Western Water & Land, Inc.

October 2, 2013

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

**RE: GM 11-28 Drill Pad Baseline Results Report, July and August 2013 Event**

Dear Mr. Danforth,

Western Water & Land, Inc. (WWL) has completed the initial baseline water sampling for the WPX Energy Rocky Mountain LLC (WPX) GM 11-28 Drill Pad in accordance with Colorado Oil and Gas Conservation Commission (COGCC) Rule 609. The GM 11-28 drill pad is located in NW ¼, NW ¼ Section 28, Township 6 South, Range 96 West, 6th PM.

In accordance with Rule 609, the baseline water quality evaluation considered all water sources (domestic wells or springs) within a 0.5-mile radius of the referenced drill pad (oil and gas location). A preliminary screening of the groundwater sources was completed to identify the sources that are potentially available for sampling pending the consent of the structure owners. Each potentially available water source was then evaluated to identify the preferred sources for the baseline program. If the number of potentially available sources was four or less, all of the sources were included in the list of preferred sources. If more than four sources were potentially available, the sources were prioritized based on WWL's hydrologic expertise and in accordance with Rule 609. A complete description of the water source evaluation process and results are provided in the water source evaluation report (GM 11-28 Drill Pad Baseline Water Quality Evaluation, June 3, 2013).

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

## FIELD SAMPLING ACTIVITIES

As described in the GM 11-28 Drill Pad Baseline Water Quality Evaluation, June 3, 2013, two potential sampling locations were identified for field sampling of water quality consistent with requirements of Rule 609. 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. Two wells were identified as preferred sampling locations:

- Water Well Permit No. 151879, and
- Water Well Permit No. 185334 (Puckett Livestock Well No. 1)


743 Horizon Court Suite 330, Grand Junction, CO 81506
Phone: (970) 242-0170 Fax: (970) 242-0270

WPX was granted permission to sample Water Well Permit No. 151879 and Water Well Permit No. 185334 (Puckett Livestock Well No. 1).

Two samples and a duplicate sample were collected for the GM 11-28 Drill Pad. Sample GM 323-28-151879 and sample GM 323-28-172632 (duplicate sample) were collected from Water Well Permit No. 151879 on July 2nd, 2013, and sample GM 11-28-185334 was collected from Water Well Permit No. 185334 (Puckett Livestock Well No. 1) on August 8th, 2013. Both samples met the 0.5-mile radius criteria under Rule 609 for Drill Pad GM 11-28, Drill Pad GM 323-28, and Drill Pad GR 14-28. Upon arrival to the Puckett Land Company property, WWL personnel spoke with the property manager Mr. Craig Kohles and located a sampling location for Water Well Permit No. 151879. Water Well Permit No. 185334 (Puckett Livestock Well No. 1) was not functioning during the initial field sampling visit; WWL returned to sample the well on August 8th, 2013 after the pump was repaired. See Figure 1 for the sampled locations. Photographs of the sampling sites are shown in Attachment A.

All sampling procedures followed the COGCC Model Sampling and Analysis Plan (SAP) protocols. Sampling Method 1 for wells with pumps and effervescent samples, described in Version 1 of the COGCC Model SAP, was used to collect these samples.

Samples were carefully packed in plastic ice chests (coolers) with ice and shipped to the analytical laboratory (ALS Laboratory, Fort Collins, 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 quality control evaluations of cation-anion balance (CAB) and total dissolved solids (calculated/measured ratio), and assigned additional qualifiers to analytical results as necessary.

### Field Procedures

WWL conducted field sampling procedures in accordance with the COGCC Model SAP. Sample GM 323-28-151879 (Water Well Permit No. 151879), sample GM 323-28-172632 (duplicate sample, Water Well Permit No. 151879), and sample GM 11-28-185334 (Water Well Permit No. 185334) were collected by direct filling methods; dissolved gas sampling was done using Method 1 for wells with pumps and effervescent samples. 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 on the COC matched the requirements of Rule 609. DRO (diesel range organics) and GRO (gasoline range organics) were designated on the COC in place of TPH, a required analysis for Rule 609. No other errors or pertinent information was observed, and no corrections were needed.

### Sample Receipt

The samples collected on July 2nd, 2013 were received in a single cooler within the temperature range criteria (4°C ± 2°C). Custody seals were intact. The lab receipt form reported headspace bubbles less than green pea size for three VOA vials in sample GM 323-28-151879; the remaining three VOA vials were received with no headspace. No qualifiers were assigned to results based on sample receipt conditions. Sample GM 11-28-185334 from August 8th, 2013 was received in a single cooler within the temperature range criteria (4°C ± 2°C). Custody seals were intact. The lab reported headspace bubbles

less than green pea size in VOA vials for sample GM 11-28-185334. In addition, the receipt form noted trip blanks listed on the COC; however, no trip blanks arrived in shipment. 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 and specific conductance for sample GM 11-28-185334. ALS reported in the lab summary narrative that the analyses for pH and specific conductance was performed outside of internal lab holding time of 4 days from sample receipt, but did not designate any qualifiers to the results. WWL has designated an "H" qualifier in the final results for lab pH and specific conductance; these 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 the following modifications: Total phosphorous was analyzed using Method 365.2. Gasoline Range Organics (TPH volatiles) were analyzed using Method SW8260_25 Revision C. Diesel Range Organics (TPH extractables) were analyzed according to SW846 8000C and 8015D.

**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 with no deviations observed except as applied to increased dilution factors. All analyzed metals had dilution factors of 10. Chloride had a dilution factor of 10 for all three samples, and sulfate had a dilution factor of 10 for sample GM 11-28-185334. ALS reports samples at the detection limit as "undetected" or "U" rather than reporting results as less than the detection reporting limit, e.g. < 0.05ug/L.

**Completeness**
Data completeness is a measure of requested analysis and received results. The analytical constituents required under Rule 609 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 Rule 609. 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 percent, 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 10 percent, and may assign a qualifier for CAB percentages between 5 and less than 10 percent. The CAB calculations for the samples are as follows:

- GM 323-28-151879: 0.73 %
- GM 323-28-172632 (GM 323-28-151879 duplicate): 1.6 %
- GM 11-28-185334: 2.82 %

The analytical results for cations and anions for the samples were not qualified on the basis of the CAB. See Attachment B, Data Quality Review Sheets.

**TDS**
The ratio of laboratory-measured TDS versus calculated TDS were computed and ratios greater than 1.20 or less than 0.8 for a sample are cause for a review of major ion reporting errors. No sample results were rejected on the basis of the TDS ratio.

In general, WWL will assign a qualifier (an estimated result) when TDS ratios are 1.5 or greater, and may assign a qualifier for TDS ratios between 1.2 and less than 1.5. The TDS calculations for the samples are as follows:

- GM 323-28-151879: 1.16
- GM 323-28-172632 (GM 323-28-151879 duplicate): 1.17
- GM 11-28-185334: 1.17

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 percent. One field duplicate (sample GM 323-28-172632) was collected for well permit number 151879 (sample GM 323-28-151879). No lab RPD values exceeded 20 percent. The results for field turbidity showed an RPD of 87 percent; however, turbidity can be variable with time in groundwater from infrequently pumped wells, and no qualifiers were assigned to turbidity based on RPD results.

**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 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 surrogate recoveries were within the acceptance criteria with the following exception for sample GM 11-28-185334:

| **Surrogate** | **QC Sample** | **Direction** |
|---|---|---|
| O-terphenyl | **MB and LCS/LCSD** | **High** |

The sample was non-detected for TEPH/DRO, and all spike recoveries in the batch were within limits. No further action was taken (ALS 2013). All other 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.

**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. No qualifiers were assigned by the laboratory because of RPD values exceeding the laboratory acceptance criteria. Data Quality Review Sheets are presented in Attachment B.

**Summary**
ALS Laboratories assigned analytical results that were undetected with a "U" qualifier. WWL assigned the qualifier "H" to analytes not meeting holding times; these results are considered estimated. No other quality control qualifiers were assigned to the analytical results by ALS Laboratories and WWL. See Attachment C for individual parameters that were qualified.

**ANALYTICAL RESULTS**

Laboratory analysis was performed by ALS Environmental (ALS), in Fort Collins, Colorado, in accordance with the analytical schedule described in Rule 609. The analytical results are summarized in Attachment C; the data are qualified as indicated. A geochemical interpretation of the analytical results can be provided upon request.

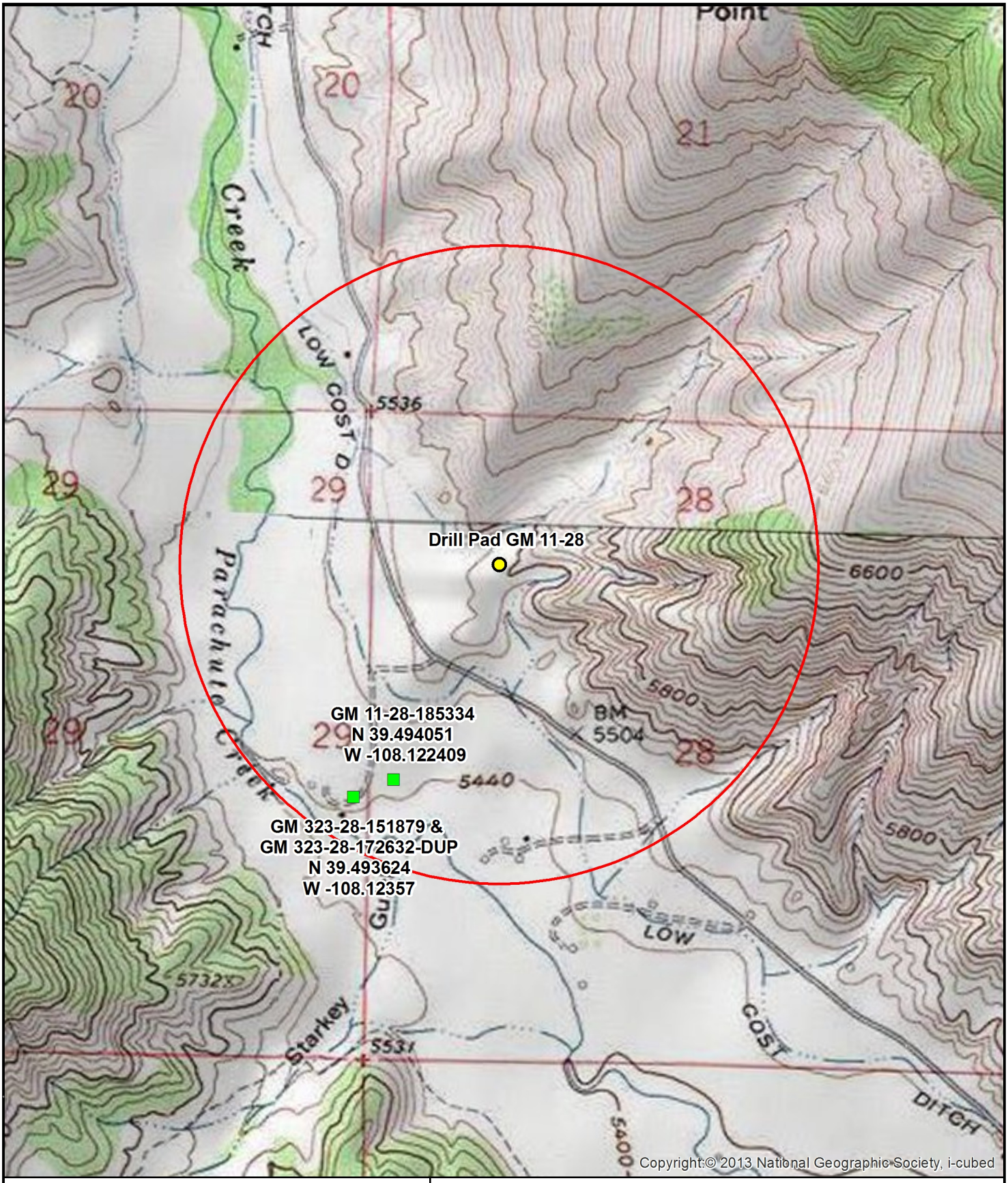
If you have any questions or concerns, please contact me at (970) 242-0170.

