

January 4, 2016

Mr. Randall Ferguson
EHS Senior Compliance Specialist
PDC Energy, Inc.
1775 Sherman Street, Suite 3000
Denver, CO 80203

Re: **Produced Water Vessel Closure Report**
Hoshiko 2 & 3 Tank Battery
Facility ID: 319529
NE S35 T6N R65W
Blanket Remediation #: 9440

Dear Mr. Ferguson,

On behalf of PDC Energy, Inc. (PDC), Tasman Geosciences, Inc. (Tasman) has prepared this Produced Water Vessel Closure Report (Report) to document environmental sampling activities performed at the above-referenced site. This Report is being submitted under the Form 27 Management Plan for Closure of Produced Water Vessels, which has been assigned Blanket Remediation #9440 by the Colorado Oil and Gas Conservation Commission (COGCC).

A summary of excavation and environmental sampling activities is provided below.

Site Assessment Activities

On March 23, 2015, confirmation sampling activities were completed following the removal of the partially buried steel produced water vessel. Soil encountered in the excavation area was field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). One soil sample (SS01) was collected below the former vessel location at approximately 6 feet below ground surface (bgs). The sample was submitted to Summit Scientific Laboratories in Golden, Colorado for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, and total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by Environmental Protection Agency (EPA) Method 8260B, and TPH - diesel range organics (DRO) by EPA Method 8015.

Analytical results indicated constituent concentrations were below COGCC Table 910-1 standards in soil sample SS01.

The excavation extent and soil sample location are illustrated on Figure 1. Soil analytical data is summarized in Table 1 and the laboratory analytical report is provided in Attachment A.

Conclusions

Based on the soil analytical data described herein, petroleum hydrocarbon impacts were not encountered during the removal of the produced water vessel. Consequently, no further site investigation is recommended at this time. The facility was decommissioned following site assessment activities.

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

Sincerely,

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

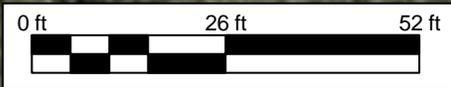
Christine Wasko
Project Manager
Tasman Geosciences, Inc.

Enclosures:

Figure 1 – Soil Sample Location Map
Table 1 – Soil Analytical Results Summary Table
Attachment A – Laboratory Analytical Report



Note: Surface drainage direction is estimated based on site topography and is not related to regional topography.



(Historical Image 2014)

DRAWN BY: MAP

Facility Diagram
 PDC Energy – DJ Basin
 Hoshiko 2, 3 Tank Battery
 NE S35 T6N R65W
 Weld County, CO

DATE: 12/22/2015

 **TASMAN** 6899 Pecos St., Unit C
 GEOSCIENCES Denver, CO 80221

LEGEND
 Excavation Extent
 Soil Sample Location

All locations are approximate unless otherwise noted

FIGURE 1
SOIL SAMPLE LOCATION MAP

TABLE 1
HOSHIKO 2 3 TANK BATTERY
SOIL ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH ⁽²⁾ (mg/kg)
COGCC standards for soil (mg/kg) ⁽¹⁾			0.17	85	100	175	23	500
SS01 @ 6'	3/23/2015	6	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50

Notes:

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

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

COGCC = Colorado Oil and Gas Conservation Commission

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

GRO = Total volatile petroleum hydrocarbons - gasoline range organics

DRO = Total extractable petroleum hydrocarbons - diesel range organics

mg/kg = Milligrams per kilogram

bgs = Below ground surface

BOLD = Analytical result is in exceedance of COGCC soil standards.

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 26, 2015

Brandon Bruns
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Hoshiko 2 & 3

Enclosed are the results of analyses for samples received by Summit Scientific on 03/23/15 18:10. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Hoshiko 2 & 3

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
03/26/15 14:41

SS01@6'
1503197-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/23/15 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1503276	03/24/15	03/24/15	8015M	

Date Sampled: **03/23/15 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		106 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/23/15 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1503280	03/24/15	03/25/15	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/23/15 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		117 %	21-167		"	"	"	"	

Summit Scientific

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.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Hoshiko 2 & 3

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 03/26/15 14:41

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Reporting			Spike Level	Source		%REC		RPD		Notes
	Result	Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch 1503276 - EPA 3550A

