

**PDC Energy, Inc.**  
**Second Quarter 2013 Groundwater Monitoring Summary**

August 14, 2013

Wiedeman 21B, 24-21, 21-2 Tank Battery  
NESW S21 T15N R67W  
Weld County, API # 05-123-11427

This groundwater summary has been prepared by Tasman Geosciences, LLC for the Wiedeman 21B, 24-21, 21-2 tank battery. On May 23, 2013, groundwater sampling was conducted at four monitoring well locations. A groundwater sample was not collected from MW01 due to insufficient water. Groundwater samples were submitted for laboratory analysis of BTEX constituents using USEPA Method 8260B. Analytical results are summarized in Table 1 below and are illustrated on Figure 2. The laboratory analytical report is included as Attachment A. Evaluation of second quarter analytical results indicates that BTEX concentrations remained below COGCC standards at the four sample locations. Although MW01 had insufficient water to collect a sample, it historically has exhibited elevated benzene concentrations.

Between March 21 and 22, 2013, in accordance with a Class V - Underground Injection Control (UIC) permit that was submitted to the U.S. Environmental Protection Agency, Region 8 on October 9, 2012, chemical oxidant (chemox) injection activities were conducted at the Site. Chemox injections were conducted at monitoring well MW01 and a summary of the chemox injection volumes and the measured back pressure during the injection activities are summarized in the table below:

**Chemox Injection Volumes and Pressure**

Well ID	25% NaOH Volume	Persulfate (lbs)	Injection Back Pressure (psi)
MW01	240	1,200	15 - 20

Notes:

25% NaOH Volume - Percent sodium hydroxide measured in gallons

lbs - Pounds

The chemox material consisted of Klozur persulfate which persists in groundwater and therefore, the constituents of concern (COC) concentrations are anticipated to remain below COGCC standards. Quarterly groundwater monitoring will continue to assess the effectiveness of chemox injections at the Site until four consecutive quarters of groundwater monitoring data, including monitoring well MW01, are below the COGCC standards.

Third quarter 2013 groundwater sampling will be conducted during August 2013.

**TABLE 1**  
**WIEDEMAN 21B, 24-21, 21-2**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth to Water (feet)
GW01	6/29/2007	180	15	<1.0	740	NM
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	50	<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	70	<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	NM
MW01	8/11/2010	310	<1.0	110	180	5.90
MW01	11/10/2010	10	<1.0	15	20	10.3
MW01	2/24/2011	33	<1.0	4.6	12	12.62
MW01	5/5/2011	17	<1.0	1.4	<1.0	NM
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	<1.0	82	210	10.61
MW01	5/29/2012	180	<1.0	120	350	9.37
MW01	5/23/2013	NS	NS	NS	NS	DRY
MW02	8/17/2007	<1.0	<1.0	<1.0	<1.0	5.43
MW02	2/21/2008	7.4	<1.0	1.1	<1.0	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	<1.0	9.38
MW02	2/9/2009	12	<1.0	10	<1.0	11.60
MW02	5/8/2009	8.2	<1.0	4.2	<1.0	10.42
MW02	8/28/2009	5.5	<1.0	<1.0	<1.0	5.53
MW02	11/11/2009	22	<1.0	37	<1.0	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	<1.0	NM
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

**TABLE 1**  
**WIEDEMAN 21B, 24-21, 21-2**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth to Water (feet)
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	NM
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	<1.0	10.23
MW02	5/29/2012	<1.0	<1.0	18	<1.0	8.84
MW02	5/23/2013	4.5	<1.0	20	74	11.83
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
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	NM
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	NM
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
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	NM
MW04	11/12/2008	<1.0	<1.0	<1.0	<1.0	NM
MW04	2/9/2009	<1.0	<1.0	<1.0	<1.0	NM
MW04	5/8/2009	<1.0	<1.0	<1.0	<1.0	NM
MW04	11/11/2009	<1.0	<1.0	<1.0	<1.0	NM
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	NM