Sincerely,

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

Attachments

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




Legend

Sample Location(s)

Drill Pad GM 11-28

0.5-Mile Radius Evaluation Area

N

Feet

1,000 500 0 1,000

1:13,000

**Figure 1: GM 11-28 Sample Location Map**
**NW1/4, NW1/4, S28, T6S, R96W, 6 PM**

Garfield County, Colorado

WPX Energy Rocky Mountain LLC

Basemap Source: Bing Maps and Esri ArcGIS Online

Western Water & Land, Inc.
Applications in Earth Science

**ATTACHMENT A**

**Photographs**

**Photo 1. Puckett Well Sampling Location (GM 323-28-151879 & 172632-dup)**


**Photo 2. Puckett Well Sampling Location (GM 323-28-151879 & 172632-dup); Point Before Softener**

**Photo 3. Puckett Well (GM 323-28-151879 & 172632-dup); Well Piped to House**


**Photo 4. Puckett Well Sampling Location (GM 11-28-185334)**


**Photo 5. Puckett Well (GM 11-28-185334)**


**Photo 6. Puckett Well (GM 11-28-185334); Highly Effervescent at Laminar Flow**

# ATTACHMENT B

## Data Quality Review Sheets

# DATA QUALITY REVIEW SHEET

| | | | |
|---|---|---|---|
| Facility ID: | 752711 | Project: | WPX BWQ |
| Station Name: | Puckett 151879 | Lab Work Order: | 1307028 |
| Sample Date: | 7/2/2013 | QA/QC Review Date: | 9/12/2013 |
| Field Sample ID: | GM 323-28-151879 | Reviewer: | S. Goodwin, J.Pahler |

| **Field Sampling Data Review** | **Yes** | **No** | **N/A** |
|---|---|---|---|
| 1. Well properly purged? | ☐ | ☐ | ☒ |
| 2. Flow rate reduced prior to sampling? | ☒ | ☐ | ☐ |
| 3. Water quality parameters stable prior to sampling? | ☒ | ☐ | ☐ |
| 4. Field instruments calibrated properly? | ☒ | ☐ | ☐ |
| 5. Sampling methods performed according to SAP procedures? | ☒ | ☐ | ☐ |
| 6. Procedures consistent with obtaining a representative sample? | ☒ | ☐ | ☐ |
| **Lab Data Report Review** | | | |
| 7. Proper sample custody maintained until laboratory receipt? | ☒ | ☐ | ☐ |
| 8. Any discrepancies noted on the lab receipt form? *If yes, list in the comments section.* | ☒ | ☐ | ☐ |
| 9. All samples analyzed for the requested analyses? | ☒ | ☐ | ☐ |
| 10. Proper laboratory methods used? | ☒ | ☐ | ☐ |
| 11. All sample holding times met? | ☒ | ☒ | ☐ |
| 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? | ☒ | ☐ | ☐ |
| 13. Lab qualifiers for data (other than non-detect)? *List in comments*. | ☐ | ☒ | ☐ |
| 14. Are corrective actions required? *If yes, please list actions and dates to be completed by:* | ☐ | ☒ | ☐ |

| *Corrective Action* | *Date to be completed* |
|---|---|
| None | |
| | |
| | |

| **Calculated Parameters** | **Calculated Value** | **Lab Value** | **Ratio/Percent Difference** | **Acceptable Limit** | **Meets QC Criteria?** |
|---|---|---|---|---|---|
| Cation/Anion Balance, % (CAB) | 0.728 | NA | NA | ±5% | ☒ |
| Total Dissolved Solids, mg/L (TDS) | 996 | 860 | 1.16 | 0.8 – 1.2 | ☒ |
| Specific Conductance, µS/cm (SpC) | 1284 | 1311 | 0.98 | 0.8 – 1.2 | ☒ |

Comments:

One small bubble in one VOA vial during sample collection, but sample arrived with headspace bubbles less than green pea size. Chloride dilution factor increased to 10 due to high concentrations.

# DATA QUALITY REVIEW SHEET

| | | | |
|---|---|---|---|
| Facility ID: | 752711 | Project: | WPX BWQ |
| Station Name: | Puckett 151879 | Lab Work Order: | 1307028-2 |
| Sample Date: | 7/2/2013 | QA/QC Review Date: | 9/12/2013 |
| Field Sample ID: | GM 323-28-172632 | Reviewer: | S. Goodwin |

| **Field Sampling Data Review** | **Yes** | **No** | **N/A** |
|---|---|---|---|
| 1. Well properly purged? | ☐ | ☐ | ☒ |
| 2. Flow rate reduced prior to sampling? | ☒ | ☐ | ☐ |
| 3. Water quality parameters stable prior to sampling? | ☒ | ☐ | ☐ |
| 4. Field instruments calibrated properly? | ☒ | ☐ | ☐ |
| 5. Sampling methods performed according to SAP procedures? | ☒ | ☐ | ☐ |
| 6. Procedures consistent with obtaining a representative sample? | ☒ | ☐ | ☐ |
| **Lab Data Report Review** | | | |
| 7. Proper sample custody maintained until laboratory receipt? | ☒ | ☐ | ☐ |
| 8. Any discrepancies noted on the lab receipt form? *If yes, list in the comments section.* | ☒ | ☐ | ☐ |
| 9. All samples analyzed for the requested analyses? | ☒ | ☐ | ☐ |
| 10. Proper laboratory methods used? | ☒ | ☐ | ☐ |
| 11. All sample holding times met? | ☒ | ☒ | ☐ |
| 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? | ☒ | ☐ | ☐ |
| 13. Lab qualifiers for data (other than non-detect)? *List in comments*. | ☐ | ☒ | ☐ |
| 14. Are corrective actions required? *If yes, please list actions and dates to be completed by:* | ☐ | ☒ | ☐ |

| *Corrective Action* | *Date to be completed* |
|---|---|
| None | |
| | |
| | |

| **Calculated Parameters** | **Calculated Value** | **Lab Value** | **Ratio/Percent Difference** | **Acceptable Limit** | **Meets QC Criteria?** |
|---|---|---|---|---|---|
| Cation/Anion Balance, % (CAB) | 1.645 | NA | NA | ±5% | ☒ |
| Total Dissolved Solids, mg/L (TDS) | 996 | 850 | 1.16 | 0.8 – 1.2 | ☒ |
| Specific Conductance, µS/cm (SpC) | 1269 | 1307 | 0.97 | 0.8 – 1.2 | ☒ |

Comments:

Sample is duplicate of GM 323-28-151879. No effervescence noted during field sampling. Sample arrived with headspace bubbles less than green pea size. Chloride dilution factor increased to 10 due to high concentration.

# DATA QUALITY REVIEW SHEET

| | | | |
|---|---|---|---|
| Facility ID: | 752711 | Project: | WPX BWQ |
| Station Name: | Puckett 185334 | Lab Work Order: | 1308154 |
| Sample Date: | 8/8/2013 | QA/QC Review Date: | 9/13/2013 |
| Field Sample ID: | GM 11-28-185334 | Reviewer: | S. Goodwin, J. Pahler |

| **Field Sampling Data Review** | **Yes** | **No** | **N/A** |
|---|---|---|---|
| 1. Well properly purged? | ☒ | ☐ | ☐ |
| 2. Flow rate reduced prior to sampling? | ☒ | ☐ | ☐ |
| 3. Water quality parameters stable prior to sampling? | ☒ | ☐ | ☐ |
| 4. Field instruments calibrated properly? | ☒ | ☐ | ☐ |
| 5. Sampling methods performed according to SAP procedures? | ☒ | ☐ | ☐ |
| 6. Procedures consistent with obtaining a representative sample? | ☒ | ☐ | ☐ |
| **Lab Data Report Review** | | | |
| 7. Proper sample custody maintained until laboratory receipt? | ☒ | ☐ | ☐ |
| 8. Any discrepancies noted on the lab receipt form? *If yes, list in the comments section.* | ☒ | ☐ | ☐ |
| 9. All samples analyzed for the requested analyses? | ☒ | ☐ | ☐ |
| 10. Proper laboratory methods used? | ☒ | ☐ | ☐ |
| 11. All sample holding times met? | ☐ | ☒ | ☐ |
| 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? | ☐ | ☒ | ☐ |
| 13. Lab qualifiers for data (other than non-detect)? *List in comments*. | ☒ | ☐ | ☐ |
| 14. Are corrective actions required? *If yes, please list actions and dates to be completed by:* | ☐ | ☒ | ☐ |

| *Corrective Action* | *Date to be completed* |
|---|---|
| None | |
| | |
| | |

| **Calculated Parameters** | **Calculated Value** | **Lab Value** | **Ratio/Percent Difference** | **Acceptable Limit** | **Meets QC Criteria?** |
|---|---|---|---|---|---|
| Cation/Anion Balance, % (CAB) | 2.82 | 2.7 | 1.04 | ±5% | ☒ |
| Total Dissolved Solids, mg/L (TDS) | 963 | 820 | 1.17 | 0.8 – 1.2 | ☒ |
| Specific Conductance, µS/cm (SpC) | 1224 | 1249 | 0.98 | 0.8 – 1.2 | ☒ |

Comments:

Field sample had strong effervescence and small bubble headspace in VOA vials. Sample arrived with headspace bubbles less than green pea size. Receipt form noted the COC listed trip blanks in the cooler however no trip blanks arrived in shipment. Hold times for pH, specific conductance, and DRO exceeded by 1 day. WWL designated an “H” qualifier to lab pH and specific conductance. Dissolved gas sample had pH > 2 at time of analysis. Chloride and sulfate had increased dilution factors of 10 due to high concentrations. Method blank below MDL for DRO. MB, LCS, and LCSD surrogate recovery exceeded upper recovery limits by 6%, 3%, and 12% respectively.

