

PDC Energy, Inc.
Fourth Quarter 2016 Groundwater Monitoring Summary

January 31, 2017

Dechant 1-31A Tank Battery
SWSW Section 31 T3N R64W
Weld County, API # 05-123-11685
Facility ID # 444062
Remediation # 9365

This groundwater monitoring summary has been prepared by Tasman Geosciences, Inc. for the Dechant 1-31A tank battery. On December 16, 2016, groundwater monitoring was conducted at fourteen monitoring well locations (MW02R, MW03R, MW05R, MW07, MW10R, MW13, MW17R, MW18 - MW24). Fourteen (14) previously installed monitoring well locations (MW01 - MW06, MW08 - MW12, and MW14 - MW16) were destroyed in 2010 and 2011 and are no longer incorporated in the monitoring well network. Fourteen 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 report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 1. Analytical results from the fourth quarter 2016 sampling event indicated that BTEX concentrations were above the COGCC regulatory standards in monitoring wells MW05-R, MW-13, and MW23. BTEX concentrations were below COGCC regulatory standards at the remaining eleven well locations.

Enhanced fluid recovery (EFR) and air sparge (AS) events were initiated at the site during the third quarter 2015. Mobile EFR/AS events were discontinued following the fourth quarter 2015. A summary of EFR/AS operational data is provided in Table 2.

During the first quarter 2016, a soil vapor extraction (SVE) and AS system was installed on site in order to address remaining dissolved phase BTEX concentrations. The SVE/AS remediation well network is evaluated quarterly based on analytical data and modified to address monitoring well locations with persisting constituent concentrations in exceedance of regulatory standards. The SVE/AS remediation well network is illustrated on Figure 2. Volatile organic compound (VOC) samples are collected from the system effluent on a quarterly basis, in order to monitor performance and calculate the total contaminant mass removed. The SVE system operated approximately 90% of the quarter, with minor downtime due to new remediation well network tie-ins. The fourth quarter 2016 VOC sample did not detect any compounds above the reporting limit, so the emissions for the quarter were calculated to be zero. Since start-up, the SVE/AS system has removed 148 pounds of hydrocarbon mass. Operation of the SVE/AS remediation system will continue as the selected remediation strategy through the first quarter 2017.

First quarter 2017 groundwater sampling will be conducted during March 2017.

TABLE 1
DECHANT 1-31A 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	
MW01	12/16/2009	<1.0	1.5	47	540	N/A
MW01	6/22/2010	Destroyed				
MW02	12/16/2009	62	1,300	610	5,600	N/A
MW02	6/22/2010	Destroyed				
MW02-R	1/25/2016	<1.0	<1.0	<1.0	<1.0	10.80
MW02-R	3/31/2016	<1.0	<1.0	<1.0	<1.0	9.98
MW02-R	6/30/2016	<1.0	<1.0	<1.0	<1.0	8.72
MW02-R	9/14/2016	<1.0	<1.0	<1.0	<1.0	9.96
MW02-R	12/16/2016	<1.0	<1.0	<1.0	<1.0	10.06
MW03	12/16/2009	440	6,000	960	12,000	N/A
MW03	6/22/2010	Destroyed				
MW03-R	1/25/2016	<1.0	<1.0	5.7	160	11.32
MW03-R	3/31/2016	<1.0	<1.0	<1.0	<1.0	10.12
MW03-R	6/30/2016	<1.0	<1.0	<1.0	<1.0	8.86
MW03-R	9/14/2016	<1.0	<1.0	1.1	1.3	10.13
MW03-R	12/16/2016	<1.0	<1.0	<1.0	<1.0	10.25
MW04	12/16/2009	<1.0	13	240	3,000	N/A
MW04	6/22/2010	<1.0	<1.0	23	260	18.05
MW04	9/17/2010	<1.0	<1.0	9.5	81	17.41
MW04	12/9/2010	<1.0	<1.0	1.4	6.7	16.88
MW04	3/10/2011	Destroyed				
MW05	12/16/2009	140	1,400	960	12,000	N/A
MW05	6/22/2010	Destroyed				
MW05-R	1/25/2016	<1.0	<1.0	300	14,000	10.77
MW05-R	3/31/2016	<1.0	<1.0	560	530	9.86
MW05-R	6/30/2016	<1.0	<1.0	250	12,000	8.60
MW05-R	9/14/2016	<1.0	<1.0	530	12,000	9.85
MW05-R	12/16/2016	380	<1.0	420	8,500	9.96
MW07	12/16/2009	<1.0	<1.0	<1.0	<1.0	N/A
MW07	6/22/2010	<1.0	<1.0	<1.0	<1.0	21.45

TABLE 1
DECHANT 1-31A 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	
MW07	9/17/2010	<1.0	<1.0	<1.0	<1.0	20.83
MW07	12/9/2010	<1.0	<1.0	<1.0	<1.0	20.32
MW07	3/10/2011	<1.0	<1.0	<1.0	<1.0	20.10
MW07	6/8/2011	<1.0	<1.0	<1.0	<1.0	20.00
MW07	9/26/2011	<1.0	<1.0	<1.0	<1.0	19.71
MW07	12/29/2011	NS	NS	NS	NS	N/A
MW07	3/7/2012	<1.0	<1.0	<1.0	<1.0	19.39
MW07	6/26/2012	<1.0	<1.0	<1.0	<1.0	18.55
MW07	9/20/2012	<1.0	<1.0	<1.0	<1.0	18.89
MW07	12/12/2012	<1.0	<1.0	<1.0	<1.0	18.56
MW07	6/21/2013	<1.0	<1.0	<1.0	<1.0	18.50
MW07	9/23/2013	<1.0	<1.0	<1.0	<1.0	18.71
MW07	12/18/2013	<1.0	<1.0	<1.0	<1.0	18.48
MW07	3/31/2014	<1.0	<1.0	<1.0	<1.0	18.28
MW07	6/17/2014	<1.0	<1.0	<1.0	<1.0	17.20
MW07	9/17/2014	<1.0	<1.0	<1.0	<1.0	16.62
MW07	12/2/2014	<1.0	<1.0	<1.0	<1.0	16.02
MW07	3/16/2015	<1.0	<1.0	<1.0	<1.0	15.23
MW07	6/25/2015	<1.0	<1.0	<1.0	<1.0	13.84
MW07	9/25/2015	<1.0	<1.0	<1.0	<1.0	14.51
MW07	12/16/2015	<1.0	<1.0	<1.0	<1.0	14.05
MW07	3/31/2016	<1.0	<1.0	<1.0	6.1	12.87
MW07	6/30/2016	<1.0	<1.0	<1.0	<1.0	11.56
MW07	9/14/2016	<1.0	<1.0	<1.0	<1.0	12.84
MW07	12/16/2016	<1.0	<1.0	<1.0	<1.0	12.94
MW08	12/16/2009	<1.0	<1.0	<1.0	<1.0	N/A
MW08	6/22/2010	Destroyed				
MW09	12/16/2009	<1.0	<1.0	<1.0	<1.0	N/A
MW09	6/22/2010	<1.0	<1.0	<1.0	<1.0	17.62
MW09	9/17/2010	<1.0	<1.0	<1.0	<1.0	17.03
MW09	12/9/2010	<1.0	<1.0	<1.0	<1.0	16.51
MW09	3/10/2011	<1.0	<1.0	<1.0	<1.0	16.32
MW09	6/8/2011	<1.0	<1.0	<1.0	<1.0	15.15

TABLE 1
DECHANT 1-31A 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	
MW09	9/26/2011	<1.0	<1.0	<1.0	<1.0	15.93
MW09	12/29/2011	<1.0	<1.0	<1.0	<1.0	15.65
MW09	3/7/2012	<1.0	<1.0	<1.0	<1.0	15.59
MW09	6/26/2012	<1.0	<1.0	<1.0	<1.0	14.73
MW09	9/20/2012	NS	NS	NS	NS	N/A
MW09	12/12/2012	<1.0	<1.0	<1.0	<1.0	14.83
MW09	6/21/2013	Destroyed				
MW10	12/16/2009	310	1,000	690	8,700	N/A
MW10	6/22/2010	8.4	5.1	30	720	17.95
MW10	9/17/2010	55	<1.0	45	280	17.36
MW10	12/9/2010	34	<1.0	780	3,700	16.83
MW10	3/10/2011	12	<1.0	870	2,600	16.60
MW10	6/8/2011	<1.0	<1.0	28	140	16.70
MW10	9/26/2011	4.3	5.2	220	3,100	16.29
MW10	12/29/2011	NS	NS	NS	NS	N/A
MW10	3/7/2012	27	12	700	5,300	15.89
MW10	6/26/2012	Destroyed				
MW10-R	8/17/2012	5.8	2.3	460	10,000	N/A
MW10-R	9/20/2012	5.4	<1.0	440	7.5	17.95
MW10-R	12/12/2012	5.8	<1.0	350	7,000	17.88
MW10-R	6/21/2013	5.5	<1.0	330	7,200	17.25
MW10-R	9/23/2013	4.4	<1.0	350	7,500	17.23
MW10-R	12/18/2013	3.4	<1.0	73	6,600	15.69
MW10-R	3/31/2014	8.8	<1.0	570	640	15.52
MW10-R	6/17/2014	4.2	<1.0	100	7,700	14.41
MW10-R	9/17/2014	<1.0	<1.0	450	6,200	13.90
MW10-R	12/2/2014	1.7	<1.0	1,000	13,000	13.23
MW10-R	3/16/2015	<1.0	<1.0	550	7,900	12.46
MW10-R	6/25/2015	<1.0	<1.0	230	2,700	11.09
MW10-R	9/25/2015	<1.0	<1.0	59	240	11.86
MW10-R	12/16/2015	<1.0	<1.0	130	530	11.41
MW10-R	3/31/2016	<1.0	<1.0	<1.0	3.0	10.22
MW10-R	6/30/2016	<1.0	<1.0	170	1,900	9.11

TABLE 1
DECHANT 1-31A 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	
MW10-R	9/14/2016	<1.0	<1.0	28	140	10.35
MW10-R	12/16/2016	<1.0	<1.0	9.8	78	10.45
MW11	1/18/2010	1.0	<1.0	4.9	<1.0	N/A
MW11	6/22/2010	<1.0	<1.0	<1.0	<1.0	18.70
MW11	9/17/2010	<1.0	<1.0	<1.0	<1.0	18.16
MW11	12/9/2010	<1.0	<1.0	<1.0	<1.0	17.55
MW11	3/10/2011	Destroyed				
MW12	1/18/2010	<1.0	<1.0	<1.0	<1.0	N/A
MW12	6/22/2010	<1.0	<1.0	<1.0	<1.0	18.85
MW12	9/17/2010	<1.0	<1.0	<1.0	<1.0	18.25
MW12	12/9/2010	<1.0	<1.0	<1.0	<1.0	17.69
MW12	3/10/2011	<1.0	<1.0	<1.0	<1.0	17.42
MW12	6/8/2011	<1.0	<1.0	<1.0	<1.0	17.33
MW12	9/26/2011	<1.0	<1.0	<1.0	<1.0	17.16
MW12	12/29/2011	NS	NS	NS	NS	N/A
MW12	3/7/2012	<1.0	<1.0	<1.0	<1.0	16.74
MW12	6/26/2012	Destroyed				
MW13	1/18/2010	35	<1.0	230	73	N/A
MW13	6/22/2010	5.1	<1.0	290	<1.0	18.56
MW13	9/17/2010	13	<1.0	160	<1.0	17.95
MW13	12/9/2010	4.4	<1.0	160	<1.0	17.42
MW13	3/10/2011	<1.0	<1.0	23	3.4	16.15
MW13	6/8/2011	<1.0	<1.0	110	<1.0	17.04
MW13	9/26/2011	2.1	<1.0	190	2.3	16.84
MW13	12/29/2011	<1.0	<1.0	190	<1.0	16.51
MW13	3/7/2012	<1.0	<1.0	150	<1.0	16.45
MW13	6/26/2012	<1.0	<1.0	150	13	15.64
MW13	9/20/2012	NS	NS	NS	NS	N/A
MW13	12/12/2012	<1.0	<1.0	110	<1.0	15.70
MW13	6/21/2013	2.2	<1.0	110	160	15.61
MW13	9/23/2013	7.2	<1.0	290	1,100	15.75
MW13	12/18/2013	1.6	<1.0	2.7	94	15.56

