



January 13, 2014

Mr. Brandon Danforth
Environmental Specialist
WPX Energy
1058 County Road 215
Parachute, Colorado 81635

**RE: SG 31-32 Completions Pit First Subsequent Sample Event Results Report,
September 2013 Event**

Dear Mr. Danforth,

Western Water & Land, Inc. (WWL) has completed the first subsequent water sampling event for the WPX Energy Rocky Mountain LLC (WPX) SG 31-32 Completions Pit in accordance with COGCC Condition of Approval 9 (COA 9). The initial baseline sampling event was conducted in June, 2013 (see SG 31-32 Completions Pit Baseline Results Report, June 2013 Event).

This report summarizes the field sampling activities, sampling locations, and quality control and water chemistry results.

FIELD SAMPLING ACTIVITIES

As described in the SG 31-32 Drill Pad Baseline Water Quality Evaluation, May 7, 2013, two potential sampling locations were identified for field sampling of water quality consistent with requirements of COA 9. According to state records, the landowners, water well permit holders or water right holders were mailed access request letters by way of certified U.S. Postal Service mail. One spring and one surface water sample were identified as preferred sampling locations:

- Colorado River (NW ¼ NE ¼ S. 5, T8S, R96W)
- Water Well Permit No. 192819

WPX was granted permission to sample all two water sources. The landowner, Mr. Donald Van Hoose, is the applicant of Well Permit No. 192819, in which a variance was granted to convert a hillside spring into a shallow well. The formal name of the spring is Una Ranch Spring, however, the spring has been sampled in the past and is referred to as Van Hoose Spring in the COGCC database. The actual spring emanation point is outside of the 1.0-mile radius, but the water is piped to Mr. Van Hoose's residence, which is located within the 1.0-mile radius (Figure 1). The spring was sampled at a pipe that discharges from a collection box near its emanation point. The spring is located on a parcel belonging to KR Holdings, LLC. The water right is listed as being owned by William Colohan, but was probably transferred to Van Hoose at a later date.

Three samples for the first subsequent sampling event were collected for the SG 31-32 Completions Pit. Sample SG 31-32-192819 was collected from Water Well Permit No. 192819, sample SG 31-32-417214 was also collected from Water Well Permit No. 192819 as a duplicate, and sample SG 31-32-CO River was collected from the Colorado River. Sampling of these water sources was initiated on September 16th, 2013. At Van Hoose Spring, groundwater is conveyed through a pipe buried about 20 feet horizontally in the hillside and passing through a capped concrete box or cistern; the spring water sample was collected from the cistern outflow pipe.

A large eddy had formed where the Colorado River was previously sampled so the closest upstream location with active flow was selected as the sample site. The sample was taken in a mild riffle section upriver about 100 feet from the previous sample (June 3rd, 2013) adjacent to a cobble bank on the south bank of the river. In addition to WWL sampling personnel, Mrs. Van Hoose was present during the sampling event. COA 9 requires that surface flow within Smith Gulch, if present, be sampled upgradient and downgradient of the SG 31-32 pad. No flow was present in Smith Gulch, and therefore, no sampling at this location occurred. Figure 1 shows the sampled locations. Photographs of the sampling sites are shown in Attachment A. Field monitoring forms are shown in Attachment B.

All sampling procedures followed the Colorado Oil & Gas Conservation Commission (COGCC) Model Sampling and Analysis Plan (SAP) protocols. Sampling Method 2 for springs and seeps, described in Version 1 of the COGCC Model SAP, was used to collect both of these samples.

Samples were carefully packed in plastic ice chests (coolers) with ice and shipped to the analytical laboratory (Accutest Mountain States Laboratory (AMS), Wheat Ridge, Colorado) by way of overnight courier (FedEx Ground).

QUALITY CONTROL

Quality control measures consisted of a review of field sampling procedures, and the analytical laboratory quality control data. Laboratory quality control information was reviewed and checked for consistency in the assignment of data qualifiers. In addition, WWL conducted post-analysis evaluations of cation-anion balance (CAB) and total dissolved solids (calculated/measured ratio); additional qualifiers were assigned to analytical results as necessary.

Field Procedures

WWL conducted field sampling procedures in accordance with the COGCC Model SAP. Sampling at SG 31-32-192819 (Van Hoose Spring) was conducted at an end-of-pipe location. Dissolved gas bottles were filled directly from the end-of-pipe discharge to reduce potential further degassing caused by turbulence in an open collection container. Sample site SG 31-32-CO River was also sampled in situ by direct filling methods; dissolved gas sampling was done using Method 2 for spring and seep sampling. No field procedure deviations or incidents occurred that were cause for data qualification.

COC

The chain-of-custody form was reviewed for correct and complete sample IDs, requested analysis, and other information. The analytes requested matched the requirements of COA 9. DRO (diesel range organics) and GRO (gasoline range organics) were designated on the COC in place of TPH, a required analysis for COA 9. No other errors or pertinent information was observed, and no corrections were needed.

Sample Receipt

The samples were received in two coolers within the temperature range criteria ($4^{\circ}\text{C} \pm 2^{\circ}\text{C}$). Custody seals were intact. The sample receipt form did not identify any discrepancies. No qualifiers were assigned to results based on sample receipt conditions.

Holding Times

All analyses were conducted within recommended holding times, with the exception of pH for all samples. WWL assigned and “H” qualifier to the pH results to indicate the results are considered estimated.

Analytical Methods

The analytical methods used by the laboratory were checked for consistency with the analytical schedule in the SAP or other pertinent documents. Analytical methods were found to be consistent with some modifications: Gasoline Range Organics (TPH volatiles) were analyzed using Method SW8260B. Diesel Range Organics (TPH extractables) were analyzed according to Method SW846-8015B.

Detection Limits

Detection limits provided with the analytical results were compared to the original quoted detection limits from the analytical laboratory. Detection limits were as quoted; no deviations were observed except as applied to increased dilution factors. Sample SG 31-32-CO River had a dilution factor of 10 for sulfate and chloride, a dilution factor of 5 for phosphorous, a dilution factor of 2 for selenium, and a dilution factor of 1 for all other analytes. Samples SG 31-32-192819 and SG 31-32-417214 had a dilution factor of 20 for sulfate, a dilution factor of 2 for bromide, chloride, fluoride, nitrate, nitrite, and selenium, and a dilution factor of 1 for all other analytes. The detection limit for nitrite as nitrogen was elevated due to matrix interference.

AMS reports sample results at the reporting limit as “undetected” or “U”, or “not detected” or “ND” rather than reporting results as less than the detection reporting limit, e.g. $< 0.05\mu\text{g/L}$.

Completeness

Data completeness is a measure of requested analysis and received results. The analytical constituents required under COA 9 were compared to those analyzed in the laboratory reports. Qualified data are included as analyzed data. No data were rejected for field or analytical reasons. WWL separately designated DRO (Diesel Range Organics) and GRO (Gasoline Range Organics) for the TPH analysis required in COA 9. All requested analytical data matched the laboratory reported data results; data completeness is considered 100 percent.

Cation-Anion Balance

The cation-anion balance (CAB) calculates the total charge of positively charged ions and the total charge of the negatively charged ions. It is a measure of the quality of the analysis; if the charge is not balanced, an error may exist in the analysis. CAB calculations were performed for each sample; if the CAB exceeded 5 percent, i.e. < 95 percent or > 105 %, the analytical results data may be qualified as estimated.

In general, WWL will assign a qualifier (estimated result) for a CAB equal to or greater than plus or minus 10 %, and may assign a qualifier for CAB percentages between plus or minus 5 and less than 10 %. The CAB calculations for the samples are as follows:

- SG 31-32-192819: 0.74%

- SG 31-32-417214: 2.16%
- SG 31-32-CO River: 1.05%

The analytical results for cations and anions for the samples were not qualified on the basis of the CAB (see Attachment C, Data Quality Review Sheets).

TDS

The ratio of laboratory-measured TDS versus calculated TDS were computed and sample ratios less than 0.80 and greater than 1.20 are cause for a review of major ion reporting errors. In general, WWL will assign a qualifier (an estimated result) when TDS ratios are less than or equal to 0.5 and 1.5 or greater, and may assign a qualifier for TDS ratios greater than 0.5 and less than 0.8 and greater than 1.2 and less than 1.5. The TDS calculations for samples are as follows:

- SG 31-32-192819: 1.12
- SG 31-32-417214: 1.12
- SG 31-32-CO River: 1.10

No sample results were rejected on the basis of the TDS ratio. No qualifiers were assigned on the basis of the TDS acceptance criteria.

Field Duplicates

Field duplicates evaluate the precision of analytical results for field samples collected for a specific sampling event. Precision is measured using the calculation of the relative percent difference (RPD) using the analytical results from the original investigative sample and the duplicate sample. The qualification criteria were considered an RPD limit of 35%. When the original sample has a detected concentration above the reporting limit (RL) and the concentration of the field duplicate is less than the RL, the calculation of a field duplicate RPD is not applied. For sample results less than 5 times the RL, the acceptance criteria is \pm RL.

One field duplicate (sample SG 31-32-417214) was collected for well permit number 192819 (sample SG 31-32-192819). Detectable results occurred for both iron related bacteria and TPH-DRO in the original sample (SG 31-32-192819) but concentrations were not detected in the duplicate sample (SG 31-32-417214). In this case, the RPD acceptance criteria of 35% is not applied because the analytical precision cannot be adequately assessed. Based on the field duplicate RPDs, the data were not qualified.

However, the high RPD for the matrix spike and matrix spike duplicate data for TPH-DRO is indicative of poor precision. WWL will assign a J qualifier to the TPH-DRO results for sample SG 31-32-192819 indicating an estimated result. The analytical laboratory does not conduct QC analysis for the BART parameters.

Laboratory Quality Control

The analytical laboratory conducts an extensive quality control program and as part of the overall quality control process, WWL verified that the lab performed and reported quality control data correctly. This included checking laboratory control samples for a laboratory acceptance criteria of \pm 20 percent and reviewing percent recoveries of analytical spike and analytical spike duplicates and other control samples. Typical percent recovery acceptance limits are 70 to 130 percent. All sampling event

data packages from the lab showed that no laboratory control samples exceeded the 20 percent criteria without data qualification.

All laboratory quality control standards were met within the established laboratory acceptance criteria.

Accuracy

Accuracy was evaluated as a percent recovery of an analyte in a reference standard or a spiked sample, e.g. matrix spike and matrix spike duplicate. In cases where percent recoveries exceeded the laboratory acceptance criteria, data would be qualified depending on whether the analyte was detected above the method detection limit or not, if the recovery of the associated control sample was acceptable, or if the analyte concentration in the sample was disproportionate to the spike level and that the recovery of the associated control sample was acceptable. No qualifiers were assigned by the laboratory because of percent recoveries exceeding the laboratory acceptance criteria.

AMS qualified the benzene result from the matrix spike for samples SG 31-32-192819 and SG 31-32-417214 with an "E" to indicate the result exceeded the calibration range. However, this involved a matrix sample that was not one of the submitted WPX baseline (field) samples, and was related to a concentration range well above the undetected results for the baseline samples. Therefore, the qualifier will not be applied to the field samples.

For the purposes of this report, it is assumed that the use of matrix spike samples that are not associated with the field samples but reflect similar ambient field sample concentrations, is acceptable in evaluating quality control of the field sample data. AMS conducted quality control matrix spike analysis using non-project field samples within the same range as the ambient concentrations of the field samples; the results were within acceptable limits. Based on the above assumption, data will not be qualified.

Precision

Precision is the measurement of how closely replicate sample constituents agree and is not related to the true value (concentration). Precision is measured using RPD calculations for laboratory duplicate samples. The RPDs were compared to the laboratory acceptance limit of 20 percent. RPDs were not used when the sample concentration was too low ($< 10X$ MDL) for accurate evaluation. Laboratory RPDs were within the acceptance limit of 20 percent with the exception of the matrix spike and matrix spike duplicate for TPH-DRO (170 percent). AMS listed the probable cause due to "sample homogeneity". No qualifiers were assigned by the laboratory because of RPD values exceeding the laboratory acceptance criteria.

However, the high RPD for the matrix spike and matrix spike duplicate data for TPH-DRO is indicative of poor precision. WWL will assign a J qualifier to the TPH-DRO results for sample SG 31-32-192819 and sample SG 31-32-CO River indicating an estimated result. The analytical laboratory does not conduct QC analysis for the BART parameters.

Data Quality Review Sheets are presented in Attachment C.

ANALYTICAL RESULTS

Laboratory analysis was performed by Accutest Mountain States, Wheatridge, CO in accordance with the analytical schedule described in Rule 609. The analytical results are summarized in Attachment D; the data are qualified as indicated. The full laboratory analytical report is presented in Attachment E. A geochemical interpretation of the analytical results can be provided upon request.

If you have any questions or concerns, please contact me at (970) 242-0170.