# ATTACHMENT C

## Summary of Analytical Results

| GM 11-28 BWQ Analytical Results Summary | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Station Name** | | | **Puckett 151879** | | | | | | **Puckett 151879** | | | | | | **Puckett 185334** | | | | | | **Trip Blank** | | | | | |
| **Facility ID** | | | **752711** | | | | | | **752711** | | | | | | **752722** | | | | | | **752711** | | | | | |
| **Field Sample ID** | | | **GM 323-28-151879** | | | | | | **GM 323-28-172632[2]** | | | | | | **GM 11-28-185334** | | | | | | **Trip Blank** | | | | | |
| **Sample Date** | | | **7/2/2013 11:00** | | | | | | **7/2/2013 11:50** | | | | | | **8/8/2013 11:00** | | | | | | **7/2/2013 0:00** | | | | | |
| **Lab Sample ID** | | | **1307028-1** | | | | | | **1307028-2** | | | | | | **1308154-1** | | | | | | **1307028-3** | | | | | |
| | **Reporting Units** | **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** | **Result** | **Lab Qual** | **WWL Qual** | **RL** | **MDL** | **DF** |
| **Bacteria[1]** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Iron Related Bacteria | nu | BART | 1 | | | | | 1 | 1 | | | | | 1 | 1 | | | 1 | | 1 | | | | | | |
| Slime forming bacteria | nu | BART | 1 | | | | | 1 | 1 | | | | | 1 | 1 | | | 1 | | 1 | | | | | | |
| Sulfate Reducing Bacteria | nu | BART | 1 | | | | | 1 | 1 | | | | | 1 | 1 | | | 1 | | 1 | | | | | | |
| **Dissolved Gases** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ethane | ug/l | RSK175 | 2 | U | | 2 | 2 | 1 | 2 | U | | 2 | 2 | 1 | 2 | U | | 2 | 2 | 1 | | | | | | |
| Methane | ug/l | RSK175 | 18 | | | 1 | 1 | 1 | 22 | | | 1 | 1 | 1 | 1 | U | | 1 | 1 | 1 | | | | | | |
| Propane | ug/l | RSK175 | 1 | U | | 1 | 1 | 1 | 1 | U | | 1 | 1 | 1 | 1 | U | | 1 | 1 | 1 | | | | | | |
| **Dissolved Metals** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Barium | ug/l | EPA200.8 | 47 | | | 1 | 0.3 | 10 | 46 | | | 1 | 0.3 | 10 | 27 | | | 1 | 0.3 | 10 | | | | | | |
| Boron | ug/l | EPA200.8 | 170 | | | 50 | 15 | 10 | 170 | | | 50 | 15 | 10 | 180 | | | 50 | 15 | 10 | | | | | | |
| Calcium | ug/l | EPA200.8 | 120000 | | | 1000 | 65 | 10 | 110000 | | | 1000 | 65 | 10 | 120000 | | | 1000 | 65 | 10 | | | | | | |
| Iron | ug/l | EPA200.8 | 100 | U | | 100 | 30 | 10 | 100 | U | | 100 | 30 | 10 | 100 | U | | 100 | 30 | 10 | | | | | | |
| Magnesium | ug/l | EPA200.8 | 53000 | | | 100 | 30 | 10 | 53000 | | | 100 | 30 | 10 | 47000 | | | 100 | 30 | 10 | | | | | | |
| Manganese | ug/l | EPA200.8 | 53 | | | 2 | 0.6 | 10 | 52 | | | 2 | 0.6 | 10 | 100 | | | 2 | 0.6 | 10 | | | | | | |
| Potassium | ug/l | EPA200.8 | 7700 | | | 1000 | 300 | 10 | 7700 | | | 1000 | 300 | 10 | 5800 | | | 1000 | 300 | 10 | | | | | | |
| Selenium | ug/l | EPA200.8 | 8 | | | 1 | 0.5 | 10 | 7.7 | | | 1 | 0.5 | 10 | 2.5 | | | 1 | 0.5 | 10 | | | | | | |
| Sodium | ug/l | EPA200.8 | 100000 | | | 1000 | 300 | 10 | 100000 | | | 1000 | 300 | 10 | 110000 | | | 1000 | 300 | 10 | | | | | | |
| Strontium | ug/l | EPA200.8 | 1600 | | | 1 | 0.3 | 10 | 1600 | | | 1 | 0.3 | 10 | 1500 | | | 1 | 0.3 | 10 | | | | | | |
| **Field_Parameters** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bubbles | nu | Field | Low | | | | | 1 | None | | | | | 1 | Low | | | | | 1 | | | | | | |
| Color | None | Field | NM | | | | | 1 | NM | | | | | 1 | Clear | | | | | | | | | | | |
| Conductivity, Field | uS/cm | Field | 1046 | | | | | 1 | 1038 | | | | | 1 | 1099 | | | | | 1 | | | | | | |
| Depth to Water | ft | Field | NM | | | | | 1 | NM | | | | | 1 | 26.99 | | | | | 1 | | | | | | |
| Discharge, measured | gpm | Field | 5.2 | | | | | 1 | NM | | | | | 1 | 12.4 | | | | | 1 | | | | | | |
| Dissolved Oxygen, Field | mg/l | Field | 2.43 | | | | | 1 | 1.74 | | | | | 1 | 1.15 | | | | | 1 | | | | | | |
| Dissolved Oxygen, Field,% | % | Field | 23.7 | | | | | 1 | 16.9 | | | | | 1 | 12.4 | | | | | 1 | | | | | | |
| Effervescence | nu | Field | None | | | | | 1 | None | | | | | 1 | Strong | | | | | 1 | | | | | | |
| Odor | nu | Field | None | | | | | 1 | None | | | | | 1 | None | | | | | 1 | | | | | | |
| ORP, field | mv | Field | NM | | | | | 1 | 81.3 | | | | | 1 | 61.1 | | | | | 1 | | | | | | |
| pH, Field | s.u. | Field | 7.16 | | | | | 1 | 7.11 | | | | | 1 | 7.3 | | | | | 1 | | | | | | |
| Specific Conductivity, Field | uS/cm | Field | 1312 | | | | | 1 | 1317 | | | | | 1 | 1265 | | | | | 1 | | | | | | |
| Temperature, Water | Deg C | Field | 14.4 | | | | | 1 | 13.9 | | | | | 1 | 18 | | | | | 1 | | | | | | |
| Turbidity, field | NTUs | Field | 8.53 | | | | | 1 | 3.37 | | | | | 1 | 8.46 | | Q | | | 1 | | | | | | |

| GM 11-28 BWQ Analytical Results Summary | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Station Name** | | | **Puckett 151879** | | | | | | **Puckett 151879** | | | | | | **Puckett 185334** | | | | | | **Trip Blank** | | | | | |
| **Facility ID** | | | **752711** | | | | | | **752711** | | | | | | **752722** | | | | | | **752711** | | | | | |
| **Field Sample ID** | | | **GM 323-28-151879** | | | | | | **GM 323-28-172632[2]** | | | | | | **GM 11-28-185334** | | | | | | **Trip Blank** | | | | | |
| **Sample Date** | | | **7/2/2013 11:00** | | | | | | **7/2/2013 11:50** | | | | | | **8/8/2013 11:00** | | | | | | **7/2/2013 0:00** | | | | | |
| **Lab Sample ID** | | | **1307028-1** | | | | | | **1307028-2** | | | | | | **1308154-1** | | | | | | **1307028-3** | | | | | |
| | **Reporting Units** | **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** | **Result** | **Lab Qual** | **WWL Qual** | **RL** | **MDL** | **DF** |
| **Inorganics** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alkalinity AS CaCO3, Total | mg/l | SM2320B | 500 | | | 20 | | 1 | 510 | | | 20 | | 1 | 450 | | | 20 | | 1 | | | | | | |
| Alkalinity, Bicarbonate as CaCO3 | mg/l | SM2320B | 500 | | | 20 | | 1 | 510 | | | 20 | | 1 | 450 | | | 20 | | 1 | | | | | | |
| Alkalinity, Carbonate as CaCO3 | mg/l | SM2320B | 20 | U | | 20 | | 1 | 20 | U | | 20 | | 1 | 20 | U | | 20 | | 1 | | | | | | |
| Bromide | mg/l | EPA300.0 | 0.21 | | | 0.2 | 0.06 | 1 | 0.2 | U | | 0.2 | 0.06 | 1 | 0.2 | U | | 0.2 | 0.06 | 1 | | | | | | |
| Chloride | mg/l | EPA300.0 | 31 | | | 2 | 0.6 | 10 | 31 | | | 2 | 0.6 | 10 | 27 | | | 2 | 0.6 | 10 | | | | | | |
| Fluoride | mg/l | EPA300.0 | 1.6 | | | 0.1 | 0.03 | 1 | 1.6 | | | 0.1 | 0.03 | 1 | 1.6 | | | 0.1 | 0.03 | 1 | | | | | | |
| Nitrate as N | mg/l | EPA300.0 | 0.91 | | | 0.2 | 0.06 | 1 | 0.89 | | | 0.2 | 0.06 | 1 | 0.28 | | | 0.2 | 0.06 | 1 | | | | | | |
| Nitrite as N | mg/l | EPA300.0 | 0.1 | U | | 0.1 | 0.03 | 1 | 0.1 | U | | 0.1 | 0.03 | 1 | 0.1 | U | | 0.1 | 0.03 | 1 | | | | | | |
| pH | s.u. | SM4500-H | 7.45 | | | 0.1 | | 1 | 7.48 | | | 0.1 | | 1 | 7.58 | | H | 0.1 | | 1 | | | | | | |
| Specific Conductivity | umhos/cm | SM2510B | 1311 | | | 1 | | 1 | 1307 | | | 1 | | 1 | 1249 | | H | 1 | | 1 | | | | | | |
| Sulfate | mg/l | EPA300.0 | 180 | | | 1 | 0.3 | 1 | 180 | | | 1 | 0.3 | 1 | 200 | | | 10 | 3 | 10 | | | | | | |
| Total Dissolved Solids | mg/l | SM2540C | 860 | | | 20 | | 1 | 850 | | | 20 | | 1 | 820 | | | 20 | | 1 | | | | | | |
| Total Phosphorous | mg/l | EPA365.2 | 0.05 | U | | 0.05 | 0.015 | 1 | 0.05 | U | | 0.05 | 0.015 | 1 | 0.05 | U | | 0.05 | 0.015 | 1 | | | | | | |
| **Organics** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Diesel Range Organics | mg/l | SW8015M | 0.5 | U | | 0.5 | 0.15 | 1 | 0.5 | U | | 0.5 | 0.15 | 1 | 0.5 | U | | 0.5 | 0.15 | 1 | | | | | | |
| Gasoline Range Organics | ug/l | SW8260_25 | 100 | U | | 100 | 30 | 1 | 100 | U | | 100 | 30 | 1 | 100 | U | | 100 | 30 | 1 | 100 | U | | 100 | 30 | 1 |
| **VOAs** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Benzene | ug/l | SW8260_25 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 |
| Ethylbenzene | ug/l | SW8260_25 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 |
| M+P-Xylene | ug/l | SW8260_25 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 |
| o-Xylene | ug/l | SW8260_25 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 |
| Toluene | ug/l | SW8260_25 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 | 1 | U | | 1 | 0.3 | 1 |

Notes:

NM = Not measured

Q = uncertain value; equipment calibration failure

U = not detected at the reporting limit

H = estimated, analyzed outside of holding time

[1] A result of 1 indicates the presence of bacteria

[2] GM 323-28-151879 Duplicate

# ATTACHMENT D

## Field Monitoring Forms

# WPX BWQ Groundwater Monitoring Field Form

| Project Information | | | |
|---|---|---|---|
| Project: | GM 11-28 BWQ | Sample Purpose: | Baseline |
| Site Name (Well Pad): | GM 11-28 | Site API: | N/A |
| Station Name: | Puckett 185334 | Sample Date: | 8-8-13 |
| COGCC Facility ID: | 752722 | Start Time: | 0940 |
| Field Sample ID: | GM11-28-185334 | End Time: | 1215 |
| Landowner Name: | Puckett Land Company | Sample Time: | 1100 |
| Landowner Address: | N/A | Sample Team: | SLG, NWS |
| Water Right/Well Owner: | Puckett Land Company | Observer: | Nick |
| Water Right/Well Permit: | 185334 | Lead Signature/Date: | 8-12-13 |
| Receipt Number: | 0380479 | | |

| Station Information | | | | | |
|---|---|---|---|---|---|
| Station Description: | Hose bib piped ~200 yds from well | | | | |
| Approximate Distance to Well Pad: | 1,000 ft | | | | |
| Station Type: | (Well) / Spring / Seep / Other: | | Water Use: | Domestic / Irrigation / (Livestock) | |
| Sampling Location: | Kitchen Tap / Pipe / Well House / (Hose bib) / Other: | | | | |
| GPS Location: | Zone 12S x 0747456 y 4375554 z 5458' | | | | |
| Total Depth (ft): | 120 | Static Depth to Water (ft): | 26.99 | Well diameter (in): | 5 |
| Purge Volume (gal) | total = 517 gal before sample | | | | |

| Weather Conditions | | | |
|---|---|---|---|
| Sky: | Clear / Scattered / Cloudy / (Overcast) | Estimated Air Temp (deg F): | 65-70° |
| Precipitation: | (None) / Light / Moderate / Heavy | Precip Type: | (None) / Rain / Sleet / Hail / Snow |
| Wind: | Calm / (Light) / Mod / Strong | Wind Speed/Direction: | 0 |

**Field Measurements**

| Parameter | Units | Reading | Time | Flag Code | Instrument | In-situ or Container | Comments |
|---|---|---|---|---|---|---|---|
| Water Temp | deg C | 18.0 | 1153 | | YSI | C | |
| pH | s.u. | 7.30 | 1153 | | YSI | C | |
| Sp. Conductivity | uS/cm | 1265 | 1153 | | YSI | C | |
| Conductivity | uS/cm | 1099 | 1153 | | YSI | C | |
| DO Saturation | % | 12.4 | 1153 | | YSI | C | |
| DO | mg/L | 1.15 | 1153 | | YSI | C | |
| Baro Press | mmHg | 1226.8 | 1153 | | YSI | C | |
| ORP | RmV | 61.1 | 1153 | | YSI | C | |
| Turbidity | NTU | 8.46* | 1153 | AV, Q | | | 8.57, 8.02, 8.21* |
| Discharge | GPM | 12.4 | 1153 | | measured | C | |
| H2S | mg/L | NM | — | | | | |
| | | | | | | | |

| | | | |
|---|---|---|---|
| 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: 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 Groundwater Monitoring Field Form

Landowner Comments on water quality:

Had the well ~~aerated~~ ~~or~~ serviced recently, pump has been properly functioning for a couple of days, doesn't know anything about quality of water.