**TABLE 1**  
**WIEDEMAN 21B, 24-21, 21-2**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth to Water (feet)
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	NM
MW04	5/5/2011	<1.0	<1.0	<1.0	<1.0	NM
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
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	NM
MW05	8/11/2010	<1.0	<1.0	<1.0	<1.0	6.58
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	NM
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
<b>COGCC standards for groundwater (ug/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	

Notes:

1). The environmental cleanup standards for groundwater that are applicable to this site are the Colorado Oil and Gas Conservation Commission (COGCC) standards for contaminants in groundwater according to Table 910-1 of the COGCC 900 Series Rule for E&P Waste Management.

**Bold** red values indicate an exceedance of the COGCC groundwater standards for the Site.

ug/L= Micrograms per liter.

NM = Not Measured

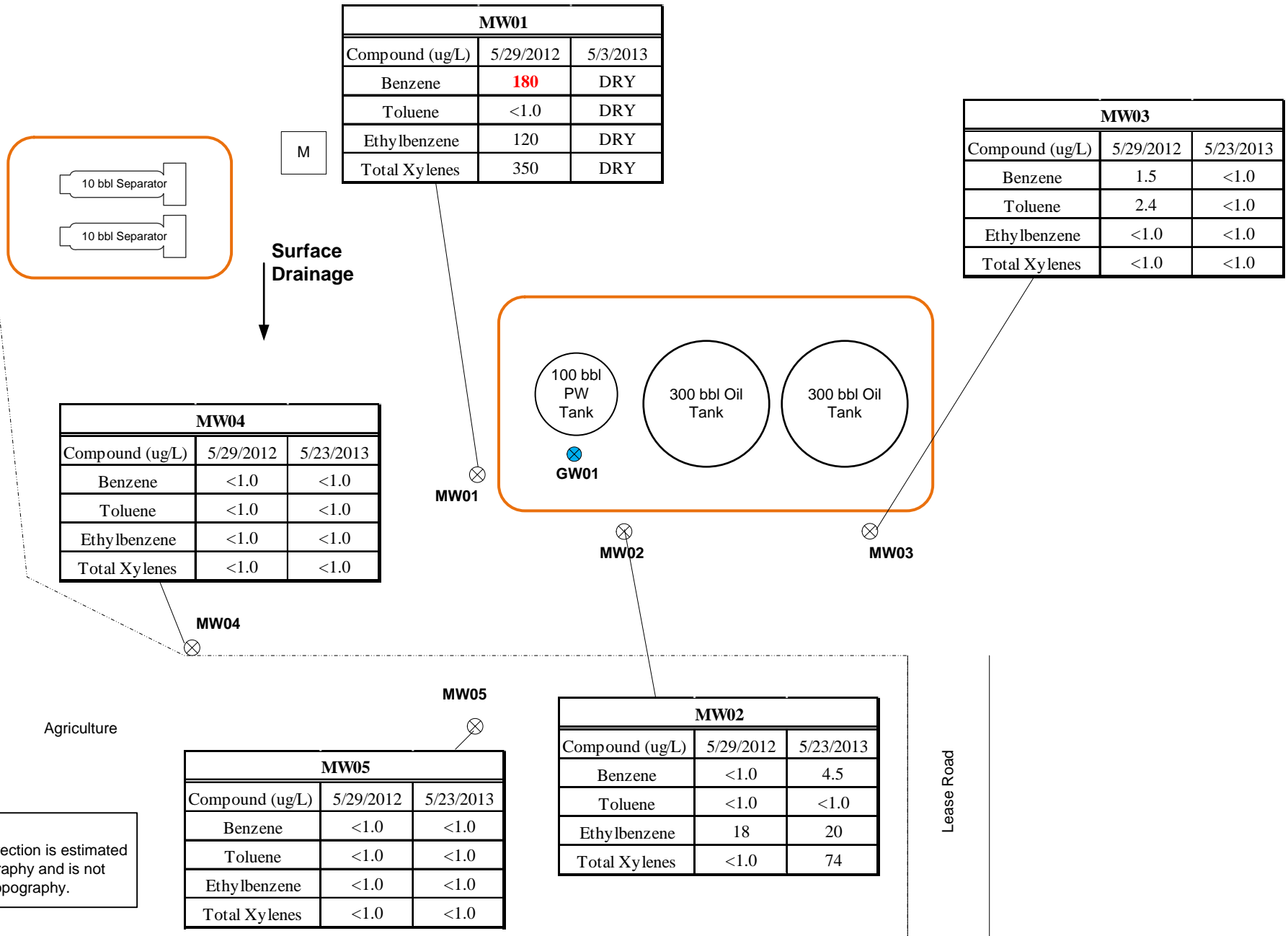


FIGURE 2  
GROUNDWATER  
ANALYTICAL  
RESULTS  
Not to Scale

## **ATTACHMENT A**

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 29, 2013

Brandon Bruns

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Wiedeman 21B, 24-21, 21-2

Enclosed are the results of analyses for samples received by Summit Scientific on 05/23/13 17:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV

Laboratory Director

This report shall not be reproduced, except in its entirety, without the written approval of Summit Scientific. Test results relate only to samples analyzed.

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
05/29/13 16:25

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW02	R305243-01	Water	05/23/13 10:20	05/23/13 17:45
MW03	R305243-02	Water	05/23/13 10:25	05/23/13 17:45
MW04	R305243-03	Water	05/23/13 10:30	05/23/13 17:45
MW05	R305243-04	Water	05/23/13 10:35	05/23/13 17:45

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
05/29/13 16:25

**MW02**  
**R305243-01 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/23/13 10:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>4.5</b>	1.0		ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>20</b>	1.0		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>74</b>	1.0		"	"	"	"	"	"	

Date Sampled: **05/23/13 10:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		107 %		37-154		"	"	"	"	
