



October 16, 2015

Mr. Erik Mickelson
Senior HSE Representative
Kerr-McGee Oil & Gas Onshore LP
1099 18th Street, Suite 1800
Denver, Colorado 80202

Subject: Sump Closure Summary Report for UPRR Pan AM V1 and Bluffs White W5-1
API Numbers: 05-123-08416 and 05-123-16567
Remediation number: 8961
Facility ID: 318111
Legal Description: NWNE 5 2N 66W
Apex Project Number: 066.1507.02COT0001

Dear Mr. Mickelson:

Apex Companies, LLC (Apex) is pleased to provide Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee) this sump closure summary report for the UPRR Pan Am V1 and Bluffs White W5-1 facility (Facility). The Facility services American Petroleum Institute (API) well numbers 05-123-08416 and 05-123-16567. On September 30, 2015 a field inspection was performed to determine if petroleum hydrocarbon impacts to subsurface soil resulted from Kerr-McGee operating a produced water sump at the Facility. This report summarizes the field inspection activities and laboratory analytical results.

Summary of Field Activities

Confirmation soil samples were collected from the sidewalls and base of the excavation, between 5 feet below ground surface (bgs) (sidewall soil sample locations SS2 through SS5) and 6 feet bgs (soil sample location SS1). Each sample was field screened for volatile organic compounds (VOCs) with a calibrated photoionization detector (PID). Confirmation soil sample SS1 was collected from the base and center of the excavation (Figure 1), and submitted to Origins Laboratory, Inc. (Denver, Colorado) for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), electrical conductivity (EC), and acidity/base testing of pH. EPA method 8260C was used for analysis of BTEX and GRO, method 8015C for analysis of DRO and ORO (C10 through C36), method 9045D for pH analysis, and method 9050A for EC. Laboratory analytical results are summarized in Table 1.

The final excavation footprint spanned approximately 22 feet by 23 feet, and extended approximately 6 feet bgs, throughout the footprint extent. Excavated material, related to the closure of the sump, was not removed from the Facility. At the time of the field inspection, surface staining or odors indicating a release of hydrocarbons was not observed. The Facility layout, which includes the excavation location and soil sample locations, is provided as Figure 1.

Laboratory Analytical Results

Analytical results of the soil sample collected from location SS1 indicate concentrations below (not detectable at laboratory reporting limits) applicable Colorado Oil and Gas Conservation

Commission (COGCC) Table 910-1 criteria for BTEX, TPH, and EC (Table 1). The pH level in the soil sample was above the applicable regulatory standard, but was collected below the designated root zone. Soil samples from sample locations SS2 through SS5 were not submitted for laboratory analysis, as analytical data from sample location SS1 did not indicate petroleum hydrocarbon impacts above Table 910-1 thresholds.

Conclusions

Based on laboratory analytical results of BTEX and TPH, concentrations of contaminants of concern are below Table 910-1 thresholds at the previous location of the sump. Consequently, no further remedial activities are needed at this time. Following site assessment activities, the produced water sump was removed and the excavation area was backfilled and contoured to match preexisting site conditions. If you have any questions regarding this submittal, please contact me at 303.242.8671.

Sincerely,
Apex Companies, LLC



Jacob Hildebrand, PMP
Project Manager

Attachments:

Table 1: Soil Sample Analytical Table
Figure 1 – Site Map
Laboratory Analytical Report



Table 1 - Soil Sample Analytical Results

Kerr-McGee Oil and Gas Onshore LP

Location: UPRR Pan AM V1 and Bluffs White W5-1

Facility ID: 318111

API #s: 05-123-08416 and 05-123-16567

County: Weld

Sample ID	Sample Date	Depth (bgs)	COGCC Allowable Concentration -->							Inorganics in Soil	
			TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	TPH-ORO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes - total (mg/kg)	Electrical Conductivity (<4 mmhos/cm or 2x background)	pH (6-9)
SS1	09/30/15	6'	<0.200	<50	<200	<0.002	<0.002	<0.002	<0.002	0.0698	9.13*

Notes:

TPH Total petroleum hydrocarbons
 GRO Gasoline range hydrocarbons (C6 - C10)
 DRO Diesel range organics (C10 - C28)
 ORO Oil range organics (C28 - C36)
Bold cell indicates result exceeded Table 910-1 allowable concentration for the contaminant of concern

bgs below ground surface
 mg/kg milligrams per kilogram
 mmhos/cm millimhos per centimeter
 NA Not analyzed / not available
 COGCC Colorado Oil and Gas Conservation Commission
 * Sample collected from below the designated root zone