Additional information:

Turbidimeter: unable to calibrate correctly - kept giving a cal error. Plan to take a sample back to WWL office + read value there.
* took turbidity measurement, although it would not calibrate (above)
ORP would not stabilize. Got DO to stabilize + every thing else (turbidity exception), made the call to sample after purging ~5.7 gallons. Water level = 27.68

Parameters read very different from last purge to end sample time. Compared 3x, all read similar.

| Calibration Information | | | Date: 8-8-13 | | | Location: Permit no. 185334 | | |
|---|---|---|---|---|---|---|---|---|
| Instrument | Parameter | Units | Time | Calibration Standard Value | Calibration Standard Temp (°C) | Instrument Reading of Standard | Adjusted Reading | Comments |
| YSI Pro | pH | s.u. | 0906 | 7.00 | 21.0 | 6.91 | | |
| YSI Pro | pH | s.u. | 0909 | 10.01 | 20.8 | 9.93 | | |
| YSI Pro | pH | s.u. | 0913 | 4.01 | 20.6 | 3.97 | 4.00 | |
| YSI Pro | SpC | uS/cm | 0902 | 8974 | 21.4 | 9148 | 8977 | |
| | SpC | uS/cm | | | | | | Not calibrated |
| YSI Pro | DO | % | 0922 | | 18.5 | 85.4% | | Level mmHg |
| | DO | % | | | | | | Not calibrated |
| | ORP | RmV | | | | | | Not calibrated |
| MicroTPW | Turbidity | NTU | | | | | | See comment above * |

In office NTU w/ MicroTPi NTU: 7.24, 7.40, 7.59
Avg = 7.41

# WPX BWQ Groundwater Monitoring Field Form

**Well Purging Information**

| | | |
|---|---|---|
| Date: 8-8-13 | Purge Method: 3 casings + stabilized parameters | |
| Total Depth, ft ($d_t$): 120 | Static Depth to Water, ft ($d_w$): 26.99 (TOC) | Sample/Set Depth (ft): 50 |
| Bore Radius (in): ~~Q~~ | ~~Bore~~ Volume ($ft^3$): 12.63 ft³ (casings to dw) | Casing Radius (in): 2.5 |
| Total Volume (gal or $ft^3$): 94.5 gal | Total Volume x 3 (gal or $ft^3$): 283.5 gal | |

1 $ft^3$ = 7.48 gal

Bore Volume = $\pi r^2(d_t-d_w)$

~~$\pi \cdot 2.5^2 (120 - 26.99)$~~ $\pi \cdot (0.208\ ft)^2 (120\ ft - 26.99\ ft) = 12.63\ ft^3 \cdot 7.48\ g$ (93 ft) = 94.5 gal

| Purge # | Time | pH (s.u.) | SpC (uS/cm) | Cond (uS/cm) | DO (%) | DO (mg/L) | ORP (RmV) | Water Clarity (Poor/Mod / Good) | Effervescence (None /Slight/ Mod/Heavy) | Volume Purged (gal) | Cum Vol Purged (gal) | Temp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0957 | 6.64 | 1242 | 1002 | 14.6 | 1.46 | 184.0 | Good | None | 141.75 | 141.75 | 14.8 |
| 2 | 1001 | 6.85 | 1246 | 996 | 13.6 | 1.37 | 173.9 | Good | None | 47.25 | 189 | 14.5 |
| 3 | 1005 | 6.98 | 1248 | 997 | 11.2 | 1.13 | 165.4 | Good | Heavy | 47.25 | 236.25 | 14.4 |
| 4 | 1009 | 7.03 | 1250 | 996 | 10.7 | 1.08 | 156.7 | Good | Med | 47.25 | 283.5 | 14.4 |
| 5 | 1013 | 7.06 | 1249 | 996 | 11.0 | 1.11 | 149.3 | Good | Med | 47.25 | 330.75 | 14.4 |
| 6 | 1017 | 7.06 | 1254 | 1001 | 9.6 | 0.97 | 139.9 | Good | Heavy | 47.25 | 378.0 | 14.4 |
| 7 | 1024 | 7.08 | 1248 | 994 | 6.3 | 0.64 | 128.1 | Good | Heavy | 47.25 | 425.25 | 14.3 |
| 8 | 1035 | 7.15 | 1249 | 993 | 6.6 | 0.68 | 115.1 | Good | Heavy | 47.25 | 422.5 | 14.2 |
| 9 | 1041 | 7.15 | 1251 | 994 | 6.6 | 0.67 | 109.3 | Good | Heavy | 47.25 | 469.75 | 14.2 |
| 10 | 1045 | 7.14 | 1254 | 994 | 6.9 | 0.71 | 106.0 | Good | Heavy | 47.25 | 517.0 | 14.1 |

WL TOC 27.68 @1049

1049 water level after purging = 27.68 toc
water level after sample collection = 27.08 toc

Discharge: 5gal/24.35 = 12.4 gpm

| Purge # | Turbidity |
|---|---|
| 8 | 65.73, 68.97* Sediment |
| 9 | 3.46, 2.49* |
| 10 | 2.72, 3.46* |

# Groundwater Monitoring Field Form

| | | |
|---|---|---|
| Facility/Site: GM 323-28 15/8/14 | Date: 7-2-13 | Observer: Shelby |
| Station/Well: GM323-28-~~15533~~41 | Start Time: 1020 | Sampling |
| Location: Parachute Creek | End Time: 1130 | Team: NWS SLG |
| Description: at house inside house sampled | | Lead Signature: |
| Project: WPX BWQ | | Date: 7 / 31 / 13 |
| Sampling Instruments: YSI Pro | | |

## Well Purging Information

Well Depth ($d_t$): _____ ft Static depth to water ($d_w$): _____ ft Sample/Set Depth: _____ ft
Bore radius ($r_w$): _____ in/ft Bore volume ($\pi r^2(d_t-d_w)$): _____ $ft^3$/gal Casing radius ($r_c$): _____ in/ft
Casing volume ($\pi r^2(d_t-d_w)(7.48)$): _____ gal Total volume: _____ $ft^3$/gal Total x 3: _____ $ft^3$/gal

| Purge # | Time | Temp (°C) | pH (s.u.) | SpC/Cond (mS/cm, µS/cm) | DO (mg/L, %) | ORP (rmV) | Turb. (NTU) | Water Clarity (poor/ mod/ good) | Volume Purged (Gallons) | Cumulative Volume Purged (Gallons) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | N/A, house well, did not purge | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
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| | | | | | | | | | | |
| | | | | | | | | | | |

## Field Measurements at Time of Sampling

| Parameter | Reading | Time | Measurement (In situ/Container) | Instrument | Comments |
|---|---|---|---|---|---|
| Air Temp °C | | | | Thermometer | |
| Water Temp °C | 14.4 | 1125 | C | pHCon10, YSI | |
| pH (s.u.) | 7.16 | 1125 | C | pHCon10/YSI | |
| SpC/Conductivity (mS/cm, µS/cm) | 1312/ 1046 | 1125 | C | pHCon10/YSI | |
| ORP (rmV) | 88.1 | 1125 | C | pH310/YSI | |
| DO (mg/L, %) | 2.43 / 23.7% | 1125 | C | DO310/YSI | 627.8 mmHg |
| Turbidity (NTU) | 8.55 | 1125 | C | MicroTPI | 955, 7.06 |
| Discharge ($ft^3$/s, L/s, gpm) | 5.20 GPM | 1125 | C | Flow meter/ bucket/estimate | |
| Water Characteristics: Odor: None/Low/Mod/High Bubbles: None/Low/Mod/High | | | | | |
| Sediment: None/Low/Mod/High Effervescence: None/Low/Mod/High | | | | | |
| VOA Headspace: None/Low/Mod/High Other: 1 small bubble VOA GTO | | | | | |
| Number and type of filters used: — | | | | Sampling Time: 1110 | |
| GPS Coordinates: UTM: 43 7550S, 747355 | | | | Elev. 5307 | |



12 S

# Groundwater Monitoring Field Form

| Instrument Calibration Information | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | Date 7-2-13 Time of Calibration | Temperature Calibration Standard | Calibration Standard Value | Instrument Reading of Standard | Adjusted Reading | Other Information |
| pH (s. u.) | 0815 | 23.5 | 4.01 | 4.02 | | |
| pH (s. u.) | 0818 | 23.5 | 7.00 | 6.93 | | |
| pH (s. u.) | 0821 | 23.5 | 10.01 | 9.98 | 10.04 | |
| Sp.Conductivity (µS/cm, mS/cm) | 0800 | 23.5 | 2070 | 2064 | 2070 | (@ 25 °C) = |
| Sp.Conductivity (µS/cm, mS/cm) | 0803 | 23.6 | 8974 | too far off | | (@ 25 °C) = |
| DO (mg/L, %) | 0824 | 23.2 | | 83.8% | | 642.8 mm Hg |
| DO (mg/L, %) | | | | | | |
| ORP (mV) | | | | | | |
| Turbidity (n.t.u) | | | | | | |

| Laboratory Information | | | | |
|---|---|---|---|---|
| Samples collected for laboratory analysis: yes / no | | | | |
| Constituents to be Analyzed (√) | | | | |
| Inorganics | Inorganics | Organics | Organics | Other |
| Common ions □ | | TPH □ | VOCs □ | TDS □ |
| Alkalinity □ | | BTEX □ | SVOCs □ | TSS □ |
| Hardness □ | | Oil & Grease □ | | T. Coli. Bact. □ |
| Chloride □ | | TOC □ | | Fecal Coli. Bact. □ |
| Fluoride □ | | DOC □ | | Phos/Ni Pest. □ |
| Phosphorus □ | | TIC □ | | |
| Sulfate □ | | DRO □ | | |
| Nitrate (as N) □ | | GRO □ | | |
| Nitrite (as N) □ | | Methane □ | | |
| Nitrogen (total) □ | | | | |
| Metals (total/dissolved): Sb, Al, As, Ba, Be, B, Cd, Ca, Cr, Cu, Fe, Pb, Li, Mg, Mn, Hg, Mo, Ni, K, Se, Si, Sr, Ag, Na, Tl, U, Va, Zn, | | | | |
| Ship Date/Time: | | Receiving Laboratory: | | |
| Comments: | | | | |

**Field Notes:**

~~Softner cannot be bypassed~~ ⇒ found a way to bypass
Well used regularly, purging not necessary

**Weather**: SKY- clear / scattered / broken / cloudy / overcast. PRECIP- none / light / mod. / heavy / snow / rain
WIND- calm / breeze / gusty / moderate / strong / est. wind speed/direction: _____/_____
TEMP- cold / cool / mild / warm / hot / est. air temperature: 81°F Comments: _____

Discharge: 1 — 35 gal / 46.355

Duplicate ID: GM323-28-172632

# Groundwater Monitoring Field Form

| | | |
|---|---|---|
| Facility/Site: GM 323-28 | Date: 7-2-13 | Observer: Shelby |
| Station/Well: GM 323-28-17263 B | Start Time: 1150 | Sampling |
| Location: Parachute Ck. House | End Time: 1215 | Team: NWS, SLG |
| Description: | | Lead Signature: |
| Project: WDX BWG | | Date: 7 / 31 / 13 |
| Sampling Instruments: YSI PRO | | |

## Well Purging Information

Well Depth ($d_t$): _____ ft Static depth to water ($d_w$): _____ ft Sample/Set Depth: _____ ft
Bore radius ($r_w$): _____ in/ft Bore volume ($\pi r^2(d_t-d_w)$: _____ $ft^3$/gal Casing radius ($r_c$): _____ in/ft
Casing volume ($\pi r^2(d_t-d_w)(7.48)$: _____ gal Total volume: _____ $ft^3$/gal Total x 3: _____ $ft^3$/gal

| Purge # | Time | Temp (°C) | pH (s.u.) | SpC/Cond (mS/cm, µS/cm) | DO (mg/L, %) | ORP (rmV) | Turb. (NTU) | Water Clarity (poor/ mod/ good) | Volume Purged (Gallons) | Cumulative Volume Purged (Gallons) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | N/A House well (duplicate), | | | | | | |
| | | | | | did not purge | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

