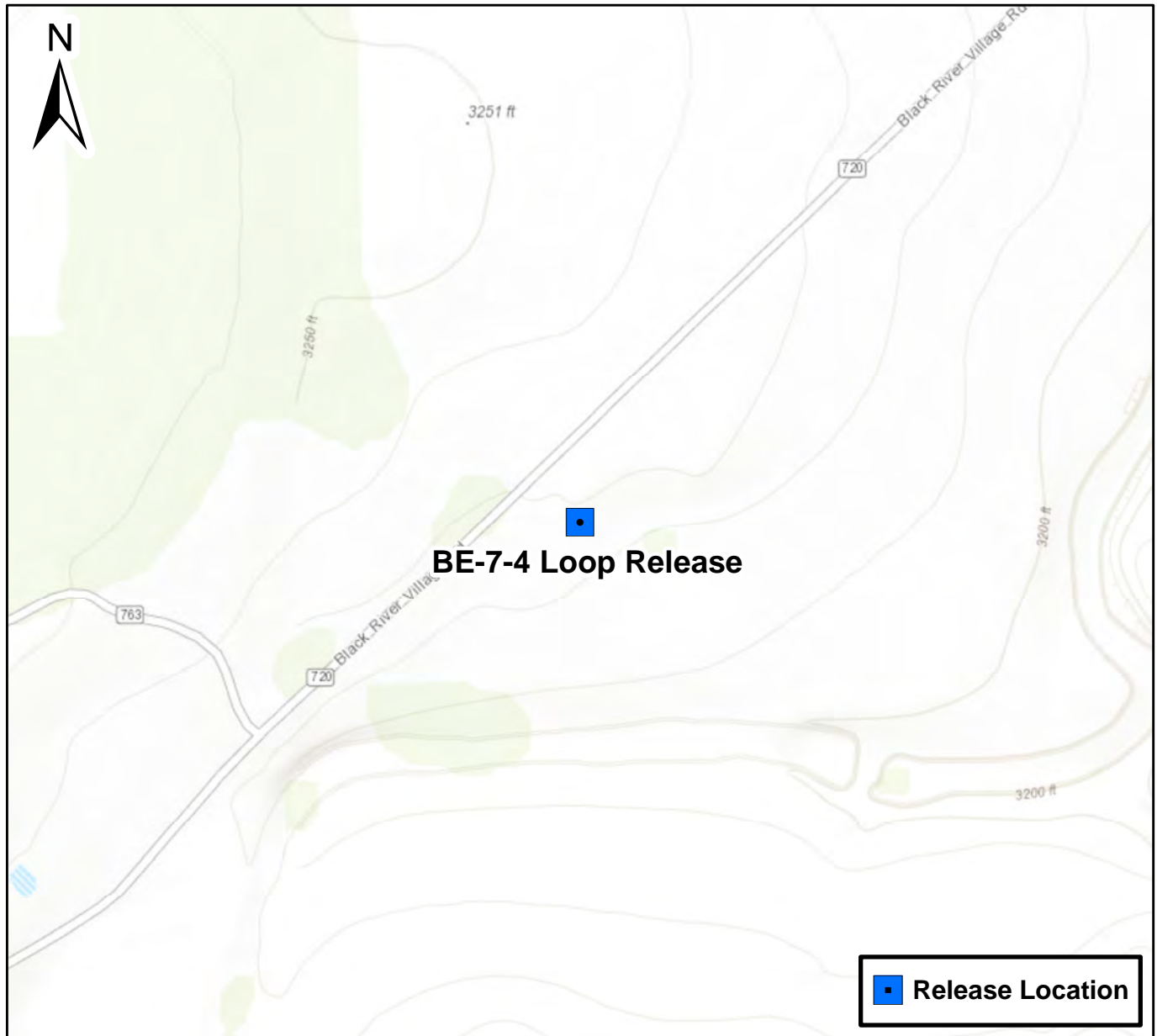
bgs - Below ground surface.

ppm - Parts per million

NA - Not applicable

## Figures





0 750 1,500 Feet

## Figure 1

Site Location Map  
 BE-7-4 Loop Release  
 NWNE S24 T24S R26E  
 Carlsbad, New Mexico







DATE:	December 9, 2016
DESIGNED BY:	B. Humphrey
DRAWN BY:	D. Arnold



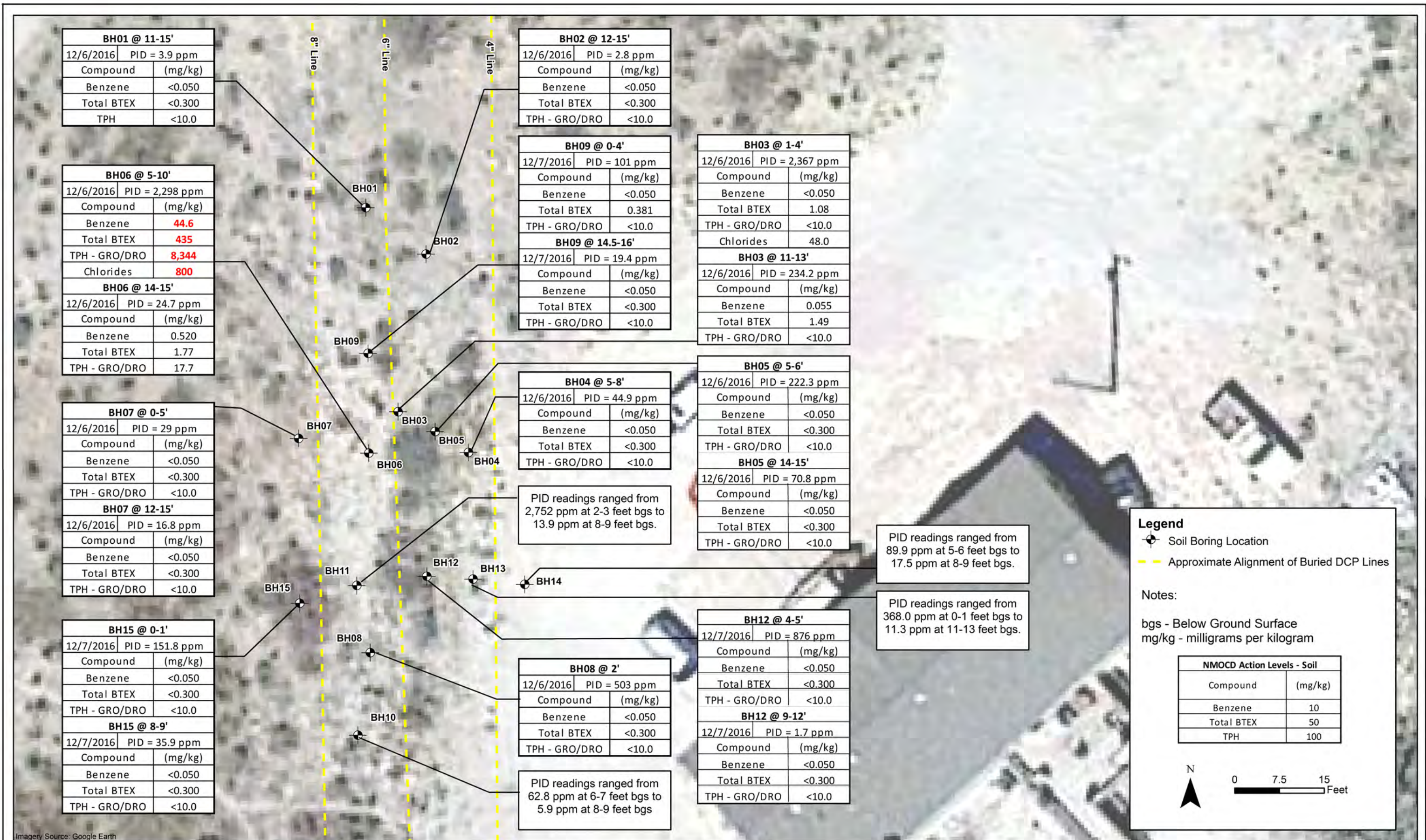
Tasman Geosciences, LLC  
6899 Pecos Street - Unit C  
Denver, CO 80221