Blank (1503276-BLK1)

Prepared & Analyzed: 03/24/15

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	13.1		"	12.2		107	30-150				

LCS (1503276-BS1)

Prepared & Analyzed: 03/24/15

C10-C28 (DRO)	424	50	mg/kg	501		84.6	73-134				
<i>Surrogate: o-Terphenyl</i>	13.7		"	12.2		112	30-150				

Matrix Spike (1503276-MS1)

Source: 1503197-01

Prepared & Analyzed: 03/24/15

C10-C28 (DRO)	450	50	mg/kg	486	ND	92.5	50-148				
<i>Surrogate: o-Terphenyl</i>	13.3		"	11.8		112	30-150				

Matrix Spike Dup (1503276-MSD1)

Source: 1503197-01

Prepared & Analyzed: 03/24/15

C10-C28 (DRO)	467	50	mg/kg	492	ND	94.9	50-148	3.72		13	
<i>Surrogate: o-Terphenyl</i>	13.4		"	12.0		112	30-150				

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Denver CO, 80203

Project: Hoshiko 2 & 3

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
03/26/15 14:41

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1503280 - EPA 5030 Soil MS

Blank (1503280-BLK1)

Prepared & Analyzed: 03/24/15

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0377</i>		<i>"</i>	<i>0.0396</i>		<i>95.2</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0394</i>		<i>"</i>	<i>0.0400</i>		<i>98.6</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0470</i>		<i>"</i>	<i>0.0400</i>		<i>118</i>	<i>21-167</i>			

LCS (1503280-BS1)

Prepared & Analyzed: 03/24/15

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0908	0.0020	"	0.100		90.8	58-130			
Toluene	0.0891	0.0050	"	0.100		89.1	61-134			
Ethylbenzene	0.102	0.0050	"	0.0992		102	74-139			
m,p-Xylene	0.213	0.010	"	0.200		107	73-137			
o-Xylene	0.100	0.0050	"	0.0984		102	73-141			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0360</i>		<i>"</i>	<i>0.0396</i>		<i>91.0</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0389</i>		<i>"</i>	<i>0.0400</i>		<i>97.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0474</i>		<i>"</i>	<i>0.0400</i>		<i>118</i>	<i>21-167</i>			

Matrix Spike (1503280-MS1)

Source: 1503197-01

Prepared & Analyzed: 03/24/15

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0887	0.0020	"	0.0971	ND	91.4	30-131			
Toluene	0.0856	0.0050	"	0.0971	ND	88.2	30-134			
Ethylbenzene	0.0986	0.0050	"	0.0963	ND	102	22-153			
m,p-Xylene	0.204	0.010	"	0.194	ND	105	10-159			
o-Xylene	0.0962	0.0050	"	0.0955	ND	101	31-151			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0366</i>		<i>"</i>	<i>0.0384</i>		<i>95.3</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0381</i>		<i>"</i>	<i>0.0388</i>		<i>98.1</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0433</i>		<i>"</i>	<i>0.0388</i>		<i>111</i>	<i>21-167</i>			

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PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Hoshiko 2 & 3

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 03/26/15 14:41

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1503280 - EPA 5030 Soil MS

Matrix Spike Dup (1503280-MSD1)	Source: 1503197-01			Prepared & Analyzed: 03/24/15						
Naphthalene	ND	0.010	mg/kg	ND	ND	10-158			42	
Benzene	0.0903	0.0020	"	0.0982	ND	91.9	30-131	1.76	34	
Toluene	0.0898	0.0050	"	0.0982	ND	91.4	30-134	4.78	30	
Ethylbenzene	0.101	0.0050	"	0.0974	ND	103	22-153	2.11	24	
m,p-Xylene	0.207	0.010	"	0.196	ND	105	10-159	1.19	68	
o-Xylene	0.0970	0.0050	"	0.0967	ND	100	31-151	0.838	38	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0357</i>		<i>"</i>	<i>0.0389</i>		<i>91.9</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0390</i>		<i>"</i>	<i>0.0393</i>		<i>99.3</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0446</i>		<i>"</i>	<i>0.0393</i>		<i>113</i>	<i>21-167</i>			

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Project: Hoshiko 2 & 3

Project Number: [none]
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Reported:
03/26/15 14:41

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference