

March 1, 2016

Mr. Rick Allison, P.G.
Environmental Protection Specialist, Northeast Region
Colorado Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, CO 80203

**Re: 2015 Annual Groundwater Monitoring Report
Wiedeman 21B, 24-21, 21-2 Tank Battery
NESW Section 21 T5N R67W
Weld County, Colorado
Facility #: 319535
Spill Tracking #: 1175631
Remediation #: 4071**

Dear Mr. Allison,

On behalf of PDC Energy, Inc. (PDC), Tasman Geosciences, Inc. (Tasman) is submitting this 2015 Annual Groundwater Monitoring Report for quarterly groundwater monitoring activities conducted at the Wiedeman 21B, 24-21, 21-2 tank battery (Site). This report documents the results of groundwater gauging, groundwater sampling, and remediation activities conducted at the Site during 2015. As per discussions with COGCC staff, PDC is providing this summary annual report to assist in updating the COGCC on the progress and status of this open remediation Site.

A historic release was discovered at the Site on June 29, 2007, during replacement of the produced water vault. Following excavation and well installation activities, groundwater monitoring began during the third quarter 2007. The monitoring well network at the Site consists of 5 temporary monitoring and remediation wells (MW01 - MW05), as shown in Figure 1. Historic groundwater monitoring results are presented in Table 1. Groundwater monitoring results for 2015 are summarized below.

Sampling Event	Wells Exceeding COGCC Standards	Maximum Benzene Concentration (µg/L)
1Q 2015	MW01	21
2Q 2015	MW01	28
3Q 2015	MW01	39
4Q 2015	MW01	15

Tasman performed chemical oxidant treatment activities at the site during the first quarter 2013. Monitored natural attenuation (MNA) was implemented as the selected remediation strategy during the second quarter 2013, and will continue through the first quarter 2016. Once concentrations are below applicable COGCC Table 910-1 groundwater standards, four quarters of compliance groundwater monitoring will be conducted to confirm that BTEX concentrations remain below standards.

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

Sincerely,



Christine Wasko
Project Manager
Tasman Geosciences, Inc.








DRAWN BY: ESS	Facility Diagram PDC Energy – DJ Basin Wiedeman 21B, 24-21, 21-2 Tank Battery NESW S21 T5N R67W Weld County, CO	 TASMAN GEOSCIENCES 6899 Pecos St., Unit C Denver CO 80221	LEGEND  Excavation Extent  Excavation Groundwater Sample Location  Monitoring Well Location  Point of Release	FIGURE 1 GROUNDWATER MONITORING SITE MAP
DATE: 2/4/2016			<small>All locations are approximate unless otherwise noted</small>	

TABLE 1
WIEDEMAN 21B, 24-21, 21-2 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 (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
GW01	6/29/2007	180	15	<1.0	740	N/A
MW01	8/17/2007	210	<1.0	91	360	6.19
MW01	2/21/2008	30	<1.0	14	<1.0	12.65
MW01	5/6/2008	22	<1.0	<1.0	<1.0	12.72
MW01	8/27/2008	500	<1.0	110	290	6.68
MW01	11/12/2008	350	<1.0	63	180	9.63
MW01	2/9/2009	12	<1.0	5.1	3.1	11.90
MW01	5/8/2009	130	<1.0	18	6.5	10.98
MW01	8/28/2009	270	<1.0	77	81	6.18
MW01	11/11/2009	800	<1.0	71	210	9.06
MW01	2/25/2010	13	<1.0	2.1	5.0	11.70
MW01	5/18/2010	200	<1.0	48	100	N/A
MW01	8/11/2010	310	<1.0	110	180	5.90
MW01	11/10/2010	180	<1.0	15	20	10.30
MW01	2/24/2011	33	<1.0	4.6	12	12.62
MW01	5/5/2011	17	<1.0	1.4	<1.0	N/A
MW01	8/2/2011	170	<1.0	100	200	5.64
MW01	11/30/2011	7.2	<1.0	2.2	2.3	8.80
MW01	2/21/2012	200	1.2	82	210	10.61
MW01	5/29/2012	180	<1.0	120	350	9.37
MW01	5/23/2013	DRY	DRY	DRY	DRY	DRY
MW01	8/27/2013	22	<1.0	2.6	3.4	4.24
MW01	11/26/2013	<1.0	<1.0	<1.0	<1.0	7.12
MW01	2/20/2014	7.3	<1.0	3.1	4.3	8.61
MW01	5/30/2014	18	<1.0	17	6.5	6.19
MW01	8/18/2014	18	<1.0	9.0	4.7	2.92
MW01	11/20/2014	16	<1.0	17	12	7.00
MW01	2/26/2015	21	<1.0	18	11	9.17
MW01	5/8/2015	28	<1.0	23	6.6	9.51
MW01	8/5/2015	39	<1.0	36	9.6	4.36
MW01	11/4/2015	15	<1.0	6.1	7.0	7.48