Surrogate: Toluene-d8		99.7 %		45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %		45-146		"	"	"	"	

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
05/29/13 16:25

**MW03**  
**R305243-02 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/23/13 10:25**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	1.0		"	"	"	"	"	"	

Date Sampled: **05/23/13 10:25**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		91.5 %		37-154		"	"	"	"	
Surrogate: Toluene-d8		99.0 %		45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.9 %		45-146		"	"	"	"	

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
05/29/13 16:25

**MW04**  
**R305243-03 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/23/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/23/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		78.7 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.7 %	45-146		"	"	"	"	

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
05/29/13 16:25

**MW05**  
**R305243-04 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/23/13 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	1.0		"	"	"	"	"	"	

Date Sampled: **05/23/13 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		96.2 %		37-154		"	"	"	"	
Surrogate: Toluene-d8		97.5 %		45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.6 %		45-146		"	"	"	"	

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

Project: Wiedeman 21B, 24-21, 21-2  
Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
05/29/13 16:25

**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 3052818 - EPA 5030 Water MS**

**Blank (3052818-BLK1)**

Prepared & Analyzed: 05/29/13

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.2		107	37-154			
Surrogate: Toluene-d8	13.7		"	13.3		103	45-149			
Surrogate: 4-Bromofluorobenzene	13.5		"	13.3		101	45-146			

**LCS (3052818-BS1)**

Prepared & Analyzed: 05/29/13

Benzene	25.0	1.0	ug/l	33.3		75.1	51-132			
Toluene	24.8	1.0	"	33.3		74.5	51-138			
Ethylbenzene	25.9	1.0	"	33.3		77.8	58-146			
m,p-Xylene	52.9	2.0	"	66.7		79.3	57-144			
o-Xylene	25.7	1.0	"	33.3		77.2	53-146			
Surrogate: 1,2-Dichloroethane-d4	14.3		"	13.2		108	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		101	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.0	45-146			