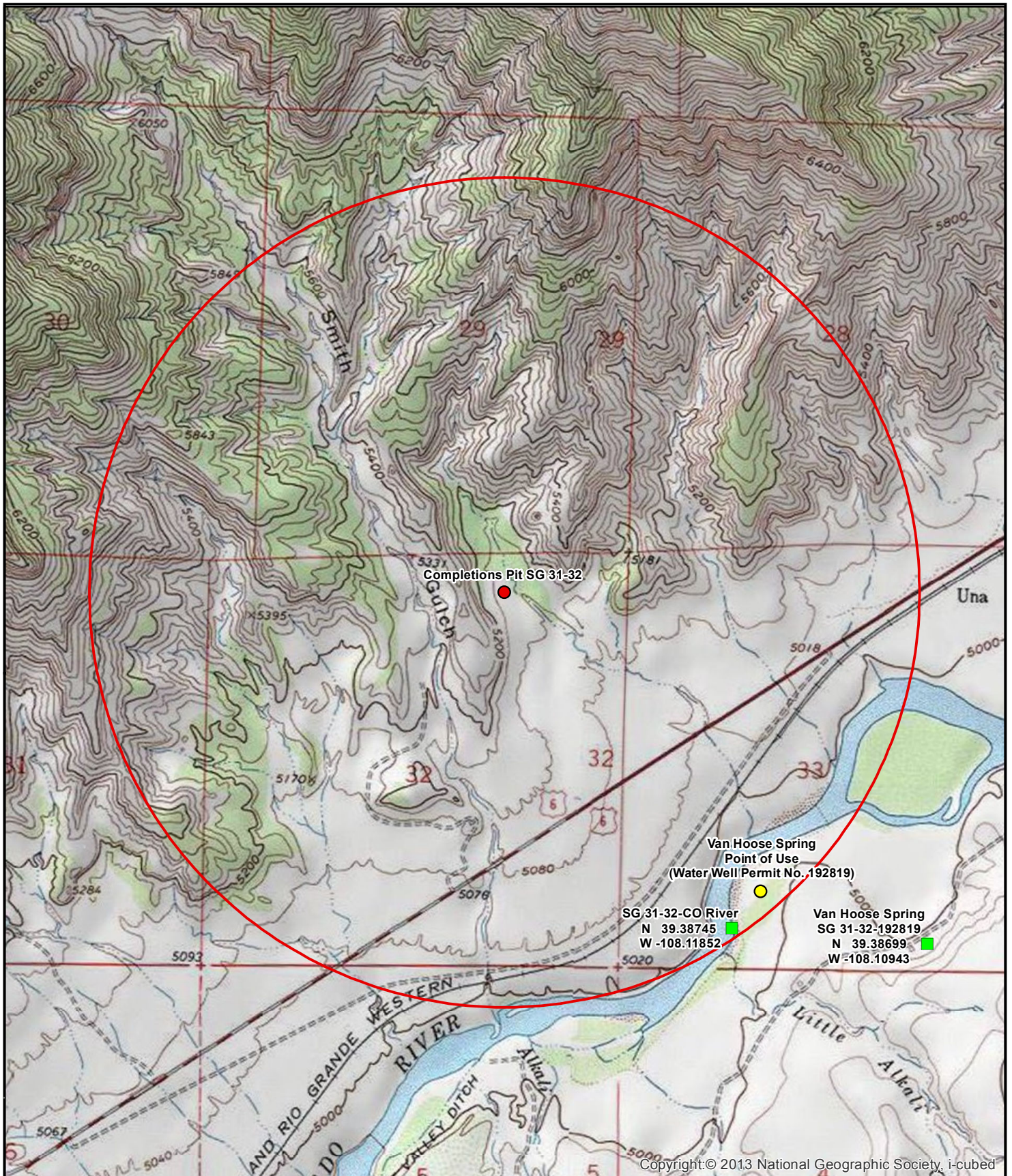
Sincerely,

A handwritten signature in black ink, appearing to read "Bruce D. Smith". The signature is fluid and cursive, with the first name "Bruce" being more legible than the last name "Smith".

Bruce D. Smith
Principal Hydrogeologist
WESTERN WATER & LAND, INC.

Attachments

Figure 1- Sampling Location Map
Attachment A - Photographs
Attachment B - Field Monitoring Forms
Attachment C - Data Quality Review Sheets
Attachment D - Summary of Analytical Results
Attachment E - Laboratory Analytical Summary Report



Legend

- Sample Location(s)
- Completions Pit SG 31-32
- Point(s) of Use
- 1-Mile Radius Evaluation Area



Feet
1,700 850 0 1,700
1:20,000

Figure 1: SG 31-32 Completions Pit Sample Location Map
One Mile Radius Water Source Evaluation
NW1/4, NE1/4, S32, T7S, R96W, 6PM

WPX Energy Rocky Mtn. LLC
 Garfield County, Colorado



Western Water & Land, Inc.
 Applications in Earth Science

Basemap Source: Bing Maps and Esri ArcGIS Online

ATTACHMENT A

Photographs



Photo 1. Colorado River Sampling Location (SG 31-32-CO River)



Photo 2. Colorado River Sampling Location (SG 31-32-CO River)



Photo 3. Van Hoose Spring Sampling Location (SG 31-32-192819 & SG 31-32-417214)



Photo 4. Van Hoose Spring Sampling Location (SG 31-32-192819 & SG 31-32-417214)

ATTACHMENT B

Field Monitoring Forms

WPX BWQ Surface Water Monitoring Field Form

Project Information			
Project:	WPX BWQ	Sample Purpose:	COA 9 1st Subsequent
Site Name (Well Pad):	SG 31-32	Site API:	Q
Station Name:	VanHoose Spring	Sample Date:	9-16-13
COGCC Facility ID:	707963	Start Time:	1040
Field Sample ID:	SG31-32-192819	End Time:	1100
Landowner Name:	Donald + Eva VanHoose	Sample Time:	NWS, SLG 1045
Landowner Address:	0875 CR 339	Sample Team:	NWS, SLG
Water Right/Well Owner:	Donald + Eva VanHoose	Observer:	SLG
Water Right/Well Permit:	192819	Lead Signature/Date:	[Signature] 9-16-13

Station Information	
Station Description:	Sampled from pipe sticking out of cistern
Approximate Distance to Well Pad:	7,000 ft
Station Type:	Stream / Spring / Seep / Pond / Lake / NPDES Outfall / Other:
Sampling Location:	Bank / Pipe / Wading / Boat / Bridge / Hose bib / Tank / Other:
Sampling Location Description:	Pool / Riffle / Eddy / Backwater / Open / Channel / Braided / Other: pipe
Sampling Location Width:	Sampling Location Depth:
GPS Location:	12S Zone 74S951 x 4363710 y NM z

Weather Conditions	
Sky:	Clear / Scattered / Cloudy / Overcast
Precipitation:	None / Light / Moderate / Heavy
Wind:	Calm / Light / Mod / Strong
Estimated Air Temp (deg F):	80
Precip Type:	None / Rain / Sleet / Hail / Snow
Wind Speed/Direction:	NM

Field Measurements							
Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments
Water Temp	deg C	10.5	1058		YSI Pro	Container	
pH	s.u.	7.22					
Sp. Conductivity	uS/cm	1098					
Conductivity	uS/cm	794					
DO Saturation	%	52.1					
DO	mg/L	5.87					
Baro Press	mmHg	637.8					
ORP	RmV	121.6					
Turbidity	NTU	0.50	1106	AV	Micro Tpi		0.58, 0.47, 0.46
Discharge	gal/min	21	1055	AV	5gal bucket		
H2S	mg/L	0.005		AV	Colorimeter		

Color:	Clear / White / Yellow / Brown / Green / Blue / Other	Light / Med / Dark
Odor:	None / Mild / Mod / Strong	
Effervescence:	None / Mild / Mod / Strong	Bubbles: None / Low / Mod / High
Sediment:	None / Light / Mod / Heavy	VOA Headspace: None / ≤ Pea Size / ≥ Pea Size

Lab Analysis:	Rule 609 / COA 9 / COA 22 / Other
Field Filtered:	Yes / No
Filter Size:	N/A
No. Filters used:	N/A

Flag Codes: NM (not measured), J (estimated), N/A (not applicable), I (insufficient sample), Q (uncertain value), Y (calculated value), AV (averaged value), EC (exceeds calibration range), OT (other flag to be defined later), NS (not stabilized)

WPX BWQ Surface Water Monitoring Field Form

Landowner Comments on water quality:

Additional information:

Discharge 5gal / 14.14 sec
 5gal / 14.31 sec AV: 21 gal/min
 5gal / 14.14 sec
 Note: approx half of Springs discharge, discharge measurement used for duplicate sample

Calibration info on SG31-32-CO River Field Form

H₂S info on SG31-32-417214 Field Form

Calibration Information			Date:			Location:		
Instrument	Parameter	Units	Time	Calibration Standard Value	Calibration Standard Temp (°C)	Instrument Reading of Standard	Adjusted Reading	Comments
	pH	s.u.						
	pH	s.u.						
	pH	s.u.						
	SpC	uS/cm						
	SpC	uS/cm						
	DO	%						
	DO	%						
	ORP	RmV						
	Turbidity	NTU						

WPX BWQ Surface Water Monitoring Field Form

Dup of SG 31-32-192819

Project Information			
Project:	WPX BWQ	Sample Purpose:	COA 9 1st Subsequent
Site Name (Well Pad):	SG 31-32	Site API:	Q
Station Name:	Van Hoose Spring	Sample Date:	9-16-13
COGCC Facility ID:	707963	Start Time:	1100
Field Sample ID:	SG 31-32-417214 (Dup)	End Time:	1137
Landowner Name:	Donald + Eva Van Hoose	Sample Time:	1107; 1320 on labels
Landowner Address:	0876 CR 339	Sample Team:	NWS, SLG
Water Right/Well Owner:	Donald + Eva Van Hoose	Observer:	SLG
Water Right/Well Permit:	192819	Lead Signature/Date:	[Signature] 9-16-13

Station Information			
Station Description: Sampled from pipe & sticking out of cistern			
Approximate Distance to Well Pad: 7,000 ft			
Station Type: Stream / Spring / Seep / Pond / Lake / NPDES Outfall / Other:			
Sampling Location: Bank / Pipe / Wading / Boat / Bridge / Hose bib / Tank / Other:			
Sampling Location Description: Pool / Riffle / Eddy / Backwater / Open / Channel / Braided / Other: Pipe			
Sampling Location Width:		Sampling Location Depth:	
GPS Location:	125	Zone	748951 x 4363710 Y NM Z

Weather Conditions			
Sky:	Clear / Scattered / Cloudy / Overcast	Estimated Air Temp (deg F):	80
Precipitation:	None / Light / Moderate / Heavy	Precip Type:	None / Rain / Sleet / Hail / Snow
Wind:	Calm / Light / Mod / Strong	Wind Speed/Direction:	NM

Field Measurements							
Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments
Water Temp	deg C	10.5	1125		YSI Pro	Container	
pH	s.u.	7.13					
Sp. Conductivity	uS/cm	1090					
Conductivity	uS/cm	789					
DO Saturation	%	48.7					
DO	mg/L	5.42					
Baro Press	mmHg	637.6					
ORP	RmV	128.0					
Turbidity	NTU	0.68	1121	AV	MicroTRI	Container	0.73, 0.65, 0.66
Discharge	gal/min	21	1055	AV	5gal bucket		
H2S	mg/L	0.005	1146	AV	Colorimeter	Container	

Color:	Clear / White / Yellow / Brown / Green / Blue / Other	Light / Med / Dark
Odor:	None / Mild / Mod / Strong	
Effervescence:	None / Mild / Mod / Strong	Bubbles: None / Low / Mod / High
Sediment:	None / Light / Mod / Heavy	VOA Headspace: None / ≤ Pea Size / ≥ Pea Size

Lab Analysis:	Rule 609 / COA 9 / COA 22 / Other
Field Filtered:	Yes / No
Filter Size:	N/A
No. Filters used:	N/A

Flag Codes: NM (not measured), J (estimated), N/A (not applicable), I (insufficient sample), Q (uncertain value), Y (calculated value), AV (averaged value), EC (exceeds calibration range), OT (other flag to be defined later), NS (not stabilized)

WPX BWQ Surface Water Monitoring Field Form

Landowner Comments on water quality:

None

Additional information:

H₂S Hech Kit: Run 1: 0 Run 2: 0


Colorimeter: 0 0.01

- Did not run H₂S tests for duplicate sample, these results were taken during sampling for SG 31-32-112819

- Calibration info on SG 31-32-CO River Field Form

Calibration Information			Date:			Location:		
Instrument	Parameter	Units	Time	Calibration Standard Value	Calibration Standard Temp (°C)	Instrument Reading of Standard	Adjusted Reading	Comments
	pH	s.u.						
	pH	s.u.						
	pH	s.u.						
	SpC	uS/cm						
	SpC	uS/cm						
	DO	%						
	DO	%						
	ORP	RmV						
	Turbidity	NTU						

WPX BWQ Surface Water Monitoring Field Form

Project Information			
Project:	WPX Sampling	Sample Purpose:	Subsequent 1 COA 9
Site Name (Well Pad):	Gg 31-32	Site API:	Q
Station Name:	VanHoose SESWS337596W	Sample Date:	9-16-13
COGCC Facility ID:	752692	Start Time:	0923
Field Sample ID:	Gg 31-32 - CO River	End Time:	1009
Landowner Name:	Donald + Eric VanHoose	Sample Time:	0940
Landowner Address:	0875 CR 339	Sample Team:	SLG, NWS
Water Right/Well Owner:	N/A	Observer:	SLG
Water Right/Well Permit:	N/A	Lead Signature/Date:	 9-16-13

Station Information			
Station Description: Bank of CO River behind VanHoose house			
Approximate Distance to Well Pad: 4,950 ft			
Station Type: Stream / Spring / Seep / Pond / Lake / NPDES Outfall / Other: River			
Sampling Location: Bank / Pipe / Wading / Boat / Bridge / Hose bib / Tank / Other:			
Sampling Location Description: Pool / Riffle / Eddy / Backwater / Open / Channel / Braided / Other:			
Sampling Location Width: 40'		Sampling Location Depth: unknown - able to see	
GPS Location:	Zone 12S	x 0748127	y 434803 z 48531

Weather Conditions			
Sky:	Clear / Scattered / Cloudy / Overcast	Estimated Air Temp (deg F):	70
Precipitation:	None / Light / Moderate / Heavy	Precip Type:	None / Rain / Sleet / Hail / Snow
Wind:	Calm / Light / Mod / Strong	Wind Speed/Direction:	NW

Field Measurements							
Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments
Water Temp	deg C	17.3	1005		YSI Pro	In-Situ	
pH	s.u.	8.07					
Sp. Conductivity	uS/cm	850					
Conductivity	uS/cm	726					
DO Saturation	%	83.6					
DO	mg/L	7.96					
Baro Press	mmHg	689.4					
ORP	RmV	135.1p					
Turbidity	NTU	192.3	1009	AV	MicroTPI	Container	
Discharge		NM					201.9, 189.2, 185.8
H2S	mg/L	0.39	0936		Colorimeter	Container	2nd = 0.37 @ 0942
H2S	mg/L	0.00	0936	J	test kit H2-C		2nd = 0.00 @ 0941
Color:	Clear / White / Yellow / Brown / Green / Blue / Other			Light / Med / Dark			
Odor:	None / Mild / Mod / Strong						
Effervescence:	None / Mild / Mod / Strong			Bubbles: None / Low / Mod / High			
Sediment:	None / Light / Mod / Heavy			VOA Headspace: None / ≤ Pea Size / ≥ Pea Size			
→ small bubble in 150							
Lab Analysis:	Rule 609 / COA 9 / COA 22 / Other						
Field Filtered:	Yes / No	Filter Size: NA		No. Filters used: NA			

Flag Codes: NM (not measured), J (estimated), N/A (not applicable), I (insufficient sample), Q (uncertain value), Y (calculated value), AV (averaged value), EC (exceeds calibration range), OT (other flag to be defined later), NS (not stabilized)

WPX BWQ Surface Water Monitoring Field Form

Landowner Comments on water quality:

None but may request for sampling to be done more frequently

Additional information:

Sampled about 100 yds upstream of where we sampled for baseline. Water level was higher & in previous spot there was a large eddy