TABLE 1
DECHANT 1-31A 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	
MW13	3/31/2014	<1.0	<1.0	<1.0	4.8	15.26
MW13	6/17/2014	3.5	<1.0	270	850	14.24
MW13	9/17/2014	<1.0	<1.0	190	120	13.43
MW13	12/2/2014	2.8	<1.0	610	280	13.09
MW13	3/16/2015	2.2	<1.0	530	210	12.31
MW13	6/25/2015	1.8	<1.0	260	310	10.91
MW13	9/25/2015	2.0	<1.0	570	710	11.61
MW13	12/16/2015	1.5	1.3	650	1,400	13.14
MW13	3/31/2016	1.6	1.8	400	1,200	10.33
MW13	6/30/2016	1.5	1.3	360	1,400	9.12
MW13	9/14/2016	1.0	<1.0	460	900	9.55
MW13	12/16/2016	<1.0	22	500	6,300	10.55
MW14	1/18/2010	<1.0	<1.0	<1.0	<1.0	N/A
MW14	6/22/2010	<1.0	<1.0	<1.0	<1.0	19.06
MW14	9/17/2010	3.9	<1.0	180	25	18.49
MW14	12/9/2010	<1.0	<1.0	3.8	<1.0	17.94
MW14	3/10/2011	1.2	<1.0	8.8	<1.0	17.64
MW14	6/8/2011	<1.0	<1.0	1.3	<1.0	17.69
MW14	9/26/2011	2.8	<1.0	150	3.0	17.37
MW14	12/29/2011	<1.0	<1.0	26	<1.0	17.03
MW14	3/7/2012	<1.0	<1.0	<1.0	<1.0	16.95
MW14	6/26/2012	Destroyed				
MW15	2/10/2010	240	<1.0	340	1,600	N/A
MW15	6/22/2010	<1.0	<1.0	<1.0	<1.0	17.04
MW15	9/17/2010	Destroyed				
MW16	2/10/2010	44	<1.0	130	450	N/A
MW16	6/22/2010	<1.0	<1.0	4.4	12	16.72
MW16	9/17/2010	Destroyed				
MW17	3/31/2014	<1.0	<1.0	<1.0	<1.0	13.68
MW17	6/17/2014	<1.0	<1.0	<1.0	<1.0	12.58
MW17	9/17/2014	<1.0	<1.0	<1.0	<1.0	12.04
MW17	12/2/2014	<1.0	<1.0	<1.0	6.6	11.42

TABLE 1
DECHANT 1-31A 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	
MW17	3/16/2015	<1.0	<1.0	1.5	2.0	10.61
MW17	6/25/2015	<1.0	<1.0	<1.0	<1.0	9.23
MW17	9/25/2015	<1.0	<1.0	<1.0	<1.0	9.92
MW17	12/16/2015	<1.0	<1.0	<1.0	<1.0	9.48
MW17 ⁽²⁾	3/31/2016	NS	NS	NS	NS	NM
MW17	6/30/2016	Destroyed				NM
MW17R	9/14/2016	<1.0	<1.0	<1.0	<1.0	8.58
MW17R	12/16/2016	<1.0	<1.0	<1.0	<1.0	8.70
MW18	3/31/2014	<1.0	<1.0	<1.0	<1.0	14.00
MW18	6/17/2014	<1.0	<1.0	<1.0	<1.0	12.92
MW18	9/17/2014	<1.0	<1.0	<1.0	<1.0	12.40
MW18	12/2/2014	<1.0	<1.0	<1.0	<1.0	11.74
MW18	3/16/2015	<1.0	<1.0	<1.0	<1.0	10.95
MW18	6/25/2015	<1.0	<1.0	<1.0	<1.0	9.55
MW18	9/25/2015	<1.0	<1.0	<1.0	<1.0	10.35
MW18	12/16/2015	<1.0	<1.0	<1.0	<1.0	9.91
MW18	3/31/2016	<1.0	<1.0	<1.0	<1.0	8.66
MW18	6/30/2016	<1.0	<1.0	<1.0	<1.0	7.61
MW18	9/14/2016	<1.0	<1.0	<1.0	<1.0	8.96
MW18	12/16/2016	<1.0	<1.0	<1.0	<1.0	9.06
MW19	3/31/2014	<1.0	<1.0	<1.0	<1.0	14.37
MW19	6/17/2014	<1.0	<1.0	<1.0	<1.0	13.29
MW19	9/17/2014	<1.0	<1.0	<1.0	<1.0	12.75
MW19	12/2/2014	<1.0	<1.0	<1.0	<1.0	12.10
MW19	3/16/2015	<1.0	<1.0	<1.0	<1.0	11.31
MW19	6/25/2015	<1.0	<1.0	<1.0	<1.0	9.93
MW19	9/25/2015	<1.0	<1.0	<1.0	<1.0	10.63
MW19	12/16/2015	<1.0	<1.0	<1.0	<1.0	10.19
MW19	3/31/2016	<1.0	<1.0	<1.0	<1.0	8.94
MW19	6/30/2016	<1.0	<1.0	<1.0	<1.0	8.28
MW19	9/14/2016	<1.0	<1.0	<1.0	<1.0	9.59
MW19	12/16/2016	<1.0	<1.0	<1.0	<1.0	9.72

TABLE 1
DECHANT 1-31A 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	
MW20	3/31/2014	<1.0	<1.0	<1.0	46	14.85
MW20	6/17/2014	<1.0	<1.0	<1.0	2.5	13.73
MW20	9/17/2014	<1.0	<1.0	<1.0	<1.0	13.21
MW20	12/2/2014	<1.0	<1.0	<1.0	<1.0	12.55
MW20	3/16/2015	<1.0	<1.0	<1.0	<1.0	11.77
MW20	6/25/2015	<1.0	<1.0	<1.0	<1.0	10.39
MW20	9/25/2015	<1.0	<1.0	<1.0	<1.0	11.16
MW20	12/16/2015	<1.0	<1.0	<1.0	<1.0	10.73
MW20	3/31/2016	<1.0	<1.0	<1.0	<1.0	9.97
MW20	6/30/2016	<1.0	<1.0	<1.0	<1.0	8.72
MW20	9/14/2016	<1.0	<1.0	<1.0	<1.0	9.96
MW20	12/16/2016	<1.0	<1.0	<1.0	<1.0	10.09
MW21	3/31/2014	<1.0	<1.0	250	1,000	14.56
MW21	6/17/2014	<1.0	<1.0	470	3,200	13.47
MW21	9/17/2014	<1.0	<1.0	380	3,400	12.97
MW21	12/2/2014	2.5	2.2	1,400	18,000	12.31
MW21	3/16/2015	3.3	3.7	1,700	26,000	11.52
MW21	6/25/2015	4.5	4.9	1,300	21,000	10.14
MW21	9/25/2015	2.6	3.6	840	14,000	10.92
MW21	12/16/2015	1.6	2.6	590	8,400	10.49
MW21	3/31/2016	2.7	3.0	860	1,100	9.91
MW21	6/30/2016	1.8	2.7	630	8,900	8.66
MW21	9/14/2016	2.8	2.5	1,000	11,000	9.91
MW21	12/16/2016	2.7	1.4	100	820	10.02
MW22	3/31/2014	<1.0	<1.0	<1.0	<1.0	13.92
MW22	6/17/2014	<1.0	<1.0	<1.0	<1.0	12.82
MW22	9/17/2014	<1.0	<1.0	<1.0	<1.0	12.30
MW22	12/2/2014	<1.0	<1.0	<1.0	<1.0	11.62
MW22	3/16/2015	<1.0	<1.0	<1.0	12	10.83
MW22	6/25/2015	<1.0	<1.0	<1.0	12	9.46
MW22	9/25/2015	<1.0	<1.0	<1.0	<1.0	10.16
MW22	12/16/2015	<1.0	<1.0	<1.0	3.6	9.73
MW22	3/31/2016	<1.0	<1.0	<1.0	4.2	8.45

TABLE 1
DECHANT 1-31A 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	
MW22	6/30/2016	<1.0	<1.0	<1.0	<1.0	7.14
MW22	9/14/2016	<1.0	<1.0	<1.0	<1.0	8.44
MW22	12/16/2016	<1.0	<1.0	<1.0	<1.0	8.55
MW23	1/25/2016	18	7.9	1,300	13,000	11.03
MW23	3/31/2016	39	15	1,300	650	10.20
MW23	6/30/2016	1.0	1.6	200	3,700	9.00
MW23	9/14/2016	8.9	<1.0	390	4,500	10.22
MW23	12/16/2016	1.6	<1.0	210	1,700	10.34
MW24	1/25/2016	<1.0	<1.0	<1.0	2.5	11.19
MW24	3/31/2016	<1.0	<1.0	<1.0	7.0	10.30
MW24	6/30/2016	<1.0	<1.0	<1.0	<1.0	9.10
MW24	9/14/2016	<1.0	<1.0	<1.0	<1.0	10.30
MW24	12/16/2016	<1.0	<1.0	<1.0	2.5	10.40

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.

3. Well inaccessible due to standing water during first quarter 2016 sampling event.

µg/L = Micrograms per liter

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

NS = Not sampled, well inaccessible

NM = Not measured

N/A = LT Environmental, Inc. field data not available

BOLD = Analytical result is not in compliance with COGCC groundwater standards.

TABLE 2
DECHANT 1-31A TANK BATTERY
EFR / AS OPERATIONAL SUMMARY TABLE

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)	Average Air Flow Rate (cfm)
Third Quarter 2015						
7/8/2015	MW10R, MW18, MW20, MW21	6	15	MW10R, MW21	20	20
7/22/2015		6	0		20	35
8/5/2015		6	0		20	35
8/19/2015		6	0		20	37.5
9/2/2015		6	0		20	35
9/16/2015		6	60		20	37.5
9/28/2015		6	0		20	40
Quarterly Totals		42	75		-	-
Fourth Quarter 2015						
10/14/2015	MW10R, MW18, MW20, MW21	6	10	MW10R, MW21	20	42.5
10/28/2015		6	0		20	30
11/14/2015	MW10R, MW18, MW21	6	4		20	40
11/25/2015	MW10R, MW18, MW20, MW21	6	15		20	30
12/10/2015		6	60		20	30
12/22/2015		6	10		20	30
Quarterly Totals		36	99		-	-

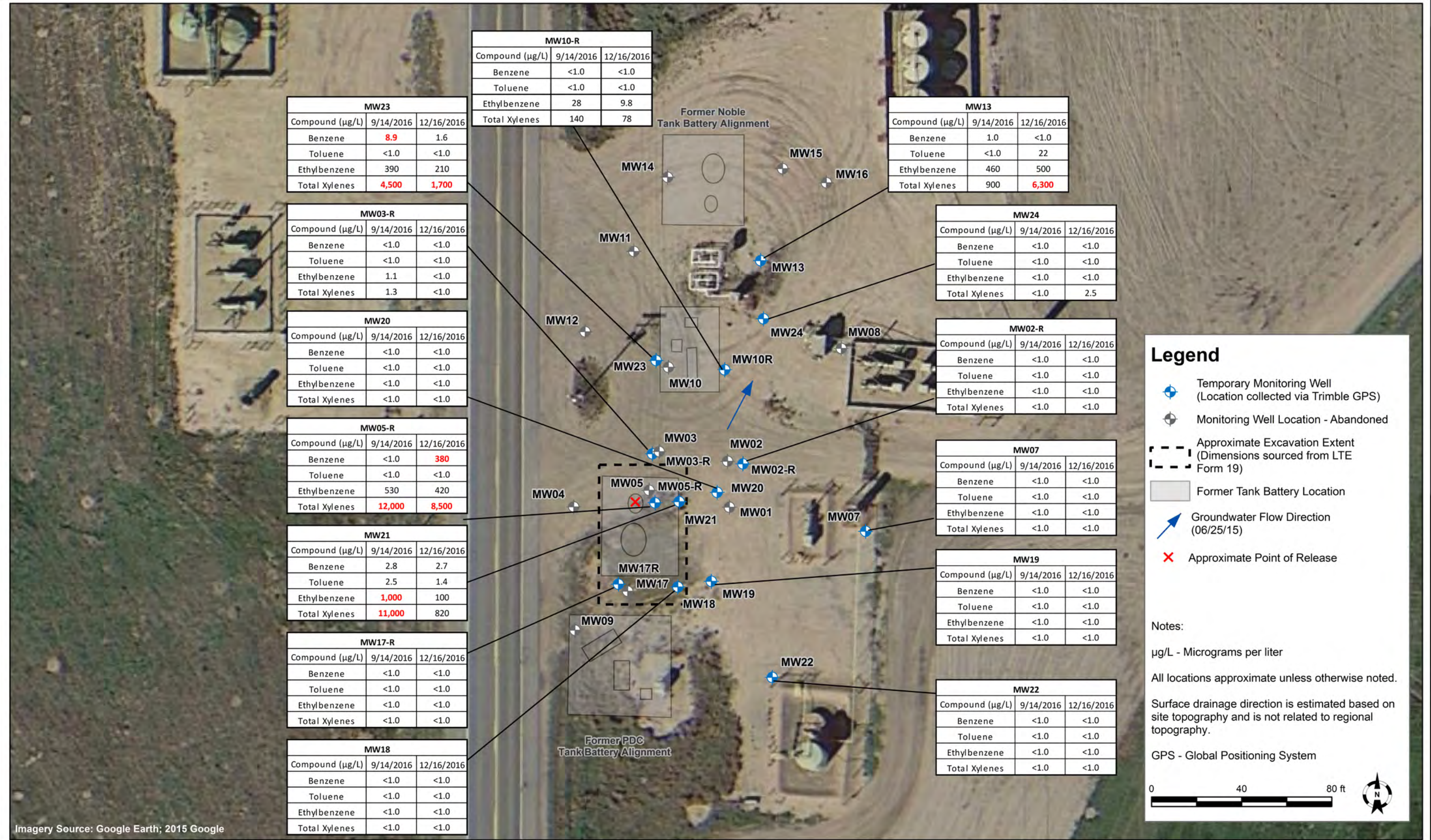
Notes:

EFR = Enhanced fluid recovery

AS = Air sparge

psi = Pounds per square inch

cfm = Cubic feet per minute



DATE: January 2017
DESIGNED BY: C. Hamlin
DRAWN BY: D. Arnold

TASMAN GEOSCIENCES
Tasman Geosciences, Inc.
6899 Pecos Street - Unit C
Denver, CO 80221

PDC Energy - DJ Basin
Dechant 1-31 A Tank Battery
SWSW Section 31, Township 3 North, Range 64 West
Weld County, Colorado

Groundwater Analytical Results
Map

Figure
1



DATE:	January 2016
DESIGNED BY:	C. Hamlin
DRAWN BY:	D. Arnold



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

PDC Energy - DJ Basin
Dechant 1-31 A Tank Battery
SWSW Section 31, Township 3 North, Range 64 West
Weld County, Colorado

Remediation System
Overview Map

Figure
2

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

December 26, 2016

Mark Longhurst
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Dechant 1-31A

Enclosed are the results of analyses for samples received by Summit Scientific on 12/16/16 16:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Shrewsbury', with a stylized, cursive script.