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WIEDEMAN 21B, 24-21, 21-2 TANK BATTERY
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Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
MW02	8/17/2007	<1.0	<1.0	<1.0	<1.0	5.43
MW02	2/21/2008	7.4	<1.0	1.1	2.2	12.20
MW02	5/6/2008	1.4	<1.0	<1.0	<1.0	12.47
MW02	8/27/2008	12	<1.0	1.6	<1.0	6.12
MW02	11/12/2008	59	<1.0	38	43	9.38
MW02	2/9/2009	12	<1.0	9.6	<1.0	11.60
MW02	5/8/2009	8.2	<1.0	4.2	11	10.42
MW02	8/28/2009	5.5	<1.0	<1.0	7.7	5.53
MW02	11/11/2009	22	<1.0	37	52	8.72
MW02	2/25/2010	<1.0	<1.0	1.3	<1.0	11.35
MW02	5/18/2010	8.7	<1.0	14	12	N/A
MW02	8/11/2010	<1.0	<1.0	<1.0	<1.0	5.26
MW02	11/10/2010	<1.0	<1.0	<1.0	<1.0	10.00
MW02	2/24/2011	<1.0	<1.0	<1.0	<1.0	12.22
MW02	5/5/2011	<1.0	<1.0	<1.0	<1.0	N/A
MW02	8/2/2011	<1.0	<1.0	<1.0	<1.0	4.84
MW02	11/30/2011	<1.0	<1.0	5.9	<1.0	7.64
MW02	2/21/2012	1.1	<1.0	14	30	10.23
MW02	5/29/2012	<1.0	<1.0	18	30	8.84
MW02	5/23/2013	4.5	<1.0	20	74	11.83
MW02	8/27/2013	4.6	<1.0	13	11	5.77
MW02	11/26/2013	1.1	<1.0	1.4	<1.0	8.86
MW02	2/20/2014	<1.0	<1.0	<1.0	<1.0	10.44
MW02	5/30/2014	<1.0	<1.0	<1.0	<1.0	7.90
MW02	8/18/2014	<1.0	<1.0	<1.0	<1.0	4.58
MW02	11/20/2014	<1.0	<1.0	<1.0	<1.0	8.85
MW02	2/26/2015	<1.0	<1.0	<1.0	<1.0	10.98
MW02	5/8/2015	<1.0	<1.0	<1.0	<1.0	11.40
MW02	8/5/2015	<1.0	<1.0	<1.0	<1.0	6.04
MW02	11/4/2015	<1.0	<1.0	<1.0	<1.0	9.36
MW03	8/17/2007	<1.0	<1.0	<1.0	<1.0	6.23
MW03	2/21/2008	<1.0	<1.0	<1.0	<1.0	13.08
MW03	5/6/2008	<1.0	<1.0	<1.0	<1.0	13.68

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MW03	8/27/2008	<1.0	<1.0	<1.0	<1.0	7.10
MW03	11/12/2008	<1.0	<1.0	<1.0	<1.0	10.64
MW03	2/9/2009	<1.0	<1.0	<1.0	<1.0	12.84
MW03	5/8/2009	<1.0	<1.0	<1.0	<1.0	11.76
MW03	8/28/2009	<1.0	<1.0	<1.0	<1.0	6.51
MW03	11/11/2009	<1.0	<1.0	<1.0	<1.0	10.01
MW03	2/25/2010	<1.0	<1.0	<1.0	<1.0	12.55
MW03	5/18/2010	<1.0	<1.0	<1.0	<1.0	N/A
MW03	8/11/2010	<1.0	<1.0	<1.0	<1.0	6.20
MW03	11/10/2010	<1.0	<1.0	<1.0	<1.0	11.23
MW03	2/24/2011	<1.0	<1.0	<1.0	<1.0	13.44
MW03	5/5/2011	<1.0	<1.0	<1.0	<1.0	N/A
MW03	8/2/2011	<1.0	<1.0	<1.0	<1.0	13.82
MW03	11/30/2011	<1.0	<1.0	<1.0	<1.0	8.80
MW03	2/21/2012	<1.0	<1.0	<1.0	<1.0	11.49
MW03	5/29/2012	1.5	2.4	<1.0	<1.0	9.79
MW03	5/23/2013	<1.0	<1.0	<1.0	<1.0	13.00
MW03	8/27/2013	<1.0	<1.0	<1.0	<1.0	6.70
MW03	11/26/2013	<1.0	<1.0	<1.0	<1.0	9.97
MW03	2/20/2014	<1.0	<1.0	<1.0	<1.0	11.55
MW03	5/30/2014	<1.0	<1.0	<1.0	<1.0	8.72
MW03	8/18/2014	<1.0	<1.0	<1.0	<1.0	5.63
MW03	11/20/2014	<1.0	<1.0	<1.0	<1.0	10.03
MW03	2/26/2015	<1.0	<1.0	<1.0	<1.0	12.21
MW03	5/8/2015	<1.0	<1.0	<1.0	<1.0	12.57
MW03	8/5/2015	<1.0	<1.0	<1.0	<1.0	6.89
MW03	11/4/2015	<1.0	<1.0	<1.0	<1.0	10.49
MW04	2/21/2008	<1.0	<1.0	<1.0	<1.0	13.20
MW04	5/6/2008	<1.0	<1.0	<1.0	<1.0	13.38
MW04	8/27/2008	<1.0	<1.0	<1.0	<1.0	N/A
MW04	11/12/2008	<1.0	<1.0	<1.0	<1.0	N/A
MW04	2/9/2009	<1.0	<1.0	<1.0	<1.0	N/A
MW04	5/8/2009	<1.0	<1.0	<1.0	<1.0	N/A