**DCP Midstream**  
**BE-7-4 Loop Release**  
NWNE, Section 24, Township 24 South, Range 26 East  
Carlsbad, New Mexico

Site And Borehole Location  
Map

Figure  
2





DATE:  
December 9, 2016

DESIGNED BY:  
B. Humphrey

DRAWN BY:  
D. Arnold



Tasman Geosciences, LLC  
6899 Pecos Street - Unit C  
Denver, CO 80221

**DCP Midstream  
BE-7-4 Loop Release**  
NWNE, Section 24, Township 24 South, Range 26 East  
Carlsbad, New Mexico

Soil Sample Analytical  
Summary Map

Figure  
3





DATE:	December 9, 2016
DESIGNED BY:	B. Humphrey
DRAWN BY:	D. Arnold



**TASMAN**  
GEOSCIENCES

Tasman Geosciences, LLC  
6899 Pecos Street - Unit C  
Denver, CO 80221

**DCP Midstream  
BE-7-4 Loop Release**  
NWNE, Section 24, Township 24 South, Range 26 East  
Carlsbad, New Mexico

Anticipated Extents of Impacted  
Soil Excavation Area

Figure  
4

## Appendix A





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

---

December 01, 2016

STEVE WEATHERS

DCP Midstream - Hobbs

1625 W. MARLAND

Hobbs, NM 88240

RE: BE-7-4 LOOP

Enclosed are the results of analyses for samples received by the laboratory on 11/30/16 19:20.

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,

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

DCP Midstream - Hobbs  
STEVE WEATHERS  
1625 W. MARLAND  
Hobbs NM, 88240  
Fax To: (575) 397-5598

Received: 11/30/2016  
Reported: 12/01/2016  
Project Name: BE-7-4 LOOP  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 11/30/2016  
Sampling Type: Water  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: DOMESTIC WELL (H602675-01)**

BTEX 8021B		mg/L		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	12/01/2016	ND	0.022	109	0.0200	0.494		
Toluene*	<0.001	0.001	12/01/2016	ND	0.023	113	0.0200	0.666		
Ethylbenzene*	<0.001	0.001	12/01/2016	ND	0.023	114	0.0200	0.0703		
Total Xylenes*	<0.003	0.003	12/01/2016	ND	0.069	115	0.0600	0.0880		
Total BTEX	<0.006	0.006	12/01/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 114 % 73.7-146

**Sample ID: TRIP BLANK (H602675-02)**

BTEX 8021B		mg/L		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	12/01/2016	ND	0.022	109	0.0200	0.494		
Toluene*	<0.001	0.001	12/01/2016	ND	0.023	113	0.0200	0.666		
Ethylbenzene*	<0.001	0.001	12/01/2016	ND	0.023	114	0.0200	0.0703		
Total Xylenes*	<0.003	0.003	12/01/2016	ND	0.069	115	0.0600	0.0880		
Total BTEX	<0.006	0.006	12/01/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 114 % 73.7-146

Cardinal Laboratories

\*=Accredited Analyte

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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

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---

Celey D. Keene, Lab Director/Quality Manager





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

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

[illegible]



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

---

December 07, 2016

BRIAN HUMPHREY

TASMAN GEOSCIENCES

6899 PECOS ST. UNIT C

DENVER, CO 80221

RE: DCP - BE-7-4 LOOP

Enclosed are the results of analyses for samples received by the laboratory on 12/06/16 18:30.

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).

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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:**TASMAN GEOSCIENCES  
BRIAN HUMPHREY  
6899 PECOS ST. UNIT C  
DENVER CO, 80221  
Fax To:Received: 12/06/2016  
Reported: 12/07/2016  
Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NMSampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene**Sample ID: BH01 @ 11-15' (H602726-01)**

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	12/07/2016	ND	2.20	110	2.00	1.16	
Toluene*	<0.050	0.050	12/07/2016	ND	2.27	114	2.00	1.77	
Ethylbenzene*	<0.050	0.050	12/07/2016	ND	2.21	111	2.00	1.65	
Total Xylenes*	<0.150	0.150	12/07/2016	ND	6.74	112	6.00	1.55	
Total BTEX	<0.300	0.300	12/07/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 119 % 73.6-140

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	12/07/2016	ND	181	90.3	200	0.656	
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	175	87.5	200	7.16	

Surrogate: 1-Chlorooctane 91.0 % 35-147

Surrogate: 1-Chlorooctadecane 89.5 % 28-171

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TASMAN GEOSCIENCES  
BRIAN HUMPHREY  
6899 PECOS ST. UNIT C  
DENVER CO, 80221  
Fax To:

Received: 12/06/2016  
Reported: 12/07/2016  
Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH02 @ 12-15' (H602726-02)**