Calibration Information			Date: 9-16-13		Location: Field			
Instrument	Parameter	Units	Time	Calibration Standard Value	Calibration Standard Temp (°C)	Instrument Reading of Standard	Adjusted Reading	Comments
YSI PRO	pH	s.u.	0903	7.0	19.8	7.089		Spotcheck - 6.95
YSI PRO	pH	s.u.	0908	10.01	19.4	10.03		
YSI PRO	pH	s.u.	0910	4.01	19.5	4.03	3.83	
YSI PRO	SpC	uS/cm	0840	2070	19	2110	2070	
YSI PRO	SpC	uS/cm	0845	8974	19.4	8915	8972	
YSI PRO	DO	%	0923		19.1	84.7%		639.6 mmHg
	DO	%						
	ORP	RmV						
Micro TP1	Turbidity	NTU	0900					

ATTACHMENT C

Data Quality Review Sheets

DATA QUALITY REVIEW SHEET

Facility ID:	707963	Project:	BWQ SG 31-32 Sub 1
Station Name:	VanHoose Spring	Lab Work Order:	D50583-1
Sample Date:	9/16/2013	QA/QC Review Date:	11/13/13
Field Sample ID:	SG 31-32-192819	Reviewer:	J. Pahler

Field Sampling Data Review	Yes	No	N/A
1. Well properly purged?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Flow rate reduced prior to sampling?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Water quality parameters stable prior to sampling?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Field instruments calibrated properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Sampling methods performed according to SAP procedures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Procedures consistent with obtaining a representative sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Any discrepancies noted on the lab receipt form? <i>If yes, list in the comments section.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. All samples analyzed for the requested analyses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Proper laboratory methods used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. All sample holding times met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12. Lab QA samples (e.g., matrix spikes and matrix spike duplicates) collected and analyzed according to lab method and results within method acceptance limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Lab qualifiers for data (other than non-detect)? <i>List in comments.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Are corrective actions required? <i>If yes, please list actions and dates to be completed by:</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<i>Corrective Action</i>	<i>Date to be completed</i>		
None			

Calculated Parameters	Calculated Value	Lab Value	Ratio/Percent Difference	Acceptable Limit	Meets QC Criteria?
Cation/Anion Balance, % (CAB)	0.741	N/A	N/A	±5%	<input checked="" type="checkbox"/>
Total Dissolved Solids, mg/L (TDS)	790	706	1.12	0.8 – 1.2	<input checked="" type="checkbox"/>
Specific Conductance, µS/cm (SpC)	1054	956	1.10	0.8 – 1.2	<input checked="" type="checkbox"/>

Comments:

RPD for MS and MSD recoveries of TPH-DRO outside control limits, probable cause due to “sample homogeneity” (RPD 170); “J” qualifier assigned by WWL. Elevated detection limit for nitrogen, nitrite, due to matrix interference. VOA pH > 2 for trip blank and MS, RSK pH > 2 for MS and MSD. Holding time exceeded for pH; WWL qualified with “H” to indicate result is estimated. MS and MSD for benzene qualified by lab with “E” to indicate value exceeded calibration range.

DATA QUALITY REVIEW SHEET

Facility ID:	707963	Project:	BWQ SG 31-32 Sub 1
Station Name:	VanHoose Spring	Lab Work Order:	D50583-2
Sample Date:	9/16/2013	QA/QC Review Date:	11/13/13
Field Sample ID:	SG 31-32-417214 (Duplicate)	Reviewer:	J. Pahler

Field Sampling Data Review	Yes	No	N/A
1. Well properly purged?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Flow rate reduced prior to sampling?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Water quality parameters stable prior to sampling?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Field instruments calibrated properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Sampling methods performed according to SAP procedures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Procedures consistent with obtaining a representative sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Any discrepancies noted on the lab receipt form? <i>If yes, list in the comments section.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. All samples analyzed for the requested analyses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Proper laboratory methods used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. All sample holding times met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12. Lab QA samples (e.g., matrix spikes and matrix spike duplicates) collected and analyzed according to lab method and results within method acceptance limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Lab qualifiers for data (other than non-detect)? <i>List in comments.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Are corrective actions required? <i>If yes, please list actions and dates to be completed by:</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<i>Corrective Action</i>	<i>Date to be completed</i>		
None			

Calculated Parameters	Calculated Value	Lab Value	Ratio/Percent Difference	Acceptable Limit	Meets QC Criteria?
Cation/Anion Balance, % (CAB)	2.162	N/A	N/A	±5%	<input checked="" type="checkbox"/>
Total Dissolved Solids, mg/L (TDS)	788	704	1.12	0.8 – 1.2	<input checked="" type="checkbox"/>
Specific Conductance, µS/cm (SpC)	1051	957	1.10	0.8 – 1.2	<input checked="" type="checkbox"/>

Comments:

RPD for MS and MSD recoveries of TPH-DRO outside control limits, probable cause due to “sample homogeneity” (RPD 170); “J” qualifier was assigned by WWL. Elevated detection limit for nitrogen, nitrite, due to matrix interference. VOA pH > 2 for trip blank and MS, RSK pH > 2 for MS and MSD. Holding time exceeded for pH; WWL qualified with “H” to indicate result is estimated. MS and MSD for benzene qualified by lab with “E” to indicate value exceeded calibration range.

DATA QUALITY REVIEW SHEET

Facility ID:	752692	Project:	BWQ SG 31-32 Sub 1
Station Name:	VanHoose SESW S33 7S 96W	Lab Work Order:	D50582-1
Sample Date:	9/16/2013	QA/QC Review Date:	11/13/13
Field Sample ID:	SG 31-32-CO River	Reviewer:	J. Pahler

Field Sampling Data Review	Yes	No	N/A
1. Well properly purged?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Flow rate reduced prior to sampling?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Water quality parameters stable prior to sampling?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Field instruments calibrated properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Sampling methods performed according to SAP procedures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Procedures consistent with obtaining a representative sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Any discrepancies noted on the lab receipt form? <i>If yes, list in the comments section.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. All samples analyzed for the requested analyses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Proper laboratory methods used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. All sample holding times met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12. Lab QA samples (e.g., matrix spikes and matrix spike duplicates) collected and analyzed according to lab method and results within method acceptance limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Lab qualifiers for data (other than non-detect)? <i>List in comments.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Are corrective actions required? <i>If yes, please list actions and dates to be completed by:</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<i>Corrective Action</i>	<i>Date to be completed</i>		
None			

Calculated Parameters	Calculated Value	Lab Value	Ratio/Percent Difference	Acceptable Limit	Meets QC Criteria?
Cation/Anion Balance, % (CAB)	1.048	N/A	N/A	±5%	<input checked="" type="checkbox"/>
Total Dissolved Solids, mg/L (TDS)	494	448	1.10	0.8 – 1.2	<input checked="" type="checkbox"/>
Specific Conductance, µS/cm (SpC)	669	744	0.90	0.8 – 1.2	<input checked="" type="checkbox"/>

Comments:

VOA pH > 2 for MS. RSK pH > 2 for sample, MS, and MSD. RPD for MS and MSD recoveries of TPH-DRO outside of control limits, probable cause due to "sample homogeneity" (RPD 170); "J" qualifier assigned by WWL. Holding time exceeded for pH; WWL qualified with "H" to indicate result is estimated.

ATTACHMENT D

Summary of Analytical Results

SG 31-32 BWQ Analytical Results Summary				Baseline						Subsequent 1											
Station Name				VanHoose Spring						VanHoose Spring						VanHoose Spring					
Facility ID				707963						707963						707963					
Sample Date				6/3/2013						9/16/2013 10:45						9/16/2013 13:20					
Field Sample ID				SG 31-32-192819						SG 31-32-192819						SG 31-32-417214 ^a					
Analytical Lab				ALS Laboratories (ALS)						Accutest (AMS)						Accutest (AMS)					
Lab Sample ID				1306024-2						D50583-1						D50583-2					
	Reporting Units	ALS Analytic Method	AMS Analytic Method	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF
Inorganics																					
Alkalinity AS CaCO3, Total	mg/l	SM2320B	SM 2320B-2011	370			20		1	340			5		1	337			5		1
Alkalinity, Bicarbonate as CaCO3	mg/l	SM2320B	SM 2320B-2011	370			20		1	340			5		1	337			5		1
Alkalinity, Carbonate as CaCO3	mg/l	SM2320B	SM 2320B-2011	20	U		20	0.3	1	5	U		5		1	5	U		5		1
Bromide	mg/l	EPA300.0	EPA 300.0/SW846 9056	1	U		1	0.3	5	0.12			0.1		2	0.13			0.1		2
Chloride	mg/l	EPA300.0	EPA 300.0/SW846 9056	14			1		5	12.2			1		2	12.1			1		2
Fluoride	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.6			0.5	0.15	5	0.3			0.2		2	0.33			0.2		2
Nitrate as N	mg/l	EPA300.0	EPA 300.0/SW846 9056	1.4			1	0.3	5	0.92			0.02		2	0.91			0.02		2
Nitrite as N	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.5	U		0.5	0.15	5	0.008	U		0.008		2	0.008	U		0.008		2
pH	s.u.	SM4500-H	SM4500HB+ 2011/9040C	7.64			0.1		1	7.73		H			1	7.75		H			1
Specific Conductivity	umhos/cm	SM2510B	SM 2510B-2011	1030			1		1	956			1		1	957			1		1
Sulfate	mg/l	EPA300.0	EPA 300.0/SW846 9056	200			5	1.5	5	217			10		20	213			10		20
Total Dissolved Solids	mg/l	SM2540C	SM 2540C-2011	710			20		1	706			10		1	704			10		1
Total Phosphorous	mg/l	EPA365.2	HACH8190/SM4500P-B/E	0.05	U		0.05	0.015	1	0.034			0.01		1	0.037			0.01		1
Dissolved Metals																					
Barium	ug/l	EPA200.8	EPA 200.7	27			1	0.3	10	32			10	1.4	1	33.3			10	1.4	1
Boron	ug/l	EPA200.8	EPA 200.7	190			50	15	10	192			50	6.6	1	187			50	6.6	1
Calcium	ug/l	EPA200.8	EPA 200.7	69000			1000	65	10	69200			400	66	1	70400			400	66	1
Iron (Ferric)	ug/l	EPA200.8	EPA 200.7	100	U		100	30	10	10	U		10	3.2	1	10	U		10	3.2	1
Magnesium	ug/l	EPA200.8	EPA 200.7	45000			100	30	10	50000			200	29	1	49500			200	29	1
Manganese	ug/l	EPA200.8	EPA 200.7	2	U		2	0.6	10	5	U		5	0.29	1	5	U		5	0.29	1
Potassium	ug/l	EPA200.8	EPA 200.7	3200			1000	300	10	3880			1000	230	1	3950			1000	230	1
Selenium	ug/l	EPA200.8	EPA 200.8	2.8			1	0.5	10	3.3			0.8	0.42	2	3.3			0.8	0.42	2
Sodium	ug/l	EPA200.8	EPA 200.7	98000			1000	300	10	96100			400	36	1	100000			400	36	1
Strontium	ug/l	EPA200.8	EPA 200.7	720			1	0.3	10	821			5	0.12	1	865			5	0.12	1
Organics																					
Diesel Range Organics	mg/l	SW8015M	SW846-8015B	0.5	U		0.5	0.15	1	1.3		J	0.19	0.17	1	0.19	U	J	0.19	0.17	1
Gasoline Range Organics	ug/l	SW8260_25	SW846 8260B	100	U		100		1	200	U		200		1	200	U		200		1
Dissolved gases ¹																					
Ethane	ug/l	RSK175	RSK175 MOD	2	U		2	2	1	1.6	U		1.6	0.8	1	1.6	U		1.6	0.8	1
Methane	ug/l	RSK175	RSK175 MOD	1	U		1	1	1	0.8	U		0.8	0.4	1	0.8	U		0.8	0.4	1
Propane	ug/l	RSK175	RSK175 MOD	1	U		1	1	1	22	U		22	11	1	22	U		22	11	1

SG 31-32 BWQ Analytical Results Summary				Baseline						Subsequent 1											
Station Name				VanHoose Spring						VanHoose Spring						VanHoose Spring					
Facility ID				707963						707963						707963					
Sample Date				6/3/2013						9/16/2013 10:45						9/16/2013 13:20					
Field Sample ID				SG 31-32-192819						SG 31-32-192819						SG 31-32-417214 ^a					
Analytical Lab				ALS Laboratories (ALS)						Accutest (AMS)						Accutest (AMS)					
Lab Sample ID				1306024-2						D50583-1						D50583-2					
VOAs																					
Benzene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	1	U		1	0.25	1	1	U		1	0.25	1
Ethylbenzene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	2	U		2	0.25	1	2	U		2	0.25	1
M+P-Xylene	ug/l	SW8260_25		1	U		1	0.3	1	NM						NM					
o-Xylene	ug/l	SW8260_25		1	U		1	0.3	1	NM						NM					
Xylenes (Total)	ug/l		SW846 8260B	NM						3	U		3	2	1	3	U		3	2	1
Toluene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	2	U		2	1	1	2	U		2	1	1
Bacteria ^{2,3}																					
Iron Related Bacteria	nu	BART	HACH IRB-BART	1					1	1			25		1	0	U		25		1
Slime Forming Bacteria	nu	BART	HACH SLYM-BART	1					1	1			500		1	1			500		1
Sulfate Reducing Bacteria	nu	BART	HACH SRB-BART	0	U				1	1			200		1	1			200		1
Field Parameters																					
Bubbles	nu	Field	Field	NM					1	None					1	None					1
Color	nu	Field	Field	Clear					1	Clear					1	Clear					1
Conductivity, Field	uS/cm	Field	Field	771					1	794					1	789					1
Discharge, measured	gpm	Field	Field	60		J			1	21					1	21					1
Dissolved Oxygen, Field	mg/l	Field	Field	6.84					1	5.87					1	5.42					1
Dissolved Oxygen, Field, %	%	Field	Field	61.5					1	52.1					1	48.7					1
Effervescence	nu	Field	Field	NM					1	None					1	None					1
H2S, Field	mg/l	HACH	HACH	0.01					1	0.005					1	0.005					1
Odor	nu	Field	Field	None					1	None					1	None					1
ORP, field	mv	Field	Field	164.9					1	121.6					1	128					1
pH, Field	s.u.	Field	Field	7.36					1	7.22					1	7.13					1
Specific Conductivity, Field	uS/cm	Field	Field	1066					1	1098					1	1090					1
Temperature, Water	Deg C	Field	Field	10.4					1	10.5					1	10.5					1
Turbidity, field	NTUs	Field	Field	0.07					1	0.5					1	0.68					1
Sediment	nu	Field	Field	NM					1	None					1	None					1
VOA Headspace	nu	Field	Field	Nm					1	None					1	None					1

Notes:

¹ AMS units converted from mg/L to ug/L

² A result of 1 indicates the presence of bacteria

³ AMS units for bacteria converted from cfu/ml to no units (detect or non-detect)

^a Field duplicate

U = not detected at the reporting limit

NM = not measured

J = estimated value; lab QA indicates poor precision

NA = not applicable

H = hold time exceeded; value estimated

SG 31-32 BWQ Analytical Results Summary				Baseline						Subsequent 1					
Station Name				VanHoose SESW S33 7S 96W						VanHoose SESW S33 7S 96W					
Facility ID				752692						752692					
Sample Date				6/3/2013						9/16/2013 9:46					
Field Sample ID				SG 31-32-CO River						SG 31-32-CO River					
Analytical Lab				ALS Laboratories (ALS)						Accutest (AMS)					
Lab Sample ID				1306024-1						D50582-1					
	Reporting Units	ALS Analytic Method	AMS Analytic Method	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF
Inorganics															
Alkalinity AS CaCO3, Total	mg/l	SM2320B	SM 2320B-2011	100			5		1	113			5		1
Alkalinity, Bicarbonate as CaCO3	mg/l	SM2320B	SM 2320B-2011	100			5		1	113			5		1
Alkalinity, Carbonate as CaCO3	mg/l	SM2320B	SM 2320B-2011	5	U		5	0.3	1	5	U		5		1
Bromide	mg/l	EPA300.0	EPA 300.0/SW846 9056	1	U		1	0.3	5	0.05	U		0.05		1
Chloride	mg/l	EPA300.0	EPA 300.0/SW846 9056	68			1		5	120			5		10
Fluoride	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.5	U		0.5	0.15	5	0.25			0.1		1
Nitrate as N	mg/l	EPA300.0	EPA 300.0/SW846 9056	1	U		1	0.3	5	0.19			0.01		1
Nitrite as N	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.5	U		0.5	0.15	5	0.004	U		0.004		1
pH	s.u.	SM4500-H	SM4500HB+-2011/9040C	8.16			0.1		1	8.18		H			1
Specific Conductivity	umhos/cm	SM2510B	SM 2510B-2011	484			1		1	744			1		1
Sulfate	mg/l	EPA300.0	EPA 300.0/SW846 9056	52			5	1.5	5	103			5		10
Total Dissolved Solids	mg/l	SM2540C	SM 2540C-2011	320			20		1	448			10		1
Total Phosphorous	mg/l	EPA365.2	HACH8190/SM4500P-B/E	0.12			0.05	0.015	1	1.4			0.05		5
Dissolved Metals															
Barium	ug/l	EPA200.8	EPA 200.7	43			1	0.3	10	62.5			10		1
Boron	ug/l	EPA200.8	EPA 200.7	50	U		50	15	10	50	U		50		1
Calcium	ug/l	EPA200.8	EPA 200.7	43000			1000	65	10	59600			400		1
Iron (Ferric)	ug/l	EPA200.8	EPA 200.7	100	U		100	30	10	25.4			10		1
Magnesium	ug/l	EPA200.8	EPA 200.7	8500			100	30	10	11900			200		1
Manganese	ug/l	EPA200.8	EPA 200.7	13			2	0.6	10	5	U		5		1
Potassium	ug/l	EPA200.8	EPA 200.7	1600			1000	300	10	3420			1000		1
Selenium	ug/l	EPA200.8	EPA 200.8	1	U		1	0.5	10	0.8	U		0.8		2
Sodium	ug/l	EPA200.8	EPA 200.7	49000			1000	300	10	82400			400		1
Strontium	ug/l	EPA200.8	EPA 200.7	300			1	0.3	10	549			5		1
Organics															
Diesel Range Organics	mg/l	SW8015M	SW846-8015B	0.5	U		0.5	0.15	1	0.19	U	J	0.19	0.17	1
Gasoline Range Organics	ug/l	SW8260_25	SW846 8260B	100	U		100		1	200	U		200		1
Dissolved gases ¹															
Ethane	ug/l	RSK175	RSK175 MOD	2	U		2	2	1	1.6	U		1.6	0.8	1
Methane	ug/l	RSK175	RSK175 MOD	1.1			1	1	1	1.7			0.8	0.4	1
Propane	ug/l	RSK175	RSK175 MOD	1	U		1	1	1	22	U		22	11	1
VOAs															
Benzene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	1	U		1	0.25	1
Ethylbenzene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	2	U		2	0.25	1
m+p-Xylene	ug/l	SW8260_25		1	U		1	0.3	1	NM					
o-Xylene	ug/l	SW8260_25		1	U		1	0.3	1	NM					
Xylenes (Total)	ug/l		SW846 8260B	NM						3	U		3	2	1
Toluene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	2	U		2	1	1
Bacteria ^{2,3}															
Iron Related Bacteria	nu	BART	HACH IRB-BART	1					1	1			25		1
Slime Forming Bacteria	nu	BART	HACH SLYM-BART	1					1	1			500		1
Sulfate Reducing Bacteria	nu	BART	HACH SRB-BART	1					1	0	U		200		1

SG 31-32 BWQ Analytical Results Summary				Baseline						Subsequent 1					
Station Name				VanHoose SESW S33 7S 96W						VanHoose SESW S33 7S 96W					
Facility ID				752692						752692					
Sample Date				6/3/2013						9/16/2013 9:46					
Field Sample ID				SG 31-32-CO River						SG 31-32-CO River					
Analytical Lab				ALS Laboratories (ALS)						Accutest (AMS)					
Lab Sample ID				1306024-1						D50582-1					
	Reporting Units	ALS Analytic Method	AMS Analytic Method	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF
Field Parameters															
Bubbles	nu	Field	Field	NM						None					1
Color	nu	Field	Field	Clear						M. Brown					1
Conductivity, Field	uS/cm	Field	Field	425.7						726					1
Discharge, measured	gpm	Field	Field	NM						NM					1
Dissolved Oxygen, Field	mg/l	Field	Field	8.68						7.96					1
Dissolved Oxygen, Field,%	%	Field	Field	87						83.6					1
Effervescence	nu	Field	Field	NM						None					1
H2S, Field	mg/l	Field	HACH	0.05						0.39					1
Odor	nu	Field	Field	None						None					1
ORP, field	mv	Field	Field	156.7						135.6					1
pH, Field	s.u.	Field	Field	8.13						8.07					1
Specific Conductivity, Field	uS/cm	Field	Field	522.3						850					1
Temperature, Water	Deg C	Field	Field	10.4						17.3					1
Turbidity, field	NTUs	Field	Field	28.46						192.3		AV			1
Sediment	nu	Field	Field	NM						Heavy					1
VOA Headspace	nu	Field	Field	NM						None					1

Notes:

¹ AMS units converted from mg/L to ug/L

² A result of 1 indicates the presence of bacteria

³ AMS units for bacteria converted from cfu/ml to no units (detect or non-detect)

U = not detected at the reporting limit

NM = not measured

J = estimated value; lab QA indicates poor precision

H = hold time exceeded; estimated value

AV = averaged value

ATTACHMENT E

Laboratory Analytical Summary Report



10/01/13

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: WPX SG 31-32

Accutest Job Number: D50583

Sampling Date: 09/16/13

Report to:

Western Water and Land, Inc.
743 Horizon Court Suite 330
Grand Junction, CO 81506
bsmith@westernwaterandland.com; jpahler@westernwaterandland.com

ATTN: Bruce Smith

Total number of pages in report: 64



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

A handwritten signature in black ink, appearing to read 'Scott Heideman'.

Scott Heideman
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

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: D50583

WWLCOGJ: WPX SG 31-32

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D50583-1	09/16/13	10:45 NS	09/17/13	AQ	Surface Water	SG 31-32-192819
D50583-1B	09/16/13	10:45 NS	09/17/13	AQ	Surface Water	SG 31-32-192819
D50583-1F	09/16/13	10:45 NS	09/17/13	AQ	Surface H2O Filtered	SG 31-32-192819
D50583-2	09/16/13	13:20 NS	09/17/13	AQ	Surface Water	SG 31-32-417214
D50583-2B	09/16/13	13:20 NS	09/17/13	AQ	Surface Water	SG 31-32-417214
D50583-2F	09/16/13	13:20 NS	09/17/13	AQ	Surface H2O Filtered	SG 31-32-417214
D50583-3	09/16/13	00:00 NS	09/17/13	AQ	Trip Blank Water	TRIP BLANK



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: WPX Energy Rocky Mountain, LLC

Job No D50583

Site: WWLCOGJ: WPX SG 31-32

Report Date 10/1/2013 10:38:37 AM

On 09/17/2013, 2 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.5 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D50583 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: V6V1161
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50589-4DUP, D50598-2MS were used as the QC samples indicated.

Matrix AQ	Batch ID: V7V1254
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D50581-1DUP, D48569-7MS were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D48569-7MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D48569-7MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D50583-3: 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: GFB414
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D50582-1MS, D50582-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D50582-1MS: Sample pH >2 at time of analysis.
- D50582-1MSD: Sample pH >2 at time of analysis.

Extractables by GC By Method SW846-8015B

Matrix AQ	Batch ID: OP8591
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D48569-3MS, D48569-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The RPD(s) for the MS and MSD recoveries of TPH-DRO (C10-C28) are outside control limits for sample OP8591-MSD. Probable cause due to sample homogeneity.

Metals By Method EPA 200.7

Matrix AQ

Batch ID: MP11112

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50583-1FMS, D50583-1FMSD were used as the QC samples for the metals analysis.

Metals By Method EPA 200.8

Matrix AQ

Batch ID: MP11116

- All samples were digested and analyzed within the recommended method holding time.
- .
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50583-2FMS, D50583-2FMSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix AQ

Batch ID: GP10946

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50578-2MS, D50578-2MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.
- D50583-1 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.
- D50583-2 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.

Wet Chemistry By Method HACH IRB-BART

Matrix AQ

Batch ID: MB251

- 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: MB252

- 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: MB253

- 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: GP11000

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50441-1DUP, D50441-1MS, D50441-1MSD were used as the QC samples for the Phosphorus, Total analysis.

Wet Chemistry By Method SM 2320B-2011

Matrix AQ

Batch ID: GN21995

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50545-1DUP, D50545-1MS, D50545-1MSD were used as the QC samples for the Alkalinity, Total as CaCO₃ analysis.

Matrix AQ

Batch ID: GN21996

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

Matrix AQ

Batch ID: GN21997

- 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: GP10973

- Sample(s) D50582-1DUP were used as the QC samples for the Specific Conductivity analysis.

Wet Chemistry By Method SM 2540C-2011

Matrix AQ

Batch ID: GN21944

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50439-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

Wet Chemistry By Method SM4500HB+-2011/9040C

Matrix AQ

Batch ID: GN21969

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D50583-1, D50583-2

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: D50583
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32
Collected: 09/16/13

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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D50583-1 SG 31-32-192819

TPH-DRO (C10-C28)	1.30	0.19	0.17	mg/l	SW846-8015B
Alkalinity, Bicarbonate as CaCO ₃	340	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO ₃	340	5.0		mg/l	SM 2320B-2011
Bromide	0.12	0.10		mg/l	EPA 300.0/SW846 9056
Chloride	12.2	1.0		mg/l	EPA 300.0/SW846 9056
Fluoride	0.30	0.20		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate	0.92	0.020		mg/l	EPA 300.0/SW846 9056
Phosphorus, Total	0.034	0.010		mg/l	HACH8190/SM4500P-B/E
Solids, Total Dissolved	706	10		mg/l	SM 2540C-2011
Specific Conductivity	956	1.0		umhos/cm	SM 2510B-2011
Sulfate	217	10		mg/l	EPA 300.0/SW846 9056
pH	7.73			su	SM4500HB+ -2011/9040C

D50583-1B SG 31-32-192819

Iron Reducing Bacteria	2300	25	CFU/ml	HACH IRB-BART
Slime Forming Bacteria	66500	500	CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria	5000	200	CFU/ml	HACH SRB-BART

D50583-1F SG 31-32-192819

Barium	32.0	10	ug/l	EPA 200.7
Boron	192	50	ug/l	EPA 200.7
Calcium	69200	400	ug/l	EPA 200.7
Magnesium	50000	200	ug/l	EPA 200.7
Potassium	3880	1000	ug/l	EPA 200.7
Selenium	3.3	0.80	ug/l	EPA 200.8
Sodium	96100	400	ug/l	EPA 200.7
Strontium	821	5.0	ug/l	EPA 200.7

D50583-2 SG 31-32-417214

Alkalinity, Bicarbonate as CaCO ₃	337	5.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO ₃	337	5.0	mg/l	SM 2320B-2011
Bromide	0.13	0.10	mg/l	EPA 300.0/SW846 9056
Chloride	12.1	1.0	mg/l	EPA 300.0/SW846 9056
Fluoride	0.33	0.20	mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate	0.91	0.020	mg/l	EPA 300.0/SW846 9056
Phosphorus, Total	0.037	0.010	mg/l	HACH8190/SM4500P-B/E
Solids, Total Dissolved	704	10	mg/l	SM 2540C-2011
Specific Conductivity	957	1.0	umhos/cm	SM 2510B-2011
Sulfate	213	10	mg/l	EPA 300.0/SW846 9056
pH	7.75		su	SM4500HB+ -2011/9040C

Summary of Hits

Page 2 of 2

Job Number: D50583
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32
Collected: 09/16/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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D50583-2B SG 31-32-417214

Slime Forming Bacteria	66500	500			CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria	5000	200			CFU/ml	HACH SRB-BART

D50583-2F SG 31-32-417214

Barium	33.3	10			ug/l	EPA 200.7
Boron	187	50			ug/l	EPA 200.7
Calcium	70400	400			ug/l	EPA 200.7
Magnesium	49500	200			ug/l	EPA 200.7
Potassium	3950	1000			ug/l	EPA 200.7
Selenium	3.3	0.80			ug/l	EPA 200.8
Sodium	100000	400			ug/l	EPA 200.7
Strontium	865	5.0			ug/l	EPA 200.7

D50583-3 TRIP BLANK

No hits reported in this sample.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	SG 31-32-192819	Date Sampled:	09/16/13
Lab Sample ID:	D50583-1	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V20955.D	1	09/18/13	BR	n/a	n/a	V6V1161
Run #2							

	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	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	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	99%		62-130%
2037-26-5	Toluene-D8	105%		70-130%
460-00-4	4-Bromofluorobenzene	92%		69-130%

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

Report of Analysis

Page 1 of 1

Client Sample ID:	SG 31-32-192819	Date Sampled:	09/16/13
Lab Sample ID:	D50583-1	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	RSK175 MOD		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FB09431.D	1	09/18/13	JS	n/a	n/a	GFB414
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	23.0 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	0.022	0.011	mg/l	

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

Report of Analysis

Page 1 of 1

Client Sample ID:	SG 31-32-192819	Date Sampled:	09/16/13
Lab Sample ID:	D50583-1	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	SW846-8015B SW846 3510C		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH013168.D	1	09/19/13	TU	09/18/13	OP8591	GFH700
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)	1.30	0.19	0.17	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	51%		20-140%		

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

Report of Analysis

Client Sample ID: SG 31-32-192819
Lab Sample ID: D50583-1
Matrix: AQ - Surface Water
Project: WWLCOGJ: WPX SG 31-32

Date Sampled: 09/16/13
Date Received: 09/17/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	340	5.0	mg/l	1	09/23/13	JD	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	09/23/13	JD	SM 2320B-2011
Alkalinity, Total as CaCO ₃	340	5.0	mg/l	1	09/23/13	JD	SM 2320B-2011
Bromide	0.12	0.10	mg/l	2	09/17/13 15:33	SK	EPA 300.0/SW846 9056
Chloride	12.2	1.0	mg/l	2	09/17/13 15:33	SK	EPA 300.0/SW846 9056
Fluoride	0.30	0.20	mg/l	2	09/17/13 15:33	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	0.92	0.020	mg/l	2	09/17/13 15:33	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite ^a	< 0.0080	0.0080	mg/l	2	09/17/13 15:33	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.034	0.010	mg/l	1	09/24/13	BF	HACH8190/SM4500P-B/E
Solids, Total Dissolved	706	10	mg/l	1	09/18/13	RW	SM 2540C-2011
Specific Conductivity	956	1.0	umhos/cm	1	09/20/13	RW	SM 2510B-2011
Sulfate	217	10	mg/l	20	09/17/13 20:00	SK	EPA 300.0/SW846 9056
pH	7.73		su	1	09/19/13 14:10	KB	SM4500HB+ -2011/9040C

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SG 31-32-192819	Date Sampled:	09/16/13
Lab Sample ID:	D50583-1B	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Project:	WWLCOGJ: WPX SG 31-32		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	2300	25	CFU/ml	1	09/23/13	MM	HACH IRB-BART
Slime Forming Bacteria	66500	500	CFU/ml	1	09/23/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	5000	200	CFU/ml	1	09/23/13	MM	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Client Sample ID: SG 31-32-192819**Lab Sample ID:** D50583-1F**Matrix:** AQ - Surface H2O Filtered**Project:** WWLCOGJ: WPX SG 31-32**Date Sampled:** 09/16/13**Date Received:** 09/17/13**Percent Solids:** n/a**Dissolved Metals Analysis**

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	32.0	10	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Boron	192	50	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Calcium	69200	400	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Iron	< 10	10	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Magnesium	50000	200	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Manganese	< 5.0	5.0	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Potassium	3880	1000	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Selenium	3.3	0.80	ug/l	2	09/18/13	09/18/13 JB	EPA 200.8 ²	EPA 200.8 ⁴
Sodium	96100	400	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Strontium	821	5.0	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³

(1) Instrument QC Batch: MA3980

(2) Instrument QC Batch: MA3983

(3) Prep QC Batch: MP11112

(4) Prep QC Batch: MP11116

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SG 31-32-417214	Date Sampled:	09/16/13
Lab Sample ID:	D50583-2	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V20956.D	1	09/18/13	BR	n/a	n/a	V6V1161
Run #2							

	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	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	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	106%		70-130%
460-00-4	4-Bromofluorobenzene	89%		69-130%

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

Report of Analysis

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Client Sample ID:	SG 31-32-417214	Date Sampled:	09/16/13
Lab Sample ID:	D50583-2	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	RSK175 MOD		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FB09432.D	1	09/18/13	JS	n/a	n/a	GFB414
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	23.0 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	0.022	0.011	mg/l	

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

Report of Analysis

Page 1 of 1

Client Sample ID:	SG 31-32-417214	Date Sampled:	09/16/13
Lab Sample ID:	D50583-2	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	SW846-8015B SW846 3510C		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH013170.D	1	09/19/13	TU	09/18/13	OP8591	GFH700
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	61%		20-140%		

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

Report of Analysis

Client Sample ID: SG 31-32-417214
Lab Sample ID: D50583-2
Matrix: AQ - Surface Water
Project: WWLCOGJ: WPX SG 31-32

Date Sampled: 09/16/13
Date Received: 09/17/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	337	5.0	mg/l	1	09/23/13	JD	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	09/23/13	JD	SM 2320B-2011
Alkalinity, Total as CaCO ₃	337	5.0	mg/l	1	09/23/13	JD	SM 2320B-2011
Bromide	0.13	0.10	mg/l	2	09/17/13 16:07	SK	EPA 300.0/SW846 9056
Chloride	12.1	1.0	mg/l	2	09/17/13 16:07	SK	EPA 300.0/SW846 9056
Fluoride	0.33	0.20	mg/l	2	09/17/13 16:07	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	0.91	0.020	mg/l	2	09/17/13 16:07	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite ^a	< 0.0080	0.0080	mg/l	2	09/17/13 16:07	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.037	0.010	mg/l	1	09/24/13	BF	HACH8190/SM4500P-B/E
Solids, Total Dissolved	704	10	mg/l	1	09/18/13	RW	SM 2540C-2011
Specific Conductivity	957	1.0	umhos/cm	1	09/20/13	RW	SM 2510B-2011
Sulfate	213	10	mg/l	20	09/17/13 20:11	SK	EPA 300.0/SW846 9056
pH	7.75		su	1	09/19/13 14:10	KB	SM4500HB+ -2011/9040C

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SG 31-32-417214	Date Sampled:	09/16/13
Lab Sample ID:	D50583-2B	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Project:	WWLCOGJ: WPX SG 31-32		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	< 25	25	CFU/ml	1	09/23/13	MM	HACH IRB-BART
Slime Forming Bacteria	66500	500	CFU/ml	1	09/23/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	5000	200	CFU/ml	1	09/23/13	MM	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Client Sample ID: SG 31-32-417214**Lab Sample ID:** D50583-2F**Matrix:** AQ - Surface H2O Filtered**Project:** WWLCOGJ: WPX SG 31-32**Date Sampled:** 09/16/13**Date Received:** 09/17/13**Percent Solids:** n/a**Dissolved Metals Analysis**

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	33.3	10	ug/l	1	09/18/13	09/19/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Boron	187	50	ug/l	1	09/18/13	09/19/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Calcium	70400	400	ug/l	1	09/18/13	09/19/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Iron	< 10	10	ug/l	1	09/18/13	09/19/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Magnesium	49500	200	ug/l	1	09/18/13	09/19/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Manganese	< 5.0	5.0	ug/l	1	09/18/13	09/19/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Potassium	3950	1000	ug/l	1	09/18/13	09/19/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Selenium	3.3	0.80	ug/l	2	09/18/13	09/18/13 JB	EPA 200.8 ²	EPA 200.8 ⁴
Sodium	100000	400	ug/l	1	09/18/13	09/19/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Strontium	865	5.0	ug/l	1	09/18/13	09/19/13 JB	EPA 200.7 ¹	EPA 200.7 ³

(1) Instrument QC Batch: MA3980

(2) Instrument QC Batch: MA3983

(3) Prep QC Batch: MP11112

(4) Prep QC Batch: MP11116

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TRIP BLANK	Date Sampled:	09/16/13
Lab Sample ID:	D50583-3	Date Received:	09/17/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	7V22784.D	1	09/19/13	JL	n/a	n/a	V7V1254
Run #2							

	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	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	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	109%		62-130%
2037-26-5	Toluene-D8	104%		70-130%
460-00-4	4-Bromofluorobenzene	89%		69-130%

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

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

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D50583

Client: WESTERN WATER & LAND INC.

Immediate Client Services Action Required: No

Date / Time Received: 9/17/2013 11:30:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: WPX SG 31-32

Airbill #'s: Fedex

Cooler Security	Y	or	N		Y	or	N
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	Y	or	N
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input checked="" 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"/>

Sample Integrity - Documentation	Y	or	N
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	Y	or	N
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	Y	or	N	N/A
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 rec'd 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"/>

Comments

Accutest Laboratories
V:(303) 425-6021

4036 Youngfield Street
F: (303) 425-6854

Wheat Ridge, CO
www.accutest.com

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

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V1161-MB	6V20952.D	1	09/18/13	BR	n/a	n/a	V6V1161

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Limits
17060-07-0	1,2-Dichloroethane-D4	95% 62-130%
2037-26-5	Toluene-D8	106% 70-130%
460-00-4	4-Bromofluorobenzene	95% 69-130%

Method Blank Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1254-MB	7V22769.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Limits
17060-07-0	1,2-Dichloroethane-D4	108% 62-130%
2037-26-5	Toluene-D8	98% 70-130%
460-00-4	4-Bromofluorobenzene	83% 69-130%

Blank Spike Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V1161-BS	6V20953.D	1	09/18/13	BR	n/a	n/a	V6V1161

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	48.1	96	70-130
100-41-4	Ethylbenzene	50	53.9	108	70-130
108-88-3	Toluene	50	52.8	106	70-130
1330-20-7	Xylene (total)	150	159	106	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	96%	62-130%
2037-26-5	Toluene-D8	105%	70-130%
460-00-4	4-Bromofluorobenzene	100%	69-130%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V1161-BS	6V20954.D	1	09/18/13	BR	n/a	n/a	V6V1161

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	1680	76	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	95%	62-130%
2037-26-5	Toluene-D8	106%	70-130%
460-00-4	4-Bromofluorobenzene	96%	69-130%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1254-BS	7V22770.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	46.0	92	70-130
100-41-4	Ethylbenzene	50	51.1	102	70-130
108-88-3	Toluene	50	50.8	102	70-130
1330-20-7	Xylene (total)	150	153	102	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	101%	62-130%
2037-26-5	Toluene-D8	105%	70-130%
460-00-4	4-Bromofluorobenzene	111%	69-130%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1254-BS	7V22771.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	1970	90	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	107%	62-130%
2037-26-5	Toluene-D8	100%	70-130%
460-00-4	4-Bromofluorobenzene	94%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D50598-2MS	6V20960.D	5	09/18/13	BR	n/a	n/a	V6V1161
D50598-2	6V20959.D	5	09/18/13	BR	n/a	n/a	V6V1161

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

CAS No.	Compound	D50598-2 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
71-43-2	Benzene	2260	E	250	2520	104	62-130
100-41-4	Ethylbenzene	690		250	1000	124	63-130
108-88-3	Toluene	171		250	431	104	60-130
1330-20-7	Xylene (total)	19.0		750	823	107	67-130

CAS No.	Surrogate Recoveries	MS	D50598-2	Limits
17060-07-0	1,2-Dichloroethane-D4	95%	106%	62-130%
2037-26-5	Toluene-D8	105%	110%	70-130%
460-00-4	4-Bromofluorobenzene	97%	94%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D50598-2MS	6V20961.D	5	09/18/13	BR	n/a	n/a	V6V1161
D50598-2	6V20959.D	5	09/18/13	BR	n/a	n/a	V6V1161

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

CAS No.	Compound	D50598-2 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
	TPH-GRO (C6-C10)	4380		11000	12900	77	19-168

CAS No.	Surrogate Recoveries	MS	D50598-2	Limits
17060-07-0	1,2-Dichloroethane-D4	97%	106%	62-130%
2037-26-5	Toluene-D8	108%	110%	70-130%
460-00-4	4-Bromofluorobenzene	98%	94%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D48569-7MS ^a	7V22772.D	1	09/18/13	JL	n/a	n/a	V7V1254
D48569-7 ^a	7V22774.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

CAS No.	Compound	D48569-7 ug/l	Spike Q	MS ug/l	MS %	Limits
71-43-2	Benzene	ND	50	46.8	94	62-130
100-41-4	Ethylbenzene	ND	50	46.5	93	63-130
108-88-3	Toluene	ND	50	49.1	98	60-130
1330-20-7	Xylene (total)	ND	150	145	97	67-130

CAS No.	Surrogate Recoveries	MS	D48569-7	Limits
17060-07-0	1,2-Dichloroethane-D4	100%	112%	62-130%
2037-26-5	Toluene-D8	105%	104%	70-130%
460-00-4	4-Bromofluorobenzene	104%	85%	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

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D48569-7MS ^a	7V22773.D	1	09/18/13	JL	n/a	n/a	V7V1254
D48569-7 ^a	7V22774.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

CAS No.	Compound	D48569-7 ug/l	Spike Q	MS ug/l	MS %	Limits
	TPH-GRO (C6-C10)	ND		2200	2020	92 19-168

CAS No.	Surrogate Recoveries	MS	D48569-7	Limits
17060-07-0	1,2-Dichloroethane-D4	98%	112%	62-130%
2037-26-5	Toluene-D8	101%	104%	70-130%
460-00-4	4-Bromofluorobenzene	95%	85%	69-130%

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

* = Outside of Control Limits.

Duplicate Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D50589-4DUP	6V20958.D	5	09/18/13	BR	n/a	n/a	V6V1161
D50589-4	6V20957.D	5	09/18/13	BR	n/a	n/a	V6V1161

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

CAS No.	Compound	D50589-4 ug/l	DUP Q	ug/l	Q	RPD	Limits
71-43-2	Benzene	2060	E	2000	E	3	30
100-41-4	Ethylbenzene	ND		ND		nc	30
108-88-3	Toluene	ND		ND		nc	30
1330-20-7	Xylene (total)	137		130		5	30
	TPH-GRO (C6-C10)	2940		2820		4	30

CAS No.	Surrogate Recoveries	DUP	D50589-4	Limits
17060-07-0	1,2-Dichloroethane-D4	98%	101%	62-130%
2037-26-5	Toluene-D8	107%	107%	70-130%
460-00-4	4-Bromofluorobenzene	92%	92%	69-130%

* = Outside of Control Limits.