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COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
MW04	11/11/2009	<1.0	<1.0	<1.0	<1.0	N/A
MW04	2/25/2010	<1.0	<1.0	<1.0	<1.0	0.00
MW04	5/18/2010	<1.0	<1.0	<1.0	<1.0	N/A
MW04	8/11/2010	<1.0	<1.0	<1.0	<1.0	7.54
MW04	11/10/2010	<1.0	<1.0	<1.0	<1.0	10.61
MW04	2/24/2011	<1.0	<1.0	<1.0	<1.0	N/A
MW04	5/5/2011	<1.0	<1.0	<1.0	<1.0	N/A
MW04	8/2/2011	<1.0	<1.0	<1.0	<1.0	7.14
MW04	11/30/2011	<1.0	<1.0	<1.0	<1.0	8.50
MW04	2/21/2012	<1.0	<1.0	<1.0	<1.0	10.92
MW04	5/29/2012	<1.0	<1.0	<1.0	<1.0	10.76
MW04	5/23/2013	<1.0	<1.0	<1.0	<1.0	12.48
MW04	8/27/2013	<1.0	<1.0	<1.0	<1.0	7.67
MW04	11/26/2013	<1.0	<1.0	<1.0	<1.0	9.36
MW04	2/20/2014	<1.0	<1.0	<1.0	<1.0	11.07
MW04	5/30/2014	<1.0	<1.0	<1.0	<1.0	9.96
MW04	8/18/2014	<1.0	<1.0	<1.0	<1.0	5.69
MW04	11/20/2014	<1.0	<1.0	<1.0	<1.0	9.46
MW04	2/26/2015	<1.0	<1.0	<1.0	<1.0	11.77
MW04	5/8/2015	<1.0	<1.0	<1.0	<1.0	12.12
MW04	8/5/2015	<1.0	<1.0	<1.0	<1.0	8.76
MW04	11/4/2015	<1.0	<1.0	<1.0	<1.0	10.24
MW05	2/21/2008	<1.0	<1.0	<1.0	<1.0	13.10
MW05	5/6/2008	<1.0	<1.0	<1.0	<1.0	13.24
MW05	8/27/2008	<1.0	<1.0	<1.0	<1.0	7.17
MW05	11/12/2008	<1.0	<1.0	<1.0	<1.0	9.86
MW05	2/9/2009	<1.0	<1.0	<1.0	<1.0	12.20
MW05	5/8/2009	<1.0	<1.0	<1.0	<1.0	11.30
MW05	8/28/2009	<1.0	<1.0	<1.0	<1.0	6.83
MW05	11/11/2009	<1.0	<1.0	<1.0	<1.0	9.31
MW05	2/25/2010	<1.0	<1.0	<1.0	<1.0	12.00
MW05	5/18/2010	<1.0	<1.0	<1.0	<1.0	N/A
MW05	8/11/2010	<1.0	<1.0	<1.0	<1.0	6.58

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COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
MW05	11/10/2010	<1.0	<1.0	<1.0	<1.0	10.67
MW05	2/24/2011	<1.0	<1.0	<1.0	<1.0	12.88
MW05	5/5/2011	<1.0	<1.0	<1.0	<1.0	N/A
MW05	8/2/2011	<1.0	<1.0	<1.0	<1.0	6.12
MW05	11/30/2011	<1.0	<1.0	<1.0	<1.0	9.32
MW05	2/21/2012	<1.0	<1.0	<1.0	<1.0	10.95
MW05	5/29/2012	<1.0	<1.0	<1.0	<1.0	10.09
MW05	5/23/2013	<1.0	<1.0	<1.0	<1.0	12.52
MW05	8/27/2013	<1.0	<1.0	<1.0	<1.0	5.35
MW05	11/26/2013	<1.0	<1.0	<1.0	<1.0	7.60
MW05	2/20/2014	<1.0	<1.0	<1.0	<1.0	9.28
MW05	5/30/2014	<1.0	<1.0	<1.0	<1.0	7.58
MW05	8/18/2014	<1.0	<1.0	<1.0	<1.0	3.58
MW05	11/20/2014	<1.0	<1.0	<1.0	<1.0	7.66
MW05	2/26/2015	<1.0	<1.0	<1.0	<1.0	9.92
MW05	5/8/2015	<1.0	<1.0	<1.0	<1.0	10.26
MW05	8/5/2015	<1.0	<1.0	<1.0	<1.0	5.83
MW05	11/4/2015	<1.0	<1.0	<1.0	<1.0	8.33

Notes:

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective January 30, 2015.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

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

DRY = Well contained insufficient volume to collect sample.

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

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