BTX 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	12/07/2016	ND	2.20	110	2.00	1.16		
Toluene*	<0.050	0.050	12/07/2016	ND	2.27	114	2.00	1.77		
Ethylbenzene*	<0.050	0.050	12/07/2016	ND	2.21	111	2.00	1.65		
Total Xylenes*	<0.150	0.150	12/07/2016	ND	6.74	112	6.00	1.55		
Total BTX	<0.300	0.300	12/07/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 118 % 73.6-140

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	12/07/2016	ND	181	90.3	200	0.656		
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	175	87.5	200	7.16		

Surrogate: 1-Chlorooctane 94.0 % 35-147

Surrogate: 1-Chlorooctadecane 95.0 % 28-171

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TASMAN GEOSCIENCES  
BRIAN HUMPHREY  
6899 PECOS ST. UNIT C  
DENVER CO, 80221  
Fax To:

Received: 12/06/2016  
Reported: 12/07/2016  
Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH03 @ 1-4' (H602726-03)**

BTX 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	12/07/2016	ND	2.20	110	2.00	1.16	
Toluene*	0.207	0.050	12/07/2016	ND	2.27	114	2.00	1.77	
Ethylbenzene*	0.125	0.050	12/07/2016	ND	2.21	111	2.00	1.65	
Total Xylenes*	0.748	0.150	12/07/2016	ND	6.74	112	6.00	1.55	
Total BTX	1.08	0.300	12/07/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 119 % 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	48.0	16.0	12/07/2016	ND	416	104	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	12/07/2016	ND	181	90.3	200	0.656	
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	175	87.5	200	7.16	

Surrogate: 1-Chlorooctane 83.2 % 35-147

Surrogate: 1-Chlorooctadecane 71.8 % 28-171

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Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH03 @ 11-13' (H602726-04)**

BTEx 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	0.055	0.050	12/07/2016	ND	2.20	110	2.00	1.16	
Toluene*	0.322	0.050	12/07/2016	ND	2.27	114	2.00	1.77	
Ethylbenzene*	0.205	0.050	12/07/2016	ND	2.21	111	2.00	1.65	
Total Xylenes*	0.906	0.150	12/07/2016	ND	6.74	112	6.00	1.55	
Total BTEX	1.49	0.300	12/07/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 123 % 73.6-140

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	12/07/2016	ND	181	90.3	200	0.656	
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	175	87.5	200	7.16	

Surrogate: 1-Chlorooctane 85.1 % 35-147

Surrogate: 1-Chlorooctadecane 78.0 % 28-171

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Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH04 @ 5-8' (H602726-05)**

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	12/07/2016	ND	2.20	110	2.00	1.16	
Toluene*	<0.050	0.050	12/07/2016	ND	2.27	114	2.00	1.77	
Ethylbenzene*	<0.050	0.050	12/07/2016	ND	2.21	111	2.00	1.65	
Total Xylenes*	<0.150	0.150	12/07/2016	ND	6.74	112	6.00	1.55	
Total BTEX	<0.300	0.300	12/07/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 118 % 73.6-140

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	12/07/2016	ND	181	90.3	200	0.656	
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	175	87.5	200	7.16	

Surrogate: 1-Chlorooctane 83.5 % 35-147

Surrogate: 1-Chlorooctadecane 75.9 % 28-171

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Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH05 @ 5-6' (H602726-06)**

BTX 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	12/07/2016	ND	2.20	110	2.00	1.16		
Toluene*	<0.050	0.050	12/07/2016	ND	2.27	114	2.00	1.77		
Ethylbenzene*	<0.050	0.050	12/07/2016	ND	2.21	111	2.00	1.65		
Total Xylenes*	<0.150	0.150	12/07/2016	ND	6.74	112	6.00	1.55		
Total BTX	<0.300	0.300	12/07/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 119 % 73.6-140

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	12/07/2016	ND	181	90.3	200	0.656		
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	175	87.5	200	7.16		

Surrogate: 1-Chlorooctane 82.5 % 35-147

Surrogate: 1-Chlorooctadecane 80.5 % 28-171

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Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH05 @ 14-15' (H602726-07)**

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	12/07/2016	ND	2.20	110	2.00	1.16	
Toluene*	<0.050	0.050	12/07/2016	ND	2.27	114	2.00	1.77	
Ethylbenzene*	<0.050	0.050	12/07/2016	ND	2.21	111	2.00	1.65	
Total Xylenes*	<0.150	0.150	12/07/2016	ND	6.74	112	6.00	1.55	
Total BTEX	<0.300	0.300	12/07/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 118 % 73.6-140

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	12/07/2016	ND	181	90.3	200	0.656	
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	175	87.5	200	7.16	

Surrogate: 1-Chlorooctane 86.4 % 35-147

Surrogate: 1-Chlorooctadecane 84.9 % 28-171

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Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH06 @ 5-10' (H602726-08)**

BTEx 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	44.6	10.0	12/07/2016	ND	2.20	110	2.00	1.16	
Toluene*	179	10.0	12/07/2016	ND	2.27	114	2.00	1.77	
Ethylbenzene*	37.3	10.0	12/07/2016	ND	2.21	111	2.00	1.65	
Total Xylenes*	174	30.0	12/07/2016	ND	6.74	112	6.00	1.55	
Total BTEx	435	60.0	12/07/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 120 % 73.6-140

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	8030	10.0	12/07/2016	ND	181	90.3	200	0.656	
DRO >C10-C28	314	10.0	12/07/2016	ND	175	87.5	200	7.16	

Surrogate: 1-Chlorooctane 123 % 35-147

Surrogate: 1-Chlorooctadecane 72.5 % 28-171

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Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH06 @ 14-15' (H602726-09)**

BTEx 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Benzene*</b>	<b>0.520</b>	0.050	12/07/2016	ND	2.20	110	2.00	1.16	
<b>Toluene*</b>	<b>0.876</b>	0.050	12/07/2016	ND	2.27	114	2.00	1.77	
<b>Ethylbenzene*</b>	<b>0.071</b>	0.050	12/07/2016	ND	2.21	111	2.00	1.65	
<b>Total Xylenes*</b>	<b>0.300</b>	0.150	12/07/2016	ND	6.74	112	6.00	1.55	
<b>Total BTEX</b>	<b>1.77</b>	0.300	12/07/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 119 % 73.6-140

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>17.7</b>	10.0	12/07/2016	ND	181	90.3	200	0.656	
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	175	87.5	200	7.16	

Surrogate: 1-Chlorooctane 85.7 % 35-147

Surrogate: 1-Chlorooctadecane 87.0 % 28-171

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Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH07 @ 0-5' (H602726-10)**

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	12/07/2016	ND	2.20	110	2.00	1.16	
Toluene*	<0.050	0.050	12/07/2016	ND	2.27	114	2.00	1.77	
Ethylbenzene*	<0.050	0.050	12/07/2016	ND	2.21	111	2.00	1.65	
Total Xylenes*	<0.150	0.150	12/07/2016	ND	6.74	112	6.00	1.55	
Total BTEX	<0.300	0.300	12/07/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 119 % 73.6-140

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	12/07/2016	ND	191	95.6	200	1.99	
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	195	97.6	200	4.39	

Surrogate: 1-Chlorooctane 84.5 % 35-147

Surrogate: 1-Chlorooctadecane 71.8 % 28-171

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Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH07 @ 12-15' (H602726-11)**

BTX 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	12/07/2016	ND	2.20	110	2.00	1.16	
Toluene*	<0.050	0.050	12/07/2016	ND	2.27	114	2.00	1.77	
Ethylbenzene*	<0.050	0.050	12/07/2016	ND	2.21	111	2.00	1.65	
Total Xylenes*	<0.150	0.150	12/07/2016	ND	6.74	112	6.00	1.55	
Total BTX	<0.300	0.300	12/07/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 118 % 73.6-140

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	12/07/2016	ND	191	95.6	200	1.99	
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	195	97.6	200	4.39	

Surrogate: 1-Chlorooctane 90.1 % 35-147

Surrogate: 1-Chlorooctadecane 84.3 % 28-171

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Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/06/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Celey D. Keene

**Sample ID: BH08 @ 2' (H602726-12)**

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	12/07/2016	ND	2.20	110	2.00	1.16		
<b>Toluene*</b>	<b>0.066</b>	0.050	12/07/2016	ND	2.27	114	2.00	1.77		
Ethylbenzene*	<0.050	0.050	12/07/2016	ND	2.21	111	2.00	1.65		
Total Xylenes*	<0.150	0.150	12/07/2016	ND	6.74	112	6.00	1.55		
Total BTEX	<0.300	0.300	12/07/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 117 % 73.6-140

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	12/07/2016	ND	191	95.6	200	1.99		
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	195	97.6	200	4.39		

Surrogate: 1-Chlorooctane 80.5 % 35-147

Surrogate: 1-Chlorooctadecane 73.4 % 28-171

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

### Notes and Definitions

QR-03	The RPD value for the sample duplicate or MS/MSD was outside if QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
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

---

Cardinal Laboratories

\*=Accredited Analyte

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---

Celey D. Keene, Lab Director/Quality Manager





CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

pg 1 of 2

BILL TO										ANALYSIS REQUEST																									
Company Name: <u>Tasman Geosciences</u>					P.O. #: <u>BE-7-4 Loop</u>																														
Project Manager: <u>Brian Humphrey / Hack Bender</u>					Company: <u>Tasman</u>																														
Address: <u>6890 Peers St. Unit C</u>					Attn: <u>Brian Humphrey</u>																														
City: <u>Denver</u>					Address: <u>humphrey@tasman-geo.com</u>																														
State: <u>CO</u> Zip: <u>80221</u>					City: <u>Evansville, IN</u>																														
Phone #: <u>720-633-5143</u> Fax #: _____					State: _____ Zip: _____																														
Project #: _____					Phone #: _____																														
Project Name: <u>OCB - BE-7-4 Loop</u>					Fax #: _____																														
Project Location: <u>Carlsbad, NM</u>																																			
Sample Name: <u>Brian Humphrey</u>																																			
FOR LAB USE ONLY																																			
Lab I.D.		Sample I.D.		(G)RAB OR (C)OMP.		# CONTAINERS		GROUNDWATER		WASTEWATER		SOIL		OIL		SLUDGE		OTHER :		ACID/BASE:		ICE / COOL		OTHER :		DATE		TIME		BTEX		TPH		CL	
H00276		3H01 @ 9-11-15'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		9:30		X		X		X	
01		3H02 @ 12-15'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		10:25		X		X		X	
02		3H03 @ 1-4'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		11:00		X		X		X	
03		3H03 @ 11-13'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		11:15		X		X		X	
04		3H04 @ 5-8'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		12:25		X		X		X	
05		3H05 @ 5-6'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		13:05		X		X		X	
06		3H05 @ 14-15'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		14:25		X		X		X	
07		3H06 @ 5-10'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		14:40		X		X		X	
08		3H06 @ 14-15'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		15:45		X		X		X	
09		3H06 @ 14-15'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		15:45		X		X		X	
10		3H07 @ 0-5'		6 1		X		X		X		X		X		X		X		X		X		X		12/6/16		15:45		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 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: hbk Date: 12-6-16 Received By: hbk Time: 6:30p

Delivered By: (Circle One) UPS 3.10c Sample Condition Cool Intact Yes Yes No No CHECKED BY: col #75

Sampler - UPS - Bus - Other: 3.10c

REMARKS: Email Results to: bhumphrey@tasman-geo.com  
hpcorder@depmidstream.com  
swenters@depmidstream.com  
Rush





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

pg 2 of 2

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December 08, 2016

BRIAN HUMPHREY

TASMAN GEOSCIENCES

6899 PECOS ST. UNIT C

DENVER, CO 80221

RE: DCP - BE-7-4 LOOP

Enclosed are the results of analyses for samples received by the laboratory on 12/07/16 15:07.

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,



Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

TASMAN GEOSCIENCES  
BRIAN HUMPHREY  
6899 PECOS ST. UNIT C  
DENVER CO, 80221  
Fax To:

Received: 12/07/2016  
Reported: 12/08/2016  
Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/07/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: BH 12 @ 4-5' (H602736-01)**

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	12/08/2016	ND	2.25	113	2.00	0.150	
Toluene*	<0.050	0.050	12/08/2016	ND	2.32	116	2.00	0.135	
Ethylbenzene*	<0.050	0.050	12/08/2016	ND	2.25	112	2.00	0.158	
Total Xylenes*	<0.150	0.150	12/08/2016	ND	6.81	114	6.00	0.229	
Total BTEX	<0.300	0.300	12/08/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 119 % 73.6-140

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	12/07/2016	ND	191	95.6	200	1.99		
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	195	97.6	200	4.39		

Surrogate: 1-Chlorooctane 94.1 % 35-147

Surrogate: 1-Chlorooctadecane 92.9 % 28-171

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TASMAN GEOSCIENCES  
BRIAN HUMPHREY  
6899 PECOS ST. UNIT C  
DENVER CO, 80221  
Fax To:

Received: 12/07/2016  
Reported: 12/08/2016  
Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/07/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: BH 12 @ 9-12' (H602736-02)**

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	12/08/2016	ND	2.25	113	2.00	0.150		
Toluene*	<0.050	0.050	12/08/2016	ND	2.32	116	2.00	0.135		
Ethylbenzene*	<0.050	0.050	12/08/2016	ND	2.25	112	2.00	0.158		
Total Xylenes*	<0.150	0.150	12/08/2016	ND	6.81	114	6.00	0.229		
Total BTEX	<0.300	0.300	12/08/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 119 % 73.6-140

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	12/07/2016	ND	191	95.6	200	1.99		
DRO >C10-C28	<10.0	10.0	12/07/2016	ND	195	97.6	200	4.39		

Surrogate: 1-Chlorooctane 96.9 % 35-147

Surrogate: 1-Chlorooctadecane 89.6 % 28-171

Cardinal Laboratories

\*=Accredited Analyte

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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





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## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

+ Cardinal cannot accept verbal changes. Please fax written changes to (575) 993-2326

December 08, 2016

BRIAN HUMPHREY

TASMAN GEOSCIENCES

6899 PECOS ST. UNIT C

DENVER, CO 80221

RE: DCP - BE-7-4 LOOP

Enclosed are the results of analyses for samples received by the laboratory on 12/07/16 17:25.

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,



Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

TASMAN GEOSCIENCES  
BRIAN HUMPHREY  
6899 PECOS ST. UNIT C  
DENVER CO, 80221  
Fax To:

Received: 12/07/2016  
Reported: 12/08/2016  
Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/07/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: BH 15 @ 0-1' (H602741-01)**

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	12/08/2016	ND	2.25	113	2.00	0.150		
Toluene*	0.077	0.050	12/08/2016	ND	2.32	116	2.00	0.135		
Ethylbenzene*	<0.050	0.050	12/08/2016	ND	2.25	112	2.00	0.158		
Total Xylenes*	<0.150	0.150	12/08/2016	ND	6.81	114	6.00	0.229		
Total BTEX	<0.300	0.300	12/08/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 119 % 73.6-140

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	12/08/2016	ND	191	95.6	200	1.99	
DRO >C10-C28	<10.0	10.0	12/08/2016	ND	195	97.6	200	4.39	

Surrogate: 1-Chlorooctane 72.6 % 35-147

Surrogate: 1-Chlorooctadecane 77.0 % 28-171

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

TASMAN GEOSCIENCES  
BRIAN HUMPHREY  
6899 PECOS ST. UNIT C  
DENVER CO, 80221  
Fax To:

Received: 12/07/2016  
Reported: 12/08/2016  
Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/07/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: BH 15 @ 8-9' (H602741-02)**

BTX 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	12/08/2016	ND	2.25	113	2.00	0.150	
Toluene*	<0.050	0.050	12/08/2016	ND	2.32	116	2.00	0.135	
Ethylbenzene*	<0.050	0.050	12/08/2016	ND	2.25	112	2.00	0.158	
Total Xylenes*	<0.150	0.150	12/08/2016	ND	6.81	114	6.00	0.229	
Total BTX	<0.300	0.300	12/08/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 119 % 73.6-140

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	12/08/2016	ND	191	95.6	200	1.99	
DRO >C10-C28	<10.0	10.0	12/08/2016	ND	195	97.6	200	4.39	

Surrogate: 1-Chlorooctane 74.8 % 35-147

Surrogate: 1-Chlorooctadecane 71.5 % 28-171

**Sample ID: BH 06 @ 5' (H602741-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	800	16.0	12/08/2016	ND	416	104	400	0.00	

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TASMAN GEOSCIENCES  
BRIAN HUMPHREY  
6899 PECOS ST. UNIT C  
DENVER CO, 80221  
Fax To:

Received: 12/07/2016  
Reported: 12/08/2016  
Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/07/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: BH 09 @ 0-4' (H602741-04)**

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	12/08/2016	ND	2.25	113	2.00	0.150	
Toluene*	0.092	0.050	12/08/2016	ND	2.32	116	2.00	0.135	
Ethylbenzene*	<0.050	0.050	12/08/2016	ND	2.25	112	2.00	0.158	
Total Xylenes*	0.289	0.150	12/08/2016	ND	6.81	114	6.00	0.229	
Total BTEX	0.381	0.300	12/08/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 119 % 73.6-140

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	12/08/2016	ND	191	95.6	200	1.99	
DRO >C10-C28	<10.0	10.0	12/08/2016	ND	195	97.6	200	4.39	

Surrogate: 1-Chlorooctane 62.8 % 35-147

Surrogate: 1-Chlorooctadecane 51.7 % 28-171

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TASMAN GEOSCIENCES  
BRIAN HUMPHREY  
6899 PECOS ST. UNIT C  
DENVER CO, 80221  
Fax To:

Received: 12/07/2016  
Reported: 12/08/2016  
Project Name: DCP - BE-7-4 LOOP  
Project Number: BE-7-4 LOOP  
Project Location: CARLSBAD, NM

Sampling Date: 12/07/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: BH 09 @ 14.5-16' (H602741-05)**

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	12/08/2016	ND	2.25	113	2.00	0.150	
Toluene*	<0.050	0.050	12/08/2016	ND	2.32	116	2.00	0.135	
Ethylbenzene*	<0.050	0.050	12/08/2016	ND	2.25	112	2.00	0.158	
Total Xylenes*	<0.150	0.150	12/08/2016	ND	6.81	114	6.00	0.229	
Total BTEX	<0.300	0.300	12/08/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 118 % 73.6-140

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	12/08/2016	ND	191	95.6	200	1.99	
DRO >C10-C28	<10.0	10.0	12/08/2016	ND	195	97.6	200	4.39	

Surrogate: 1-Chlorooctane 67.7 % 35-147

Surrogate: 1-Chlorooctadecane 61.5 % 28-171

Cardinal Laboratories

\*=Accredited Analyte

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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

---

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

RUSH

### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: Tasman Geosciences

Project Manager: Brian Humphrey

Address: 6899 Peers St. Unit C

City: Denver State: CO Zip: 80221

Phone #: 303-487-1228 Fax #:

Project #: Project Owner:

Project Name: DCP BE-7-4-Loop

Project Location: Carlsbad NM

Sampler Name: Brian Humphrey

#### BILL TO

P.O. #: Tasman

Company: BE-7-4 Loop

Attn: Brian Humphrey

Address:

City:

State: Zip:

Phone #:

Fax #:

#### ANALYSIS REQUEST

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP	# CONTAINERS	MATRIX						DATE	TIME	PRESERV	SAMPLING	BTEX	TPH	CL	
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :								ACID/BASE:
H602741	BH15 @ 0-1'	G 1	1	X									12/7/16	1430	X	X	
	BH15 @ 8-9'	G 1	1	X									12/7/16	1450	X	X	
	BH06 @ 5'	G 1	1	X									12-7-16	1515			X
	BH09 @ 0-4'	G 1	1	X									12-7-16	0945	X	X	
	BH09 @ 14.5-16'	G 1	1	X									12-7-16	1005	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 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: [Signature] Date: 12-7-16 Received By: [Signature]

Time: 3:25 Date: 12-7-16 Received By: [Signature]

Time: 3:10 Date: 12-7-16 Received By: [Signature]

Time: 3:10 Date: 12-7-16 Received By: [Signature]

Time: 3:10 Date: 12-7-16 Received By: [Signature]

Time: 3:10 Date: 12-7-16 Received By: [Signature]

Time: 3:10 Date: 12-7-16 Received By: [Signature]

Time: 3:10 Date: 12-7-16 Received By: [Signature]

Time: 3:10 Date: 12-7-16 Received By: [Signature]

Time: 3:10 Date: 12-7-16 Received By: [Signature]

Phone Result: ☐ Yes ☐ No Add'l Phone #:

Fax Result: ☐ Yes ☐ No Add'l Fax #:

REMARKS: Email Report to: bhumphrey@tasman-geo.com  
suweflars@dcpmidstream.com  
hpcorder@dcpmidstream.com

## Appendix B

## Borehole Logging Form

<b>Boring/Well ID #:</b> BH01		<b>SITE NAME:</b> BE-7-4 Loop			<b>CLIENT NAME:</b> DCP Midstream		
<b>Date Started:</b> 12/6/2016		<b>Location:</b> Eddy County, NM					
<b>Date Completed:</b> 12/6/2016		<b>TOC Elevation:</b> NA		<b>DTW:</b> Not Encountered			
<b>Type of Drill:</b> Direct Push		<b>Geologist:</b> Brian Humphrey					
<b>Bit Size:</b> 2-Inch		<b>Project Manager:</b> Brian Humphrey					
<b>Drilling Company:</b> Tasman Geosciences							
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Macro Core	90	7.0	No	SM	Fine and silty sand, light brown, dry, no odor.
2							
3							
4							
5		Macro Core	90	0.4	No	SM	Very fine sand and silt, light brown, dry, no odor.
6							
7							
8							
9		Macro Core	60	0.9	No	SM	As above with increasing fines.
10		Macro Core	40	0.8	No	SM	As above.
11	Macro Core	100	3.9	Yes	SM	Fine and silty sand, light brown with white striations, dry, no odor.	
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

## Borehole Logging Form

<b>Boring/Well ID #: BH02</b>		<b>SITE NAME: BE-7-4 Loop</b>			<b>CLIENT NAME: DCP Midstream</b>		
Date Started: 12/6/2016		Location: Eddy County, NM					
Date Completed: 12/6/2016		TOC Elevation: NA		DTW: Not Encountered			
Type of Drill: Direct Push		Geologist: Brian Humphrey					
Bit Size: 2-Inch		Project Manager: Brian Humphrey					
Drilling Company: Tasman Geosciences							
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Macro Core	70	9.4	No	SM	Fine and silty sand, light brown, dry, no odor.
2							
3							
4		Macro Core	90	1.9	No	SM	Very fine sand and silt, light brown, dry, no odor.
5							
6							
7		Macro Core	75	2.0	No	SM	As above with increasing fines and silt.
8							
9							
10	Macro Core	90	5.3	No	SM	As above.	
11							
12							
13	Macro Core	95	2.8	Yes	SM	As above.	
14							
15							
16	Macro Core	100				GM	Fine sand and silt with few medium sized gravels, light brown, dry, no odor.
17							
18							
19							
20							
21							
22							
23							
24							
25							



## Borehole Logging Form

<b>Boring/Well ID #: BH03</b>		<b>SITE NAME: BE-7-4 Loop</b>		<b>CLIENT NAME: DCP Midstream</b>								
Date Started: 12/6/2016		Location: Eddy County, NM										
Date Completed: 12/6/2016		TOC Elevation: NA		DTW: Not Encountered								
Type of Drill: Direct Push		Geologist: Brian Humphrey										
Bit Size: 2-Inch		Project Manager: Brian Humphrey										
Drilling Company: Tasman Geosciences												
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description					
1	Well not installed	Macro Core	100	2,367	Yes	SM	Fine and silty sand, light brown, dry, sulfur odor.					
2												
3												
4												
5		Macro Core	90	1,248	No	SM	As above.					
6		Macro Core	90	148.1	No	SM	Fine sand and silt, light brown, dry, no odor.					
7		Macro Core	90	243.6	No	SM	Fine sand and silt, light brown with white striations, dry, no odor.					
8												
9	Macro Core	90	13.0	No	SM	As above. Hard layer encountered at 11 feet bgs.						
10												
11							Macro Core	90	234.2	Yes	SM	Fine sand and silt, light brown, dry, no odor.
12												
13	Macro Core	90	5.4	No	SM	As above.						
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												

## Borehole Logging Form

<b>Boring/Well ID #: BH04</b>		<b>SITE NAME: BE-7-4 Loop</b>			<b>CLIENT NAME: DCP Midstream</b>		
Date Started: 12/6/2016		Location: Eddy County, NM					
Date Completed: 12/6/2016		TOC Elevation: NA		DTW: Not Encountered			
Type of Drill: Direct Push		Geologist: Brian Humphrey					
Bit Size: 2-Inch		Project Manager: Brian Humphrey					
Drilling Company: Tasman Geosciences							
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Macro Core	100	36.8	No	SM	Fine and silty sand, light brown, dry, no odor.
2							
3							
4							
5		Macro Core	100	44.9	No	SM	As above.
6					Yes	SP	Fine sand and silt, few medium grained caliche gravel deposits, Light brown and white, dry, no odor.
7							
8							
9		Macro Core	90	24.8	No	SP	As above.
10							
11							
12							
13		Macro Core	100	3.5	Yes	SP	As above.
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							