## Field Measurements at Time of Sampling

| Parameter | Reading | Time | Measurement (In situ/Container) | Instrument | Comments |
|---|---|---|---|---|---|
| Air Temp °C | | | | Thermometer | |
| Water Temp °C | 13.9 | 1206 | C | pHCon10, YSI | |
| pH (s.u.) | 7.11 | 1206 | C | pHCon10/YSI | |
| SpC/Conductivity (mS/cm, µS/cm) | 1317 / 1038 | 1206 | C | pHCon10/YSI | |
| ORP (rmV) | 81.3 | 1206 | C | pH310/YSI | |
| DO (mg/L, %) | 1.74 / 16.9% | 1206 | C | DO310/YSI | |
| Turbidity (NTU) | 3.37 | 1206 | C | MicroTPI | 3.39, 3.45 |
| Discharge ($ft^3$/s, L/s, gpm) | not taken | | | Flow meter/ bucket/estimate | |

Water Characteristics: Odor: None/Low/Mod/High Bubbles: None/Low/Mod/High
Sediment: None/Low/Mod/High Effervescence: None/Low/Mod/High
VOA Headspace: None/Low/Mod/High Other:
Number and type of filters used: — Sampling Time: 1410 (on label) 1150 (actual)
GPS Coordinates: UTM 4375508, 747355 elev. 5307

# Groundwater Monitoring Field Form

Calibration info on GM 323-28-15179

| Instrument Calibration Information | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | Date 7-2 Time of Calibration | Temperature Calibration Standard | Calibration Standard Value | Instrument Reading of Standard | Adjusted Reading | Other Information |
| **pH** (s. u.) | | | | | | |
| **pH** (s. u.) | | | | | | |
| **pH** (s. u.) | | | | | | |
| **Sp.Conductivity** (µS/cm, mS/cm) | | | | | | (@ 25 °C) = |
| **Sp.Conductivity** (µS/cm, mS/cm) | | | | | | (@ 25 °C) = |
| **DO** (mg/L, %) | | | | | | |
| **DO** (mg/L, %) | | | | | | |
| **ORP** (mV) | | | | | | |
| **Turbidity** (n.t.u) | | | | | | |

| Laboratory Information | | | | |
|---|---|---|---|---|
| Samples collected for laboratory analysis: yes / no | | | | |
| **Constituents to be Analyzed (√)** | | | | |
| **Inorganics** | **Inorganics** | **Organics** | **Organics** | **Other** |
| Common ions □ | | TPH □ | VOCs □ | TDS □ |
| Alkalinity □ | | BTEX □ | SVOCs □ | TSS □ |
| Hardness □ | | Oil & Grease □ | | T. Coli. Bact. □ |
| Chloride □ | | TOC □ | | Fecal Coli. Bact. □ |
| Fluoride □ | | DOC □ | | Phos/Ni Pest. □ |
| Phosphorus □ | | TIC □ | | |
| Sulfate □ | | DRO □ | | |
| Nitrate (as N) □ | | GRO □ | | |
| Nitrite (as N) □ | | Methane □ | | |
| Nitrogen (total) □ | | | | |
| Metals (total/dissolved): Sb, Al, As, Ba, Be, B, Cd, Ca, Cr, Cu, Fe, Pb, Li, Mg, Mn, Hg, Mo, Ni, K, Se, Si, Sr, Ag, Na, Tl, U, Va, Zn, | | | | |
| Ship Date/Time: | | Receiving Laboratory: | | |
| Comments: | | | | |

**Field Notes:**

Duplicate for GM323-28-15179

**Weather**: SKY- clear / scattered / broken / cloudy / overcast. PRECIP- none / light / mod. / heavy / snow / rain
WIND- calm / breeze / gusty / moderate / strong / est. wind speed/direction: _____ / _____
TEMP- cold / cool / mild / warm / hot / est. air temperature: 81°F Comments: _____

# ATTACHMENT E

## Laboratory Analytical Summary Report

# 1307028

**GC/MS Volatiles:**
The samples were analyzed using GC/MS following the current revision of SOP 525 based on SW-846 Method 8260C. The samples were also analyzed for Gasoline Range Organics (GRO).

All acceptance criteria were met.

**Dissolved Gasses:**
The samples were prepared and analyzed according to method RSK-175 procedures and the current revision of SOP 449.

All acceptance criteria were met.:

**DRO:**
The samples were analyzed following the current revision of SOP 406 generally based on SW-846 Methods 8000C and 8015D. TEPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C10 to C28.

All acceptance criteria were met.

**BART:**
The Biological Activity Reaction Test was completed with the Iron-Related Bacteria, Sulfate-Reducing Bacteria, and Slime-Forming Bacteria kit manufactured by Hach Company. The analysis was performed following the manufacturer provided instructions. If the target analyte is not detected (absent), then the sample will be reported with “ND” in the result field and a “U” flag. If the target analyte is detected (present), then the sample will be reported with a “1” for a result without a flag.

**Metals:**
The samples were analyzed following Methods for the Determination of Metals in Environmental Samples – Supplement 1 procedures. Analysis by ICPMS followed method 200.8 and the current revision of SOP 827.

The samples were to be analyzed for dissolved metals. The samples were filtered through a 0.45 micron filter and preserved with nitric acid to a pH less than two prior to analysis.

All acceptance criteria were met.

**Inorganics:**
The samples were analyzed following MCAWW, EMSL, Standard Method procedures for the current revisions of the following SOPs and methods:

| Analyte | Method | SOP # |
|---|---|---|
| Alkalinity | SM2320B | 1106 |
| Bicarbonate | SM2320B | 1106 |
| Carbonate | SM2320B | 1106 |
| pH | SM4500-$H^+$ B | 1126 |
| Total phosphorus | 365.2 | 1119 |
| Specific conductance | SM2510B | 1128 |
| TDS | SM2540C | 1101 |
| Bromide | 300.0 Revision 2.1 | 1113 |
| Chloride | 300.0 Revision 2.1 | 1113 |
| Fluoride | 300.0 Revision 2.1 | 1113 |
| Nitrate as N | 300.0 Revision 2.1 | 1113 |
| Nitrite as N | 300.0 Revision 2.1 | 1113 |
| Sulfate | 300.0 Revision 2.1 | 1113 |

CCB4 was above the reporting limit for fluoride. The samples bracketed by this CCB contained more than ten times the concentration of fluoride that was detected in the CCB.

All remaining acceptance criteria were met.

# ALS Environmental -- FC

## Sample Number(s) Cross-Reference Table

**OrderNum:** 1307028
**Client Name:** Western Water and Land, Inc.
**Client Project Name:** WPX Baseline Water Quality
**Client Project Number:** GM 323-28
**Client PO Number:**

| Client Sample Number | Lab Sample Number | COC Number | Matrix | Date Collected | Time Collected |
|---|---|---|---|---|---|
| GM 323-28-151879 | 1307028-1 | | WATER | 02-Jul-13 | 11:10 |
| GM 323-28-172632 | 1307028-2 | | WATER | 02-Jul-13 | 14:10 |
| Trip Blank | 1307028-3 | | WATER | 02-Jul-13 | |

# ALS Laboratory Group

225 Commerce Drive, Fort Collins, Colorado 80524
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

## Chain-of-Custody

Form 202r8

WORKORDER # 1307028

PAGE 1 of 1

DISPOSAL By Lab or Return to Client

| | | | |
|---|---|---|---|
| PROJECT NAME | WPX BWQ | SAMPLER | Shelby Goodwin |
| FACILITY NAME | GM 323-28 | PROJECT NO. | 30000.01.11 |
| FACILITY ID (API) | | EDD FORMAT | Contact Bruce Smith |
| COMPANY NAME | Western Water + Land | PURCHASE ORDER | |
| SEND REPORT TO | Bruce Smith | BILL TO COMPANY | WPX Energy |
| ADDRESS | 743 Horizon Ct. Suite 330 | INVOICE ATTN TO | Brandon Danforth |
| CITY / STATE / ZIP | Grand Jct., CO 81506 | ADDRESS | 1058 CR 215 |
| PHONE | 970-242-0170 | CITY / STATE / ZIP | Parachute, CO 81635 |
| FAX | | PHONE | 970-263-2792 |
| E-MAIL | bsmith@westernwaterandland.com | FAX | |
| | | E-MAIL | |

DATE 7-2-13

TURNAROUND Standard

| Lab ID | Field ID | Matrix | Sample Date | Sample Time | # Bottles | Pres. | QC | NGI | BART | BTEX | 420 | Dissolved Gases & MEP | D22 | Dissolved metals (lab filter) | Anions, alk, TDS, pH, conduc. | Total Phosphorus | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ~~GM 323-28-151819~~ | | | ~~1110~~ | | | | | | | | | | | | | | | | | | | | | | | | |
| (1) | GM 323-28-151879 | W | 7-2-13 | 1110 | 15 | 1,3 | IV | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| (2) | GM 323-28-172032 | W | 7-2-13 | 1410 | 15 | 1,3 | IV | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| (3) TB | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

**For metals or anions, please detail analytes below.**

| Comments: | QC PACKAGE (check below) | |
|---|---|---|
| Dissolved metals need to be labratory filtered | | LEVEL II (Standard QC) |
| | | LEVEL III (Std QC + forms) |
| | X | LEVEL IV (Std QC + forms + raw data) |
| | | |

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

| | SIGNATURE | PRINTED NAME | DATE | TIME |
|---|---|---|---|---|
| RELINQUISHED BY | S. Goodwin | Shelby Goodwin | 7-2-13 | 1500 |
| RECEIVED BY | Lauren Schmitz | Lauren Schmitz | 7/3/13 | 1125 |
| RELINQUISHED BY | | | | |
| RECEIVED BY | | | | |
| RELINQUISHED BY | | | | |
| RECEIVED BY | | | | |

**ALS Environmental - Fort Collins**
**CONDITION OF SAMPLE UPON RECEIPT FORM**

Client: Western Water  Workorder No: 1307028

Project Manager: ARW  Initials: LAS  Date: 7/3/13

| | | | |
|---|---|---|---|
| 1. Does this project require any special handling in addition to standard ALS procedures? | | YES | (NO) |
| 2. Are custody seals on shipping containers intact? | NONE | (YES) | NO |
| 3. Are Custody seals on sample containers intact? | (NONE) | YES | NO |
| 4. Is there a COC (Chain-of-Custody) present or other representative documents? | | (YES) | NO |
| 5. Are the COC and bottle labels complete and legible? | | (YES) | NO |
| 6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.) | | (YES) | NO |
| 7. Were airbills / shipping documents present and/or removable? | DROP OFF | (YES) | NO |
| 8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles) | N/A | (YES) | NO |
| 9. Are all aqueous non-preserved samples pH 4-9? | N/A | (YES) | NO |
| 10. Is there sufficient sample for the requested analyses? | | (YES) | NO |
| 11. Were all samples placed in the proper containers for the requested analyses? | | (YES) | NO |
| 12. Are all samples within holding times for the requested analyses? | | (YES) | NO |
| 13. Were all sample containers received intact? (not broken or leaking, etc.) | | (YES) | NO |
| (14.) Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ✓ < green pea ___ > green pea | N/A | YES | (NO) * |
| 15. Do any water samples contain sediment? Amount<br>Amount of sediment: ___ dusting ___ moderate ___ heavy | N/A | YES | (NO) |
| 16. Were the samples shipped on ice? | | (YES) | NO |
| 17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: (#2) #4 | RAD ONLY | (YES) | NO |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Cooler #: | 1 | | | | | | | |
| Temperature (°C): | 3.4 | | | | | | | |
| No. of custody seals on cooler: | 2 | | | | | | | |
| DOT Survey/ Acceptance Information — External µR/hr reading: | 12 | | | | | | | |
| Background µR/hr reading: | 10 | | | | | | | |

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES / NO / NA** (If no, see Form 008.)

**Additional Information:** PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

(*14) 1307028-1-3 (GM-323-28-151879) for VOA } all arrived
1-5 for GRO } with headspace
1-6 ≤ pea-size

↳ three vials available without headspace. gw

If applicable, was the client contacted? YES / NO / (NA) Contact: _____ Date/Time: _____

**Project Manager Signature / Date:** 7/3/13

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

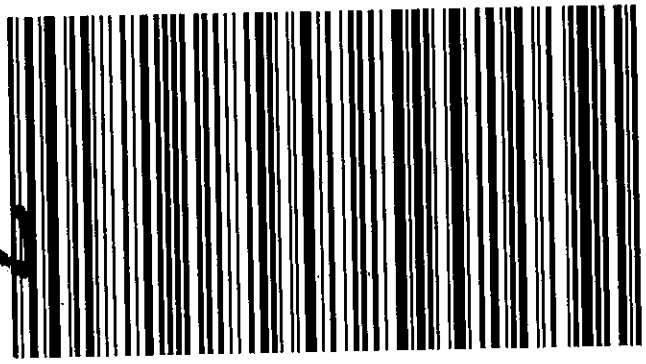
1307028

11/25

FedEx Relabel

Ground

DENV-802 10



TRK# 9622 0417 3 (000 045 7800 7) 00 7957 9518 5272
(IC AUTODIM)

3.4°C

**Client:** Western Water and Land, Inc. **Date:** *02-Aug-13*
**Project:** GM 323-28 WPX Baseline Water Quality **Work Order:** 1307028
**Sample ID:** GM 323-28-151879 **Lab ID:** 1307028-1
**Legal Location:** **Matrix:** WATER
**Collection Date:** 7/2/2013 11:10 **Percent Moisture:**

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|
| **ALKALINITY AS CALCIUM CARBONATE** | | | **SM2320B** | | Prep Date: **7/8/2013** | PrepBy: **AJD** |
| **BICARBONATE AS CaCO3** | **500** | | **20** | **MG/L** | 1 | 7/8/2013 |
| CARBONATE AS CaCO3 | ND | | 20 | MG/L | 1 | 7/8/2013 |
| **TOTAL ALKALINITY AS CaCO3** | **500** | | **20** | **MG/L** | 1 | 7/8/2013 |
| **BIOLOGICAL ACTIVITY REACTION TEST** | | | **BART** | | Prep Date: **7/8/2013** | PrepBy: **BAS** |
| **IRON RELATED BACTERIA** | **1** | | | **NU** | 1 | 7/16/2013 |
| **SLIME FORMING BACTERIA** | **1** | | | **NU** | 1 | 7/16/2013 |
| **SULFATE REDUCING BACTERIA** | **1** | | | **NU** | 1 | 7/16/2013 |
| **DIESEL RANGE ORGANICS** | | | **SW8015M** | | Prep Date: **7/9/2013** | PrepBy: **KLR** |
| Diesel Range Organics | ND | | 0.5 | MG/L | 1 | 7/9/2013 16:28 |
| *Surr: O-TERPHENYL* | *72* | | *51-97* | *%REC* | 1 | 7/9/2013 16:28 |
| **DISSOLVED GASSES** | | | **RSK175** | | Prep Date: **7/8/2013** | PrepBy: **JFN** |
| **METHANE** | **18** | | **1** | **UG/L** | 1 | 7/8/2013 12:00 |
| ETHANE | ND | | 2 | UG/L | 1 | 7/8/2013 12:00 |
| PROPANE | ND | | 1 | UG/L | 1 | 7/8/2013 12:00 |
| **GC/MS VOLATILES** | | | **SW8260_25** | | Prep Date: **7/9/2013** | PrepBy: **SDW** |
| BENZENE | ND | | 1 | UG/L | 1 | 7/9/2013 13:54 |
| TOLUENE | ND | | 1 | UG/L | 1 | 7/9/2013 13:54 |
| ETHYLBENZENE | ND | | 1 | UG/L | 1 | 7/9/2013 13:54 |
| M+P-XYLENE | ND | | 1 | UG/L | 1 | 7/9/2013 13:54 |
| O-XYLENE | ND | | 1 | UG/L | 1 | 7/9/2013 13:54 |
| GASOLINE RANGE ORGANICS | ND | | 100 | UG/L | 1 | 7/9/2013 13:54 |
| *Surr: DIBROMOFLUOROMETHANE* | *103* | | *84-118* | *%REC* | 1 | 7/9/2013 13:54 |
| *Surr: TOLUENE-D8* | *99* | | *85-115* | *%REC* | 1 | 7/9/2013 13:54 |
| *Surr: 4-BROMOFLUOROBENZENE* | *99* | | *85-115* | *%REC* | 1 | 7/9/2013 13:54 |
| **ION CHROMATOGRAPHY** | | | **EPA300.0** | | Prep Date: **7/3/2013** | PrepBy: **AJD** |
| **BROMIDE** | **0.21** | | **0.2** | **MG/L** | 1 | 7/3/2013 17:58 |
| **CHLORIDE** | **31** | | **2** | **MG/L** | 10 | 7/3/2013 18:26 |
| **FLUORIDE** | **1.6** | | **0.1** | **MG/L** | 1 | 7/3/2013 17:58 |
| **NITRATE AS N** | **0.91** | | **0.2** | **MG/L** | 1 | 7/3/2013 17:58 |
| NITRITE AS N | ND | | 0.1 | MG/L | 1 | 7/3/2013 17:58 |
| **SULFATE** | **180** | | **1** | **MG/L** | 1 | 7/3/2013 17:58 |
| **METALS BY 200.8** | | | **EPA200.8** | | Prep Date: **7/9/2013** | PrepBy: **BAS** |
| **BORON** | **170** | | **50** | **UG/L** | 10 | 7/10/2013 12:25 |
| **BARIUM** | **47** | | **1** | **UG/L** | 10 | 7/10/2013 12:25 |
| **CALCIUM** | **120000** | | **1000** | **UG/L** | 10 | 7/10/2013 12:25 |
| IRON | ND | | 100 | UG/L | 10 | 7/10/2013 12:25 |
| **POTASSIUM** | **7700** | | **1000** | **UG/L** | 10 | 7/10/2013 12:25 |
| **MAGNESIUM** | **53000** | | **100** | **UG/L** | 10 | 7/10/2013 12:25 |
| **MANGANESE** | **53** | | **2** | **UG/L** | 10 | 7/10/2013 12:25 |
| **SODIUM** | **100000** | | **1000** | **UG/L** | 10 | 7/10/2013 12:25 |

| | | | |
|---|---|---|---|
| **Client:** | Western Water and Land, Inc. | **Date:** | *02-Aug-13* |
| **Project:** | GM 323-28 WPX Baseline Water Quality | **Work Order:** | 1307028 |
| **Sample ID:** | GM 323-28-151879 | **Lab ID:** | 1307028-1 |
| **Legal Location:** | | **Matrix:** | WATER |
| **Collection Date:** | 7/2/2013 11:10 | **Percent Moisture:** | |

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|
| **SELENIUM** | **8** | | **1** | **UG/L** | 10 | 7/10/2013 12:25 |
| **STRONTIUM** | **1600** | | **1** | **UG/L** | 10 | 7/10/2013 12:25 |
| **PH** | | | **SM4500-H** | | Prep Date: **7/5/2013** | PrepBy: **AJD** |
| **PH** | **7.45** | | **0.1** | **pH** | 1 | 7/5/2013 |
| **SPECIFIC CONDUCTANCE IN WATER** | | | **SM2510B** | | Prep Date: **7/5/2013** | PrepBy: **AJD** |
| **SPECIFIC CONDUCTIVITY** | **1311** | | **1** | **umhos/cm** | 1 | 7/5/2013 |
| **TOTAL DISSOLVED SOLIDS** | | | **SM2540C** | | Prep Date: **7/5/2013** | PrepBy: **AJD** |
| **TOTAL DISSOLVED SOLIDS** | **860** | | **20** | **MG/L** | 1 | 7/8/2013 |
| **TOTAL PHOSPHORUS AS P** | | | **EPA365.2** | | Prep Date: **7/5/2013** | PrepBy: **TWK** |
| TOTAL PHOSPHORUS | ND | | 0.05 | MG/L | 1 | 7/5/2013 |

| | | | |
|---|---|---|---|
| **Client:** | Western Water and Land, Inc. | **Date:** | *02-Aug-13* |
| **Project:** | GM 323-28 WPX Baseline Water Quality | **Work Order:** | 1307028 |
| **Sample ID:** | GM 323-28-172632 | **Lab ID:** | 1307028-2 |
| **Legal Location:** | | **Matrix:** | WATER |
| **Collection Date:** | 7/2/2013 14:10 | **Percent Moisture:** | |

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|
| **ALKALINITY AS CALCIUM CARBONATE** | | | **SM2320B** | | Prep Date: **7/8/2013** | PrepBy: **AJD** |
| **BICARBONATE AS CaCO3** | **510** | | **20** | **MG/L** | 1 | 7/8/2013 |
| CARBONATE AS CaCO3 | ND | | 20 | MG/L | 1 | 7/8/2013 |
| **TOTAL ALKALINITY AS CaCO3** | **510** | | **20** | **MG/L** | 1 | 7/8/2013 |
| **BIOLOGICAL ACTIVITY REACTION TEST** | | | **BART** | | Prep Date: **7/9/2013** | PrepBy: **BAS** |
| **IRON RELATED BACTERIA** | **1** | | | **NU** | 1 | 7/17/2013 |
| **SLIME FORMING BACTERIA** | **1** | | | **NU** | 1 | 7/17/2013 |
| **SULFATE REDUCING BACTERIA** | **1** | | | **NU** | 1 | 7/17/2013 |
| **DIESEL RANGE ORGANICS** | | | **SW8015M** | | Prep Date: **7/9/2013** | PrepBy: **KLR** |
| Diesel Range Organics | ND | | 0.5 | MG/L | 1 | 7/9/2013 15:57 |
| *Surr: O-TERPHENYL* | *75* | | *51-97* | *%REC* | 1 | 7/9/2013 15:57 |
| **DISSOLVED GASSES** | | | **RSK175** | | Prep Date: **7/8/2013** | PrepBy: **JFN** |
| **METHANE** | **22** | | **1** | **UG/L** | 1 | 7/8/2013 12:09 |
| ETHANE | ND | | 2 | UG/L | 1 | 7/8/2013 12:09 |
| PROPANE | ND | | 1 | UG/L | 1 | 7/8/2013 12:09 |
| **GC/MS VOLATILES** | | | **SW8260_25** | | Prep Date: **7/9/2013** | PrepBy: **SDW** |
| BENZENE | ND | | 1 | UG/L | 1 | 7/9/2013 14:18 |
| TOLUENE | ND | | 1 | UG/L | 1 | 7/9/2013 14:18 |
| ETHYLBENZENE | ND | | 1 | UG/L | 1 | 7/9/2013 14:18 |
| M+P-XYLENE | ND | | 1 | UG/L | 1 | 7/9/2013 14:18 |
| O-XYLENE | ND | | 1 | UG/L | 1 | 7/9/2013 14:18 |
| GASOLINE RANGE ORGANICS | ND | | 100 | UG/L | 1 | 7/9/2013 14:18 |
| *Surr: DIBROMOFLUOROMETHANE* | *102* | | *84-118* | *%REC* | 1 | 7/9/2013 14:18 |
| *Surr: TOLUENE-D8* | *100* | | *85-115* | *%REC* | 1 | 7/9/2013 14:18 |
| *Surr: 4-BROMOFLUOROBENZENE* | *97* | | *85-115* | *%REC* | 1 | 7/9/2013 14:18 |
| **ION CHROMATOGRAPHY** | | | **EPA300.0** | | Prep Date: **7/3/2013** | PrepBy: **AJD** |
| BROMIDE | ND | | 0.2 | MG/L | 1 | 7/3/2013 18:12 |
| **CHLORIDE** | **31** | | **2** | **MG/L** | 10 | 7/3/2013 18:40 |
| **FLUORIDE** | **1.6** | | **0.1** | **MG/L** | 1 | 7/3/2013 18:12 |
| **NITRATE AS N** | **0.89** | | **0.2** | **MG/L** | 1 | 7/3/2013 18:12 |
| NITRITE AS N | ND | | 0.1 | MG/L | 1 | 7/3/2013 18:12 |
| **SULFATE** | **180** | | **1** | **MG/L** | 1 | 7/3/2013 18:12 |
| **METALS BY 200.8** | | | **EPA200.8** | | Prep Date: **7/9/2013** | PrepBy: **BAS** |
| **BORON** | **170** | | **50** | **UG/L** | 10 | 7/10/2013 12:28 |
| **BARIUM** | **46** | | **1** | **UG/L** | 10 | 7/10/2013 12:28 |
| **CALCIUM** | **110000** | | **1000** | **UG/L** | 10 | 7/10/2013 12:28 |
| IRON | ND | | 100 | UG/L | 10 | 7/10/2013 12:28 |
| **POTASSIUM** | **7700** | | **1000** | **UG/L** | 10 | 7/10/2013 12:28 |
| **MAGNESIUM** | **53000** | | **100** | **UG/L** | 10 | 7/10/2013 12:28 |
| **MANGANESE** | **52** | | **2** | **UG/L** | 10 | 7/10/2013 12:28 |
| **SODIUM** | **100000** | | **1000** | **UG/L** | 10 | 7/10/2013 12:28 |

| | | | |
|---|---|---|---|
| **Client:** | Western Water and Land, Inc. | **Date:** | *02-Aug-13* |
| **Project:** | GM 323-28 WPX Baseline Water Quality | **Work Order:** | 1307028 |
| **Sample ID:** | GM 323-28-172632 | **Lab ID:** | 1307028-2 |
| **Legal Location:** | | **Matrix:** | WATER |
| **Collection Date:** | 7/2/2013 14:10 | **Percent Moisture:** | |

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|
| **SELENIUM** | **7.7** | | **1** | **UG/L** | 10 | 7/10/2013 12:28 |
| **STRONTIUM** | **1600** | | **1** | **UG/L** | 10 | 7/10/2013 12:28 |
| **PH** | | | **SM4500-H** | | Prep Date: **7/5/2013** | PrepBy: **AJD** |
| **PH** | **7.48** | | **0.1** | **pH** | 1 | 7/5/2013 |
| **SPECIFIC CONDUCTANCE IN WATER** | | | **SM2510B** | | Prep Date: **7/5/2013** | PrepBy: **AJD** |
| **SPECIFIC CONDUCTIVITY** | **1307** | | **1** | **umhos/cm** | 1 | 7/5/2013 |
| **TOTAL DISSOLVED SOLIDS** | | | **SM2540C** | | Prep Date: **7/5/2013** | PrepBy: **AJD** |
| **TOTAL DISSOLVED SOLIDS** | **850** | | **20** | **MG/L** | 1 | 7/8/2013 |
| **TOTAL PHOSPHORUS AS P** | | | **EPA365.2** | | Prep Date: **7/5/2013** | PrepBy: **TWK** |
| TOTAL PHOSPHORUS | ND | | 0.05 | MG/L | 1 | 7/5/2013 |

| | | | |
|---|---|---|---|
| **Client:** | Western Water and Land, Inc. | **Date:** | *02-Aug-13* |
| **Project:** | GM 323-28 WPX Baseline Water Quality | **Work Order:** | 1307028 |
| **Sample ID:** | Trip Blank | **Lab ID:** | 1307028-3 |
| **Legal Location:** | | **Matrix:** | WATER |
| **Collection Date:** | 7/2/2013 | **Percent Moisture:** | |

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|
| **GC/MS VOLATILES** | | | **SW8260_25** | | Prep Date: **7/9/2013** | PrepBy: **SDW** |
| BENZENE | ND | | 1 | UG/L | 1 | 7/9/2013 14:41 |
| TOLUENE | ND | | 1 | UG/L | 1 | 7/9/2013 14:41 |
| ETHYLBENZENE | ND | | 1 | UG/L | 1 | 7/9/2013 14:41 |
| M+P-XYLENE | ND | | 1 | UG/L | 1 | 7/9/2013 14:41 |
| O-XYLENE | ND | | 1 | UG/L | 1 | 7/9/2013 14:41 |
| GASOLINE RANGE ORGANICS | ND | | 100 | UG/L | 1 | 7/9/2013 14:41 |
| *Surr: DIBROMOFLUOROMETHANE* | *103* | | *84-118* | *%REC* | 1 | 7/9/2013 14:41 |
| *Surr: TOLUENE-D8* | *101* | | *85-115* | *%REC* | 1 | 7/9/2013 14:41 |
| *Surr: 4-BROMOFLUOROBENZENE* | *99* | | *85-115* | *%REC* | 1 | 7/9/2013 14:41 |

| | | | |
|---|---|---|---|
| **Client:** | Western Water and Land, Inc. | **Date:** | *02-Aug-13* |
| **Project:** | GM 323-28 WPX Baseline Water Quality | **Work Order:** | 1307028 |
| **Sample ID:** | Trip Blank | **Lab ID:** | 1307028-3 |
| **Legal Location:** | | **Matrix:** | WATER |
| **Collection Date:** | 7/2/2013 | **Percent Moisture:** | |

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|

## Explanation of Qualifiers

**Radiochemistry:**

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
# - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

**Inorganics:**

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

**Organics:**

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

**Diesel Range Organics:**

| | | | |
|---|---|---|---|
| **Client:** | Western Water and Land, Inc. | **Date:** | *02-Aug-13* |
| **Project:** | GM 323-28 WPX Baseline Water Quality | **Work Order:** | 1307028 |
| **Sample ID:** | Trip Blank | **Lab ID:** | 1307028-3 |
| **Legal Location:** | | **Matrix:** | WATER |
| **Collection Date:** | 7/2/2013 | **Percent Moisture:** | |

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

Batch ID: **EX130709-1-1** Instrument ID **FUELS-1** Method: **SW8015M**

**LCS** Sample ID: **EX130709-1** Units: **MG/L** Analysis Date: **7/9/2013 14:25**

Client ID: Run ID: **GC130709-1A** Prep Date: **7/9/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 9.85 | 0.5 | 10 | | 98 | 36-150 | | | 20 | |
| Surr: O-TERPHENYL | 1.11 | | 1.25 | | 89 | 51-97 | | | | |

**LCSD** Sample ID: **EX130709-1** Units: **MG/L** Analysis Date: **7/9/2013 14:56**

Client ID: Run ID: **GC130709-1A** Prep Date: **7/9/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 9.95 | 0.5 | 10 | | 100 | 36-150 | 9.85 | 1 | 20 | |
| Surr: O-TERPHENYL | 1.08 | | 1.25 | | 86 | 51-97 | | 3 | | |

**MB** Sample ID: **EX130709-1** Units: **MG/L** Analysis Date: **7/9/2013 13:54**

Client ID: Run ID: **GC130709-1A** Prep Date: **7/9/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | ND | 0.5 | | | | | | | | |
| Surr: O-TERPHENYL | 0.948 | | 1.25 | | 76 | 51-97 | | | | |

**MS** Sample ID: **1307028-1** Units: **MG/L** Analysis Date: **7/9/2013 16:58**

Client ID: **GM 323-28-151879** Run ID: **GC130709-1A** Prep Date: **7/9/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 10.2 | 0.5 | 10 | 0.5 | 102 | 36-150 | | | 20 | |
| Surr: O-TERPHENYL | 1.1 | | 1.25 | | 88 | 51-97 | | | | |

**MSD** Sample ID: **1307028-1** Units: **MG/L** Analysis Date: **7/9/2013 17:29**

Client ID: **GM 323-28-151879** Run ID: **GC130709-1A** Prep Date: **7/9/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 9.78 | 0.5 | 10 | 0.5 | 98 | 36-150 | 10.2 | 5 | 20 | |
| Surr: O-TERPHENYL | 1.1 | | 1.25 | | 88 | 51-97 | | 0 | | |

**The following samples were analyzed in this batch:** 1307028-1 1307028-2

# QC BATCH REPORT

Batch ID: **HC130708-9-1** Instrument ID **MEE-1** Method: **RSK175**

**LCS** Sample ID: **HC130708-9** Units: **UG/L** Analysis Date: **7/8/2013 11:51**
Client ID: Run ID: **HC130708-9A** Prep Date: **7/8/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| METHANE | 130 | 1 | 142 | | 92 | 80-120 | | | 25 | |
| ETHANE | 249 | 2 | 267 | | 93 | 80-120 | | | 25 | |
| PROPANE | 359 | 1 | 391 | | 92 | 80-120 | | | 25 | |

**LCSD** Sample ID: **HC130708-9** Units: **UG/L** Analysis Date: **7/8/2013 12:16**
Client ID: Run ID: **HC130708-9A** Prep Date: **7/8/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| METHANE | 121 | 1 | 142 | | 85 | 80-120 | 130 | 8 | 25 | |
| ETHANE | 229 | 2 | 267 | | 86 | 80-120 | 249 | 9 | 25 | |
| PROPANE | 330 | 1 | 391 | | 84 | 80-120 | 359 | 9 | 25 | |

**MB** Sample ID: **HC130708-9** Units: **UG/L** Analysis Date: **7/8/2013 11:54**
Client ID: Run ID: **HC130708-9A** Prep Date: **7/8/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| METHANE | ND | 1 | | | | | | | | |
| ETHANE | ND | 2 | | | | | | | | |
| PROPANE | ND | 1 | | | | | | | | |

**MS** Sample ID: **1307028-1** Units: **UG/L** Analysis Date: **7/8/2013 12:03**
Client ID: **GM 323-28-151879** Run ID: **HC130708-9A** Prep Date: **7/8/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| METHANE | 143 | 1 | 142 | 18 | 88 | 70-130 | | | 25 | |
| ETHANE | 236 | 2 | 267 | 2 | 88 | 70-130 | | | 25 | |
| PROPANE | 341 | 1 | 391 | 1 | 87 | 70-130 | | | 25 | |

**MSD** Sample ID: **1307028-1** Units: **UG/L** Analysis Date: **7/8/2013 12:06**
Client ID: **GM 323-28-151879** Run ID: **HC130708-9A** Prep Date: **7/8/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| METHANE | 148 | 1 | 142 | 18 | 91 | 70-130 | 143 | 3 | 25 | |
| ETHANE | 245 | 2 | 267 | 2 | 92 | 70-130 | 236 | 4 | 25 | |
| PROPANE | 354 | 1 | 391 | 1 | 90 | 70-130 | 341 | 3 | 25 | |

**The following samples were analyzed in this batch:** 1307028-1 1307028-2

# QC BATCH REPORT

Batch ID: **IP130709-1-2** Instrument ID **ICPMS2** Method: **EPA200.8**

**LCS** Sample ID: **FM130708-1** Units: **UG/L** Analysis Date: **7/10/2013 12:30**

Client ID: Run ID: **IM130710-10A2** Prep Date: **7/9/2013** DF: **10**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BARIUM | 95.9 | 1 | 100 | | 96 | 85-115 | | | 20 | |
| BORON | 857 | 50 | 1000 | | 86 | 85-115 | | | 20 | |
| CALCIUM | 9140 | 1000 | 10000 | | 91 | 85-115 | | | 20 | |
| IRON | 5080 | 100 | 5000 | | 102 | 85-115 | | | 20 | |
| MAGNESIUM | 9180 | 100 | 10000 | | 92 | 85-115 | | | 20 | |
| MANGANESE | 192 | 2 | 200 | | 96 | 85-115 | | | 20 | |
| POTASSIUM | 5340 | 1000 | 5000 | | 107 | 85-115 | | | 20 | |
| SELENIUM | 99.5 | 1 | 100 | | 99 | 85-115 | | | 20 | |
| SODIUM | 10200 | 1000 | 10000 | | 102 | 85-115 | | | 20 | |
| STRONTIUM | 93.9 | 1 | 100 | | 94 | 85-115 | | | 20 | |

