



12/08/14

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: RMV 108-4 BWQ

Accutest Job Number: D63168

Sampling Date: 10/07/14

Report to:

Western Water and Land, Inc.

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ATTN: Shelby Kipp

Total number of pages in report: 56



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: D63168

WWLCOGJ: RMV 108-4 BWQ

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D63168-1	10/07/14	08:20 NWS	10/08/14	AQ	Ground Water	RMV 108-4-SPRING
D63168-1F	10/07/14	08:20 NWS	10/08/14	AQ	Groundwater Filtered	RMV 108-4-SPRING
D63168-2	10/07/14	12:30 SLK	10/08/14	AQ	Ground Water	RMV 108-4-HILLSIDE SPG
D63168-2F	10/07/14	12:30 SLK	10/08/14	AQ	Groundwater Filtered	RMV 108-4-HILLSIDE SPG
D63168-3	10/07/14	00:00 NWS	10/08/14	AQ	Trip Blank Water	TRIP BLANK

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: WPX Energy Rocky Mountain, LLC

Job No D63168

Site: WWLCOGJ: RMV 108-4 BWQ

Report Date 10/30/2014 7:29:40 P

On 10/08/2014, 2 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 1.4 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D63168 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: V7V1586

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D60545-9DUP, D63012-1MS were used as the QC samples indicated.
- D63012-1MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D60545-9DUP: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- V7V1586-MB for Ethylbenzene: Compound ND in associated samples.

Volatiles by GC By Method RSK175 MOD

Matrix: AQ

Batch ID: GFB574

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D63150-1MS, D63150-1MSD were used as the QC samples indicated.
- D63168-1, -2: The pH of the sample was >2 at time of analysis.
- D63150-1MS, -1MSD: The pH of the sample was >2 at time of analysis.

Extractables by GC By Method SW846-8015B

Matrix: AQ

Batch ID: OP10785

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D60544-16MS, D60544-16MSD were used as the QC samples indicated.

Metals By Method EPA 200.7

Matrix: AQ

Batch ID: MP14233

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D63068-1MS, D63068-1MSD were used as the QC samples for the metals analysis.
- MP14233-MB1 for Iron: All sample results < RL or > 10x MB concentration.

Metals By Method EPA 200.8

Matrix: AQ **Batch ID:** MP14240

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D63128-1MS, D63128-1MSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix: AQ **Batch ID:** GP13711

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D63168-1MS, D63168-1MSD 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:** GN27080

- 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:** MB439

- 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:** MB440

- 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:** GP13743

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D63155-23DUP, D63155-23MS, D63155-23MSD were used as the QC samples for the Phosphorus, Total analysis.

Wet Chemistry By Method SM 2320B-2011

Matrix: AQ **Batch ID:** GN26898

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D63168-1DUP were used as the QC samples for the Alkalinity, Total as CaCO₃ analysis.

Matrix: AQ **Batch ID:** GN26901

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

Matrix: AQ **Batch ID:** GN26902

- 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:** GP13733

- Sample(s) D63221-1DUP were used as the QC samples for the Specific Conductivity analysis.

Wet Chemistry By Method SM 2540C-2011

Matrix: AQ **Batch ID:** GN26842

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D63077-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

Wet Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ **Batch ID:** GN26876

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D63168-1, D63168-2

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: D63168
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ
Collected: 10/07/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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D63168-1 RMV 108-4-SPRING

Alkalinity, Bicarbonate as CaCO3	361	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	361	5.0	2.0	mg/l	SM 2320B-2011
Bromide	0.11	0.050	0.025	mg/l	EPA 300.0/SW846 9056
Chloride	12.0	0.50	0.40	mg/l	EPA 300.0/SW846 9056
Fluoride	0.28	0.10	0.050	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria	9000	25		CFU/ml	HACH IRB-BART
Nitrogen, Nitrate	0.50	0.050	0.030	mg/l	EPA 300.0/SW846 9056
Phosphorus, Total	0.13	0.010	0.0080	mg/l	HACH8190/SM4500P-B/E
Slime Forming Bacteria	350000	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved	424	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity	687	1.0		umhos/cm	SM 2510B-2011
Sulfate	62.1	2.5	1.0	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	700	200		CFU/ml	HACH SRB-BART
pH	7.51			su	SM4500HB+ -2011/9040C

D63168-1F RMV 108-4-SPRING

Barium	81.5	4.0	0.16	ug/l	EPA 200.8
Boron	46.0 J	50	6.6	ug/l	EPA 200.7
Calcium	71200	400	66	ug/l	EPA 200.7
Iron	7.4 J	10	3.2	ug/l	EPA 200.7
Magnesium	33500	200	29	ug/l	EPA 200.7
Potassium	3320	1000	230	ug/l	EPA 200.7
Selenium	2.0	0.80	0.42	ug/l	EPA 200.8
Sodium	42700	400	36	ug/l	EPA 200.7
Strontium	672	5.0	0.12	ug/l	EPA 200.7

