PDC Energy, Inc.

Third Quarter 2016 Groundwater Monitoring Summary

August 16, 2016

H&S (Mineral) #1 Tank Battery
NWSW S6 T4N R65W
Weld County, API # 05-123-11529
Facility ID # 319594
Remediation # 7945

This groundwater summary has been prepared by Tasman Geosciences, Inc. for the H&S (Mineral) #1 tank battery. On July 18, 2016 groundwater sampling was conducted at all eight monitoring well locations (BH01R, BH02 – BH08). Monitoring well BH01 was replaced by monitoring well BH01R prior to the third quarter 2016 groundwater sampling event. Eight groundwater samples were submitted to Summit Scientific Laboratories for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260B. Analytical results are summarized in Table 1 and the laboratory analytical report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 1. Third quarter 2016 analytical results indicate that the benzene concentration is above the applicable COGCC Table 910-1 standard in monitoring well BH02. BTEX concentrations are below applicable COGCC regulatory standards in the remaining seven well locations.

Tasman initiated enhanced fluid recovery (EFR) and air sparge (AS) events at the site during the third quarter 2013. A summary of the EFR/AS operational data is provided in Table 2. EFR/AS remained the selected remediation strategy through the third quarter 2016. Additional remediation strategies are being evaluated for implementation during the fourth quarter 2016.

The fourth quarter 2016 groundwater sampling event will be conducted during October 2016.

TABLE 1
H & S (MINERAL) #1 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water [2] (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) [1]		**5**	**560**	**700**	**1,400**	
BH01	7/25/2013	**6,700**	**6,200**	**1,100**	**19,000**	16.53
BH01	10/31/2013	**1,700**	**1,800**	170	**4,400**	15.65
BH01	1/24/2014	**6.5**	<1.0	<1.0	**3,000**	17.19
BH01	4/30/2014	**290**	**990**	76	**2,700**	17.35
BH01	7/25/2014	**45**	100	53	**2,100**	14.68
BH01	10/27/2014	**21**	19	21	**2,100**	13.75
BH01	1/20/2015	**9.7**	13	<1.0	**1,600**	15.85
BH01	5/13/2015	4.9	13	5.2	**2,600**	15.90
BH01	7/30/2015	<1.0	6.5	<1.0	290	14.23
BH01	10/26/2015	1.1	15	5.3	400	13.57
BH01	1/26/2016	3.1	19	<1.0	980	16.04
BH01	4/21/2016	NS	NS	NS	NS	16.64
BH01	7/18/2016	Destroyed				
BH01R	7/18/2016	<1.0	2.4	<1.0	1,200	15.42
BH02	7/25/2013	**3,300**	**4,700**	**2,100**	**36,000**	17.63
BH02	10/31/2013	**770**	24	39	**3,300**	16.75
BH02	1/24/2014	**730**	20	<1.0	**2,600**	18.25
BH02	4/30/2014	**84**	12	3.8	410	18.39
BH02	7/25/2014	**53**	2.3	<1.0	68	15.75
BH02	10/27/2014	4.3	<1.0	<1.0	24	14.91
BH02	1/20/2015	**160**	<1.0	<1.0	390	17.02
BH02	5/13/2015	**93**	1.2	<1.0	75	17.14
BH02	7/30/2015	3.4	1.1	<1.0	57	15.61
BH02	10/26/2015	**39**	16	3.9	450	14.70
BH02	1/26/2016	<1.0	2.5	1.4	18	17.16
BH02	4/21/2016	**81**	<1.0	2.7	7.8	17.74
BH02	7/18/2016	**71**	1.0	<1.0	14	15.33
BH03	7/25/2013	**760**	**4,400**	**1,300**	**23,000**	15.98

