



September 30, 2015

Mr. Sam LaRue  
Senior HSE Representative  
Kerr-McGee Oil & Gas Onshore LP  
1099 18<sup>th</sup> Street, Suite 1800  
Denver, Colorado 80202

**Re: Sump Replacement Summary Letter Report  
Doris Smith & Co. 41D-21-62N66W/21NENE  
API: 05-123-09626  
Facility ID: 318658  
Legal: NENE Sec 21-T2N-R66W  
Remediation Project #8961**

Dear Mr. LaRue:

On behalf of Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee), Tasman Geosciences, Inc. (Tasman) has prepared this Sump Replacement Summary Letter Report (Report) to document sampling activities and the results of environmental testing at the above-referenced site. This Report is being submitted under the Form 27 Management Plan for Closure/Replacement of Produced Water Vessels, which has been assigned Remediation #8961 by the COGCC. Tasman provided environmental services at the site that included collection of confirmation soil and groundwater samples from the excavation and documentation of field activities, as described below.

### **Site Assessment Activities**

The field activities described herein were performed with the purpose of assessing potential hydrocarbon impacts at the site related to the replacement of the produced water sump on May 14, 2014. Soil and groundwater sampling activities, laboratory analytical results, and conclusions are presented below. The general site layout and sample locations are provided in the attached site map (Attachment A).

The final extent of the excavation measured approximately 12 feet by 12 feet with an approximate depth of 3 feet below ground surface (bgs). No impacted material was removed from the site during replacement activities. A liner was not present at the location. Groundwater was encountered in the excavation at an approximate depth of 3 feet bgs.

Confirmation soil samples were collected from the sidewalls of the excavation area at approximately 1.5 feet bgs. Soil samples were field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). The confirmation soil sample collected from the west sidewall of the excavation area was submitted to eAnalytics Laboratory in Loveland, Colorado, for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX),



total petroleum hydrocarbons (TPH) – gasoline range organics (GRO) by United States Environmental Protection Agency (USEPA) Method 8260B, and TPH – diesel range and oil range organics (DRO and ORO) by USEPA Method 8015. In addition, a groundwater sample (GW01) was collected from within the excavation and submitted for laboratory analysis of BTEX by USEPA Method 8260B. Soil and groundwater analytical data are summarized in Table 1 and Table 2, respectively. The laboratory analytical report is provided in Attachment B.

## **Results**

Soil analytical results from the sample collected from the west sidewall of the final extent of the excavation area indicated that BTEX and TPH concentrations were below the applicable COGCC Table 910-1 standards. Groundwater analytical results from the sample collected from the excavation area indicated that BTEX concentrations were below the applicable COGCC Table 910-1 groundwater standards. The remaining three soil samples collected from the sidewalls of the excavation area were not submitted for laboratory analysis as analytical data confirmed the absence of petroleum hydrocarbon impacts above regulatory standards.

## **Conclusions**

Analytical results described herein confirm BTEX and TPH impacts are not present at concentrations above applicable regulatory standards in the former sump location. Consequently, no further site assessment or remedial activity is recommended at this time. Following site assessment activities, the produced water sump was replaced and the excavation area was backfilled and contoured to match pre-existing site conditions. The production facility remains operational.

Please contact me at (720) 409-8791 if you have any questions regarding this report or require additional information.

Sincerely,

A handwritten signature in blue ink that reads 'Christine Wasko'.

Christine Wasko  
Project Scientist

## **Attachments:**

Table 1 – Soil Sample Results Summary Table  
Table 2 – Groundwater Sample Results Summary Table  
Attachment A – Site Map  
Attachment B – Laboratory Analytical Reports



## Tables



**TABLE 1**  
**DORIS SMITH AND CO 41D-21-62N66W/21NENE**  
**SOIL SAMPLE RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL AND GAS ONSHORE LP**

Sample ID	Date Sampled	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TVPH - GRO (mg/kg)	TEPH - DRO (mg/kg)	TEPH - ORO (mg/kg)
<b>COGCC standards for soil (mg/kg) <sup>(1)</sup></b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>500</b>		
W01@1.5'	5/14/2014	1.5	<0.01	<0.01	<0.01	<0.01	<50	<50	<50

**Notes:**

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective February 1, 2014.

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit

TVPH - GRO = Total volatile petroleum hydrocarbons - gasoline range organics

TEPH - DRO = Total extractable petroleum hydrocarbons - diesel range organics

TEPH - ORO = Total extractable petroleum hydrocarbons - oil range organics

mg/kg = Milligrams per kilogram

bgs = Below ground surface

**BOLD** = Analytical result is in exceedance of COGCC Table 910-1 soil standards

&



**TABLE 2**  
**DORIS SMITH AND CO 41D-21-62N66W/21NENE**  
**GROUNDWATER SAMPLE RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL AND GAS ONSHORE LP**

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth To Water (ft bgs)
<b>COGCC standards for groundwater (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	
GW01	5/14/2014	<1.0	<1.0	<1.0	<1.0	3

**Notes:**

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective February 1, 2014.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

(<) = Analytical result is less than the indicated laboratory reporting limit.

ft bgs = Feet below ground surface

**BOLD** = Analytical result is in exceedance of COGCC Table 910-1 groundwater standards.



## **Attachment A**



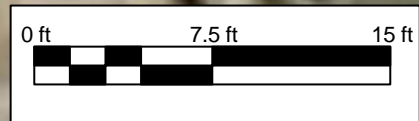


Surface  
Drainage



B – Benzene  
TPH – Total Petroleum Hydrocarbons  
mg/kg – Milligrams Per Kilogram  
µg/L – Micrograms Per Liter

Image Source:  
Google Earth 2015



DRAWN BY: BRN

DATE: 9/21/2015

**Facility Diagram**  
Kerr-McGee Oil and Gas Onshore, LP  
Doris Smith & Co. 41D-21-62N66W21NENE  
NENE S21 T2N R66W  
Weld County, CO



6899 Pecos St., Unit C  
Denver, CO 80221

LEGEND  
Approximate Excavation Extent  
Former Infrastructure  
Berm

Approximate Soil  
Sample Location  
Approximate Groundwater  
Sample Location

FIGURE 1  
SITE MAP



## **Attachment B**



# Test Report



May 14, 2014

Client: Tasman Geosciences / Anadarko

Project: Doris Smith & CO 41D-21 #1

Lab ID: 1385

Date Samples Received: 5/14/2014

Number of Samples: 5

Sample Condition: Samples arrived intact and in appropriate sample containers

Sample Temperature: Within acceptable range of 2-6° C, or as specified in EPA Method

The quality control procedures associated with the requested analyses were satisfactorily passed before the samples were run.

Thank you for allowing eAnalytics Laboratory to provide laboratory services for you.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Dieken".

Christopher Dieken  
Quality Assurance Manager

A handwritten signature in black ink, appearing to read "Todd Rhea".

Todd Rhea  
Laboratory Manager

**eAnalytics Laboratory**

1767 Rocky Mountain Avenue Loveland CO 80538



## Chain of Custody

# eANALYTICS

## LABORATORY

Chain of Custody Form

eANALYTICS LABORATORY			1767 Rocky Mountain Avenue Loveland CO 80538   Phone: (970) 667-6973   Fax: (970) 669-0941   www.eAnalyticsLab.com										
CLIENT INFORMATION (*New Clients please fill out completely)			ANALYSIS INFORMATION (Select analysis by checking box on corresponding sample line)										
Company: Tasman Geosciences / Anadarko			Number of Containers	Matrix: (S) Soil (W) Water (V) Vapor (O) Other	BTEX (EPA 8260)	BTEX/GRO (EPA 8260)	DRO/ORO (EPA 8015)	TPH-GRO/DRO/ORO (EPA 8260/8015)	SAR (US Dept of Ag Method 20B)	EC (US Dept of Ag Method 3)	pH (EPA 9045D)	Other Analysis	
Project: Dons Smith & CO 41D-21 #1													
Project Manager: Paul Schneider / Phil Hamlin													
Sampler: Jenna Barker Christine Wasco													
Phone/Email: 720-987-9717 / JBarker@Tasman-Geo.com													
Address: 6899 Pecos Street, Unit C Denver, CO 80221													
Lab ID	Sample Name	Sampling Date/Time											
1	GW01	5/14/14 1330	N	X									
2	NO1@1.5'	5/14/14 1305	S		XX								
3	NO1@1.5'	5/14/14 1300	S		XX								
4	NO1@1.5'	5/14/14 1310	S		XX								
5	SO1@1.5'	5/14/14 1315	S		XX								
Comments: Return by 7am please WO# 88549893													
<b>Turnaround Time (Business Days)</b> TAT begins when sample is received by eANALYTICS <input type="radio"/> Normal (5-10 Days) <input type="radio"/> 3 Day (1.25x) <input type="radio"/> 1 Day (2x) <input type="radio"/> Same Day (3x) <input checked="" type="radio"/> Next Bus. Morning (APC Pricing)			<b>Record of Custody</b> Relinquished by: [Signature] Date: 5/14/14 Time: 1300 Company: [Signature] Date: [ ] Time: [ ] Received by: [Signature] Date: [ ] Time: [ ] Company: [Signature] Date: [ ] Time: [ ] Relinquished by: [Signature] Date: [ ] Time: [ ] Company: [Signature] Date: [ ] Time: [ ] Received by: [Signature] Date: 5/14/14 Time: 1500 Company: eANALYTICS Date: [ ] Time: [ ]										
<b>For eANALYTICS Use</b> Samples Received Intact <input checked="" type="checkbox"/> Yes / No Stored Within Temperature Range (2-6°C) <input checked="" type="checkbox"/> Yes / No Sample Preservative: Ice / None <input checked="" type="checkbox"/> Acid / Other													

WO # 1385

eANALYTICS: Environmental testing made Easy

Page 1 of 1

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538

The results contained within this report relate only to the items analyzed



**e**ANALYTICS  
LABORATORY

Client: Tasman Geosciences / Anadarko

Lab ID: 1385

Project: Doris Smith &amp; CO 41D-21 #1

Analysis: Volatile Organics  
TPHMethod: EPA8260  
EPA8260/8015

Sample Name	Benzene	Toluene	Ethyl- benzene	Total Xylenes	TPH GRO C6-C10	TPH DRO C10-C28	TPH ORO C28-C36	Date Sampled	Date Analyzed	Lab ID	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				
W01 @ 1.5'	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	< 50	05/14/14	05/14/14	1385	2

**eAnalytics Laboratory**

1767 Rocky Mountain Avenue Loveland CO 80538



**e**ANALYTICS  
LABORATORY

Client: Tasman Geosciences / Anadarko      Lab ID: 1385

Project: Doris Smith & CO 41D-21 #1

Analysis: Volatile Organics      Method: EPA8260

Sample Name	Benzene	Toluene	Ethyl- benzene	Total Xylenes	Date Sampled	Date Analyzed	Lab ID	
	ug/L	ug/L	ug/L	ug/L				
GW01	< 1.0	< 1.0	< 1.0	< 1.0	05/14/14	05/14/14	1385	1

**eAnalytics Laboratory**

1767 Rocky Mountain Avenue Loveland CO 80538



**e**ANALYTICS  
LABORATORY

Client: Tasman Geosciences / Anadarko

Lab ID: 1385

Project: Doris Smith &amp; CO 41D-21 #1

Method: EPA8260

Sample Name	Dibromo- fluoromethane % Recovery	1,2 Dichloro- ethane-D4 % Recovery	Toluene-D8 % Recovery	Bromo- fluorobenzene % Recovery	Date Sampled	Date Analyzed	Lab ID
W01 @ 1.5'	99	91	111	93	05/14/14	05/14/14	1385 2

**eAnalytics Laboratory**

1767 Rocky Mountain Avenue Loveland CO 80538



**e**ANALYTICS  
LABORATORY

Client: Tasman Geosciences / Anadarko

Lab ID: 1385

Project: Doris Smith &amp; CO 41D-21 #1

Method: EPA8260

Sample Name	Dibromo- fluoromethane % Recovery	1,2 Dichloro- ethane-D4 % Recovery	Toluene-D8 % Recovery	Bromo- fluorobenzene % Recovery	Date Sampled	Date Analyzed	Lab ID
GW01	96	87	108	109	05/14/14	05/14/14	1385 1



# eANALYTICS

## LABORATORY

Client: Tasman Geosciences / Anadarko

Lab ID: 1385

Project: Doris Smith &amp; CO 41D-21 #1

Analysis: Volatile Organics  
TPHMethod: EPA8260  
EPA8260/8015

Sample Name	Benzene % Rec	Toluene % Rec	Ethyl- benzene % Rec	Total Xylenes % Rec	TPH GRO C6-C10 % Rec	TPH DRO C10-C28 % Rec	TPH ORO C28-C36 % Rec	Date Analyzed	Lab ID	
Laboratory Control Sample	91	104	102	104	93	95	93	05/14/14	LCS	1385 1
(70-130%)										
Method Blank	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	< 50	05/14/14	MB	1385 1
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg			

**eAnalytics Laboratory**

1767 Rocky Mountain Avenue Loveland CO 80538



**e**ANALYTICS  
LABORATORY

Client: Tasman Geosciences / Anadarko

Lab ID: 1385

Project: Doris Smith &amp; CO 41D-21 #1

Analysis: Volatile Organics

Method: EPA8260

Sample Name	Benzene	Toluene	Ethyl- benzene	Total Xylenes	Date Analyzed	Lab ID	
	% Rec	% Rec	% Rec	% Rec			
Laboratory Control Sample	94	99	92	100	05/14/14	LCS	1385 1
(70-130%)							
Method Blank	< 1.0	< 1.0	< 1.0	< 1.0	05/14/14	MB	1385 1
	ug/L	ug/L	ug/L	ug/L			

**eAnalytics Laboratory**

1767 Rocky Mountain Avenue Loveland CO 80538