D63168-2 RMV 108-4-HILLSIDE SPG

Alkalinity, Bicarbonate as CaCO3	298	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	298	5.0	2.0	mg/l	SM 2320B-2011
Bromide	0.10	0.050	0.025	mg/l	EPA 300.0/SW846 9056
Chloride	12.3	0.50	0.40	mg/l	EPA 300.0/SW846 9056
Fluoride	0.28	0.10	0.050	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria	9000	25		CFU/ml	HACH IRB-BART
Nitrogen, Nitrate	1.1	0.050	0.030	mg/l	EPA 300.0/SW846 9056
Phosphorus, Total	0.11	0.010	0.0080	mg/l	HACH8190/SM4500P-B/E
Slime Forming Bacteria	350000	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved	446	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity	671	1.0		umhos/cm	SM 2510B-2011
Sulfate	70.6	2.5	1.0	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	200	200		CFU/ml	HACH SRB-BART
pH	7.73			su	SM4500HB+ -2011/9040C

Summary of Hits

Job Number: D63168
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ
Collected: 10/07/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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D63168-2F RMV 108-4-HILLSIDE SPG

Barium	87.0	4.0	0.16	ug/l	EPA 200.8
Boron	48.9 J	50	6.6	ug/l	EPA 200.7
Calcium	69500	400	66	ug/l	EPA 200.7
Iron	7.4 J	10	3.2	ug/l	EPA 200.7
Magnesium	32900	200	29	ug/l	EPA 200.7
Potassium	3490	1000	230	ug/l	EPA 200.7
Selenium	2.4	0.80	0.42	ug/l	EPA 200.8
Sodium	45200	400	36	ug/l	EPA 200.7
Strontium	658	5.0	0.12	ug/l	EPA 200.7

D63168-3 TRIP BLANK

No hits reported in this sample.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: RMV 108-4-SPRING	
Lab Sample ID: D63168-1	Date Sampled: 10/07/14
Matrix: AQ - Ground Water	Date Received: 10/08/14
Method: SW846 8260B	Percent Solids: n/a
Project: WWLCOGJ: RMV 108-4 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V29116.D	1	10/11/14	EV	n/a	n/a	V7V1586
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	1.0	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	98%		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
4

Report of Analysis

Client Sample ID: RMV 108-4-SPRING	Date Sampled: 10/07/14
Lab Sample ID: D63168-1	Date Received: 10/08/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: RSK175 MOD	
Project: WWLCOGJ: RMV 108-4 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FB12310.D	1	10/09/14	JJ	n/a	n/a	GFB574
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
 RL = Reporting Limit

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

Report of Analysis

Client Sample ID: RMV 108-4-SPRING	Date Sampled: 10/07/14
Lab Sample ID: D63168-1	Date Received: 10/08/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846-8015B SW846 3510C	
Project: WWLCOGJ: RMV 108-4 BWQ	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD36026.D	1	10/10/14	JS	10/09/14	OP10785	GFD1648
Run #2							

	Initial Volume	Final Volume
Run #1	1060 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	79%		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-SPRING	Date Sampled: 10/07/14
Lab Sample ID: D63168-1	Date Received: 10/08/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: WWLCOGJ: RMV 108-4 BWQ	