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Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water [2] (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) [1]		**5**	**560**	**700**	**1,400**	
BH03	10/31/2013	3.6	8.6	2.2	100	15.15
BH03	1/24/2014	2.6	2.0	<1.0	62	16.63
BH03	4/30/2014	1.1	1.6	<1.0	45	16.79
BH03	7/25/2014	**33**	20	<1.0	480	14.14
BH03	10/27/2014	**17**	3.3	<1.0	210	13.27
BH03	1/20/2015	<1.0	<1.0	<1.0	8.7	15.35
BH03	5/13/2015	<1.0	<1.0	<1.0	8.2	15.38
BH03	7/30/2015	<1.0	<1.0	<1.0	4.9	13.72
BH03	10/26/2015	<1.0	<1.0	<1.0	12	13.09
BH03	1/26/2016	<1.0	1.4	<1.0	9.7	15.55
BH03	4/21/2016	<1.0	1.0	<1.0	5.7	16.16
BH03	7/18/2016	<1.0	<1.0	<1.0	<1.0	13.75
BH04	7/25/2013	**1,700**	170	**1,200**	**19,000**	15.91
BH04	10/31/2013	**2,500**	140	620	**13,000**	15.09
BH04	1/24/2014	**2,100**	320	**740**	**14,000**	16.60
BH04	4/30/2014	**1,700**	300	**1,100**	**19,000**	16.74
BH04	7/25/2014	**410**	9.3	36	**6,400**	14.11
BH04	10/27/2014	**37**	2.4	<1.0	630	13.22
BH04	1/20/2015	**45**	<1.0	<1.0	520	15.46
BH04	5/13/2015	2.6	<1.0	<1.0	110	15.40
BH04	7/30/2015	**8.8**	1.2	2.4	780	13.76
BH04	10/26/2015	3.2	3.9	7.2	450	13.05
BH04	1/26/2016	<1.0	2.2	2.4	43	15.51
BH04	4/21/2016	<1.0	<1.0	<1.0	10	16.10
BH04	7/18/2016	<1.0	<1.0	<1.0	2.0	13.71
BH05	7/25/2013	**17**	**3,300**	**930**	**15,000**	13.07
BH05	10/31/2013	<1.0	<1.0	2.0	85	12.01
BH05	1/24/2014	<1.0	<1.0	<1.0	<1.0	13.52
BH05	4/30/2014	<1.0	<1.0	<1.0	4.5	13.65

TABLE 1
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Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water [2] (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) [1]		**5**	**560**	**700**	**1,400**	
BH05	7/25/2014	<1.0	<1.0	<1.0	5.8	11.03
BH05	10/27/2014	<1.0	<1.0	<1.0	2.9	10.37
BH05	1/20/2015	<1.0	<1.0	<1.0	<1.0	12.50
BH05	5/13/2015	<1.0	<1.0	<1.0	<1.0	12.41
BH05	7/30/2015	<1.0	<1.0	<1.0	2.3	10.91
BH05	10/26/2015	<1.0	<1.0	<1.0	<1.0	10.17
BH05	1/26/2016	<1.0	<1.0	<1.0	<1.0	12.79
BH05	4/21/2016	<1.0	<1.0	<1.0	<1.0	13.20
BH05	7/18/2016	<1.0	<1.0	<1.0	<1.0	11.11
BH06	7/25/2013	1.9	12	**3,100**	**46,000**	13.47
BH06	10/31/2013	<1.0	<1.0	1.9	57	12.46
BH06	1/24/2014	<1.0	<1.0	<1.0	2.9	13.95
BH06	4/30/2014	<1.0	<1.0	2.0	49	14.06
BH06	7/25/2014	<1.0	<1.0	<1.0	4.9	11.44
BH06	10/27/2014	<1.0	<1.0	<1.0	2.6	10.81
BH06	1/20/2015	<1.0	<1.0	<1.0	2.3	12.93
BH06	5/13/2015	<1.0	<1.0	**750**	**10,000**	12.82
BH06	7/30/2015	<1.0	<1.0	<1.0	<1.0	11.32
BH06	10/26/2015	<1.0	<1.0	<1.0	<1.0	10.59
BH06	1/26/2016	<1.0	<1.0	<1.0	<1.0	13.09
BH06	4/21/2016	<1.0	<1.0	270	**4,800**	13.55
BH06	7/18/2016	<1.0	<1.0	9.6	240	11.18
BH07	7/25/2013	<1.0	<1.0	<1.0	<1.0	15.33
BH07	10/31/2013	<1.0	<1.0	<1.0	<1.0	14.31
BH07	1/24/2014	<1.0	<1.0	<1.0	<1.0	15.81
BH07	4/30/2014	<1.0	<1.0	<1.0	<1.0	15.96
BH07	7/25/2014	<1.0	<1.0	<1.0	<1.0	13.27
BH07	10/27/2014	<1.0	<1.0	<1.0	<1.0	10.60
BH07	1/20/2015	<1.0	<1.0	<1.0	<1.0	14.78

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Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water [2] (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) [1]		**5**	**560**	**700**	**1,400**	
BH07	5/13/2015	<1.0	<1.0	<1.0	<1.0	14.53
BH07	7/30/2015	<1.0	<1.0	<1.0	<1.0	13.17
BH07	10/26/2015	<1.0	<1.0	<1.0	<1.0	12.37
BH07	1/26/2016	<1.0	<1.0	<1.0	<1.0	14.92
BH07	4/21/2016	<1.0	<1.0	<1.0	<1.0	15.39
BH07	7/18/2016	<1.0	<1.0	<1.0	<1.0	13.11
BH08	7/25/2013	<1.0	<1.0	<1.0	<1.0	13.47
BH08	10/31/2013	<1.0	<1.0	<1.0	<1.0	12.41
BH08	1/24/2014	<1.0	<1.0	<1.0	<1.0	13.91
BH08	4/30/2014	<1.0	<1.0	<1.0	<1.0	14.05
BH08	7/25/2014	<1.0	<1.0	<1.0	<1.0	11.42
BH08	10/27/2014	NS	NS	NS	NS	NM
BH08	1/22/2015	<1.0	<1.0	<1.0	<1.0	12.88
BH08	5/13/2015	<1.0	<1.0	<1.0	<1.0	12.90
BH08	7/30/2015	<1.0	<1.0	<1.0	<1.0	11.30
BH08	10/26/2015	<1.0	<1.0	<1.0	<1.0	10.56
BH08	1/26/2016	<1.0	<1.0	<1.0	<1.0	13.04
BH08	4/21/2016	<1.0	<1.0	<1.0	<1.0	13.57
BH08	7/18/2016	<1.0	<1.0	<1.0	<1.0	11.22

Notes:
COGCC = Colorado Oil and Gas Conservation Commission
1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective January 30, 2015.
2. Depth to water measured from top of well casing
µg/L = Micrograms per liter
(<) = Analytical result is less than the indicated laboratory reporting limit.
NM = Not measured
NS = Not sampled
BOLD = Analytical result is in exceedance of COGCC groundwater standards.

TABLE 2
H&S (MINERAL) #1 TANK BATTERY
EFR / AS OPERATIONAL SUMMARY TABLE

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)
Third Quarter 2013					
8/6/2013	BH02, BH03, BH04, BH05, BH06	6	50	BH01, BH02, BH03, BH05, BH06	10
8/19/2013	BH01, BH02, BH03, BH04, BH05, BH06	6	80	BH01, BH02, BH03, BH04, BH05, BH06	10
9/8/2013		6	21		10
9/16/2013		6	80		10
9/30/2013		5	90	BH01, BH02, BH03, BH05, BH06	20
Quarterly Totals		29	321		-
Fourth Quarter 2013					
10/11/2013	BH01, BH02, BH03, BH04, BH05, BH06	6	80	BH01, BH02, BH03, BH05, BH06	10
10/24/2013	BH01, BH02, BH03, BH04, BH06	6	110	BH01, BH02, BH03, BH05, BH06	12
11/26/2013	BH01, BH02, BH03, BH04, BH05, BH06	6	40		10
12/17/2013		6	42		10
Quarterly Totals		24	272		-
First Quarter 2014					
1/7/2014	BH01, BH02, BH03, BH04, BH05, BH06	5.5	90	BH01, BH02, BH03, BH05, BH06	10
1/22/2014		6	230		10
2/24/2014		6	180		10
3/11/2014		6	90		10
3/20/2014		6	135		10
Quarterly Totals		29.5	725		-
Second Quarter 2014					
4/10/2014	BH01, BH02, BH03, BH04, BH05	8	230	BH01, BH02, BH03, BH05	10
4/23/2014	BH01, BH02, BH03, BH04, BH05, BH06	6	180	BH01, BH02, BH03, BH04, BH05, BH06	20
5/13/2014		6	220		10
5/28/2014		6	180		20
6/10/2014		8	270		25
6/23/2014		6	185		20
Quarterly Totals		40	1265		-

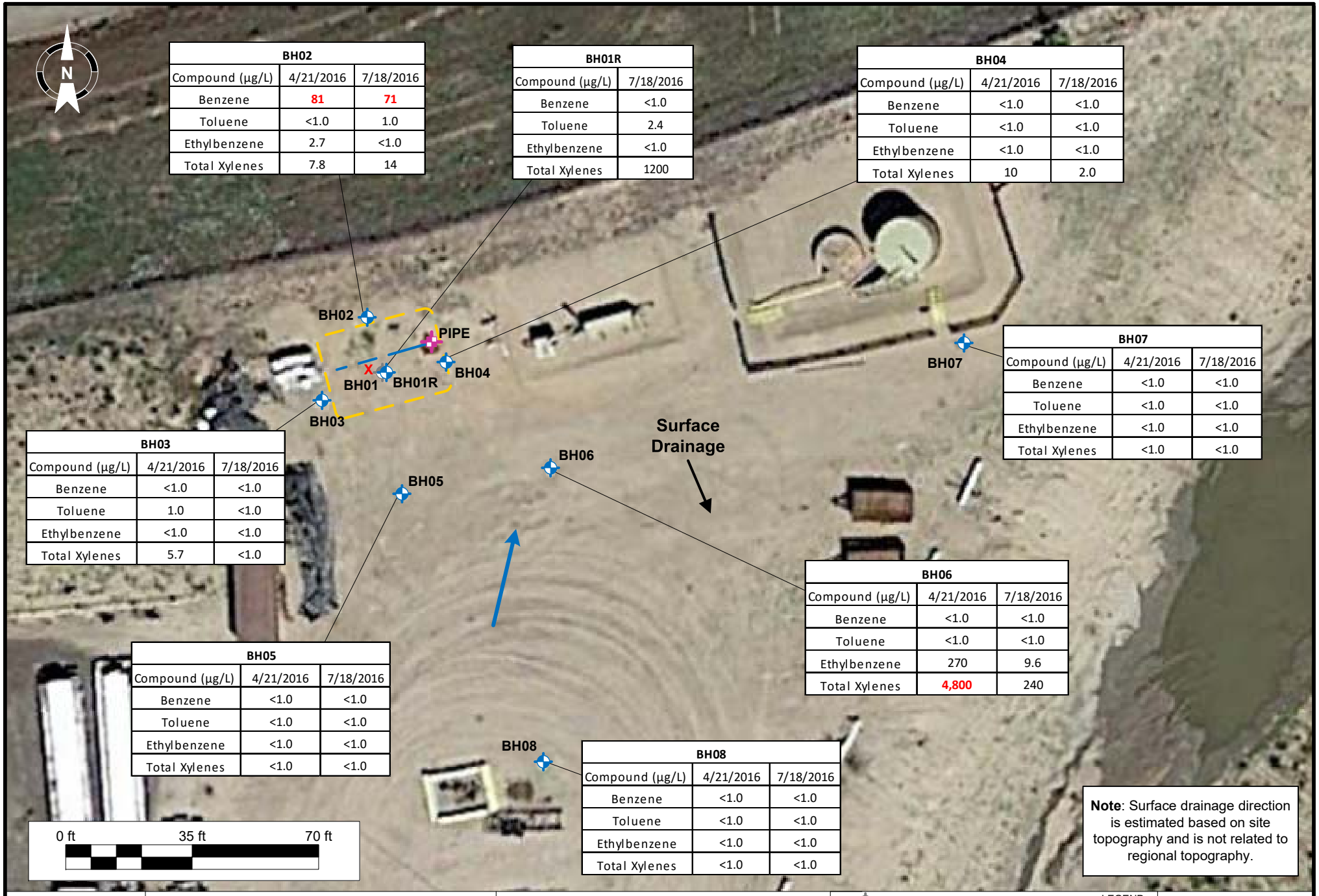
TABLE 2
H&S (MINERAL) #1 TANK BATTERY
EFR / AS OPERATIONAL SUMMARY TABLE

Third Quarter 2014					
7/11/2014	BH01, BH02, BH03, BH04, BH05, BH06	6	150	BH01, BH02, BH03, BH04, BH05, BH06	20
7/16/2014		6	240		15
8/8/2014		6	250		15
8/25/2014		6	230		20
9/10/2014		6	300		20
9/22/2014		6	350		20
Quarterly Totals		36	1520		-
Fourth Quarter 2014					
10/10/2014	BH01, BH02, BH03, BH04, BH05, BH06	6	100	BH01, BH02, BH03, BH04, BH05, BH06	20
10/24/2014	Pipe, BH01, BH02, BH03,BH05, BH06	6	50		15
11/7/2014		6	270		20
11/25/2014	Pipe, BH01, BH02, BH03,BH05	6	207		20
12/10/2014	BH01, BH02, BH03, BH04, BH05, BH06	6	18	BH01, BH02, BH03, BH05, BH06	30
Quarterly Totals		30	645		-
First Quarter 2015					
1/2/2015	Pipe, BH01, BH02, BH03,BH05, BH06	6	150	BH01, BH02, BH03, BH04, BH05, BH06	15
1/14/2015	Pipe, BH01, BH02, BH03, BH04	5	245	BH01, BH02, BH03, BH04	20
2/3/2015	Pipe, BH01, BH02, BH03, BH05, BH06	6	120	BH01, BH02, BH03, BH04, BH05, BH06	20
2/18/2015	Pipe, BH01, BH02, BH03, BH04, BH05, BH06	6	250		20
3/13/2015		6	100		20
3/25/2015		6	160		20
Quarterly Totals		35	1025		-
Second Quarter 2015					
4/1/2015	Pipe, BH01, BH02, BH03,BH04, BH05, BH06	6	165	BH01, BH02, BH03, BH04, BH05, BH06	20
4/21/2015	Pipe, BH01, BH02, BH03, BH04, BH05	6	180	BH01, BH02, BH03, BH04, BH05	20
5/5/2015	Pipe, BH01, BH02, BH03,BH04, BH05, BH06	6	80	BH01, BH02, BH03, BH04, BH05, BH06	20
5/19/2015		6	250		20
6/2/2015		6	270		20
6/16/2015		6	350		20
6/30/2015		6	340		20
Quarterly Totals		42	1635		-

TABLE 2
H&S (MINERAL) #1 TANK BATTERY
EFR / AS OPERATIONAL SUMMARY TABLE

Third Quarter 2015					
7/14/2015	Pipe, BH01, BH02, BH03,BH04, BH05, BH06	6	375	BH01, BH02, BH03, BH04,	20
7/28/2015		6	405		20
8/11/2015		6	320	BH01, BH02, BH04, BH05	20
8/25/2015		6	505	BH01, BH02, BH03, BH04, BH05, BH06	20
9/8/2015		6	90		20
9/22/2015		6	700		20
Quarterly Totals		36	2395		-
Fourth Quarter 2015					
10/6/2015	Pipe, BH01, BH02, BH03,BH04, BH05, BH06	6	550	BH01, BH02, BH03, BH04, BH05, BH06	20
10/20/2015		6	400		20
11/3/2015	Pipe, BH01, BH02, BH03,BH04, BH05	6	552		20
11/19/2015	Pipe, BH01, BH03, BH05, BH06	6	320	BH01, BH02, BH03, BH04, BH05	20
12/1/2015		6	142		20
12/22/2015	Pipe, BH01, BH02, BH03	6	260	BH02, BH03, BH04	20
Quarterly Totals		36	2224		-
First Quarter 2016					
1/13/2016	Pipe, BH01, BH03, BH05, BH06	6	20	BH01, BH02, BH03, BH04, BH05	20
2/12/2016		6	200		20
2/25/2016		6	420		20
3/10/2016		6	250		20
3/24/2016		6	320		24
Quarterly Totals		30	1210		-
Second Quarter 2016					
4/7/2016	Pipe, BH03, BH05, BH06	6	840	BH01, BH02, BH03, BH04, BH05, BH06	20
4/22/2016		6	250		25
5/19/2016		6	210		20
6/2/2016		6	210		20
6/16/2016		6	294		20
6/28/2016		6	350		20
Quarterly Totals		36	2154		-
Third Quarter 2016					
7/14/2016	Pipe, BH03, BH05, BH06	6	294	BH01, BH02, BH03, BH04, BH05, BH06	20
7/26/2016		6	320		20
8/11/2016		6	270		20
8/23/2016		6	210		20
Quarterly Totals		24	1094		-

Notes:
EFR = Enhanced fluid recovery
AS = Air sparge
psi = Pounds per square inch



BH02		
Compound (µg/L)	4/21/2016	7/18/2016
Benzene	81	71
Toluene	<1.0	1.0
Ethylbenzene	2.7	<1.0
Total Xylenes	7.8	14

BH01R	
Compound (µg/L)	7/18/2016
Benzene	<1.0
Toluene	2.4
Ethylbenzene	<1.0
Total Xylenes	1200

BH04		
Compound (µg/L)	4/21/2016	7/18/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	10	2.0

BH07		
Compound (µg/L)	4/21/2016	7/18/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH03		
Compound (µg/L)	4/21/2016	7/18/2016
Benzene	<1.0	<1.0
Toluene	1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	5.7	<1.0

BH06		
Compound (µg/L)	4/21/2016	7/18/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	270	9.6
Total Xylenes	4,800	240

BH05		
Compound (µg/L)	4/21/2016	7/18/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH08		
Compound (µg/L)	4/21/2016	7/18/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

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

DRAWN BY: MRW

DATE: 7/18/2016

Facility Diagram
PDC Energy – DJ Basin
H&S (Mineral) #1 Tank Battery
NWSW S6 T4N R65W
Weld County, CO

TASMAN GEOSCIENCES
6899 Pecos Street
Unit C
Denver, CO 80221

LEGEND
- Destroyed Monitoring Well Location
- Monitoring Well Location
- Horizontal Remediation Well Location
- Groundwater Flow Direction
- X Point of Release
- Excavation Extent

All locations are approximate unless otherwise noted

FIGURE 1
GROUNDWATER ANALYTICAL RESULTS MAP

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

September 12, 2016

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

RE: H&S Mineral #1

Enclosed are the results of analyses for samples received by Summit Scientific on 07/18/16 17:00. 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: H&S Mineral #1 Project Number: [none] Project Manager: Mark Longhurst	**Reported:** 09/12/16 12:39

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01R	1607116-01	Water	07/18/16 13:42	07/18/16 17:00
BH02	1607116-02	Water	07/18/16 13:33	07/18/16 17:00
BH03	1607116-03	Water	07/18/16 13:30	07/18/16 17:00
BH04	1607116-04	Water	07/18/16 14:00	07/18/16 17:00
BH05	1607116-05	Water	07/18/16 13:55	07/18/16 17:00
BH06	1607116-06	Water	07/18/16 13:40	07/18/16 17:00
BH07	1607116-07	Water	07/18/16 13:40	07/18/16 17:00
BH08	1607116-08	Water	07/18/16 14:07	07/18/16 17:00

Case Narrative

Client: Tasman Geosciences

Project: HS Mineral #1

Report Number 1607116

Per client requiest via email dated 9/12/16 from Brock Nelson the sample ID in this report has been changed in the following manner:

BH01 to BH01R

PDC Energy 1775 Sherman St. STE. 3000 Denver CO, 80203	Project: H&S Mineral #1 Project Number: [none] Project Manager: Mark Longhurst	**Reported:** 09/12/16 12:39

Summit Scientific 1607116

741 Corporate Circle Suite I • Golden, Colorado 80401
303-277-9310 • 303-374-5933 Fax

Page 1 of 1

Client: PDC Energy
Address:
City/State/Zip:
Phone: Fax:
Sampler Name: Mark P. Roselip A

Project Manager: Mark Longhurst
E-Mail: Mark.Longhurst@PDCE.com
Project Name: H&S Mineral #1
Project Number:

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative: HCl	Preservative: HNO_3	Preservative: None	Preservative: Other (Specify)	Matrix: Groundwater	Matrix: Soil	Matrix: Air - Canister Serial #	Matrix: Other (Specify)	Analyze For: BTEX 8260	Special Instructions
BH01	7-18-16	13:42	3	X				X				X	
BH02	7-18-16	13:33	3	X				X				X	
BH03	7-18-16	13:30	3	X				X				X	
BH04	7-18-16	14:00	3	X				X				X	
BH05	7-18-16	13:55	3	X				X				X	
BH06	7-18-16	13:40	3	X				X				X	
BH07	7-18-16	13:40	3	X				X				X	
BH08	7-18-16	14:07	3	X				X				X	

Relinquished by: Mark Roselip Date/Time: 7-18-16
Received by: Date/Time: 7-18-16 17:00

Relinquished by: Date/Time:
Received by: Date/Time: 7/18/16

Relinquished by: Date/Time:
Received in Lab by: Date/Time: 7-20-16

Turn Around Time (Check)
Same Day [ ] 72 Hours [ ]
24 Hours [ ] Standard [X]
48 Hours [ ]

Sample Integrity:
Temperature Upon Receipt: 6.2°C on ICE
Intact: Yes [X] No [ ]

Notes:

www.s2scientific.com

S2

PDC Energy 1775 Sherman St. STE. 3000 Denver CO, 80203	Project: H&S Mineral #1 Project Number: [none] Project Manager: Mark Longhurst	**Reported:** 09/12/16 12:39

Sample Receipt Checklist

S2 Work Order: 1607116

Client: PDC Client Project ID: H&S Mineral #1

Shipped Via: HD (UPS, FedEx, Hand Delivered, Pick-up, etc.) Airbill #: _____

Matrix (check all that apply): ____Air ____Soil/Solid ✓Water ____Other: _____ (Describe)

Cooler ID					
Temp (°C)	6.2°C				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C [(1)]? NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.	✓			
Were all samples received intact [(1)]?	✓			
Was adequate sample volume provided [(1)]?	✓			
If custody seals are present, are they intact [(1)]?			✓	
Are short holding time analytes or samples with HTs due within 48 hours present?		✓		
Is a chain-of-custody (COC) form present and filled out completely [(1)]?	✓			
Does the COC agree with the number and type of sample bottles received [(1)]?	✓			
Do the sample IDs on the bottle labels match the COC [(1)]?	✓	✓		BH03, 1 vial labeled BH06
Is the COC properly relinquished by the client w/ date and time recorded [(1)]?	✓			
For volatiles in water – is there headspace present? **If yes, contact client and note in narrative.**		✓		
Are samples preserved that require preservation **(excluding cooling)**[(1)]? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	✓			
If samples are acid preserved for metals, is the pH ≤ 2[(1)]? Record the pH in Comments.			✓	
If dissolved metals are requested, were samples field filtered?			✓	
Additional Comments (if any):				

[(1)] **If NO, then contact the client before proceeding with analysis and note in case narrative.**

Mindy Mach — **Custodian Printed Name**

Signature or Initials of Custodian

7/9/16 11:17 — **Date/Time**

PDC Energy 1775 Sherman St. STE. 3000 Denver CO, 80203	Project: H&S Mineral #1 Project Number: [none] Project Manager: Mark Longhurst	**Reported:** 09/12/16 12:39

BH01R
1607116-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/16 13:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1607173	07/19/16	07/20/16	EPA 8260B	
Toluene	**2.4**	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	**1200**	1.0	"	"	"	"	"	"	

Date Sampled: **07/18/16 13:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*87.3 %*	*37-154*		"	"	"	"	
Surrogate: Toluene-d8		*97.7 %*	*45-149*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*82.7 %*	*45-146*		"	"	"	"	

PDC Energy 1775 Sherman St. STE. 3000 Denver CO, 80203	Project: H&S Mineral #1 Project Number: [none] Project Manager: Mark Longhurst	**Reported:** 09/12/16 12:39

BH02
1607116-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/16 13:33**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	**71**	1.0	ug/l	1	1607173	07/19/16	07/20/16	EPA 8260B	
Toluene	**1.0**	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	**14**	1.0	"	"	"	"	"	"	

Date Sampled: **07/18/16 13:33**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*92.3 %*	*37-154*		"	"	"	"	
Surrogate: Toluene-d8		*97.6 %*	*45-149*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.2 %*	*45-146*		"	"	"	"	

PDC Energy	Project: H&S Mineral #1	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	09/12/16 12:39

BH03

1607116-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/16 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1607173	07/19/16	07/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **07/18/16 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*88.4 %*	*37-154*		"	"	"	"	
Surrogate: Toluene-d8		*97.2 %*	*45-149*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*92.3 %*	*45-146*		"	"	"	"	

PDC Energy	Project: H&S Mineral #1	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	09/12/16 12:39

BH04
1607116-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1607173	07/19/16	07/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	**2.0**	1.0	"	"	"	"	"	"	

Date Sampled: **07/18/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*89.1 %*	*37-154*		"	"	"	"	
Surrogate: Toluene-d8		*97.1 %*	*45-149*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*94.9 %*	*45-146*		"	"	"	"	

PDC Energy 1775 Sherman St. STE. 3000 Denver CO, 80203	Project: H&S Mineral #1 Project Number: [none] Project Manager: Mark Longhurst	**Reported:** 09/12/16 12:39

BH05
1607116-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/16 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1607173	07/19/16	07/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **07/18/16 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*90.1 %*	*37-154*		"	"	"	"	
Surrogate: Toluene-d8		*98.0 %*	*45-149*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*93.2 %*	*45-146*		"	"	"	"	

PDC Energy 1775 Sherman St. STE. 3000 Denver CO, 80203	Project: H&S Mineral #1 Project Number: [none] Project Manager: Mark Longhurst	**Reported:** 09/12/16 12:39