Non-Cropland

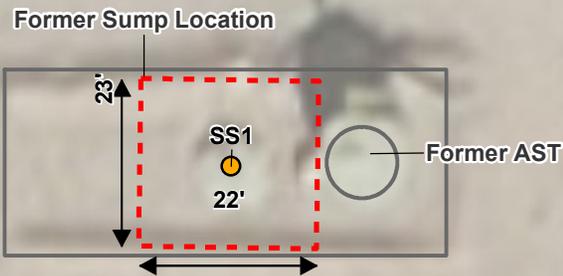


Figure 1
UPRR 42 Pan AM V1 &
Bluffs White W5-1
Site Map

Legend

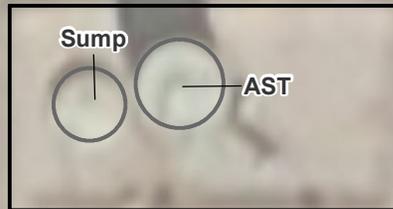
-  Soil Sample
-  Former Berm
-  Existing Berm
-  Excavation Extent

Non-Cropland



Non-Cropland

Production Equipment



Site Characteristics

Legal Location: NWNE, Sec 5, T2N R66W
County: Weld
Land Use: Non-Cropland
Topography: 3-9% Slopes
Run-Off Risk: Medium
Excavation Area: ~506.0 Sq-ft
Soil Type: Renohill clay loam
Receiving Waters: Platteville Ditch,
 1,250-ft Northwest of pad

REVISED	BY	COMMENT
10/5/2015	BJB	Figure 1



October 07, 2015

Apex Companies, LLC
Brad Keiding
3240 W. 71st Avenue, Suite 1
Westminster CO 80030

Project Name - UPRR 42 Pan Am V1 & Bluffs
White W5-1

Project Number - 88864616

Attached are your analytical results for UPRR 42 Pan Am V1 & Bluffs White W5-1 received by Origins Laboratory, Inc. September 30, 2015. This project is associated with Origins project number X509397-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Apex Companies, LLC
3240 W. 71st Avenue, Suite 1
Westminster CO 80030

Brad Keiding
Project Number: 88864616
Project: UPRR 42 Pan Am V1 & Bluffs White
W5-1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS1	X509397-01	Soil	September 30, 2015 16:30	09/30/2015 18:24

Brad changed the project name and wo# to UPRR 42 Pan Am V1 and Bluffs White W5-1, WO# 88906129 on 10/01/15.

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Brad Keiding
 Project Number: 88864616
 Project: UPRR 42 Pan Am V1 & Bluffs White W5-1

Origins Laboratory

F-012207-01-R1
 Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: 1509397

Client: Apex

Client Project ID: Bluffs White W5-1, W5-2

Checklist Completed by: J. Pellegrini

Shipped Via: HD

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 9/20/15 1835

Airbill #: NA

Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____

Cooler Number/Temperature: 1 / 10.6 °C 1 °C 1 °C 1 °C (Describe)

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?		<input checked="" type="checkbox"/>		< 24 hours
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	<input checked="" type="checkbox"/>			PH
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

J. Pellegrini
 Reviewed by (Project Manager)

9/30/15
 Date/Time Reviewed

Origins Laboratory, Inc.



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Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Brad Keiding
 Project Number: 88864616
 Project: UPRR 42 Pan Am V1 & Bluffs White W5-1

SS1
9/30/2015 4:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X509397-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5130006	09/30/2015	10/01/2015	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl 91.3 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5130007	"	10/01/2015	
Benzene	ND	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 103 % 70-130 " " "
Surrogate: Toluene-d8 99.3 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 101 % 70-130 " " "

pH in Soil by EPA 9045D

pH	9.13		pH Units	1	5130010	09/30/2015	09/30/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0698		mmhos/cm	"	5130011	"	"	
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Apex Companies, LLC
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 Westminster CO 80030

Brad Keiding
 Project Number: 88864616
 Project: UPRR 42 Pan Am V1 & Bluffs White
 W5-1

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5130007 - EPA 5030 (soil)

Blank (5130007-BLK1)

Prepared: 09/30/2015 Analyzed: 09/30/2015

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	67.2		ug/kg	62.5		108	70-130			
Surrogate: Toluene-d8	62.6		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	65.7		"	62.5		105	70-130			

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 Westminster CO 80030

Brad Keiding
 Project Number: 88864616
 Project: UPRR 42 Pan Am V1 & Bluffs White
 W5-1

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5130007 - EPA 5030 (soil)

LCS (5130007-BS1)

Prepared: 09/30/2015 Analyzed: 09/30/2015

Benzene	0.105	0.002	mg/kg	0.100		105	77.1-124			
Toluene	0.107	0.002	"	0.100		107	74.5-128			
Ethylbenzene	0.114	0.002	"	0.100		114	66.4-127			
m,p-Xylene	0.226	0.004	"	0.200		113	76.6-124			
o-Xylene	0.112	0.002	"	0.100		112	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	63.9		ug/kg	62.5		102	70-130			
Surrogate: Toluene-d8	61.7		"	62.5		98.7	70-130			
Surrogate: 4-Bromofluorobenzene	63.9		"	62.5		102	70-130			

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Brad Keiding
 Project Number: 88864616
 Project: UPRR 42 Pan Am V1 & Bluffs White W5-1

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5130007 - EPA 5030 (soil)

Matrix Spike (5130007-MS1)	Source: X509373-04			Prepared: 09/30/2015 Analyzed: 10/01/2015						
Benzene	0.104	0.002	mg/kg	0.100	ND	104	71.8-126			
Toluene	0.105	0.002	"	0.100	0.002	103	65.1-130			
Ethylbenzene	0.116	0.002	"	0.100	ND	116	62.2-130			
m,p-Xylene	0.160	0.004	"	0.200	ND	79.8	46.5-137			
o-Xylene	0.117	0.002	"	0.100	0.004	113	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	57.2		ug/kg	62.5		91.6	70-130			
Surrogate: Toluene-d8	58.9		"	62.5		94.3	70-130			
Surrogate: 4-Bromofluorobenzene	61.4		"	62.5		98.2	70-130			

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Brad Keiding
 Project Number: 88864616
 Project: UPRR 42 Pan Am V1 & Bluffs White
 W5-1

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5130007 - EPA 5030 (soil)

Matrix Spike Dup (5130007-MSD1)	Source: X509373-04			Prepared: 09/30/2015 Analyzed: 10/01/2015						
Benzene	0.107	0.002	mg/kg	0.100	ND	107	71.8-126	3.01	11.3	
Toluene	0.106	0.002	"	0.100	0.002	105	65.1-130	1.59	15.4	
Ethylbenzene	0.118	0.002	"	0.100	ND	118	62.2-130	0.974	19.6	
m,p-Xylene	0.154	0.004	"	0.200	ND	77.0	46.5-137	3.55	19.2	
o-Xylene	0.123	0.002	"	0.100	0.004	119	54.2-134	5.02	17.9	
Surrogate: 1,2-Dichloroethane-d4	59.4		ug/kg	62.5		95.1	70-130			
Surrogate: Toluene-d8	60.6		"	62.5		96.9	70-130			
Surrogate: 4-Bromofluorobenzene	62.2		"	62.5		99.5	70-130			

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Brad Keiding
 Project Number: 88864616
 Project: UPRR 42 Pan Am V1 & Bluffs White W5-1

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Extractable Petroleum Hydrocarbons by 8015C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5I30006 - EPA 3580

Blank (5I30006-BLK1)

Prepared: 09/30/2015 Analyzed: 09/30/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	46		"	50.0		91.7	59-131			

LCS (5I30006-BS1)

Prepared: 09/30/2015 Analyzed: 09/30/2015

Diesel (C10-C28)	800	50	mg/kg	1000		79.7	64-121			
Residual Range Organics (C28-C36)	760	200	"	1000		76.1	58-124			
Surrogate: o-Terphenyl	41		"	50.0		81.7	59-131			

Matrix Spike (5I30006-MS1)

Source: X509373-04

Prepared: 09/30/2015 Analyzed: 09/30/2015

Diesel (C10-C28)	830	50	mg/kg	1000	ND	83.2	53-125			
Residual Range Organics (C28-C36)	790	200	"	1000	14	77.3	47-133			
Surrogate: o-Terphenyl	41		"	50.0		82.0	59-131			

Matrix Spike Dup (5I30006-MSD1)

Source: X509373-04

Prepared: 09/30/2015 Analyzed: 09/30/2015

Diesel (C10-C28)	810	50	mg/kg	1000	ND	81.4	53-125	2.18	20	
Residual Range Organics (C28-C36)	760	200	"	1000	14	74.9	47-133	3.11	20	
Surrogate: o-Terphenyl	40		"	50.0		79.8	59-131			

Origins Laboratory, Inc.



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Brad Keiding
 Project Number: 88864616
 Project: UPRR 42 Pan Am V1 & Bluffs White W5-1

Classical Chemistry Parameters - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5I30010 - NO PREP										
Duplicate (5I30010-DUP1)		Source: X509388-01			Prepared: 09/30/2015 Analyzed: 09/30/2015					
pH	8.59		pH Units		8.58			0.116	25	
Batch 5I30011 - NO PREP										
Blank (5I30011-BLK1)		Prepared: 09/30/2015 Analyzed: 09/30/2015								
Specific Conductance (EC)	0.00250		mmhos/cm							
Duplicate (5I30011-DUP1)		Source: X509388-01			Prepared: 09/30/2015 Analyzed: 09/30/2015					
Specific Conductance (EC)	0.850		mmhos/cm		0.815			4.20	25	

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Westminster CO 80030

Brad Keiding
Project Number: 88864616
Project: UPRR 42 Pan Am V1 & Bluffs White
W5-1

Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President