Duplicate Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D50581-1DUP	7V22776.D	1	09/18/13	JL	n/a	n/a	V7V1254
D50581-1	7V22775.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

CAS No.	Compound	D50581-1 ug/l	DUP Q	ug/l	Q	RPD	Limits
71-43-2	Benzene	1.4		1.4		0	30
100-41-4	Ethylbenzene	3.8		3.7		3	30
108-88-3	Toluene	ND		ND		nc	30
1330-20-7	Xylene (total)	25.2		24.6		2	30
	TPH-GRO (C6-C10)	403		399		1	30

CAS No.	Surrogate Recoveries	DUP	D50581-1	Limits
17060-07-0	1,2-Dichloroethane-D4	102%	108%	62-130%
2037-26-5	Toluene-D8	99%	99%	70-130%
460-00-4	4-Bromofluorobenzene	94%	96%	69-130%

* = 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

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB414-MB	FB09426.D	1	09/18/13	JS	n/a	n/a	GFB414

The QC reported here applies to the following samples:

Method: RSK175 MOD

D50583-1, D50583-2

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	0.022	0.011	mg/l	

Blank Spike Summary

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB414-BS	FB09427.D	10	09/18/13	JS	n/a	n/a	GFB414

The QC reported here applies to the following samples: Method: RSK175 MOD

D50583-1, D50583-2

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.51	0.501	98	70-130
74-84-0	Ethane	0.956	0.751	79	70-130
74-98-6	Propane	1.4	1.12	80	67-130

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D50582-1MS ^a	FB09429.D	10	09/18/13	JS	n/a	n/a	GFB414
D50582-1MSD ^a	FB09430.D	10	09/18/13	JS	n/a	n/a	GFB414
D50582-1 ^a	FB09428.D	1	09/18/13	JS	n/a	n/a	GFB414

The QC reported here applies to the following samples:

Method: RSK175 MOD

D50583-1, D50583-2

CAS No.	Compound	D50582-1 mg/l	Spike Q	Spike mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
74-82-8	Methane	0.0017		0.51	0.531	104	0.533	104	0	51-155/30
74-84-0	Ethane	ND		0.956	0.835	87	0.840	88	1	58-130/30
74-98-6	Propane	ND		1.4	1.32	94	1.34	96	2	46-130/30

(a) Sample pH > 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: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8591-MB	FH013122.D	1	09/18/13	TU	09/18/13	OP8591	GFH700

The QC reported here applies to the following samples: Method: SW846-8015B

D50583-1, D50583-2

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	35% 20-140%

Blank Spike Summary

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8591-BS	FH013124.D	1	09/18/13	TU	09/18/13	OP8591	GFH700

The QC reported here applies to the following samples: Method: SW846-8015B

D50583-1, D50583-2

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	20	11.2	56	36-140

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	47%	20-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D50583
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8591-MS	FH013126.D	1	09/18/13	TU	09/18/13	OP8591	GFH700
OP8591-MSD	FH013128.D	1	09/18/13	TU	09/18/13	OP8591	GFH700
D48569-3	FH013130.D	1	09/18/13	TU	09/18/13	OP8591	GFH700

The QC reported here applies to the following samples: Method: SW846-8015B

D50583-1, D50583-2

CAS No.	Compound	D48569-3 mg/l	Spike Q	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	20	10.4	52	12.9	65	170*	28-140/30

CAS No.	Surrogate Recoveries	MS	MSD	D48569-3	Limits
84-15-1	o-Terphenyl	61%	73%	51%	20-140%

* = 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: D50583
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 09/18/13

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	1.7	<10
Beryllium	10	.8	1.7		
Boron	50	6.7	6.6	6.0	<50
Cadmium	10	.4	.36		
Calcium	400	2.2	66	18.3	<400
Chromium	10	.4	1.4		
Cobalt	5.0	.4	.51		
Copper	10	1.2	1.5		
Iron	10	2.2	3.2	2.4	<10
Lead	50	3.6	4.1		
Lithium	5.0	1.9	1.9		
Magnesium	200	14	29	2.0	<200
Manganese	5.0	.01	.29	0.0	<5.0
Molybdenum	10	.8	1.1		
Nickel	30	.9	.87		
Phosphorus	100	15	24		
Potassium	1000	130	230	83.0	<1000
Selenium	50	8.8	9.3		
Silicon	50	5.2	5.6		
Silver	30	.4	.4		
Sodium	400	4.9	36	73.8	<400
Strontium	5.0	.01	.12	0.10	<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 MP11112: D50583-1F, D50583-2F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D50583
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 09/18/13

Metal	D50583-1F Original MS		Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium	32.0	2080	2000	102.4	70-130
Beryllium					
Boron	192	1260	1000	106.8	70-130
Cadmium					
Calcium	67800	93300	25000	96.4	70-130
Chromium					
Cobalt					
Copper	anr				
Iron	0.0	4840	5000	96.8	70-130
Lead					
Lithium					
Magnesium	50000	74700	25000	98.8	70-130
Manganese	0.10	514	500	102.8	70-130
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	3880	32800	25000	115.7	70-130
Selenium					
Silicon					
Silver					
Sodium	92600	124000	25000	111.6	70-130
Strontium	821	1350	500	105.8	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP11112: D50583-1F, D50583-2F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583
Account: WILLCOF - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 09/18/13

Metal	D50583-1F Original MSD		Spikelot ICPAL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	32.0	2060	2000	101.4	1.0	20
Beryllium						
Boron	192	1270	1000	107.8	0.8	20
Cadmium						
Calcium	67800	94200	25000	100.0	1.0	20
Chromium						
Cobalt						
Copper	anr					
Iron	0.0	4810	5000	96.2	0.6	20
Lead						
Lithium						
Magnesium	50000	74900	25000	99.6	0.3	20
Manganese	0.10	513	500	102.6	0.2	20
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	3880	32900	25000	116.1	0.3	20
Selenium						
Silicon						
Silver						
Sodium	92600	125000	25000	115.6	0.8	20
Strontium	821	1350	500	105.8	0.0	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP11112: D50583-1F, D50583-2F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583
Account: WILLCOF - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50583
 Account: WILLCOF - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 09/18/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	1970	2000	98.5	85-115
Beryllium				
Boron	1050	1000	105.0	85-115
Cadmium				
Calcium	25100	25000	100.4	85-115
Chromium				
Cobalt				
Copper	anr			
Iron	4790	5000	95.8	85-115
Lead				
Lithium				
Magnesium	24800	25000	99.2	85-115
Manganese	512	500	102.4	85-115
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	26000	25000	104.0	85-115
Selenium				
Silicon				
Silver				
Sodium	25800	25000	103.2	85-115
Strontium	504	500	100.8	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP11112: D50583-1F, D50583-2F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50583
Account: WILLCOF - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D50583
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11116
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 09/18/13

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		
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	0.018	<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 MP11116: D50583-1F, D50583-2F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11116
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 09/18/13

Metal	D50583-2F Original MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium				
Cobalt				
Copper				
Iron	anr			
Lead				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	3.3	184	200	90.4 70-130
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium	anr			
Vanadium				
Zinc				

Associated samples MP11116: D50583-1F, D50583-2F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11116
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 09/18/13

Metal	D50583-2F Original MSD	Spikelot ICPAL2	% Rec	MSD RPD	QC Limit
Aluminum					
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Chromium					
Cobalt					
Copper					
Iron	anr				
Lead					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium	3.3	184	200	90.4	0.0
Silver	anr				20
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium	anr				
Vanadium					
Zinc					

Associated samples MP11116: D50583-1F, D50583-2F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50583
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11116
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 09/18/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium				
Cobalt				
Copper				
Iron	anr			
Lead				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	196	200	98.0	85-115
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium	anr			
Vanadium				
Zinc				

Associated samples MP11116: D50583-1F, D50583-2F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (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: D50583
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN21996	5.0	2.0	mg/l	100	95.0	94.9	90-110%
Alkalinity, Carbonate	GN21997	5.0	0.0	mg/l	100	95.0	94.9	80-120%
Alkalinity, Total as CaCO3	GN21995	5.0	2.0	mg/l	100	95.0	94.9	90-110%
Bromide	GP10946/GN21930	0.050	0.0	mg/l	20	19.7	98.5	90-110%
Chloride	GP10946/GN21930	0.50	0.0	mg/l	20	20.0	100.0	90-110%
Fluoride	GP10946/GN21930	0.10	0.0	mg/l	10	9.62	96.2	90-110%
Iron Reducing Bacteria	MB251	25	<25	CFU/ml				
Nitrogen, Nitrate	GP10946/GN21930	0.010	0.0	mg/l	4.52	4.44	98.3	90-110%
Nitrogen, Nitrite	GP10946/GN21930	0.0040	0.0	mg/l	6.09	6.20	101.8	90-110%
Phosphorus, Total	GP11000/GN22026	0.010	0.0	mg/l	0.304	0.33	109.2	80-120%
Slime Forming Bacteria	MB252	500	<500	CFU/ml				
Solids, Total Dissolved	GN21944	10	0.0	mg/l	400	395	98.8	90-110%
Specific Conductivity	GP10973/GN21980			umhos/cm	99.7	93.1	93.4	90-110%
Sulfate	GP10946/GN21930	0.50	0.0	mg/l	30	29.4	98.0	90-110%
Sulfate Reducing Bacteria	MB253	200	<200	CFU/ml				
pH	GN21969			su	8.00	8.00	100.0	99.3-100.7%

Associated Samples:

Batch MB251: D50583-1B, D50583-2B
Batch MB252: D50583-1B, D50583-2B
Batch MB253: D50583-1B, D50583-2B
Batch GN21944: D50583-1, D50583-2
Batch GN21969: D50583-1, D50583-2
Batch GN21995: D50583-1, D50583-2
Batch GN21996: D50583-1, D50583-2
Batch GN21997: D50583-1, D50583-2
Batch GP10946: D50583-1, D50583-2
Batch GP10973: D50583-1, D50583-2
Batch GP11000: D50583-1, D50583-2

(*) Outside of QC limits

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DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D50583
Account: WILLCOF - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO ₃	GN21995	D50545-1	mg/l	169	167	1.0	0-20%
Phosphorus, Total	GP11000/GN22026	D50441-1	mg/l	0.065	0.067	3.0	0-20%
Solids, Total Dissolved	GN21944	D50439-1	mg/l	600	632	5.2	0-20%
Specific Conductivity	GP10973/GN21980	D50582-1	umhos/cm	744	736	1.1	0-20%

Associated Samples:

Batch GN21944: D50583-1, D50583-2

Batch GN21995: D50583-1, D50583-2

Batch GP10973: D50583-1, D50583-2

Batch GP11000: D50583-1, D50583-2

(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D50583
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO ₃	GN21995	D50545-1	mg/l	169	100	261	92.1	80-120%
Bromide	GP10946/GN21930	D50578-2	mg/l	0.0	2.5	2.6	104.0	80-120%
Bromide	GP10946/GN21930	D50578-2	mg/l	0.054	2.5	2.6	104.0	80-120%
Chloride	GP10946/GN21930	D50578-2	mg/l	36.3	500	525	95.8	80-120%
Chloride	GP10946/GN21930	D50578-2	mg/l	46.2	500	525	95.8	80-120%
Fluoride	GP10946/GN21930	D50578-2	mg/l	3.2	2.5	2.9	105.6	80-120%
Fluoride	GP10946/GN21930	D50578-2	mg/l	0.26	2.5	2.9	105.6	80-120%
Nitrogen, Nitrate	GP10946/GN21930	D50578-2	mg/l	13.2	28.3	42.4	103.4	80-120%
Nitrogen, Nitrate	GP10946/GN21930	D50578-2	mg/l	17.6	28.3	42.4	103.4	80-120%
Nitrogen, Nitrite	GP10946/GN21930	D50578-2	mg/l	0.0084	0.305	0.32	102.3	80-120%
Nitrogen, Nitrite	GP10946/GN21930	D50578-2	mg/l	0.0	0.305	0.32	102.3	80-120%
Phosphorus, Total	GP11000/GN22026	D50441-1	mg/l	0.065	0.40	0.42	88.8	80-120%
Sulfate	GP10946/GN21930	D50578-2	mg/l	19.5	10	24.8	108.3	80-120%
Sulfate	GP10946/GN21930	D50578-2	mg/l	14.0	10	24.8	108.3	80-120%

Associated Samples:

Batch GN21995: D50583-1, D50583-2

Batch GP10946: D50583-1, D50583-2

Batch GP11000: D50583-1, D50583-2

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

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MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D50583
Account: WILLCOF - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO ₃	GN21995	D50545-1	mg/l	169	100	261	0.1	20%
Bromide	GP10946/GN21930	D50578-2	mg/l	0.0	2.5	2.6	0.0	20%
Bromide	GP10946/GN21930	D50578-2	mg/l	0.054	2.5	2.6	0.0	20%
Chloride	GP10946/GN21930	D50578-2	mg/l	36.3	500	516	1.7	20%
Chloride	GP10946/GN21930	D50578-2	mg/l	46.2	500	516	1.7	20%
Fluoride	GP10946/GN21930	D50578-2	mg/l	3.2	2.5	2.9	0.0	20%
Fluoride	GP10946/GN21930	D50578-2	mg/l	0.26	2.5	2.9	0.0	20%
Nitrogen, Nitrate	GP10946/GN21930	D50578-2	mg/l	13.2	28.3	42.0	0.9	20%
Nitrogen, Nitrate	GP10946/GN21930	D50578-2	mg/l	17.6	28.3	42.0	0.9	20%
Nitrogen, Nitrite	GP10946/GN21930	D50578-2	mg/l	0.0084	0.305	0.31	3.2	20%
Nitrogen, Nitrite	GP10946/GN21930	D50578-2	mg/l	0.0	0.305	0.31	3.2	20%
Phosphorus, Total	GP11000/GN22026	D50441-1	mg/l	0.065	0.40	0.420	0.0	20%
Sulfate	GP10946/GN21930	D50578-2	mg/l	19.5	10	24.8	0.0	20%
Sulfate	GP10946/GN21930	D50578-2	mg/l	14.0	10	24.8	0.0	20%

Associated Samples:

Batch GN21995: D50583-1, D50583-2

Batch GP10946: D50583-1, D50583-2

Batch GP11000: D50583-1, D50583-2

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4
10



10/01/13

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: WPX SG 31-32

Accutest Job Number: D50582

Sampling Date: 09/16/13

Report to:

Western Water and Land, Inc.
743 Horizon Court Suite 330
Grand Junction, CO 81506
bsmith@westernwaterandland.com; jpahler@westernwaterandland.com
ATTN: Bruce Smith

Total number of pages in report: **51**



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

A handwritten signature in black ink, appearing to read 'Scott Heideman'.

Scott Heideman
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

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

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

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Sample Summary

WPX Energy Rocky Mountain, LLC

Job No: D50582

WWLCOGJ: WPX SG 31-32

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D50582-1	09/16/13	09:46 NS	09/17/13	AQ	Surface Water	SG 31-32-CO RIVER
D50582-1B	09/16/13	09:46 NS	09/17/13	AQ	Surface Water	SG 31-32-CO RIVER
D50582-1F	09/16/13	09:46 NS	09/17/13	AQ	Surface H2O Filtered	SG 31-32-CO RIVER
D50582-2	09/16/13	00:00 NS	09/17/13	AQ	Trip Blank Water	TRIP BLK #3 469425,469712



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: WPX Energy Rocky Mountain, LLC

Job No D50582

Site: WWLCOGJ: WPX SG 31-32

Report Date 10/1/2013 10:37:07 AM

On 09/17/2013, 1 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.5 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D50582 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: V7V1254

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50581-1DUP, D48569-7MS were used as the QC samples indicated.
- D48569-7MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D48569-7MS: 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: GFB414

- All samples were analyzed within the recommended method holding time.
- Sample(s) D50582-1MS, D50582-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D50582-1MS: Sample pH >2 at time of analysis.
- D50582-1: Sample pH >2 at time of analysis.
- D50582-1MSD: Sample pH >2 at time of analysis.