BH06
1607116-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/16 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1607173	07/19/16	07/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	**9.6**	1.0	"	"	"	"	"	"	
Xylenes (total)	**240**	1.0	"	"	"	"	"	"	

Date Sampled: **07/18/16 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*89.2 %*	*37-154*		"	"	"	"	
Surrogate: Toluene-d8		*96.8 %*	*45-149*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.3 %*	*45-146*		"	"	"	"	

PDC Energy	Project: H&S Mineral #1	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	09/12/16 12:39

BH07

1607116-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/16 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1607173	07/19/16	07/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **07/18/16 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*88.9 %*	*37-154*		"	"	"	"	
Surrogate: Toluene-d8		*98.0 %*	*45-149*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*92.9 %*	*45-146*		"	"	"	"	

PDC Energy	Project: H&S Mineral #1	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	09/12/16 12:39

BH08
1607116-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/16 14:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1607173	07/19/16	07/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **07/18/16 14:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*90.2 %*	*37-154*		"	"	"	"	
Surrogate: Toluene-d8		*97.3 %*	*45-149*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*92.7 %*	*45-146*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1607173 - EPA 5030 Water MS										
Blank (1607173-BLK1)				Prepared & Analyzed: 07/19/16						
Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	*11.4*		"	*13.3*		*85.6*	*37-154*			
Surrogate: Toluene-d8	*12.9*		"	*13.3*		*96.5*	*45-149*			
Surrogate: 4-Bromofluorobenzene	*12.8*		"	*13.3*		*96.3*	*45-146*			
LCS (1607173-BS1)				Prepared & Analyzed: 07/19/16						
Benzene	33.1	1.0	ug/l	33.3		99.4	51-132			
Toluene	36.3	1.0	"	33.3		109	51-138			
Ethylbenzene	37.7	1.0	"	33.1		114	58-146			
m,p-Xylene	66.6	2.0	"	66.5		100	57-144			
o-Xylene	36.1	1.0	"	32.7		110	53-146			
Surrogate: 1,2-Dichloroethane-d4	*12.2*		"	*13.3*		*91.4*	*37-154*			
Surrogate: Toluene-d8	*13.1*		"	*13.3*		*98.2*	*45-149*			
Surrogate: 4-Bromofluorobenzene	*12.4*		"	*13.3*		*93.1*	*45-146*			
Matrix Spike (1607173-MS1)		**Source: 1607114-01**		Prepared & Analyzed: 07/19/16						
Benzene	33.4	1.0	ug/l	33.3	ND	100	34-141			
Toluene	35.7	1.0	"	33.3	ND	107	27-151			
Ethylbenzene	62.3	1.0	"	33.1	35.2	81.8	29-160			
m,p-Xylene	142	2.0	"	66.5	127	22.5	20-166			
o-Xylene	35.6	1.0	"	32.7	ND	109	33-159			
Surrogate: 1,2-Dichloroethane-d4	*12.5*		"	*13.3*		*94.1*	*37-154*			
Surrogate: Toluene-d8	*12.8*		"	*13.3*		*96.2*	*45-149*			
Surrogate: 4-Bromofluorobenzene	*13.1*		"	*13.3*		*98.2*	*45-146*			

PDC Energy	Project: H&S Mineral #1	
1775 Sherman St. STE. 3000	Project Number: [none]	**Reported:**
Denver CO, 80203	Project Manager: Mark Longhurst	09/12/16 12:39

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1607173 - EPA 5030 Water MS										
Matrix Spike Dup (1607173-MSD1)	**Source: 1607114-01**			Prepared & Analyzed: 07/19/16						
Benzene	33.2	1.0	ug/l	33.3	ND	99.7	34-141	0.420	32	
Toluene	36.1	1.0	"	33.3	ND	108	27-151	1.03	25	
Ethylbenzene	58.0	1.0	"	33.1	35.2	68.8	29-160	7.13	50	
m,p-Xylene	126	2.0	"	66.5	127	NR	20-166	12.3	36	QM-07
o-Xylene	35.6	1.0	"	32.7	ND	109	33-159	0.141	26	
Surrogate: 1,2-Dichloroethane-d4	*13.6*		*"*	*13.3*		*102*	*37-154*			
Surrogate: Toluene-d8	*12.9*		*"*	*13.3*		*96.7*	*45-149*			
Surrogate: 4-Bromofluorobenzene	*13.3*		*"*	*13.3*		*99.5*	*45-146*			

Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
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