

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Accutest Job Number: D61758

Sampling Date: 09/02/14

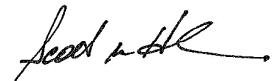
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Total number of pages in report: 48



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



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Certifications: CO (CO00049), ID, NE (CO00049), ND (R-027), NJ (CO 0007), OK (D9942), UT (NELAP CO00049), TX (T104704511)

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Test results relate only to samples analyzed.

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Sample Summary

WPX Energy Rocky Mountain, LLC

Job No: D61758

WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D61758-1	09/02/14	10:30 SLK	09/03/14	AQ	Ground Water	RMV 108-4-49368 F
D61758-1F	09/02/14	10:30 SLK	09/03/14	AQ	Groundwater Filtered	RMV 108-4-49368 F

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: WPX Energy Rocky Mountain, LLC

Job No D61758

Site: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Report Date 9/16/2014 11:21:50 A

On 09/03/2014, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3.2 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D61758 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix: AQ

Batch ID: V3V1883

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D61731-1MS, D61731-6DUP were used as the QC samples indicated.
- D61731-6DUP: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D61731-1MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.

Volatiles by GC By Method RSK175 MOD

Matrix: AQ

Batch ID: GFB563

- All samples were analyzed within the recommended method holding time.
- Sample(s) D61757-1MS, D61757-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D61757-1, -1MS, -1MSD: The pH of the sample was >2 at time of analysis.

Extractables by GC By Method SW846-8015B

Matrix: AQ

Batch ID: OP10559

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D60526-1MS, D60526-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method EPA 200.7

Matrix: AQ

Batch ID: MP13916

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D61668-1FMS, D61668-1FMSD were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Sodium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

Metals By Method EPA 200.8

Matrix: AQ **Batch ID:** MP13914

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D61771-1AMS, D61771-1AMSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix: AQ **Batch ID:** GP13431

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D61736-3MS, D61736-3MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate analysis.

Wet Chemistry By Method HACH IRB-BART

Matrix: AQ **Batch ID:** MB421

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method HACH SLYM-BART

Matrix: AQ **Batch ID:** MB422

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method HACH SRB-BART

Matrix: AQ **Batch ID:** MB423

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method HACH8190/SM4500P-B/E

Matrix: AQ **Batch ID:** GP13488

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D61817-1DUP, D61817-1MS, D61817-1MSD were used as the QC samples for the Phosphorus, Total analysis.

Wet Chemistry By Method SM 2320B-2011

Matrix: AQ **Batch ID:** GN26383

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D61758-1MS, D61758-1MSD, D61983-1DUP were used as the QC samples for the Alkalinity, Total as CaCO₃ analysis.

Matrix: AQ **Batch ID:** GN26384

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Matrix: AQ **Batch ID:** GN26385

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method SM 2510B-2011

Matrix: AQ **Batch ID:** GP13448

- Sample(s) D61758-1DUP were used as the QC samples for the Specific Conductivity analysis.

Wet Chemistry By Method SM 2540C-2011

Matrix: AQ **Batch ID:** GN26364

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D61757-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

Wet Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ **Batch ID:** GN26298

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D61758-1

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D61758
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ
Collected: 09/02/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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D61758-1 RMV 108-4-49368 F

Alkalinity, Bicarbonate as CaCO3	279	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	279	5.0	2.0	mg/l	SM 2320B-2011
Bromide	0.12	0.050	0.025	mg/l	EPA 300.0/SW846 9056
Chloride	12.9	0.50	0.40	mg/l	EPA 300.0/SW846 9056
Fluoride	0.22	0.10	0.050	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria	263	25		CFU/ml	HACH IRB-BART
Nitrogen, Nitrate	1.7	0.050	0.030	mg/l	EPA 300.0/SW846 9056
Phosphorus, Total	0.072	0.010	0.0080	mg/l	HACH8190/SM4500P-B/E
Solids, Total Dissolved	450	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity	660	1.0		umhos/cm	SM 2510B-2011
Sulfate	79.9	2.5	1.0	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	5000	200		CFU/ml	HACH SRB-BART
pH	7.72			su	SM4500HB+ -2011/9040C

D61758-1F RMV 108-4-49368 F

Barium	91.7	4.0	0.16	ug/l	EPA 200.8
Boron	20.4 J	50	6.6	ug/l	EPA 200.7
Calcium	67400	400	66	ug/l	EPA 200.7
Magnesium	29300	200	29	ug/l	EPA 200.7
Manganese	0.50 J	5.0	0.29	ug/l	EPA 200.7
Potassium	3650	1000	230	ug/l	EPA 200.7
Selenium	3.2	0.80	0.42	ug/l	EPA 200.8
Sodium	50300	400	36	ug/l	EPA 200.7
Strontium	654	5.0	0.12	ug/l	EPA 200.7

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: RMV 108-4-49368 F Lab Sample ID: D61758-1 Matrix: AQ - Ground Water Method: SW846 8260B Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ	Date Sampled: 09/02/14 Date Received: 09/03/14 Percent Solids: n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V32319.D	1	09/04/14	JL	n/a	n/a	V3V1883
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics + GRO

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.80	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.31	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.89	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	101%		62-130%
2037-26-5	Toluene-D8	102%		70-130%
460-00-4	4-Bromofluorobenzene	97%		69-130%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.1
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Report of Analysis

Client Sample ID: RMV 108-4-49368 F Lab Sample ID: D61758-1 Matrix: AQ - Ground Water Method: RSK175 MOD Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ	Date Sampled: 09/02/14 Date Received: 09/03/14 Percent Solids: n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FB12064.D	1	09/05/14	JJ	n/a	n/a	GFB563
Run #2							

Run #	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	19.0 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.00080	0.00040	mg/l	
74-84-0	Ethane	ND	0.0016	0.00080	mg/l	
74-98-6	Propane	ND	0.0022	0.0011	mg/l	

(a) The pH of the sample was > 2 at time of analysis.

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: RMV 108-4-49368 F	Date Sampled: 09/02/14
Lab Sample ID: D61758-1	Date Received: 09/03/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846-8015B SW846 3510C	
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI16386.D	1	09/06/14	JS	09/04/14	OP10559	GF1943
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	0.19	0.17	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	90%		10-130%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: RMV 108-4-49368 F	Date Sampled: 09/02/14
Lab Sample ID: D61758-1	Date Received: 09/03/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ	

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	279	5.0	2.0	mg/l	1	09/10/14	JD	SM 2320B-2011
Alkalinity, Carbonate	2.0 U	5.0	2.0	mg/l	1	09/10/14	JD	SM 2320B-2011
Alkalinity, Total as CaCO3	279	5.0	2.0	mg/l	1	09/10/14	JD	SM 2320B-2011
Bromide	0.12	0.050	0.025	mg/l	1	09/03/14 14:33	SK	EPA 300.0/SW846 9056
Chloride	12.9	0.50	0.40	mg/l	1	09/03/14 14:33	SK	EPA 300.0/SW846 9056
Fluoride	0.22	0.10	0.050	mg/l	1	09/03/14 14:33	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	263	25		CFU/ml	1	09/03/14	MM	HACH IRB-BART
Nitrogen, Nitrate	1.7	0.050	0.030	mg/l	5	09/03/14 19:34	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.0030 U	0.0040	0.0030	mg/l	1	09/03/14 14:33	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.072	0.010	0.0080	mg/l	1	09/09/14 09:00	AK	HACH8190/SM4500P-B/E
Slime Forming Bacteria	0	500		CFU/ml	1	09/03/14	MM	HACH SLYM-BART
Solids, Total Dissolved	450	10	5.0	mg/l	1	09/09/14	JD	SM 2540C-2011
Specific Conductivity	660	1.0		umhos/cm	1	09/04/14	JD	SM 2510B-2011
Sulfate	79.9	2.5	1.0	mg/l	5	09/03/14 19:34	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	5000	200		CFU/ml	1	09/03/14	MM	HACH SRB-BART
pH	7.72			su	1	09/04/14 12:55	SK	SM4500HB+ -2011/9040C

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: RMV 108-4-49368 F Lab Sample ID: D61758-1F Matrix: AQ - Groundwater Filtered Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ	Date Sampled: 09/02/14 Date Received: 09/03/14 Percent Solids: n/a
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Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	91.7	4.0	0.16	ug/l	2	09/04/14	09/12/14 NT	EPA 200.8 ²	EPA 200.8 ³
Boron	20.4 J	50	6.6	ug/l	1	09/04/14	09/04/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Calcium	67400	400	66	ug/l	1	09/04/14	09/04/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Iron	3.2 U	10	3.2	ug/l	1	09/04/14	09/04/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Magnesium	29300	200	29	ug/l	1	09/04/14	09/04/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Manganese	0.50 J	5.0	0.29	ug/l	1	09/04/14	09/04/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Potassium	3650	1000	230	ug/l	1	09/04/14	09/04/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Selenium	3.2	0.80	0.42	ug/l	2	09/04/14	09/12/14 NT	EPA 200.8 ²	EPA 200.8 ³
Sodium	50300	400	36	ug/l	1	09/04/14	09/04/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Strontium	654	5.0	0.12	ug/l	1	09/04/14	09/04/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴

- (1) Instrument QC Batch: MA5202
- (2) Instrument QC Batch: MA5238
- (3) Prep QC Batch: MP13914
- (4) Prep QC Batch: MP13916

RL = Reporting Limit
 MDL = Method Detection Limit

U = Indicates a result < MDL
 J = Indicates a result > = MDL but < RL

4.2
4

Misc. Forms

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Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D61758
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V1883-MB	3V32303.D	1	09/04/14	JL	n/a	n/a	V3V1883

The QC reported here applies to the following samples:

Method: SW846 8260B

D61758-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.31	ug/l	
108-88-3	Toluene	ND	1.0	0.80	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.89	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Results	Limits
17060-07-0	1,2-Dichloroethane-D4	95%	62-130%
2037-26-5	Toluene-D8	95%	70-130%
460-00-4	4-Bromofluorobenzene	98%	69-130%

Blank Spike Summary

Job Number: D61758
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V1883-BS	3V32304.D	1	09/04/14	JL	n/a	n/a	V3V1883

The QC reported here applies to the following samples:

Method: SW846 8260B

D61758-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	53.4	107	70-130
100-41-4	Ethylbenzene	50	50.1	100	70-130
108-88-3	Toluene	50	51.6	103	70-130
1330-20-7	Xylene (total)	150	148	99	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	99%	62-130%
2037-26-5	Toluene-D8	96%	70-130%
460-00-4	4-Bromofluorobenzene	102%	69-130%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: D61758
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V1883-BS	3V32305.D	1	09/04/14	JL	n/a	n/a	V3V1883

The QC reported here applies to the following samples:

Method: SW846 8260B

D61758-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	1800	82	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	98%	62-130%
2037-26-5	Toluene-D8	97%	70-130%
460-00-4	4-Bromofluorobenzene	101%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: D61758
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D61731-1MS ^a	3V32307.D	5	09/04/14	JL	n/a	n/a	V3V1883
D61731-1 ^a	3V32309.D	5	09/04/14	JL	n/a	n/a	V3V1883

The QC reported here applies to the following samples:

Method: SW846 8260B

D61758-1

CAS No.	Compound	D61731-1 ug/l	Spike Q	MS ug/l	MS %	Limits
71-43-2	Benzene	460	250	669	84	62-130
100-41-4	Ethylbenzene	12.7	250	239	91	63-130
108-88-3	Toluene	5.1	250	235	92	60-130
1330-20-7	Xylene (total)	60.7	750	728	89	67-130

CAS No.	Surrogate Recoveries	MS	D61731-1	Limits
17060-07-0	1,2-Dichloroethane-D4	99%	99%	62-130%
2037-26-5	Toluene-D8	95%	95%	70-130%
460-00-4	4-Bromofluorobenzene	100%	98%	69-130%

(a) The pH of the sample aliquot for VOA analysis was > 2 at time of analysis.

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: D61758
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D61731-1MS ^a	3V32308.D	5	09/04/14	JL	n/a	n/a	V3V1883
D61731-1 ^a	3V32309.D	5	09/04/14	JL	n/a	n/a	V3V1883

The QC reported here applies to the following samples:

Method: SW846 8260B

D61758-1

CAS No.	Compound	D61731-1 ug/l	Spike Q	MS ug/l	MS %	Limits
	TPH-GRO (C6-C10)	1510	11000	10700	84	19-168

CAS No.	Surrogate Recoveries	MS	D61731-1	Limits
17060-07-0	1,2-Dichloroethane-D4	97%	99%	62-130%
2037-26-5	Toluene-D8	97%	95%	70-130%
460-00-4	4-Bromofluorobenzene	100%	98%	69-130%

(a) The pH of the sample aliquot for VOA analysis was > 2 at time of analysis.

* = Outside of Control Limits.

Duplicate Summary

Job Number: D61758
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D61731-6DUP ^a	3V32311.D	5	09/04/14	JL	n/a	n/a	V3V1883
D61731-6 ^a	3V32310.D	5	09/04/14	JL	n/a	n/a	V3V1883

The QC reported here applies to the following samples:

Method: SW846 8260B

D61758-1

CAS No.	Compound	D61731-6 ug/l	DUP Q	D61731-6 ug/l	Q	RPD	Limits
71-43-2	Benzene	296		288		3	30
100-41-4	Ethylbenzene	ND		ND		nc	30
108-88-3	Toluene	13.7		14.0		2	30
1330-20-7	Xylene (total)	ND		ND		nc	30
	TPH-GRO (C6-C10)	1980		1990		1	30

CAS No.	Surrogate Recoveries	DUP	D61731-6	Limits
17060-07-0	1,2-Dichloroethane-D4	101%	97%	62-130%
2037-26-5	Toluene-D8	98%	96%	70-130%
460-00-4	4-Bromofluorobenzene	100%	99%	69-130%

(a) The pH of the sample aliquot for VOA analysis was > 2 at time of analysis.

* = Outside of Control Limits.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D61758
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB563-MB	FB12052.D	1	09/05/14	JJ	n/a	n/a	GFB563

The QC reported here applies to the following samples:

Method: RSK175 MOD

D61758-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.00080	0.00040	mg/l	
74-84-0	Ethane	ND	0.0016	0.00080	mg/l	
74-98-6	Propane	ND	0.0022	0.0011	mg/l	

7.1.1
7

Blank Spike Summary

Job Number: D61758
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB563-BS	FB12053.D	10	09/05/14	JJ	n/a	n/a	GFB563

The QC reported here applies to the following samples:

Method: RSK175 MOD

D61758-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.51	0.532	104	70-130
74-84-0	Ethane	0.956	1.04	109	70-130
74-98-6	Propane	1.4	1.55	111	67-130

7.2.1
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D61758
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D61757-1MS ^a	FB12055.D	10	09/05/14	JJ	n/a	n/a	GFB563
D61757-1MSD ^a	FB12056.D	10	09/05/14	JJ	n/a	n/a	GFB563
D61757-1 ^a	FB12054.D	1	09/05/14	JJ	n/a	n/a	GFB563

The QC reported here applies to the following samples:

Method: RSK175 MOD

D61758-1

CAS No.	Compound	D61757-1		MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
		mg/l	Q							
74-82-8	Methane	ND	0.51	0.492	96	0.51	0.528	104	7	51-155/30
74-84-0	Ethane	ND	0.956	0.954	100	0.956	1.03	108	8	58-130/30
74-98-6	Propane	ND	1.4	1.42	101	1.4	1.52	108	7	46-130/30

(a) The pH of the sample was > 2 at time of analysis.

* = Outside of Control Limits.

7.3.1
7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D61758
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP10559-MB	FI16356.D	1	09/05/14	JS	09/04/14	OP10559	GF1943

The QC reported here applies to the following samples:

Method: SW846-8015B

D61758-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	0.20	0.18	mg/l	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	85% 10-130%

8.1.1
8

Blank Spike Summary

Job Number: D61758
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP10559-BS	FI16358.D	1	09/05/14	JS	09/04/14	OP10559	GF1943

The QC reported here applies to the following samples:

Method: SW846-8015B

D61758-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	2.75	55	33-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	85%	10-130%

8.2.1
8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D61758
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP10559-MS	FI16360.D	1	09/05/14	JS	09/04/14	OP10559	GFI943
OP10559-MSD	FI16362.D	1	09/05/14	JS	09/04/14	OP10559	GFI943
D60526-1	FI16364.D	1	09/05/14	JS	09/04/14	OP10559	GFI943

The QC reported here applies to the following samples:

Method: SW846-8015B

D61758-1

CAS No.	Compound	D60526-1 mg/l	Spike Q mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	5	2.46	49	5	2.40	48	2	33-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D60526-1	Limits
84-15-1	o-Terphenyl	80%	76%	76%	10-130%

8.3.1
8

* = Outside of Control Limits.

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D61758
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

QC Batch ID: MP13914
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 09/04/14

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	1.1	2		
Antimony	0.40	.0022	.011		
Arsenic	0.20	.017	.044		
Barium	2.0	.016	.079	0.074	<2.0
Beryllium	0.20	.016	.069		
Boron	40	.49	2.1		
Cadmium	0.10	.036	.042		
Calcium	400	5.6	12		
Chromium	2.0	.053	.053		
Cobalt	0.20	.0049	.015		
Copper	2.0	.06	.13		
Iron	10	3.5	4.6		
Lead	0.50	.0079	.008		
Magnesium	100	1.3	1.3		
Manganese	1.0	.12	.13		
Molybdenum	1.0	.049	.029		
Nickel	2.0	.0088	.027		
Phosphorus	60	2.6	4.3		
Potassium	200	2.9	2.9		
Selenium	0.40	.06	.21	0.0010	<0.40
Silver	0.10	.0019	.008		
Sodium	500	4.9	4.9		
Strontium	20	.01	.015		
Thallium	0.20	.0024	.005		
Tin	10	.063	1.3		
Titanium	2.0	.059	.092		
Uranium	0.20	.0017	.002		
Vanadium	1.0	.037	.2		
Zinc	10	.21	.96		

Associated samples MP13914: D61758-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.1.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D61758
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

QC Batch ID: MP13914
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 09/04/14

Metal	D61771-1A Original MS		SpikeLot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	122	540	400	102.0	70-130
Beryllium					
Boron					
Cadmium					
Calcium	anr				
Chromium					
Cobalt					
Copper					
Iron	anr				
Lead					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium	1.5	202	200	100.3	70-130
Silver					
Sodium	anr				
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP13914: D61758-1F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.1.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D61758
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

QC Batch ID: MP13914
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 09/04/14

Metal	D61771-1A Original MSD		SpikeLot ICPAL2 % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	122	540	400	102.0	0.0	20
Beryllium						
Boron						
Cadmium						
Calcium	anr					
Chromium						
Cobalt						
Copper						
Iron	anr					
Lead						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium	1.5	200	200	99.3	1.0	20
Silver						
Sodium	anr					
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP13914: D61758-1F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.1.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D61758
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

QC Batch ID: MP13914
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 09/04/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	402	400	100.5	85-115
Beryllium				
Boron				
Cadmium				
Calcium	anr			
Chromium				
Cobalt				
Copper				
Iron	anr			
Lead				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	195	200	97.5	85-115
Silver				
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP13914: D61758-1F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.1.3
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D61758
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

QC Batch ID: MP13916
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 09/04/14

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	8.6	11		
Antimony	30	3.2	21		
Arsenic	25	5.2	9		
Barium	10	1.4	1.4		
Beryllium	10	.8	1.7		
Boron	50	6.7	6.6	0.50	<50
Cadmium	10	.4	.36		
Calcium	400	2.2	66	7.7	<400
Chromium	10	.4	1.4		
Cobalt	5.0	.4	.51		
Copper	10	1.2	1.5		
Iron	10	2.2	3.2	0.30	<10
Lead	50	3.6	4.1		
Lithium	5.0	1.9	1.9		
Magnesium	200	14	29	9.3	<200
Manganese	5.0	.01	.29	0.20	<5.0
Molybdenum	10	.8	1.1		
Nickel	30	.9	.87		
Phosphorus	100	15	24		
Potassium	1000	130	230	21.3	<1000
Selenium	50	8.8	9.3		
Silicon	50	5.2	5.6		
Silver	30	.4	.4		
Sodium	400	4.9	36	38.3	<400
Strontium	5.0	.01	.12	0.0	<5.0
Thallium	10	2.9	4.9		
Tin	50	13	13		
Titanium	10	.15	.43		
Uranium	50	3.7	3.9		
Vanadium	10	.4	.39		
Zinc	30	.6	1.9		

Associated samples MP13916: D61758-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D61758
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

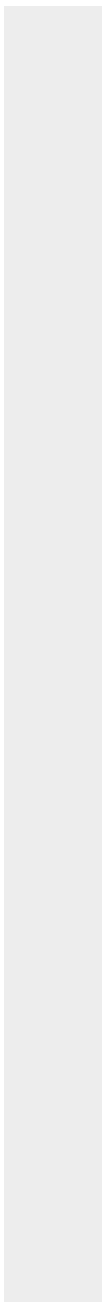
QC Batch ID: MP13916
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 09/04/14

Metal	RL	IDL	MDL	MB	raw	final
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(anr) Analyte not requested



9.2.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D61758
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

QC Batch ID: MP13916
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 09/04/14

Metal	D61668-1F Original MS		SpikeLot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium	anr				
Beryllium					
Boron	80.8	1190	1000	110.9	70-130
Cadmium					
Calcium	130000	151000	25000	84.0	70-130
Chromium	anr				
Cobalt					
Copper					
Iron	21.0	4970	5000	99.0	70-130
Lead					
Lithium					
Magnesium	66500	90700	25000	96.8	70-130
Manganese	4.6	499	500	98.9	70-130
Molybdenum					
Nickel					
Phosphorus					
Potassium	7740	34300	25000	106.2	70-130
Selenium					
Silicon					
Silver					
Sodium	402000	410000	25000	32.0 (a)	70-130
Strontium	1870	2290	500	84.0	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP13916: D61758-1F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D61758
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

QC Batch ID: MP13916
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 09/04/14

Metal	D61668-1F Original MS	SpikeLot ICPALL2	% Rec	QC Limits
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- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D61758
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

QC Batch ID: MP13916
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 09/04/14

Metal	D61668-1F Original MSD		SpikeLot ICPAL2 % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	anr					
Beryllium						
Boron	80.8	1190	1000	110.9	0.0	20
Cadmium						
Calcium	130000	154000	25000	96.0	2.0	20
Chromium	anr					
Cobalt						
Copper						
Iron	21.0	4900	5000	97.6	1.4	20
Lead						
Lithium						
Magnesium	66500	91400	25000	99.6	0.8	20
Manganese	4.6	494	500	97.9	1.0	20
Molybdenum						
Nickel						
Phosphorus						
Potassium	7740	34100	25000	105.4	0.6	20
Selenium						
Silicon						
Silver						
Sodium	402000	419000	25000	68.0 (a)	2.2	20
Strontium	1870	2310	500	88.0	0.9	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP13916: D61758-1F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D61758
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

QC Batch ID: MP13916
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 09/04/14

Metal	D61668-1F Original MSD	SpikeLot ICPALL2 % Rec	MSD RPD	QC Limit
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- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

9.2.2
9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D61758
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

QC Batch ID: MP13916
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 09/04/14

Metal	BSP Result	SpikeLot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	anr			
Beryllium				
Boron	1030	1000	103.0	85-115
Cadmium				
Calcium	25300	25000	101.2	85-115
Chromium	anr			
Cobalt				
Copper				
Iron	4930	5000	98.6	85-115
Lead				
Lithium				
Magnesium	25600	25000	102.4	85-115
Manganese	496	500	99.2	85-115
Molybdenum				
Nickel				
Phosphorus				
Potassium	26100	25000	104.4	85-115
Selenium				
Silicon				
Silver				
Sodium	26300	25000	105.2	85-115
Strontium	509	500	101.8	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP13916: D61758-1F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D61758
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

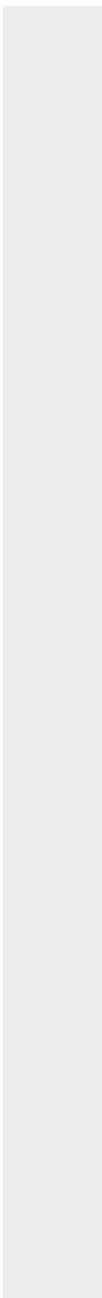
QC Batch ID: MP13916
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 09/04/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
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(anr) Analyte not requested



General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D61758
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN26384	5.0	0.0	mg/l	100	96.4	96.4	90-110%
Alkalinity, Carbonate	GN26385	5.0	0.0	mg/l	100	96.4	96.4	80-120%
Alkalinity, Total as CaCO3	GN26383	5.0	0.0	mg/l	100	96.4	96.4	90-110%
Bromide	GP13431/GN26280	0.050	0.0	mg/l	0.5	0.494	98.8	90-110%
Chloride	GP13431/GN26280	0.50	0.0	mg/l	5	4.86	97.2	90-110%
Fluoride	GP13431/GN26280	0.10	0.0	mg/l	1	1.01	101.0	90-110%
Iron Reducing Bacteria	MB421	25	<25	CFU/ml				
Nitrogen, Nitrate	GP13431/GN26280	0.010	0.0	mg/l	0.1	0.102	102.0	90-110%
Nitrogen, Nitrite	GP13431/GN26280	0.0040	0.0	mg/l	0.05	0.0534	106.8	90-110%
Phosphorus, Total	GP13488/GN26377	0.010	0.0	mg/l	0.38	0.36	95.8	80-120%
Slime Forming Bacteria	MB422	500	<500	CFU/ml				
Solids, Total Dissolved	GN26364	10	0.0	mg/l	400	399	99.8	90-110%
Specific Conductivity	GP13448/GN26295			umhos/cm	99.4	98.6	99.2	90-110%
Sulfate	GP13431/GN26280	0.50	0.0	mg/l	5	5.02	100.4	90-110%
Sulfate Reducing Bacteria	MB423	200	<200	CFU/ml				
pH	GN26298			su	8.00	8.02	100.3	99.1-100.9%

Associated Samples:

- Batch MB421: D61758-1
- Batch MB422: D61758-1
- Batch MB423: D61758-1
- Batch GN26298: D61758-1
- Batch GN26364: D61758-1
- Batch GN26383: D61758-1
- Batch GN26384: D61758-1
- Batch GN26385: D61758-1
- Batch GP13431: D61758-1
- Batch GP13448: D61758-1
- Batch GP13488: D61758-1

(*) Outside of QC limits

10.1
10

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D61758
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN26383	D61983-1	mg/l	94.7	93.3	1.4	0-20%
Phosphorus, Total	GP13488/GN26377	D61817-1	mg/l	0.026	0.023	12.2	0-20%
Solids, Total Dissolved	GN26364	D61757-1	mg/l	356	372	4.4	0-20%
Specific Conductivity	GP13448/GN26295	D61758-1	umhos/cm	660	664	0.6	0-20%

Associated Samples:

Batch GN26364: D61758-1

Batch GN26383: D61758-1

Batch GP13448: D61758-1

Batch GP13488: D61758-1

(*) Outside of QC limits

10.2
10

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D61758
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN26383	D61758-1	mg/l	279	100	366	86.3	80-120%
Bromide	GP13431/GN26280	D61736-3	mg/l	0.0	0.5	0.52	104.0	80-120%
Chloride	GP13431/GN26280	D61736-3	mg/l	1.2	5	6.0	96.0	80-120%
Fluoride	GP13431/GN26280	D61736-3	mg/l	0.24	1	1.2	96.0	80-120%
Nitrogen, Nitrate	GP13431/GN26280	D61736-3	mg/l	0.10	0.1	0.20	100.0	80-120%
Nitrogen, Nitrite	GP13431/GN26280	D61736-3	mg/l	0.0	0.05	0.050	100.0	80-120%
Phosphorus, Total	GP13488/GN26377	D61817-1	mg/l	0.026	0.40	0.47	111.0	80-120%
Sulfate	GP13431/GN26280	D61736-3	mg/l	21.1	5	26.0	98.0	80-120%

Associated Samples:

Batch GN26383: D61758-1

Batch GP13431: D61758-1

Batch GP13488: D61758-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.3
10

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D61758
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX Spruce Creek Pit 14-4-794 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN26383	D61758-1	mg/l	279	100	364	0.4	20%
Bromide	GP13431/GN26280	D61736-3	mg/l	0.0	0.5	0.52	0.0	20%
Chloride	GP13431/GN26280	D61736-3	mg/l	1.2	5	6.0	0.0	20%
Fluoride	GP13431/GN26280	D61736-3	mg/l	0.24	1	1.3	8.0	20%
Nitrogen, Nitrate	GP13431/GN26280	D61736-3	mg/l	0.10	0.1	0.19	5.1	20%
Nitrogen, Nitrite	GP13431/GN26280	D61736-3	mg/l	0.0	0.05	0.046	8.3	20%
Phosphorus, Total	GP13488/GN26377	D61817-1	mg/l	0.026	0.40	0.43	8.9	20%
Sulfate	GP13431/GN26280	D61736-3	mg/l	21.1	5	26.1	0.4	20%

Associated Samples:

Batch GN26383: D61758-1

Batch GP13431: D61758-1

Batch GP13488: D61758-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4
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