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	361	5.0	2.0	mg/l	1	10/13/14	JD	SM 2320B-2011
Alkalinity, Carbonate	2.0 U	5.0	2.0	mg/l	1	10/13/14	JD	SM 2320B-2011
Alkalinity, Total as CaCO ₃	361	5.0	2.0	mg/l	1	10/13/14	JD	SM 2320B-2011
Bromide	0.11	0.050	0.025	mg/l	1	10/08/14 14:31	SK	EPA 300.0/SW846 9056
Chloride	12.0	0.50	0.40	mg/l	1	10/08/14 14:31	SK	EPA 300.0/SW846 9056
Fluoride	0.28	0.10	0.050	mg/l	1	10/08/14 14:31	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	9000	25		CFU/ml	1	10/14/14	MM	HACH IRB-BART
Nitrogen, Nitrate	0.50	0.050	0.030	mg/l	5	10/08/14 17:54	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.0030 U	0.0040	0.0030	mg/l	1	10/08/14 14:31	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.13	0.010	0.0080	mg/l	1	10/11/14 09:00	JB	HACH8190/SM4500P-B/E
Slime Forming Bacteria	350000	500		CFU/ml	1	10/14/14	MM	HACH SLYM-BART
Solids, Total Dissolved	424	10	5.0	mg/l	1	10/09/14	JD	SM 2540C-2011
Specific Conductivity	687	1.0		umhos/cm	1	10/10/14	JD	SM 2510B-2011
Sulfate	62.1	2.5	1.0	mg/l	5	10/08/14 17:54	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	700	200		CFU/ml	1	10/14/14	MM	HACH SRB-BART
pH	7.51			su	1	10/10/14 13:15	TB	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-SPRING Lab Sample ID: D63168-1F Matrix: AQ - Groundwater Filtered Project: WWLCOGJ: RMV 108-4 BWQ	Date Sampled: 10/07/14 Date Received: 10/08/14 Percent Solids: n/a
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Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	81.5	4.0	0.16	ug/l	2	10/09/14	10/17/14 JB	EPA 200.8 ²	EPA 200.8 ⁴
Boron	46.0 J	50	6.6	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Calcium	71200	400	66	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Iron	7.4 J	10	3.2	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Magnesium	33500	200	29	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Manganese	0.29 U	5.0	0.29	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Potassium	3320	1000	230	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Selenium	2.0	0.80	0.42	ug/l	2	10/09/14	10/17/14 JB	EPA 200.8 ²	EPA 200.8 ⁴
Sodium	42700	400	36	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Strontium	672	5.0	0.12	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³

- (1) Instrument QC Batch: MA5359
- (2) Instrument QC Batch: MA5387
- (3) Prep QC Batch: MP14233
- (4) Prep QC Batch: MP14240

RL = Reporting Limit
 MDL = Method Detection Limit

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

4.2
4

Report of Analysis

Client Sample ID: RMV 108-4-HILLSIDE SPG	Date Sampled: 10/07/14
Lab Sample ID: D63168-2	Date Received: 10/08/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8260B	
Project: WWLCOGJ: RMV 108-4 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V29117.D	1	10/11/14	EV	n/a	n/a	V7V1586
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	1.0	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	98%		62-130%
2037-26-5	Toluene-D8	102%		70-130%
460-00-4	4-Bromofluorobenzene	98%		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

4.3
4

Report of Analysis

Client Sample ID: RMV 108-4-HILLSIDE SPG		Date Sampled: 10/07/14
Lab Sample ID: D63168-2		Date Received: 10/08/14
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: RSK175 MOD		
Project: WWLCOGJ: RMV 108-4 BWQ		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FB12311.D	1	10/09/14	JJ	n/a	n/a	GFB574
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

4.3
4

Report of Analysis

Client Sample ID: RMV 108-4-HILLSIDE SPG	Date Sampled: 10/07/14
Lab Sample ID: D63168-2	Date Received: 10/08/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846-8015B SW846 3510C	
Project: WWLCOGJ: RMV 108-4 BWQ	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD36028.D	1	10/10/14	JS	10/09/14	OP10785	GFD1648
Run #2							

	Initial Volume	Final Volume
Run #1	1060 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	83%		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

4.3
4

Report of Analysis

Client Sample ID: RMV 108-4-HILLSIDE SPG	Date Sampled: 10/07/14
Lab Sample ID: D63168-2	Date Received: 10/08/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: WWLCOGJ: RMV 108-4 BWQ	

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	298	5.0	2.0	mg/l	1	10/13/14	JD	SM 2320B-2011
Alkalinity, Carbonate	2.0 U	5.0	2.0	mg/l	1	10/13/14	JD	SM 2320B-2011
Alkalinity, Total as CaCO3	298	5.0	2.0	mg/l	1	10/13/14	JD	SM 2320B-2011
Bromide	0.10	0.050	0.025	mg/l	1	10/08/14 14:45	SK	EPA 300.0/SW846 9056
Chloride	12.3	0.50	0.40	mg/l	1	10/08/14 14:45	SK	EPA 300.0/SW846 9056
Fluoride	0.28	0.10	0.050	mg/l	1	10/08/14 14:45	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	9000	25		CFU/ml	1	10/14/14	MM	HACH IRB-BART
Nitrogen, Nitrate	1.1	0.050	0.030	mg/l	5	10/08/14 19:04	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.0030 U	0.0040	0.0030	mg/l	1	10/08/14 14:45	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.11	0.010	0.0080	mg/l	1	10/11/14 09:00	JB	HACH8190/SM4500P-B/E
Slime Forming Bacteria	350000	500		CFU/ml	1	10/14/14	MM	HACH SLYM-BART
Solids, Total Dissolved	446	10	5.0	mg/l	1	10/09/14	JD	SM 2540C-2011
Specific Conductivity	671	1.0		umhos/cm	1	10/10/14	JD	SM 2510B-2011
Sulfate	70.6	2.5	1.0	mg/l	5	10/08/14 19:04	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	200	200		CFU/ml	1	10/14/14	MM	HACH SRB-BART
pH	7.73			su	1	10/10/14 13:15	TB	SM4500HB+ -2011/9040C