Extractables by GC By Method SW846-8015B

Matrix AQ

Batch ID: OP8591

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D48569-3MS, D48569-3MSD were used as the QC samples indicated.
- The RPD(s) for the MS and MSD recoveries of TPH-DRO (C10-C28) are outside control limits for sample OP8591-MSD. Probable cause due to sample homogeneity.

Metals By Method EPA 200.7

Matrix AQ

Batch ID: MP11115

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50586-1AMS, D50586-1AMSD were used as the QC samples for the metals analysis.

Metals By Method EPA 200.8

Matrix AQ

Batch ID: MP11129

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50613-1FMS, D50613-1FMSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix AQ

Batch ID: GP10946

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50578-2MS, D50578-2MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.

Wet Chemistry By Method HACH IRB-BART

Matrix AQ

Batch ID: MB251

- 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: MB252

- 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: MB253

- 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: GP11000

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50441-1DUP, D50441-1MS, D50441-1MSD were used as the QC samples for the Phosphorus, Total analysis.

Wet Chemistry By Method SM 2320B-2011

Matrix AQ

Batch ID: GN21995

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50545-1DUP, D50545-1MS, D50545-1MSD were used as the QC samples for the Alkalinity, Total as CaCO₃ analysis.

Matrix AQ

Batch ID: GN21996

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

Matrix AQ

Batch ID: GN21997

- 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: GP10973

- Sample(s) D50582-1DUP were used as the QC samples for the Specific Conductivity analysis.

Wet Chemistry By Method SM 2540C-2011

Matrix AQ

Batch ID: GN21944

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50439-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

Wet Chemistry By Method SM4500HB+-2011/9040C

Matrix AQ

Batch ID: GN21969

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D50582-1

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

Page 1 of 1

Job Number: D50582
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32
Collected: 09/16/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

D50582-1 SG 31-32-CO RIVER

Methane ^a	0.0017	0.00080	0.00040	mg/l	RSK175 MOD
Alkalinity, Bicarbonate as CaCO ₃	113	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO ₃	113	5.0		mg/l	SM 2320B-2011
Chloride	120	5.0		mg/l	EPA 300.0/SW846 9056
Fluoride	0.25	0.10		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate	0.19	0.010		mg/l	EPA 300.0/SW846 9056
Phosphorus, Total	1.4	0.050		mg/l	HACH8190/SM4500P-B/E
Solids, Total Dissolved	448	10		mg/l	SM 2540C-2011
Specific Conductivity	744	1.0		umhos/cm	SM 2510B-2011
Sulfate	103	5.0		mg/l	EPA 300.0/SW846 9056
pH	8.18			su	SM4500HB+ -2011/9040C

D50582-1B SG 31-32-CO RIVER

Iron Reducing Bacteria	9000	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria	66500	500		CFU/ml	HACH SLYM-BART

D50582-1F SG 31-32-CO RIVER

Barium	62.5	10		ug/l	EPA 200.7
Calcium	59600	400		ug/l	EPA 200.7
Iron	25.4	10		ug/l	EPA 200.7
Magnesium	11900	200		ug/l	EPA 200.7
Potassium	3420	1000		ug/l	EPA 200.7
Sodium	82400	400		ug/l	EPA 200.7
Strontium	549	5.0		ug/l	EPA 200.7

D50582-2 TRIP BLK #3 469425,469712

No hits reported in this sample.

(a) Sample pH > 2 at time of analysis.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	SG 31-32-CO RIVER	Date Sampled:	09/16/13
Lab Sample ID:	D50582-1	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V22786.D	1	09/19/13	JL	n/a	n/a	V7V1254
Run #2							

	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	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	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	122%		62-130%
2037-26-5	Toluene-D8	105%		70-130%
460-00-4	4-Bromofluorobenzene	89%		69-130%

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

Report of Analysis

Page 1 of 1

Client Sample ID:	SG 31-32-CO RIVER	Date Sampled:	09/16/13
Lab Sample ID:	D50582-1	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	RSK175 MOD		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FB09428.D	1	09/18/13	JS	n/a	n/a	GFB414
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	23.0 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.0017	0.00080	0.00040	mg/l	
74-84-0	Ethane	ND	0.0016	0.00080	mg/l	
74-98-6	Propane	ND	0.022	0.011	mg/l	

(a) Sample pH > 2 at time of analysis.

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

Report of Analysis

Page 1 of 1

Client Sample ID:	SG 31-32-CO RIVER	Date Sampled:	09/16/13
Lab Sample ID:	D50582-1	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Method:	SW846-8015B SW846 3510C		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH013166.D	1	09/19/13	TU	09/18/13	OP8591	GFH700
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	72%		20-140%		

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

Report of Analysis

Client Sample ID: SG 31-32-CO RIVER
Lab Sample ID: D50582-1
Matrix: AQ - Surface Water
Project: WWLCOGJ: WPX SG 31-32

Date Sampled: 09/16/13
Date Received: 09/17/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	113	5.0	mg/l	1	09/23/13	JD	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	09/23/13	JD	SM 2320B-2011
Alkalinity, Total as CaCO ₃	113	5.0	mg/l	1	09/23/13	JD	SM 2320B-2011
Bromide	< 0.050	0.050	mg/l	1	09/17/13 15:21	SK	EPA 300.0/SW846 9056
Chloride	120	5.0	mg/l	10	09/17/13 19:02	SK	EPA 300.0/SW846 9056
Fluoride	0.25	0.10	mg/l	1	09/17/13 15:21	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	0.19	0.010	mg/l	1	09/17/13 15:21	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	< 0.0040	0.0040	mg/l	1	09/17/13 15:21	SK	EPA 300.0/SW846 9056
Phosphorus, Total	1.4	0.050	mg/l	5	09/24/13	BF	HACH8190/SM4500P-B/E
Solids, Total Dissolved	448	10	mg/l	1	09/18/13	RW	SM 2540C-2011
Specific Conductivity	744	1.0	umhos/cm	1	09/20/13	RW	SM 2510B-2011
Sulfate	103	5.0	mg/l	10	09/17/13 19:02	SK	EPA 300.0/SW846 9056
pH	8.18		su	1	09/19/13 14:10	KB	SM4500HB+ -2011/9040C

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SG 31-32-CO RIVER	Date Sampled:	09/16/13
Lab Sample ID:	D50582-1B	Date Received:	09/17/13
Matrix:	AQ - Surface Water	Percent Solids:	n/a
Project:	WWLCOGJ: WPX SG 31-32		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	9000	25	CFU/ml	1	09/23/13	MM	HACH IRB-BART
Slime Forming Bacteria	66500	500	CFU/ml	1	09/23/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	< 200	200	CFU/ml	1	09/23/13	MM	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Client Sample ID: SG 31-32-CO RIVER
Lab Sample ID: D50582-1F
Matrix: AQ - Surface H2O Filtered
Project: WWLCOGJ: WPX SG 31-32

Date Sampled: 09/16/13
Date Received: 09/17/13
Percent Solids: n/a

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	62.5	10	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Boron	< 50	50	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Calcium	59600	400	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Iron	25.4	10	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Magnesium	11900	200	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Manganese	< 5.0	5.0	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Potassium	3420	1000	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Selenium	< 0.80	0.80	ug/l	2	09/19/13	09/20/13 JB	EPA 200.8 ²	EPA 200.8 ⁴
Sodium	82400	400	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³
Strontium	549	5.0	ug/l	1	09/18/13	09/18/13 JB	EPA 200.7 ¹	EPA 200.7 ³

(1) Instrument QC Batch: MA3980

(2) Instrument QC Batch: MA3988

(3) Prep QC Batch: MP11115

(4) Prep QC Batch: MP11129

RL = Reporting Limit

Report of Analysis

Page 1 of 1

Client Sample ID:	TRIP BLK #3 469425,469712	Date Sampled:	09/16/13
Lab Sample ID:	D50582-2	Date Received:	09/17/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	WWLCOGJ: WPX SG 31-32		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V22785.D	1	09/19/13	JL	n/a	n/a	V7V1254
Run #2							

	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	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	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	119%		62-130%
2037-26-5	Toluene-D8	105%		70-130%
460-00-4	4-Bromofluorobenzene	88%		69-130%

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

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

PAGE ____ OF ____

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

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # D50582	
Client / Reporting Information		Project Information	
Company Name Western Water and Land, Inc.		Project Name WPX SG 31-32	
Street Address 743 Horizon Ct., Suite 330		Street	
City Grand Junction, CO 81506		City	
Project Contact Bruce Smith bsmith@westernwaterandland.com		Project #	
Phone # (970) 242-0170		Client Purchase Order #	
Sampler(s) Name(s) Nick Solawetz		Project Manager Renee Jackson	
		Billing Information (If different from Report to)	
		Company Name WPX Energy	
		Street Address 1058 County Rd 215	
		City Parachute, CO 81635	
		Attention: Brandon Danforth	
Field ID / Point of Collection SG 31-32 - CRRIVES		Date 9-16-13	
MECH/DI Vial # Top BLK #3 469425, 469712		Time 0946	
Sampled by NS		Matrix SW	
# of bottles 15		# of bottles 300	
HCl		HNO3	
H2SO4		H2O2	
DI Water		MEOH	
LINCONE			
PH, SCON, TDS		XCARBICALK	
BRO, CHL, F, NO2, NO3, SO4		TPO4	
*Dissolved Metals - Lab Filtered		VRSK175DCMEP No HCL	
V8260BTXGRO		B8016DRO	
BART		**Isotopic Methane	
LAB USE ONLY			
Turnaround Time (Business days)		Data Deliverable Information	
<input type="checkbox"/> Std. 15 Business Days		<input type="checkbox"/> Commercial "A" (Level 1)	
<input checked="" type="checkbox"/> Std. 10 Business Days		<input type="checkbox"/> Commercial "B" (Level 2)	
<input type="checkbox"/> 5 Day RUSH		<input type="checkbox"/> COMMEN	
<input type="checkbox"/> 3 Day Emergency		<input type="checkbox"/> COMMEN+	
<input type="checkbox"/> 2 Day Emergency			
<input type="checkbox"/> 1 Day Emergency			
Emergency & Rush T/A data available via Lablink		Approved By (Accutest PM): / Date:	
		<input type="checkbox"/> State Forms Required	
		<input type="checkbox"/> Send Forms to State	
		<input type="checkbox"/> Report by Fax	
		<input checked="" type="checkbox"/> Report by PDF	
		<input checked="" type="checkbox"/> EDD Format	
		Commercial "A" = Results Only	
		Commercial "B" = Results + QC Summary	
		Commercial "BN" = Results/QC/Narrative (+ = chromatograms)	
		Comments / Special Instructions	
		*Dissolved Metals (200.7/200.8): Ba, B, Ca, Fe, Mg, Mn, K, SeMS, Na, Sr	
		**Hold pending RSK175 results	
		Dis. Glasses uppreserved	
		Not field filtered	
Relinquished by Sampler:		Received By:	
1 Nick Solawetz		1 D J R	
Relinquished by Sampler:		Received By:	
3		3	
Relinquished by:		Received By:	
5		5	
Custody Seal # FX		Intact <input checked="" type="checkbox"/> Not Intact <input type="checkbox"/>	
Preserved where applicable <input type="checkbox"/>		On Ice <input checked="" type="checkbox"/>	
Cooler Temp. 2.5			

D50582: Chain of Custody

Page 1 of 2

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D50582

Client: WESTERN WATER & LAND INC.

Immediate Client Services Action Required: No

Date / Time Received: 9/17/2013 11:30:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: WPX SG 31-32

Airbill #'s: Fedex

Cooler Security
Y or N
Y or N

- | | |
|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 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
Y or N

- | | |
|-----------------------------------------------------------------------------------------|--|
| 1. Temp criteria achieved: <input checked="" type="checkbox"/> <input type="checkbox"/> | |
| 2. Cooler temp verification: Infrared gun | |
| 3. Cooler media: Ice (bag) | |

Quality Control Preservation
Y or N
N/A

- | | |
|---------------------------------------------------------------------------------------------------------------|--|
| 1. Trip Blank present / cooler: <input checked="" type="checkbox"/> <input type="checkbox"/> | |
| 2. Trip Blank listed on COC: <input checked="" 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"/> | |

Sample Integrity - Documentation
Y or N

- | | |
|-----------------------------------------------------------------------------------------------------|--|
| 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
Y or N

- | | |
|-----------------------------------------------------------------------------------------------|--|
| 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
Y or N N/A

- | | |
|--------------------------------------------------------------------------------------------------------------------------|--|
| 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 rec'd 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"/> | |

Comments

 Accutest Laboratories
 V: (303) 425-6021

 4036 Youngfield Street
 F: (303) 425-6854

 Wheat Ridge, CO
 www.accutest.com

D50582: Chain of Custody

Page 2 of 2

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

Page 1 of 1

Job Number: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1254-MB	7V22769.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Limits
17060-07-0	1,2-Dichloroethane-D4	108% 62-130%
2037-26-5	Toluene-D8	98% 70-130%
460-00-4	4-Bromofluorobenzene	83% 69-130%

Blank Spike Summary

Page 1 of 1

Job Number: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1254-BS	7V22770.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	46.0	92	70-130
100-41-4	Ethylbenzene	50	51.1	102	70-130
108-88-3	Toluene	50	50.8	102	70-130
1330-20-7	Xylene (total)	150	153	102	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	101%	62-130%
2037-26-5	Toluene-D8	105%	70-130%
460-00-4	4-Bromofluorobenzene	111%	69-130%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1254-BS	7V22771.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	1970	90	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	107%	62-130%
2037-26-5	Toluene-D8	100%	70-130%
460-00-4	4-Bromofluorobenzene	94%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Page 1 of 1

Job Number: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D48569-7MS ^a	7V22772.D	1	09/18/13	JL	n/a	n/a	V7V1254
D48569-7 ^a	7V22774.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

CAS No.	Compound	D48569-7 ug/l	Spike Q	MS ug/l	MS %	Limits
71-43-2	Benzene	ND	50	46.8	94	62-130
100-41-4	Ethylbenzene	ND	50	46.5	93	63-130
108-88-3	Toluene	ND	50	49.1	98	60-130
1330-20-7	Xylene (total)	ND	150	145	97	67-130

CAS No.	Surrogate Recoveries	MS	D48569-7	Limits
17060-07-0	1,2-Dichloroethane-D4	100%	112%	62-130%
2037-26-5	Toluene-D8	105%	104%	70-130%
460-00-4	4-Bromofluorobenzene	104%	85%	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

Page 1 of 1

Job Number: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D48569-7MS ^a	7V22773.D	1	09/18/13	JL	n/a	n/a	V7V1254
D48569-7 ^a	7V22774.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

CAS No.	Compound	D48569-7 ug/l	Spike Q	MS ug/l	MS %	Limits
	TPH-GRO (C6-C10)	ND	2200	2020	92	19-168

CAS No.	Surrogate Recoveries	MS	D48569-7	Limits
17060-07-0	1,2-Dichloroethane-D4	98%	112%	62-130%
2037-26-5	Toluene-D8	101%	104%	70-130%
460-00-4	4-Bromofluorobenzene	95%	85%	69-130%

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

* = Outside of Control Limits.