Paul Shrewsbury
President



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

Project: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-02R	1612118-01	Water	12/16/16 13:05	12/16/16 16:30
MW-03R	1612118-02	Water	12/16/16 13:00	12/16/16 16:30
MW-05R	1612118-03	Water	12/16/16 13:05	12/16/16 16:30
MW-07	1612118-04	Water	12/16/16 12:10	12/16/16 16:30
MW-10R	1612118-05	Water	12/16/16 12:25	12/16/16 16:30
MW-13	1612118-06	Water	12/16/16 11:45	12/16/16 16:30
MW-18	1612118-07	Water	12/16/16 12:55	12/16/16 16:30
MW-19	1612118-08	Water	12/16/16 12:17	12/16/16 16:30
MW-20	1612118-09	Water	12/16/16 13:17	12/16/16 16:30
MW-21	1612118-10	Water	12/16/16 13:25	12/16/16 16:30
MW-22	1612118-11	Water	12/16/16 11:55	12/16/16 16:30
MW-23	1612118-12	Water	12/16/16 12:35	12/16/16 16:30
MW-24	1612118-13	Water	12/16/16 12:03	12/16/16 16:30
MW-17R	1612118-14	Water	12/16/16 12:40	12/16/16 16:30

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

Summit Scientific

1612118.1

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 • 303-374-5933 Fax

Page 1 of 2

Client: PDC/Tasman

Address: 6899 Rose St

City/State/Zip:

Phone: 779-265-4235

Fax:

Sampler Name: Max Garza

Project Manager: Mark Longhurst

E-Mail: Mark.Longhurst@pdc.com

Project Name: Dechant 1-31A

Project Number:

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative			Matrix		Analyze For:				Special Instructions			
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	BTEX				
MW-02R	12/16/16	13:05	3			X		X			X					
MW-03R		13:00														
MW-05R		13:05														
MW-07		12:10														
MW-10R		12:25														
MW-13		11:45														
MW-18		12:55														
MW-19		12:17														
MW-20		13:17														
MW-21		13:25														

Relinquished by: <u>Max Garza</u>	Date/Time: <u>12/16/16 1630</u>	Received by: <u>MD</u>	Date/Time: <u>12/16/16 1630</u>	Turn Around Time (Check) Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>	Notes: <u>on ice</u>
Relinquished by: <u>MD</u>	Date/Time: <u>12/16/16 1700</u>	Received by: <u>MD</u>	Date/Time: <u>12/16/16 1700</u>	Sample Integrity: Temperature Upon Receipt: <u>4.5°C</u> Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:		

www.s2scientific.com

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: Dechant 1-31A

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

Summit Scientific

1612118.0

741 Corporate Circle Suite 1 ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933 Fax

Page 2 of 2

Client: PDC/Tasman

Address:

City/State/Zip:

Phone:

Fax:

Sampler Name: Max G012A

Project Manager: Mark Longhurst

E-Mail:

Project Name: Dechant 1-31A

Project Number:

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:				Special Instructions
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)				
MW-22	12/16/16	11:55	3			X									
MW-23		12:35				X									
MW-24		12:03				X									
MW-17R		12:40				X									
[Handwritten signature across the table]															
Relinquished by: <u>Max G012A</u>		Date/Time: <u>12/16/16 1630</u>		Received by: <u>[Signature]</u>		Date/Time: <u>12/16/16 1630</u>		Turn Around Time (Check)				Notes:			
								Same Day <input type="checkbox"/> 72 Hours <input checked="" type="checkbox"/>				<u>on Re</u>			
								24 Hours <input type="checkbox"/>							
								48 Hours <input type="checkbox"/>							
Relinquished by: <u>[Signature]</u>		Date/Time: <u>12/16/16 1700</u>		Received by: <u>[Signature]</u>		Date/Time: <u>12-16-16 1700</u>		Sample Integrity:							
								Temperature Upon Receipt: <u>4.5°C</u>							
								Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>							

www.s2scientific.com

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

Sample Receipt Checklist

S2 Work Order: 1612118

Client: PDC/Harman

Client Project ID: Dechant 1-31A

Shipped Via: P/U

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

Airbill #: _____

Matrix (check all that apply): ☐ Air ☐ Soil/Solid ☒ Water ☐ Other: _____
(Describe)

Cooler ID					
Temp (°C)	<u>4.5</u>				

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⁾ ?	<input checked="" type="checkbox"/>			
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⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?			<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form 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 w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	12/16/16
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⁾ ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

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

Nakitz
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

12/16/16 1700
Date/Time



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

Project: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-02R
1612118-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.5 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-03R
1612118-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		100 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.4 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-05R
1612118-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	380	10	ug/l	10	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	420	100	"	100	"	"	"	"	
Xylenes (total)	8500	100	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		101 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-07
1612118-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		97.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.6 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-10R
1612118-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	9.8	1.0	"	"	"	"	"	"	
Xylenes (total)	78	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.4 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-13
1612118-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	22	10	"	10	"	"	"	"	
Ethylbenzene	500	100	"	100	"	"	"	"	
Xylenes (total)	6300	10	"	10	"	"	"	"	

Date Sampled: **12/16/16 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		135 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-18
1612118-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.8 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.6 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-19
1612118-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 12:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 12:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.0 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-20
1612118-09 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 13:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		101 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.3 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-21
1612118-10 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	2.7	1.0	ug/l	1	1612210	12/23/16	12/23/16	EPA 8260B	
Toluene	1.4	1.0	"	"	"	"	"	"	
Ethylbenzene	100	10	"	10	"	"	"	"	
Xylenes (total)	820	10	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		112 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		94.9 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		114 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-22
1612118-11 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/23/16	12/23/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		91.9 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.0 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-23
1612118-12 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1.6	1.0	ug/l	1	1612210	12/24/16	12/24/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	210	1.0	"	"	"	"	"	"	
Xylenes (total)	1700	100	"	100	"	"	"	"	

Date Sampled: **12/16/16 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		86.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		104 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		124 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-24
1612118-13 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 12:03**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	2.5	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 12:03**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		96.0 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.3 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

MW-17R
1612118-14 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/16/16 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612210	12/22/16	12/22/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.1 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.3 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.3 %	45-146		"	"	"	"	

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1612210 - EPA 5030 Water MS

Blank (1612210-BLK1)

Prepared & Analyzed: 12/22/16

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.3		99.1	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		98.6	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.1	45-146			

LCS (1612210-BS1)

Prepared & Analyzed: 12/22/16

Benzene	34.4	1.0	ug/l	33.3		103	51-132			
Toluene	42.2	1.0	"	33.3		127	51-138			
Ethylbenzene	37.7	1.0	"	33.1		114	58-146			
m,p-Xylene	74.6	2.0	"	66.5		112	57-144			
o-Xylene	37.6	1.0	"	32.7		115	53-146			
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.3		100	37-154			
Surrogate: Toluene-d8	13.3		"	13.3		100	45-149			
Surrogate: 4-Bromofluorobenzene	12.7		"	13.3		95.3	45-146			

Matrix Spike (1612210-MS1)

Source: 1612118-01

Prepared & Analyzed: 12/22/16

Benzene	34.4	1.0	ug/l	33.3	ND	103	34-141			
Toluene	41.7	1.0	"	33.3	ND	125	27-151			
Ethylbenzene	38.9	1.0	"	33.1	ND	118	29-160			
m,p-Xylene	75.8	2.0	"	66.5	ND	114	20-166			
o-Xylene	38.6	1.0	"	32.7	ND	118	33-159			
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.3		100	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		100	45-149			
Surrogate: 4-Bromofluorobenzene	12.7		"	13.3		95.3	45-146			

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: Dechant 1-31A
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

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

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

Batch 1612210 - EPA 5030 Water MS

Matrix Spike Dup (1612210-MSD1)	Source: 1612118-01			Prepared & Analyzed: 12/22/16						
Benzene	34.6	1.0	ug/l	33.3	ND	104	34-141	0.493	32	
Toluene	40.0	1.0	"	33.3	ND	120	27-151	4.16	25	
Ethylbenzene	39.4	1.0	"	33.1	ND	119	29-160	1.30	50	
m,p-Xylene	76.8	2.0	"	66.5	ND	116	20-166	1.39	36	
o-Xylene	37.9	1.0	"	32.7	ND	116	33-159	2.01	26	
Surrogate: 1,2-Dichloroethane-d4	14.6		"	13.3		110	37-154			
Surrogate: Toluene-d8	12.9		"	13.3		97.0	45-149			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.5	45-146			

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: Dechant 1-31A

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/26/16 10:47

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