**CLIENT NAME: DCP Midstream**

Location: Eddy County, NM

TOC Elevation:	NA	DTW: Not Encountered
----------------	----	----------------------

Geologist:	Brian Humphrey
------------	----------------

Project Manager:	Brian Humphrey
------------------	----------------

Drilling Company: Tasman Geosciences

Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Macro Core	100	149.0	No	SM	Fine sand and silt, light brown, dry, no odor.
2							
3							
4							
5							
6		Macro Core	100	222.3	Yes	SM	As above.
7		Macro Core	100	126.3	No	SP	Fine sand and silt with medium grained caliche deposits interbedded, light brown and white, dry, no odor.
8							
9							
10							
11	Macro Core	100	118.2	No	SM	Fine sand and silt, light brown and white, dry, no odor.	
12	Macro Core	100	70.8	No	SM	As above.	
13							
14							
15	Macro Core	100	70.8	Yes	SM	As above with slight gray staining.	
16	Macro Core	100	11.7	No	SM	As above without staining.	
17							
18							
19	<div></div>						
20							
21							
22							
23							
24							
25							

## Borehole Logging Form

<b>Boring/Well ID #:</b> BH06		<b>SITE NAME:</b> BE-7-4 Loop			<b>CLIENT NAME:</b> DCP Midstream		
<b>Date Started:</b> 12/6/2016		<b>Location:</b> Eddy County, NM					
<b>Date Completed:</b> 12/6/2016		<b>TOC Elevation:</b> NA		<b>DTW:</b> Not Encountered			
<b>Type of Drill:</b> Direct Push		<b>Geologist:</b> Brian Humphrey					
<b>Bit Size:</b> 2-Inch		<b>Project Manager:</b> Brian Humphrey					
<b>Drilling Company:</b> Tasman Geosciences							
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Macro Core	80	268.0	No	SM	Fine sand and silt, light brown, dry, slight odor.
2							
3							
4							
5							
6							
7							
8	Well not installed	Macro Core	95	2,298	Yes	SM	Fine sand and silt, light brown with white striations, dry, strong odor.
9							
10							
11							
12							
13							
14							
15	Well not installed	Macro Core	100	613.3	No	SM	As above.
16							
17							
18							
19							
20							
21							
22	Well not installed	Macro Core	100	1,354	No	SM	As above.
23							
24							
25							
26							
27							
28							
29	Well not installed	Macro Core	100	24.7	Yes	SM	As above.
30							
31							
32							
33							
34							
35							
36	Well not installed	Macro Core	100	12.0	No	SM	As above.
37							
38							
39							
40							
41							
42							
43	Well not installed	X					
44							
45							
46							
47							
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50	Well not installed	X					
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57	Well not installed	X					
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64	Well not installed	X					
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71	Well not installed	X					
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78	Well not installed	X					
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85	Well not installed	X					
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92	Well not installed	X					
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99	Well not installed	X					
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106	Well not installed	X					
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113	Well not installed	X					
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120	Well not installed	X					
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127	Well not installed	X					
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134	Well not installed	X					
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141	Well not installed	X					
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148	Well not installed	X					
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155	Well not installed	X					
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162	Well not installed	X					
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169	Well not installed	X					
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183	Well not installed	X					
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190	Well not installed	X					
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197	Well not installed	X					
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204	Well not installed	X					
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211	Well not installed	X					
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218	Well not installed	X					
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225	Well not installed	X					
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232	Well not installed	X					
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239	Well not installed	X					
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246	Well not installed	X					
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253	Well not installed	X					
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260	Well not installed	X					
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281	Well not installed	X					
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295	Well not installed	X					
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302	Well not installed	X					
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309	Well not installed	X					
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316	Well not installed	X					
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323	Well not installed	X					
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330	Well not installed	X					
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337	Well not installed	X					
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344	Well not installed	X					
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351	Well not installed	X					
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358	Well not installed	X					
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365	Well not installed	X					
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372	Well not installed	X					
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379	Well not installed	X					
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386	Well not installed	X					
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393	Well not installed	X					
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400	Well not installed	X					
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407	Well not installed	X					
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414	Well not installed	X					
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421	Well not installed	X					
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428	Well not installed	X					
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435	Well not installed	X					
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442	Well not installed	X					
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449	Well not installed	X					
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456	Well not installed	X					
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463	Well not installed	X					
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470	Well not installed	X					
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477	Well not installed	X					
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484	Well not installed	X					
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491	Well not installed	X					
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498	Well not installed	X					
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505	Well not installed	X					
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512	Well not installed	X					
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519	Well not installed	X					
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526	Well not installed	X					
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533	Well not installed	X					
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540	Well not installed	X					
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547	Well not installed	X					
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554	Well not installed	X					
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561	Well not installed	X					
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566							
567							
568	Well not installed	X					
569							
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575	Well not installed	X					
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577							
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579							
580							
581							
582	Well not installed	X					
583							
584							
585							
586							
587							
588							
589	Well not installed						

## Borehole Logging Form

<b>Boring/Well ID #: BH07</b>		<b>SITE NAME: BE-7-4 Loop</b>			<b>CLIENT NAME: DCP Midstream</b>		
Date Started: 12/6/2016		Location: Eddy County, NM					
Date Completed: 12/6/2016		TOC Elevation: NA		DTW: Not Encountered			
Type of Drill: Direct Push		Geologist: Brian Humphrey					
Bit Size: 2-Inch		Project Manager: Brian Humphrey					
Drilling Company: Tasman Geosciences							
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Macro Core	100	29.0	Yes	SM	Fine sand and silt, light brown, dry, no odor.
2							
3							
4							
5		Macro Core	100	11.9	No	SM	As above.
6							
7							
8							
9		Macro Core	100	5.9	No	SM	As above.
10							
11							
12							
13		Macro Core	100	16.8	Yes	GM	Fine sand and silt with large gravel, light brown, white, orange, gray rock, dry, no odor.
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

## Borehole Logging Form

<b>Boring/Well ID #: BH08</b>		<b>SITE NAME: BE-7-4 Loop</b>		<b>CLIENT NAME: DCP Midstream</b>			
Date Started: 12/6/2016		Location: Eddy County, NM					
Date Completed: 12/6/2016		TOC Elevation: NA		DTW: Not Encountered			
Type of Drill: Hand Augur		Geologist: Brian Humphrey					
Bit Size: 3-Inch		Project Manager: Brian Humphrey					
Drilling Company: Tasman Geosciences							
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Grab	100	299.0	No	SM	Fine sand and silt, light brown, dry, no odor.
2							
3							
4							
5							
6							
7							
8							
9	X						
10							
11							
12							
13							
14							
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22							
23							
24							
25							