Duplicate Summary

Page 1 of 1

Job Number: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D50581-1DUP	7V22776.D	1	09/18/13	JL	n/a	n/a	V7V1254
D50581-1	7V22775.D	1	09/18/13	JL	n/a	n/a	V7V1254

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

CAS No.	Compound	D50581-1 ug/l	DUP Q	ug/l	Q	RPD	Limits
71-43-2	Benzene	1.4		1.4		0	30
100-41-4	Ethylbenzene	3.8		3.7		3	30
108-88-3	Toluene	ND		ND		nc	30
1330-20-7	Xylene (total)	25.2		24.6		2	30
	TPH-GRO (C6-C10)	403		399		1	30

CAS No.	Surrogate Recoveries	DUP	D50581-1	Limits
17060-07-0	1,2-Dichloroethane-D4	102%	108%	62-130%
2037-26-5	Toluene-D8	99%	99%	70-130%
460-00-4	4-Bromofluorobenzene	94%	96%	69-130%

* = 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: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB414-MB	FB09426.D	1	09/18/13	JS	n/a	n/a	GFB414

The QC reported here applies to the following samples: Method: RSK175 MOD

D50582-1

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	0.022	0.011	mg/l	

Blank Spike Summary

Page 1 of 1

Job Number: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB414-BS	FB09427.D	10	09/18/13	JS	n/a	n/a	GFB414

The QC reported here applies to the following samples:

Method: RSK175 MOD

D50582-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.51	0.501	98	70-130
74-84-0	Ethane	0.956	0.751	79	70-130
74-98-6	Propane	1.4	1.12	80	67-130

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D50582

Account: WILLCOP WPX Energy Rocky Mountain, LLC

Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D50582-1MS ^a	FB09429.D	10	09/18/13	JS	n/a	n/a	GFB414
D50582-1MSD ^a	FB09430.D	10	09/18/13	JS	n/a	n/a	GFB414
D50582-1 ^a	FB09428.D	1	09/18/13	JS	n/a	n/a	GFB414

The QC reported here applies to the following samples:

Method: RSK175 MOD

D50582-1

CAS No.	Compound	D50582-1 mg/l	Q	Spike mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
74-82-8	Methane	0.0017		0.51	0.531	104	0.533	104	0	51-155/30
74-84-0	Ethane	ND		0.956	0.835	87	0.840	88	1	58-130/30
74-98-6	Propane	ND		1.4	1.32	94	1.34	96	2	46-130/30

(a) Sample pH > 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: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8591-MB	FH013122.D	1	09/18/13	TU	09/18/13	OP8591	GFH700

The QC reported here applies to the following samples: Method: SW846-8015B

D50582-1

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	35% 20-140%

Blank Spike Summary

Job Number: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8591-BS	FH013124.D	1	09/18/13	TU	09/18/13	OP8591	GFH700

The QC reported here applies to the following samples: Method: SW846-8015B

D50582-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	20	11.2	56	36-140

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	47%	20-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D50582
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP8591-MS	FH013126.D	1	09/18/13	TU	09/18/13	OP8591	GFH700
OP8591-MSD	FH013128.D	1	09/18/13	TU	09/18/13	OP8591	GFH700
D48569-3	FH013130.D	1	09/18/13	TU	09/18/13	OP8591	GFH700

The QC reported here applies to the following samples: Method: SW846-8015B

D50582-1

CAS No.	Compound	D48569-3 mg/l	Spike Q	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	20	10.4	52	12.9	65	170*	28-140/30
CAS No.	Surrogate Recoveries	MS	MSD	D48569-3	Limits				
84-15-1	o-Terphenyl	61%	73%	51%	20-140%				

* = 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: D50582
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 09/18/13

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	1.5	<10
Beryllium	10	.8	1.7		
Boron	50	6.7	6.6	4.4	<50
Cadmium	10	.4	.36		
Calcium	400	2.2	66	3.4	<400
Chromium	10	.4	1.4		
Cobalt	5.0	.4	.51		
Copper	10	1.2	1.5		
Iron	10	2.2	3.2	1.4	<10
Lead	50	3.6	4.1		
Lithium	5.0	1.9	1.9		
Magnesium	200	14	29	-3.8	<200
Manganese	5.0	.01	.29	0.0	<5.0
Molybdenum	10	.8	1.1		
Nickel	30	.9	.87		
Phosphorus	100	15	24		
Potassium	1000	130	230	68.6	<1000
Selenium	50	8.8	9.3		
Silicon	50	5.2	5.6		
Silver	30	.4	.4		
Sodium	400	4.9	36	9.4	<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 MP11115: D50582-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D50582
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 09/18/13

Metal	D50586-1A Original MS		Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	41.7	2050	2000	100.4	70-130
Beryllium					
Boron	75.8	1140	1000	106.4	70-130
Cadmium	anr				
Calcium	43500	68800	25000	101.2	70-130
Chromium	anr				
Cobalt					
Copper					
Iron	214	5010	5000	95.9	70-130
Lead	anr				
Lithium					
Magnesium	8070	33500	25000	101.7	70-130
Manganese	13.7	529	500	103.1	70-130
Molybdenum					
Nickel					
Phosphorus					
Potassium	1310	29200	25000	111.6	70-130
Selenium	anr				
Silicon					
Silver	anr				
Sodium	65400	92800	25000	109.6	70-130
Strontium	268	780	500	102.4	70-130
Thallium					
Tin	anr				
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP11115: D50582-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582
 Account: WILLCOF - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 09/18/13

Metal	D50586-1A Original MSD	Spikelot ICPAL2	% Rec	MSD RPD	QC Limit
Aluminum					
Antimony					
Arsenic	anr				
Barium	41.7	2010	2000	98.4	2.0
Beryllium					
Boron	75.8	1130	1000	105.4	0.9
Cadmium	anr				
Calcium	43500	67200	25000	94.8	2.4
Chromium	anr				
Cobalt					
Copper					
Iron	214	4950	5000	94.7	1.2
Lead	anr				
Lithium					
Magnesium	8070	33000	25000	99.7	1.5
Manganese	13.7	523	500	101.9	1.1
Molybdenum					
Nickel					
Phosphorus					
Potassium	1310	28600	25000	109.2	2.1
Selenium	anr				
Silicon					
Silver	anr				
Sodium	65400	91200	25000	103.2	1.7
Strontium	268	769	500	100.2	1.4
Thallium					
Tin	anr				
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP11115: D50582-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582
Account: WILLCOF - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50582

Account: WILLCOP - WPX Energy Rocky Mountain, LLC

Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115

Methods: EPA 200.7

Matrix Type: AQUEOUS

Units: ug/l

Prep Date: 09/18/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	1950	2000	97.5	85-115
Beryllium				
Boron	1040	1000	104.0	85-115
Cadmium	anr			
Calcium	25100	25000	100.4	85-115
Chromium	anr			
Cobalt				
Copper				
Iron	4780	5000	95.6	85-115
Lead	anr			
Lithium				
Magnesium	24700	25000	98.8	85-115
Manganese	512	500	102.4	85-115
Molybdenum				
Nickel				
Phosphorus				
Potassium	25700	25000	102.8	85-115
Selenium	anr			
Silicon				
Silver	anr			
Sodium	25600	25000	102.4	85-115
Strontium	498	500	99.6	85-115
Thallium				
Tin	anr			
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP11115: D50582-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50582
Account: WILLCOF - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D50582
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11129
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 09/19/13

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		
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	0.20	<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 MP11129: D50582-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11129
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 09/19/13

Metal	D50613-1F Original MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Magnesium				
Manganese				
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium				
Selenium	0.0	196	200	98.0 70-130
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP11129: D50582-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11129
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 09/19/13

Metal	D50613-1F Original MSD	Spikelot ICPAL2	% Rec	MSD RPD	QC Limit
Aluminum					
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron					
Lead	anr				
Magnesium					
Manganese					
Molybdenum	anr				
Nickel	anr				
Phosphorus					
Potassium					
Selenium	0.0	190	200	95.0	3.1
Silver	anr				20
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP11129: D50582-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50582
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11129
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 09/19/13

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Magnesium				
Manganese				
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium				
Selenium	202	200	101.0	85-115
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP11129: D50582-1F

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: D50582
Account: WILLCOF - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN21996	5.0	2.0	mg/l	100	95.0	94.9	90-110%
Alkalinity, Carbonate	GN21997	5.0	0.0	mg/l	100	95.0	94.9	80-120%
Alkalinity, Total as CaCO3	GN21995	5.0	2.0	mg/l	100	95.0	94.9	90-110%
Bromide	GP10946/GN21930	0.050	0.0	mg/l	20	19.7	98.5	90-110%
Chloride	GP10946/GN21930	0.50	0.0	mg/l	20	20.0	100.0	90-110%
Fluoride	GP10946/GN21930	0.10	0.0	mg/l	10	9.62	96.2	90-110%
Iron Reducing Bacteria	MB251	25	<25	CFU/ml				
Nitrogen, Nitrate	GP10946/GN21930	0.010	0.0	mg/l	4.52	4.44	98.3	90-110%
Nitrogen, Nitrite	GP10946/GN21930	0.0040	0.0	mg/l	6.09	6.20	101.8	90-110%
Phosphorus, Total	GP11000/GN22026	0.010	0.0	mg/l	0.304	0.33	109.2	80-120%
Slime Forming Bacteria	MB252	500	<500	CFU/ml				
Solids, Total Dissolved	GN21944	10	0.0	mg/l	400	395	98.8	90-110%
Specific Conductivity	GP10973/GN21980			umhos/cm	99.7	93.1	93.4	90-110%
Sulfate	GP10946/GN21930	0.50	0.0	mg/l	30	29.4	98.0	90-110%
Sulfate Reducing Bacteria	MB253	200	<200	CFU/ml				
pH	GN21969			su	8.00	8.00	100.0	99.3-100.7%

Associated Samples:

Batch MB251: D50582-1B
Batch MB252: D50582-1B
Batch MB253: D50582-1B
Batch GN21944: D50582-1
Batch GN21969: D50582-1
Batch GN21995: D50582-1
Batch GN21996: D50582-1
Batch GN21997: D50582-1
Batch GP10946: D50582-1
Batch GP10973: D50582-1
Batch GP11000: D50582-1

(*) Outside of QC limits

10.1
10

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D50582
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN21995	D50545-1	mg/l	169	167	1.0	0-20%
Phosphorus, Total	GP11000/GN22026	D50441-1	mg/l	0.065	0.067	3.0	0-20%
Solids, Total Dissolved	GN21944	D50439-1	mg/l	600	632	5.2	0-20%
Specific Conductivity	GP10973/GN21980	D50582-1	umhos/cm	744	736	1.1	0-20%

Associated Samples:

Batch GN21944: D50582-1

Batch GN21995: D50582-1

Batch GP10973: D50582-1

Batch GP11000: D50582-1

(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D50582
Account: WILLCOF - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO ₃	GN21995	D50545-1	mg/l	169	100	261	92.1	80-120%
Bromide	GP10946/GN21930	D50578-2	mg/l	0.0	2.5	2.6	104.0	80-120%
Bromide	GP10946/GN21930	D50578-2	mg/l	0.054	2.5	2.6	104.0	80-120%
Chloride	GP10946/GN21930	D50578-2	mg/l	36.3	500	525	95.8	80-120%
Chloride	GP10946/GN21930	D50578-2	mg/l	46.2	500	525	95.8	80-120%
Fluoride	GP10946/GN21930	D50578-2	mg/l	3.2	2.5	2.9	105.6	80-120%
Fluoride	GP10946/GN21930	D50578-2	mg/l	0.26	2.5	2.9	105.6	80-120%
Nitrogen, Nitrate	GP10946/GN21930	D50578-2	mg/l	13.2	28.3	42.4	103.4	80-120%
Nitrogen, Nitrate	GP10946/GN21930	D50578-2	mg/l	17.6	28.3	42.4	103.4	80-120%
Nitrogen, Nitrite	GP10946/GN21930	D50578-2	mg/l	0.0084	0.305	0.32	102.3	80-120%
Nitrogen, Nitrite	GP10946/GN21930	D50578-2	mg/l	0.0	0.305	0.32	102.3	80-120%
Phosphorus, Total	GP11000/GN22026	D50441-1	mg/l	0.065	0.40	0.42	88.8	80-120%
Sulfate	GP10946/GN21930	D50578-2	mg/l	19.5	10	24.8	108.3	80-120%
Sulfate	GP10946/GN21930	D50578-2	mg/l	14.0	10	24.8	108.3	80-120%

Associated Samples:

Batch GN21995: D50582-1

Batch GP10946: D50582-1

Batch GP11000: D50582-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.3
10

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D50582
Account: WILLCOF - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: WPX SG 31-32

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO ₃	GN21995	D50545-1	mg/l	169	100	261	0.1	20%
Bromide	GP10946/GN21930	D50578-2	mg/l	0.0	2.5	2.6	0.0	20%
Bromide	GP10946/GN21930	D50578-2	mg/l	0.054	2.5	2.6	0.0	20%
Chloride	GP10946/GN21930	D50578-2	mg/l	36.3	500	516	1.7	20%
Chloride	GP10946/GN21930	D50578-2	mg/l	46.2	500	516	1.7	20%
Fluoride	GP10946/GN21930	D50578-2	mg/l	3.2	2.5	2.9	0.0	20%
Fluoride	GP10946/GN21930	D50578-2	mg/l	0.26	2.5	2.9	0.0	20%
Nitrogen, Nitrate	GP10946/GN21930	D50578-2	mg/l	13.2	28.3	42.0	0.9	20%
Nitrogen, Nitrate	GP10946/GN21930	D50578-2	mg/l	17.6	28.3	42.0	0.9	20%
Nitrogen, Nitrite	GP10946/GN21930	D50578-2	mg/l	0.0084	0.305	0.31	3.2	20%
Nitrogen, Nitrite	GP10946/GN21930	D50578-2	mg/l	0.0	0.305	0.31	3.2	20%
Phosphorus, Total	GP11000/GN22026	D50441-1	mg/l	0.065	0.40	0.420	0.0	20%
Sulfate	GP10946/GN21930	D50578-2	mg/l	19.5	10	24.8	0.0	20%
Sulfate	GP10946/GN21930	D50578-2	mg/l	14.0	10	24.8	0.0	20%

Associated Samples:

Batch GN21995: D50582-1

Batch GP10946: D50582-1

Batch GP11000: D50582-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4
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