RL = Reporting Limit
 MDL = Method Detection Limit

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

4.3
4

Report of Analysis

Client Sample ID: RMV 108-4-HILLSIDE SPG Lab Sample ID: D63168-2F Matrix: AQ - Groundwater Filtered Project: WWLCOGJ: RMV 108-4 BWQ	Date Sampled: 10/07/14 Date Received: 10/08/14 Percent Solids: n/a
--	---

Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	87.0	4.0	0.16	ug/l	2	10/09/14	10/17/14 JB	EPA 200.8 ²	EPA 200.8 ⁴
Boron	48.9 J	50	6.6	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Calcium	69500	400	66	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Iron	7.4 J	10	3.2	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Magnesium	32900	200	29	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Manganese	0.29 U	5.0	0.29	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Potassium	3490	1000	230	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Selenium	2.4	0.80	0.42	ug/l	2	10/09/14	10/17/14 JB	EPA 200.8 ²	EPA 200.8 ⁴
Sodium	45200	400	36	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Strontium	658	5.0	0.12	ug/l	1	10/09/14	10/10/14 KV	EPA 200.7 ¹	EPA 200.7 ³

- (1) Instrument QC Batch: MA5359
- (2) Instrument QC Batch: MA5387
- (3) Prep QC Batch: MP14233
- (4) Prep QC Batch: MP14240

RL = Reporting Limit
 MDL = Method Detection Limit

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

4.4
4

Report of Analysis

Client Sample ID: TRIP BLANK	
Lab Sample ID: D63168-3	Date Sampled: 10/07/14
Matrix: AQ - Trip Blank Water	Date Received: 10/08/14
Method: SW846 8260B	Percent Solids: n/a
Project: WWLCOGJ: RMV 108-4 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V29118.D	1	10/11/14	EV	n/a	n/a	V7V1586
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	1.0	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	100%		62-130%
2037-26-5	Toluene-D8	101%		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

4.5
4

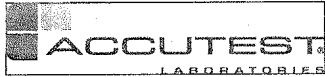
Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL: 303-425-6021 FAX: 303-425-6854
www.accutest.com

FED-EX Tracking #
Accutest Job #
Requested Analysis (see TEST CODE sheet)
Matrix Codes

Client / Reporting Information
Project Name: RMV 108-4 BWQ
Company Name: Western Water and Land, Inc.
Street Address: 743 Horizon Ct., Suite 330
City: Grand Junction, CO 81506
Project Contact: Bruce Smith
Project #
Client Purchase Order #
Project Manager: Michael Gardner

Table with columns: Field ID / Point of Collection, MECH/ID Val #, Date, Time, Sampled by, Matrix, # of Bottles, and various chemical analysis results (PH, SCOD, TDS, etc.).

Turnaround Time (Business Days)
Data Deliverable Information
Comments / Special Instructions

Chain of Custody Log
Received By: Service Center
Relinquished By:
Date Time:
Custody Seal #

5.1
5



Accutest Job Number: D63168 **Client:** WWL **Project:** RMV
Date / Time Received: 10/8/2014 11:30:00 AM **Delivery Method:** _____ **Airbill #'s:** CO
Cooler Temps (Initial/Adjusted): 0

Cooler Security

	<u>Y or N</u>			<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Cooler Temperature

	<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	_____ ; _____	
3. Cooler media:	_____ Ice (Bag) _____	
4. No. Coolers:	_____ 1 _____	

Quality Control Preservation

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

Comments

Sample Integrity - Documentation

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

Sample Integrity - Condition

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	_____ Intact _____		

Sample Integrity - Instructions

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

5.1
5

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: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1586-MB	7V29104.D	1	10/10/14	EV	n/a	n/a	V7V1586

The QC reported here applies to the following samples:

Method: SW846 8260B

D63168-1, D63168-2, D63168-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene ^a	0.40	1.0	0.31	ug/l	J
108-88-3	Toluene	ND	1.0	0.80	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.89	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Limits	
17060-07-0	1,2-Dichloroethane-D4	99%	62-130%
2037-26-5	Toluene-D8	103%	70-130%
460-00-4	4-Bromofluorobenzene	98%	69-130%

(a) Compound ND in associated samples.

Blank Spike Summary

Job Number: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1586-BS	7V29105.D	1	10/10/14	EV	n/a	n/a	V7V1586

The QC reported here applies to the following samples:

Method: SW846 8260B

D63168-1, D63168-2, D63168-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	48.7	97	70-130
100-41-4	Ethylbenzene	50	50.4	101	70-130
108-88-3	Toluene	50	51.8	104	70-130
1330-20-7	Xylene (total)	150	150	100	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	100%	62-130%
2037-26-5	Toluene-D8	103%	70-130%
460-00-4	4-Bromofluorobenzene	100%	69-130%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1586-BS	7V29106.D	1	10/11/14	EV	n/a	n/a	V7V1586

The QC reported here applies to the following samples:

Method: SW846 8260B

D63168-1, D63168-2, D63168-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	2120	96	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	99%	62-130%
2037-26-5	Toluene-D8	103%	70-130%
460-00-4	4-Bromofluorobenzene	98%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D63012-1MS ^a	7V29109.D	20	10/11/14	EV	n/a	n/a	V7V1586
D63012-1 ^a	7V29107.D	1	10/11/14	EV	n/a	n/a	V7V1586
D63012-1 ^a	7V29108.D	20	10/11/14	EV	n/a	n/a	V7V1586

The QC reported here applies to the following samples:

Method: SW846 8260B

D63168-1, D63168-2, D63168-3

CAS No.	Compound	D63012-1 ug/l	Spike Q	MS ug/l	MS %	Limits
71-43-2	Benzene	ND	1000	916	92	62-130
100-41-4	Ethylbenzene	ND	1000	939	94	63-130
108-88-3	Toluene	ND	1000	971	97	60-130
1330-20-7	Xylene (total)	ND	3000	2810	94	67-130

CAS No.	Surrogate Recoveries	MS	D63012-1	D63012-1	Limits
17060-07-0	1,2-Dichloroethane-D4	101%	101%	100%	62-130%
2037-26-5	Toluene-D8	102%	102%	102%	70-130%
460-00-4	4-Bromofluorobenzene	99%	98%	97%	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: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D63012-1MS ^a	7V29110.D	20	10/11/14	EV	n/a	n/a	V7V1586
D63012-1 ^a	7V29107.D	1	10/11/14	EV	n/a	n/a	V7V1586
D63012-1 ^a	7V29108.D	20	10/11/14	EV	n/a	n/a	V7V1586

The QC reported here applies to the following samples:

Method: SW846 8260B

D63168-1, D63168-2, D63168-3

CAS No.	Compound	D63012-1 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
	TPH-GRO (C6-C10)	1240		44000	43100	95	19-168

CAS No.	Surrogate Recoveries	MS	D63012-1	D63012-1	Limits
17060-07-0	1,2-Dichloroethane-D4	98%	101%	100%	62-130%
2037-26-5	Toluene-D8	102%	102%	102%	70-130%
460-00-4	4-Bromofluorobenzene	98%	98%	97%	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: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D60545-9DUP ^a	7V29112.D	10	10/11/14	EV	n/a	n/a	V7V1586
D60545-9 ^a	7V29111A.D	10	10/11/14	EV	n/a	n/a	V7V1586

The QC reported here applies to the following samples:

Method: SW846 8260B

D63168-1, D63168-2, D63168-3

CAS No.	Compound	D60545-9 ug/l	DUP Q	D60545-9 ug/l	Q	RPD	Limits
71-43-2	Benzene	281		278		1	30
100-41-4	Ethylbenzene	441		431		2	30
108-88-3	Toluene	98.7		94.3		5	30
1330-20-7	Xylene (total)	936		918		2	30
	TPH-GRO (C6-C10)	14800		14500		2	30

CAS No.	Surrogate Recoveries	DUP	D60545-9	Limits
17060-07-0	1,2-Dichloroethane-D4	99%	97%	62-130%
2037-26-5	Toluene-D8	102%	101%	70-130%
460-00-4	4-Bromofluorobenzene	99%	98%	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: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB574-MB	FB12298.D	1	10/09/14	JJ	n/a	n/a	GFB574

The QC reported here applies to the following samples:

Method: RSK175 MOD

D63168-1, D63168-2

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: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB574-BS	FB12299.D	10	10/09/14	JJ	n/a	n/a	GFB574

The QC reported here applies to the following samples:

Method: RSK175 MOD

D63168-1, D63168-2

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.512	0.610	119	70-130
74-84-0	Ethane	0.923	1.12	121	70-130
74-98-6	Propane	1.38	1.66	120	67-130

7.2.1
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D63150-1MS ^a	FB12301.D	10	10/09/14	JJ	n/a	n/a	GFB574
D63150-1MSD ^a	FB12302.D	10	10/09/14	JJ	n/a	n/a	GFB574
D63150-1 ^a	FB12300.D	1	10/09/14	JJ	n/a	n/a	GFB574

The QC reported here applies to the following samples:

Method: RSK175 MOD

D63168-1, D63168-2

CAS No.	Compound	D63150-1		MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD	
		mg/l	Q								
74-82-8	Methane	ND		0.512	0.586	114	0.512	0.582	114	1	51-155/30
74-84-0	Ethane	ND		0.923	1.07	116	0.923	1.07	116	0	58-130/30
74-98-6	Propane	ND		1.38	1.61	117	1.38	1.61	117	0	46-130/30

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

* = Outside of Control Limits.