## Borehole Logging Form

<b>Boring/Well ID #: BH09</b>		<b>SITE NAME: BE-7-4 Loop</b>			<b>CLIENT NAME: DCP Midstream</b>		
Date Started: 12/7/2016		Location: Eddy County, NM					
Date Completed: 12/7/2016		TOC Elevation: NA		DTW: Not Encountered			
Type of Drill: Direct Push		Geologist: Brian Humphrey					
Bit Size: 2-Inch		Project Manager: Brian Humphrey					
Drilling Company: Tasman Geosciences							
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Macro Core	90	101	Yes	SM	Fine sand and silt, brown and light brown, dry, very slight odor.
2							
3							
4							
5							
6							
7							
8	Well not installed	Macro Core	95	26.7	No	SM	As above with increasing fines.
9							
10							
11							
12							
13							
14							
15	Well not installed	Macro Core	100	22.9	No	SM	As above.
16							
17							
18							
19							
20							
21							
22	Well not installed	Macro Core	100	2.5	No	SM	As above.
23							
24							
25							
26							
27							
28							
29	Well not installed	Macro Core	100	4.2	No	GM	Fine sand and silt with large gravel, light brown and white, dry, no odor.
30							
31							
32							
33							
34							
35							
36	Well not installed	Macro Core	100	19.4	Yes	SC	Clayey silt with some fine sand, gray and white, dry, no odor.
37							
38							
39							
40							
41							
42							

## Borehole Logging Form

<b>Boring/Well ID #:</b> BH10		<b>SITE NAME:</b> BE-7-4 Loop		<b>CLIENT NAME:</b> DCP Midstream			
Date Started: 12/7/2016		Location: Eddy County, NM					
Date Completed: 12/7/2016		TOC Elevation: NA		DTW: Not Encountered			
Type of Drill: Hand Augur		Geologist: Brian Humphrey					
Bit Size: 3-Inch		Project Manager: Brian Humphrey					
Drilling Company: Tasman Geosciences							
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Grab	100	11.5	No	SM	Fine sand and silt, light brown, dry, no odor.
2							
3							
4							
5							
6							
7							
8							
9							
10	X						
11							
12							
13							
14							
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22							
23							
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## Borehole Logging Form

<b>Boring/Well ID #:</b> BH12		<b>SITE NAME:</b> BE-7-4 Loop		<b>CLIENT NAME:</b> DCP Midstream			
<b>Date Started:</b> 12/7/2016		<b>Location:</b> Eddy County, NM					
<b>Date Completed:</b> 12/7/2016		<b>TOC Elevation:</b> NA		<b>DTW:</b> Not Encountered			
<b>Type of Drill:</b> Hand Augur		<b>Geologist:</b> Brian Humphrey					
<b>Bit Size:</b> 3-Inch		<b>Project Manager:</b> Brian Humphrey					
<b>Drilling Company:</b> Tasman Geosciences							
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Grab	100	462.0	No	SM	Fine sand and silt, light brown, dry, no odor.
2				763.0	No		
3				838.7	No		
4				824.0	No		
5				876.0	Yes		
6				331.0	No		
7				382.0	No		
8				360.5	No		
9				344.7	No		
10							
11	X						
12							
13							
14							
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23							
24							
25							

## Borehole Logging Form

<b>Boring/Well ID #:</b> BH13		<b>SITE NAME:</b> BE-7-4 Loop		<b>CLIENT NAME:</b> DCP Midstream	
<b>Date Started:</b> 12/7/2016		<b>Location:</b> Eddy County, NM			
<b>Date Completed:</b> 12/7/2016		<b>TOC Elevation:</b> NA		<b>DTW:</b> Not Encountered	
<b>Type of Drill:</b> Hand Augur 0-9'/Direct Push 9-13'		<b>Geologist:</b> Brian Humphrey			
<b>Bit Size:</b> 3-Inch and 2-Inch		<b>Project Manager:</b> Brian Humphrey			
<b>Drilling Company:</b> Tasman Geosciences					

Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Grab	100	368.0	No	SM	Fine sand and silt, light brown, dry, no odor.
2				354.9	No		
3				193.1	No		
4				260.5	No		
5				271.0	No		
6				202.0	No		
7				221.2	No		
8				249.1	No		
9				237.2	No		
10	Macro Core	90	16.1	No	SM	Fine sand and silt, light brown with yellow staining, dry, no odor.	
11							
12							
13	Macro Core	90	11.3	No	GM	Fine sand and silt with large gravel, light brown and white, dry, no odor.	
14							
15							
16							
17							
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19							
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## Borehole Logging Form

<b>Boring/Well ID #:</b> BH14		<b>SITE NAME:</b> BE-7-4 Loop		<b>CLIENT NAME:</b> DCP Midstream			
<b>Date Started:</b> 12/7/2016		<b>Location:</b> Eddy County, NM					
<b>Date Completed:</b> 12/7/2016		<b>TOC Elevation:</b> NA		<b>DTW:</b> Not Encountered			
<b>Type of Drill:</b> Hand Augur		<b>Geologist:</b> Brian Humphrey					
<b>Bit Size:</b> 3-Inch		<b>Project Manager:</b> Brian Humphrey					
<b>Drilling Company:</b> Tasman Geosciences							
Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Grab	100	44.0	No	SM	Fine sand and silt, light brown, dry, no odor.
2							
3							
4							
5							
6							
7							
8							
9							
10	X						
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## Borehole Logging Form

<b>Boring/Well ID #:</b> BH15		<b>SITE NAME:</b> BE-7-4 Loop		<b>CLIENT NAME:</b> DCP Midstream	
Date Started: 12/7/2016		Location: Eddy County, NM			
Date Completed: 12/7/2016		TOC Elevation: NA		DTW: Not Encountered	
Type of Drill: Hand Augur		Geologist: Brian Humphrey			
Bit Size: 3-Inch		Project Manager: Brian Humphrey			
Drilling Company: Tasman Geosciences					

Depth (feet)	Well Completion	Sample Type	% Recovery	PID (ppm)	Laboratory Sample	USCS	Description
1	Well not installed	Grab	100	151.8	Yes	SM	Fine sand and silt, light brown, dry, no odor.
2				45.4	No		
3				88.2	No		
4				64.7	No		
5				94.7	No		
6				53.8	No		
7				60.2	No		
8				59.7	No		
9				35.9	Yes		
10	X						
11							
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