**LCS Dup (3052818-BSD1)**

Prepared & Analyzed: 05/29/13

Benzene	24.1	1.0	ug/l	33.3		72.3	51-132	3.79	17	
Toluene	23.8	1.0	"	33.3		71.6	51-138	4.07	17	
Ethylbenzene	25.0	1.0	"	33.3		74.9	58-146	3.73	16	
m,p-Xylene	50.4	2.0	"	66.7		75.5	57-144	4.84	16	
o-Xylene	24.6	1.0	"	33.3		73.8	53-146	4.41	15	
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.2		107	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.7	45-149			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.7	45-146			

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Page 7 of 9



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

Project: Wiedeman 21B, 24-21, 21-2  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
05/29/13 16:25

**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 3052818 - EPA 5030 Water MS**

Matrix Spike (3052818-MS1)		Source: R305243-04			Prepared & Analyzed: 05/29/13					
Benzene	25.0	1.0	ug/l	33.3	ND	75.0	34-141			
Toluene	25.1	1.0	"	33.3	ND	75.2	27-151			
Ethylbenzene	26.9	1.0	"	33.3	ND	80.6	29-160			
m,p-Xylene	55.0	2.0	"	66.7	ND	82.5	20-166			
o-Xylene	26.2	1.0	"	33.3	ND	78.6	33-159			
Surrogate: 1,2-Dichloroethane-d4	12.1		"	13.2		91.4	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.4	45-149			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.8	45-146			
Matrix Spike Dup (3052818-MSD1)		Source: R305243-04			Prepared & Analyzed: 05/29/13					
Benzene	22.3	1.0	ug/l	33.3	ND	66.8	34-141	11.6	32	
Toluene	22.4	1.0	"	33.3	ND	67.1	27-151	11.5	25	
Ethylbenzene	23.4	1.0	"	33.3	ND	70.3	29-160	13.6	50	
m,p-Xylene	48.2	2.0	"	66.7	ND	72.3	20-166	13.2	36	
o-Xylene	23.0	1.0	"	33.3	ND	69.1	33-159	12.8	26	
Surrogate: 1,2-Dichloroethane-d4	11.5		"	13.2		87.1	37-154			
Surrogate: Toluene-d8	13.1		"	13.3		98.3	45-149			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.8	45-146			

Summit Scientific

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
05/29/13 16:25

### 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

A handwritten signature in black ink, appearing to read 'Daniel A. Bruns IV'.



## **ATTACHMENT A**

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 29, 2013

Brandon Bruns

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Wiedeman 21B, 24-21, 21-2

Enclosed are the results of analyses for samples received by Summit Scientific on 05/23/13 17:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV

Laboratory Director

This report shall not be reproduced, except in its entirety, without the written approval of Summit Scientific. Test results relate only to samples analyzed.

Summit Scientific is the sole authority for authorizing edits or modifications to this document. Unauthorized modification of this report is strictly prohibited.



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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
05/29/13 16:25

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW02	R305243-01	Water	05/23/13 10:20	05/23/13 17:45
MW03	R305243-02	Water	05/23/13 10:25	05/23/13 17:45
MW04	R305243-03	Water	05/23/13 10:30	05/23/13 17:45
MW05	R305243-04	Water	05/23/13 10:35	05/23/13 17:45

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
05/29/13 16:25

**MW02**  
**R305243-01 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/23/13 10:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>4.5</b>	1.0		ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>20</b>	1.0		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>74</b>	1.0		"	"	"	"	"	"	

Date Sampled: **05/23/13 10:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		107 %		37-154		"	"	"	"	
Surrogate: Toluene-d8		99.7 %		45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %		45-146		"	"	"	"	

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1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
05/29/13 16:25

**MW03**  
**R305243-02 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/23/13 10:25**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	1.0		"	"	"	"	"	"	

Date Sampled: **05/23/13 10:25**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		91.5 %		37-154		"	"	"	"	
Surrogate: Toluene-d8		99.0 %		45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.9 %		45-146		"	"	"	"	

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Denver CO, 80203

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
05/29/13 16:25

**MW04**  
**R305243-03 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/23/13 10:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	1.0		"	"	"	"	"	"	

Date Sampled: **05/23/13 10:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		78.7 %		37-154		"	"	"	"	
Surrogate: Toluene-d8		98.4 %		45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.7 %		45-146		"	"	"	"	

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
05/29/13 16:25

**MW05**  
**R305243-04 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/23/13 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	1.0		"	"	"	"	"	"	

Date Sampled: **05/23/13 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		96.2 %		37-154		"	"	"	"	
Surrogate: Toluene-d8		97.5 %		45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.6 %		45-146		"	"	"	"	

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

Project: Wiedeman 21B, 24-21, 21-2  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
05/29/13 16:25

**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 3052818 - EPA 5030 Water MS**

**Blank (3052818-BLK1)**

Prepared & Analyzed: 05/29/13

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.2		107	37-154			
Surrogate: Toluene-d8	13.7		"	13.3		103	45-149			
Surrogate: 4-Bromofluorobenzene	13.5		"	13.3		101	45-146			

**LCS (3052818-BS1)**

Prepared & Analyzed: 05/29/13

Benzene	25.0	1.0	ug/l	33.3		75.1	51-132			
Toluene	24.8	1.0	"	33.3		74.5	51-138			
Ethylbenzene	25.9	1.0	"	33.3		77.8	58-146			
m,p-Xylene	52.9	2.0	"	66.7		79.3	57-144			
o-Xylene	25.7	1.0	"	33.3		77.2	53-146			
Surrogate: 1,2-Dichloroethane-d4	14.3		"	13.2		108	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		101	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.0	45-146			

**LCS Dup (3052818-BSD1)**

Prepared & Analyzed: 05/29/13

Benzene	24.1	1.0	ug/l	33.3		72.3	51-132	3.79	17	
Toluene	23.8	1.0	"	33.3		71.6	51-138	4.07	17	
Ethylbenzene	25.0	1.0	"	33.3		74.9	58-146	3.73	16	
m,p-Xylene	50.4	2.0	"	66.7		75.5	57-144	4.84	16	
o-Xylene	24.6	1.0	"	33.3		73.8	53-146	4.41	15	
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.2		107	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.7	45-149			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.7	45-146			

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
05/29/13 16:25

**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 3052818 - EPA 5030 Water MS**

Matrix Spike (3052818-MS1)		Source: R305243-04			Prepared & Analyzed: 05/29/13					
Benzene	25.0	1.0	ug/l	33.3	ND	75.0	34-141			
Toluene	25.1	1.0	"	33.3	ND	75.2	27-151			
Ethylbenzene	26.9	1.0	"	33.3	ND	80.6	29-160			
m,p-Xylene	55.0	2.0	"	66.7	ND	82.5	20-166			
o-Xylene	26.2	1.0	"	33.3	ND	78.6	33-159			
Surrogate: 1,2-Dichloroethane-d4	12.1		"	13.2		91.4	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.4	45-149			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.8	45-146			
Matrix Spike Dup (3052818-MSD1)		Source: R305243-04			Prepared & Analyzed: 05/29/13					
Benzene	22.3	1.0	ug/l	33.3	ND	66.8	34-141	11.6	32	
Toluene	22.4	1.0	"	33.3	ND	67.1	27-151	11.5	25	
Ethylbenzene	23.4	1.0	"	33.3	ND	70.3	29-160	13.6	50	
m,p-Xylene	48.2	2.0	"	66.7	ND	72.3	20-166	13.2	36	
o-Xylene	23.0	1.0	"	33.3	ND	69.1	33-159	12.8	26	
Surrogate: 1,2-Dichloroethane-d4	11.5		"	13.2		87.1	37-154			
Surrogate: Toluene-d8	13.1		"	13.3		98.3	45-149			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.8	45-146			

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
05/29/13 16:25

### 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

A handwritten signature in black ink, appearing to read 'Daniel A. Bruns IV'.