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: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP10785-MB	FD36008.D	1	10/10/14	JS	10/09/14	OP10785	GFD1648

The QC reported here applies to the following samples:

Method: SW846-8015B

D63168-1, D63168-2

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	79% 10-130%

Blank Spike Summary

Job Number: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP10785-BS	FD36010.D	1	10/10/14	JS	10/09/14	OP10785	GFD1648

The QC reported here applies to the following samples:

Method: SW846-8015B

D63168-1, D63168-2

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	2.17	43	33-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	79%	10-130%

8.2.1

8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D63168
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP10785-MS	FD36012.D	1	10/10/14	JS	10/09/14	OP10785	GFD1648
OP10785-MSD	FD36014.D	1	10/10/14	JS	10/09/14	OP10785	GFD1648
D60544-16	FD36016.D	1	10/10/14	JS	10/09/14	OP10785	GFD1648

The QC reported here applies to the following samples:

Method: SW846-8015B

D63168-1, D63168-2

CAS No.	Compound	D60544-16 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	2.30	46	5	2.25	45	2	33-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D60544-16	Limits
84-15-1	o-Terphenyl	79%	77%	81%	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: D63168
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

QC Batch ID: MP14233
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/09/14

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	1.7	<50
Cadmium	10	.4	.36		
Calcium	400	2.2	66	3.6	<400
Chromium	10	.4	1.4		
Cobalt	5.0	.4	.51		
Copper	10	1.2	1.5		
Iron	10	2.2	3.2	10.5	* (a)
Lead	50	3.6	4.1		
Lithium	5.0	1.9	1.9		
Magnesium	200	14	29	14.0	<200
Manganese	5.0	.01	.29	-1.0	<5.0
Molybdenum	10	.8	1.1		
Nickel	30	.9	.87		
Phosphorus	100	15	24		
Potassium	1000	130	230	16.9	<1000
Selenium	50	8.8	9.3		
Silicon	50	5.2	5.6		
Silver	30	.4	.4		
Sodium	400	4.9	36	95.4	<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 MP14233: D63168-1F, D63168-2F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D63168
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

QC Batch ID: MP14233
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/09/14

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

(a) All sample results < RL or > 10x MB concentration.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D63168
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: RMV 108-4 BWQ

QC Batch ID: MP14233
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 10/09/14

Metal	D63068-1 Original MS		SpikeLot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron	122	1220	1000	109.8	70-130
Cadmium	anr				
Calcium	23200	49400	25000	104.8	70-130
Chromium					
Cobalt					
Copper	anr				
Iron	46600	50900	5000	86.0	70-130
Lead	anr				
Lithium					
Magnesium	3360	28900	25000	102.2	70-130
Manganese	803	1290	500	97.4	70-130
Molybdenum					
Nickel					
Phosphorus	anr				
Potassium	1370	27100	25000	102.9	70-130
Selenium					
Silicon					
Silver	anr				
Sodium	77100	101000	25000	95.6	70-130
Strontium	265	765	500	100.0	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP14233: D63168-1F, D63168-2F

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

9.1.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D63168
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

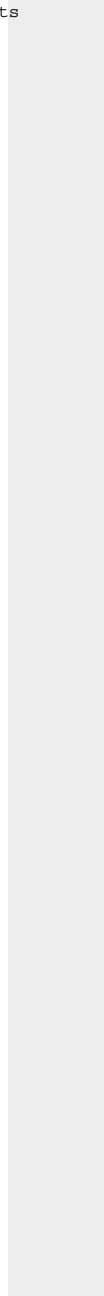
QC Batch ID: MP14233
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/09/14

Metal	D63068-1 Original MS	SpikeLot ICPAL2	% Rec	QC Limits
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(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D63168
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: RMV 108-4 BWQ

QC Batch ID: MP14233
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 10/09/14

Metal	D63068-1 Original MSD	Spikelot ICPAL2	% Rec	MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic	anr					
Barium						
Beryllium						
Boron	122	1220	1000	109.8	0.0	20
Cadmium	anr					
Calcium	23200	49300	25000	104.4	0.2	20
Chromium						
Cobalt						
Copper	anr					
Iron	46600	50600	5000	80.0	0.6	20
Lead	anr					
Lithium						
Magnesium	3360	29300	25000	103.8	1.4	20
Manganese	803	1280	500	95.4	0.8	20
Molybdenum						
Nickel						
Phosphorus	anr					
Potassium	1370	27500	25000	104.5	1.5	20
Selenium						
Silicon						
Silver	anr					
Sodium	77100	101000	25000	95.6	0.0	20
Strontium	265	764	500	99.8	0.1	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP14233: D63168-1F, D63168-2F

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

9.1.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D63168
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

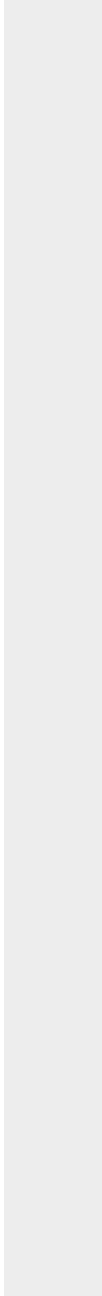
QC Batch ID: MP14233
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/09/14

Metal	D63068-1 Original MSD	SpikeLot ICPAL2	% Rec	MSD RPD	QC Limit
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(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D63168
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: RMV 108-4 BWQ

QC Batch ID: MP14233
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 10/09/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron	1080	1000	108.0	85-115
Cadmium	anr			
Calcium	26600	25000	106.4	85-115
Chromium				
Cobalt				
Copper	anr			
Iron	5060	5000	101.2	85-115
Lead	anr			
Lithium				
Magnesium	26000	25000	104.0	85-115
Manganese	496	500	99.2	85-115
Molybdenum				
Nickel				
Phosphorus	anr			
Potassium	26000	25000	104.0	85-115
Selenium				
Silicon				
Silver	anr			
Sodium	25700	25000	102.8	85-115
Strontium	507	500	101.4	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP14233: D63168-1F, D63168-2F

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

9.1.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D63168
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

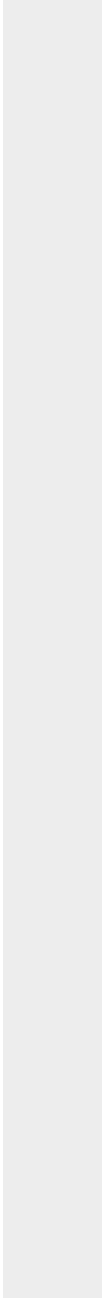
QC Batch ID: MP14233
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/09/14

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



BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D63168
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

QC Batch ID: MP14240
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 10/09/14

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	0.048	<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	0.11	<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 MP14240: D63168-1F, D63168-2F

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

9.2.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D63168
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: RMV 108-4 BWQ

QC Batch ID: MP14240
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 10/09/14

Metal	D63128-1 Original MS		SpikeLot ICPAL2		QC Limits
			%	Rec	
Aluminum					
Antimony					
Arsenic	anr				
Barium	35.8	437	400	100.3	70-130
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron	anr				
Lead	anr				
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	0.87	220	200	109.6	70-130
Silver	anr				
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP14240: D63168-1F, D63168-2F

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

9.2.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D63168
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: RMV 108-4 BWQ

QC Batch ID: MP14240
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 10/09/14

Metal	D63128-1 Original MSD		SpikeLot ICPAL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	35.8	433	400	99.3	0.9	20
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt						
Copper	anr					
Iron	anr					
Lead	anr					
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	0.87	215	200	107.1	2.3	20
Silver	anr					
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP14240: D63168-1F, D63168-2F

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

9.2.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D63168
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: RMV 108-4 BWQ

QC Batch ID: MP14240
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 10/09/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	399	400	99.8	85-115
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	216	200	108.0	85-115
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP14240: D63168-1F, D63168-2F

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

9.2.3
 9

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: D63168
Account: WILLCOOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN26901	5.0	0.0	mg/l	100	92.0	92.2	90-110%
Alkalinity, Carbonate	GN26902	5.0	0.0	mg/l	100	92.2	92.2	80-120%
Alkalinity, Total as CaCO3	GN26898	5.0	0.0	mg/l	100	92.2	92.2	90-110%
Bromide	GP13711/GN26831	0.050	0.0	mg/l	0.5	0.525	105.0	90-110%
Chloride	GP13711/GN26831	0.50	0.0	mg/l	5	4.97	99.4	90-110%
Fluoride	GP13711/GN26831	0.10	0.0	mg/l	1	1.04	104.0	90-110%
Iron Reducing Bacteria	GN27080	25	<25	CFU/ml				
Nitrogen, Nitrate	GP13711/GN26831	0.010	0.0	mg/l	0.1	0.106	106.0	90-110%
Nitrogen, Nitrite	GP13711/GN26831	0.0040	0.0	mg/l	0.05	0.0536	107.2	90-110%
Phosphate, Ortho	GP13711/GN26831	0.050	0.0	mg/l	0.5	0.518	103.6	90-110%
Phosphorus, Total	GP13743/GN26887	0.010	0.0	mg/l	0.38	0.41	107.0	80-120%
Slime Forming Bacteria	MB439	500	<500	CFU/ml				
Solids, Total Dissolved	GN26842	10	0.0	mg/l	400	396	99.0	90-110%
Specific Conductivity	GP13733/GN26868			umhos/cm	99.4	95.8	96.4	90-110%
Specific Conductivity	GP13733/GN26868			umhos/cm	99.4	98.5	99.1	90-110%
Sulfate	GP13711/GN26831	0.50	0.0	mg/l	5	5.08	101.6	90-110%
Sulfate Reducing Bacteria	MB440	200	<200	CFU/ml				
pH	GN26876			su	8.00	7.99	99.9	99.1-100.9%

Associated Samples:

Batch MB439: D63168-1, D63168-2
 Batch MB440: D63168-1, D63168-2
 Batch GN26842: D63168-1, D63168-2
 Batch GN26876: D63168-1, D63168-2
 Batch GN26898: D63168-1, D63168-2
 Batch GN26901: D63168-1, D63168-2
 Batch GN26902: D63168-1, D63168-2
 Batch GN27080: D63168-1, D63168-2
 Batch GP13711: D63168-1, D63168-2
 Batch GP13733: D63168-1, D63168-2
 Batch GP13743: D63168-1, D63168-2
 (*) Outside of QC limits

10.1
10

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D63168
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN26898	D63168-1	mg/l	361	319	12.3	0-20%
Phosphorus, Total	GP13743/GN26887	D63155-23	mg/l	0.015	0.017	12.5	0-20%
Solids, Total Dissolved	GN26842	D63077-1	mg/l	152	150	1.3	0-20%
Specific Conductivity	GP13733/GN26868	D63221-1	umhos/cm	251	253	0.8	0-20%

Associated Samples:

Batch GN26842: D63168-1, D63168-2

Batch GN26898: D63168-1, D63168-2

Batch GP13733: D63168-1, D63168-2

Batch GP13743: D63168-1, D63168-2

(*) Outside of QC limits

10.2
10

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D63168
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Bromide	GP13711/GN26831	D63168-1	mg/l	0.11	0.5	0.56	90.0	80-120%
Chloride	GP13711/GN26831	D63168-1	mg/l	12.0	5	16.8	96.0	80-120%
Fluoride	GP13711/GN26831	D63168-1	mg/l	0.28	1	1.2	92.0	80-120%
Nitrogen, Nitrate	GP13711/GN26831	D63168-1	mg/l	0.50	0.5	1.1	120.0	80-120%
Nitrogen, Nitrite	GP13711/GN26831	D63168-1	mg/l	0.0030 U	0.05	0.045	90.0	80-120%
Phosphate, Ortho	GP13711/GN26831	D63168-1	mg/l	0.035 U	0.5	0.42	84.0	80-120%
Phosphorus, Total	GP13743/GN26887	D63155-23	mg/l	0.015	0.40	0.40	96.3	80-120%
Sulfate	GP13711/GN26831	D63168-1	mg/l	62.1	25	87.6	102.0	80-120%

Associated Samples:

Batch GP13711: D63168-1, D63168-2

Batch GP13743: D63168-1, D63168-2

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.3
10

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D63168
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: RMV 108-4 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Bromide	GP13711/GN26831	D63168-1	mg/l	0.11	0.5	0.55	1.8	20%
Chloride	GP13711/GN26831	D63168-1	mg/l	12.0	5	16.8	0.0	20%
Fluoride	GP13711/GN26831	D63168-1	mg/l	0.28	1	1.2	0.0	20%
Nitrogen, Nitrate	GP13711/GN26831	D63168-1	mg/l	0.50	0.5	1.1	0.0	20%
Nitrogen, Nitrite	GP13711/GN26831	D63168-1	mg/l	0.0030 U	0.05	0.044	2.2	20%
Phosphate, Ortho	GP13711/GN26831	D63168-1	mg/l	0.035 U	0.5	0.41	2.4	20%
Phosphorus, Total	GP13743/GN26887	D63155-23	mg/l	0.015	0.40	0.39	2.5	20%
Sulfate	GP13711/GN26831	D63168-1	mg/l	62.1	25	87.5	0.1	20%

Associated Samples:

Batch GP13711: D63168-1, D63168-2

Batch GP13743: D63168-1, D63168-2

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4
10