**MB** Sample ID: **F130708-1** Units: **UG/L** Analysis Date: **7/10/2013 12:14**

Client ID: Run ID: **IM130710-10A2** Prep Date: **7/9/2013** DF: **10**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BARIUM | ND | 1 | | | | | | | | |
| BORON | ND | 50 | | | | | | | | |
| CALCIUM | ND | 1000 | | | | | | | | |
| IRON | ND | 100 | | | | | | | | |
| MAGNESIUM | ND | 100 | | | | | | | | |
| MANGANESE | ND | 2 | | | | | | | | |
| POTASSIUM | ND | 1000 | | | | | | | | |
| SELENIUM | ND | 1 | | | | | | | | |
| SODIUM | ND | 1000 | | | | | | | | |
| STRONTIUM | ND | 1 | | | | | | | | |

**The following samples were analyzed in this batch:** 1307028-1 1307028-2

Batch ID: **VL130709-4-3** Instrument ID **HPV1** Method: **SW8260_25**

**LCS** Sample ID: **VL130709-4** Units: **UG/L** Analysis Date: **7/9/2013 12:44**

Client ID: Run ID: **VL130709-4A** Prep Date: **7/9/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BENZENE | 9.69 | 1 | 10 | | 97 | 83-117 | | | 20 | |
| TOLUENE | 9.59 | 1 | 10 | | 96 | 82-113 | | | 20 | |
| ETHYLBENZENE | 9.93 | 1 | 10 | | 99 | 81-113 | | | 20 | |
| M+P-XYLENE | 20.3 | 1 | 20 | | 101 | 82-115 | | | 20 | |
| O-XYLENE | 10 | 1 | 10 | | 100 | 81-115 | | | 20 | |
| GASOLINE RANGE ORGANICS | 458 | 100 | 500 | | 91.548 | 80-120 | | | 20 | |
| Surr: DIBROMOFLUOROMETHA | 25.3 | | 25 | | 101 | 84-118 | | | | |
| Surr: TOLUENE-D8 | 25.3 | | 25 | | 101 | 85-115 | | | | |
| Surr: 4-BROMOFLUOROBENZE | 24.6 | | 25 | | 99 | 85-115 | | | | |

**LCSD** Sample ID: **VL130709-4** Units: **UG/L** Analysis Date: **7/9/2013 13:07**

Client ID: Run ID: **VL130709-4A** Prep Date: **7/9/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BENZENE | 9.77 | 1 | 10 | | 98 | 83-117 | 9.69 | 1 | 20 | |
| TOLUENE | 9.61 | 1 | 10 | | 96 | 82-113 | 9.59 | 0 | 20 | |
| ETHYLBENZENE | 9.85 | 1 | 10 | | 99 | 81-113 | 9.93 | 1 | 20 | |
| M+P-XYLENE | 20.2 | 1 | 20 | | 101 | 82-115 | 20.3 | 0 | 20 | |
| O-XYLENE | 10.1 | 1 | 10 | | 101 | 81-115 | 10 | 0 | 20 | |
| GASOLINE RANGE ORGANICS | 473 | 100 | 500 | | 94.684 | 80-120 | 458 | | 20 | |
| Surr: DIBROMOFLUOROMETHA | 26 | | 25 | | 104 | 84-118 | | 3 | | |
| Surr: TOLUENE-D8 | 25 | | 25 | | 100 | 85-115 | | 1 | | |
| Surr: 4-BROMOFLUOROBENZE | 24.9 | | 25 | | 100 | 85-115 | | 1 | | |

**MB** Sample ID: **VL130709-4** Units: **UG/L** Analysis Date: **7/9/2013 13:31**

Client ID: Run ID: **VL130709-4A** Prep Date: **7/9/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BENZENE | ND | 1 | | | | | | | | |
| TOLUENE | ND | 1 | | | | | | | | |
| ETHYLBENZENE | ND | 1 | | | | | | | | |
| M+P-XYLENE | ND | 1 | | | | | | | | |
| O-XYLENE | ND | 1 | | | | | | | | |
| GASOLINE RANGE ORGANICS | ND | 100 | | | | | | | | |
| Surr: DIBROMOFLUOROMETHA | 25.8 | | 25 | | 103 | 84-118 | | | | |
| Surr: TOLUENE-D8 | 25.2 | | 25 | | 101 | 85-115 | | | | |
| Surr: 4-BROMOFLUOROBENZE | 24.7 | | 25 | | 99 | 85-115 | | | | |

**The following samples were analyzed in this batch:** 1307028-1 1307028-2 1307028-3

# QC BATCH REPORT

Batch ID: **AK130708-1-2** Instrument ID **NONE** Method: **SM2320B**

**LCS** Sample ID: **AK130708-1** Units: **MG/L** Analysis Date: **7/8/2013**
Client ID: Run ID: **AK130708-1A** Prep Date: **7/8/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL ALKALINITY AS CaCO3 | 98 | 5 | 100 | | 98 | 85-115 | | | 15 | |

**MB** Sample ID: **AK130708-1** Units: **MG/L** Analysis Date: **7/8/2013**
Client ID: Run ID: **AK130708-1A** Prep Date: **7/8/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BICARBONATE AS CaCO3 | ND | 5 | | | | | | | | |
| CARBONATE AS CaCO3 | ND | 5 | | | | | | | | |
| TOTAL ALKALINITY AS CaCO3 | ND | 5 | | | | | | | | |

**The following samples were analyzed in this batch:** 1307028-1 1307028-2

# QC BATCH REPORT

Batch ID: **IC130703-1-2** Instrument ID **IC** Method: **EPA300.0**

**LCS** Sample ID: **IC130703-1** Units: **MG/L** Analysis Date: **7/3/2013 11:24**

Client ID: Run ID: **IC130703-1A1** Prep Date: **7/3/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| FLUORIDE | 1.85 | 0.1 | 2 | | 93 | 90-110 | | | 15 | |
| CHLORIDE | 4.73 | 0.2 | 5 | | 95 | 90-110 | | | 15 | |
| NITRITE AS N | 1.86 | 0.1 | 2 | | 93 | 90-110 | | | 15 | |
| BROMIDE | 5.09 | 0.2 | 5 | | 102 | 90-110 | | | 15 | |
| NITRATE AS N | 4.82 | 0.2 | 5 | | 96 | 90-110 | | | 15 | |
| SULFATE | 18.4 | 1 | 20 | | 92 | 90-110 | | | 15 | |

**MB** Sample ID: **IC130703-1** Units: **MG/L** Analysis Date: **7/3/2013 12:34**

Client ID: Run ID: **IC130703-1A1** Prep Date: **7/3/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| FLUORIDE | ND | 0.1 | | | | | | | | |
| CHLORIDE | ND | 0.2 | | | | | | | | |
| NITRITE AS N | ND | 0.1 | | | | | | | | |
| BROMIDE | ND | 0.2 | | | | | | | | |
| NITRATE AS N | ND | 0.2 | | | | | | | | |
| SULFATE | ND | 1 | | | | | | | | |

**The following samples were analyzed in this batch:** 1307028-1 1307028-2

# QC BATCH REPORT

Batch ID: **TD130705-1-1** Instrument ID **Balance** Method: **SM2540C**

**DUP** Sample ID: **1307028-1** Units: **MG/L** Analysis Date: **7/8/2013**
Client ID: **GM 323-28-151879** Run ID: **TD130708-1A** Prep Date: **7/5/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL DISSOLVED SOLIDS | 863 | 20 | | | | | 860 | 0 | 5 | |

**LCS** Sample ID: **TD130705-1** Units: **MG/L** Analysis Date: **7/8/2013**
Client ID: Run ID: **TD130708-1A** Prep Date: **7/5/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL DISSOLVED SOLIDS | 410 | 20 | 400 | | 103 | 85-115 | | | 5 | |

**MB** Sample ID: **TD130705-1** Units: **MG/L** Analysis Date: **7/8/2013**
Client ID: Run ID: **TD130708-1A** Prep Date: **7/5/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL DISSOLVED SOLIDS | ND | 20 | | | | | | | | |

**The following samples were analyzed in this batch:** 1307028-1 1307028-2

# QC BATCH REPORT

Batch ID: **TP130705-1-1** Instrument ID **Spec** Method: **EPA365.2**

**LCS** Sample ID: **TP130705-1** Units: **MG/L** Analysis Date: **7/5/2013**
Client ID: Run ID: **TP130705-1A** Prep Date: **7/5/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL PHOSPHORUS | 0.523 | 0.05 | 0.5 | | 105 | 80-120 | | | 20 | |

**MB** Sample ID: **TP130705-1** Units: **MG/L** Analysis Date: **7/5/2013**
Client ID: Run ID: **TP130705-1A** Prep Date: **7/5/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL PHOSPHORUS | ND | 0.05 | | | | | | | | |

**The following samples were analyzed in this batch:** 1307028-1 1307028-2

# 1308154

### GC/MS Volatiles:
The samples were analyzed using GC/MS following the current revision of SOP 525 based on SW-846 Method 8260C. The samples were also analyzed for Gasoline Range Organics (GRO).

All acceptance criteria were met.

### Dissolved Gasses:
The sample was prepared and analyzed according to method RSK-175 procedures and the current revision of SOP 449.

All acceptance criteria were met with the following exception:

The sample had a pH > 2 at the time of analysis.

### DRO:
The sample was analyzed following the current revision of SOP 406 generally based on SW-846 Methods 8000C and 8015D. TEPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C10 to C28.

All surrogate recoveries were within acceptable limits with the following exceptions:

| Surrogate | Sample | Direction |
|---|---|---|
| O-terphenyl | MB and LCS/LCSD | High |

The sample was non-detect for TEPH/DRO. All spike recoveries in the batch were within limits. No further action was taken.

### BART:
The Biological Activity Reaction Test was completed with the Iron-Related Bacteria, Sulfate-Reducing Bacteria, and Slime-Forming Bacteria kit manufactured by Hach Company. The analysis was performed following the manufacturer provided instructions. If the target analyte is not detected (absent), then the sample will be reported with “ND” in the result field and a “U” flag. If the target analyte is detected (present), then the sample will be reported with a “1” for a result without a flag.

## Metals:

The sample was analyzed following Methods for the Determination of Metals in Environmental Samples – Supplement 1 procedures. Analysis by ICPMS followed method 200.8 and the current revision of SOP 827.

The sample was to be analyzed for dissolved metals. The sample was filtered through a 0.45 micron filter and preserved with nitric acid to a pH less than two prior to analysis.

All acceptance criteria were met.

## Inorganics:

The sample was analyzed following MCAWW, EMSL, Standard Method procedures for the current revisions of the following SOPs and methods:

| Analyte | Method | SOP # |
|---|---|---|
| Alkalinity | SM2320B | 1106 |
| Bicarbonate | SM2320B | 1106 |
| Carbonate | SM2320B | 1106 |
| pH | SM4500-$H^+$ B | 1126 |
| Total phosphorus | 365.2 | 1119 |
| Specific conductance | SM2510B | 1128 |
| TDS | SM2540C | 1101 |
| Bromide | 300.0 Revision 2.1 | 1113 |
| Chloride | 300.0 Revision 2.1 | 1113 |
| Fluoride | 300.0 Revision 2.1 | 1113 |
| Nitrate as N | 300.0 Revision 2.1 | 1113 |
| Nitrite as N | 300.0 Revision 2.1 | 1113 |
| Sulfate | 300.0 Revision 2.1 | 1113 |

The sample was analyzed outside of the established ALS internal holding time for pH and specific conductance.

All remaining acceptance criteria were met.

# ALS Environmental -- FC

## Sample Number(s) Cross-Reference Table

**OrderNum:** 1308154
**Client Name:** Western Water and Land, Inc.
**Client Project Name:** GM 11-28 BWQ
**Client Project Number:** 30000.01.29
**Client PO Number:**

| Client Sample Number | Lab Sample Number | COC Number | Matrix | Date Collected | Time Collected |
|---|---|---|---|---|---|
| GM 11-28-185334 | 1308154-1 | | WATER | 08-Aug-13 | 11:00 |

# ALS Laboratory Group

225 Commerce Drive, Fort Collins, Colorado 80524
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

## Chain-of-Custody

Form 202r8

WORKORDER # 1308154

PAGE 1 of 1

DISPOSAL By Lab or Return to Client

| | | | |
|---|---|---|---|
| PROJECT NAME | GM 11-28 - BWG | SAMPLER | SLG |
| FACILITY NAME | GM 11-28 | PROJECT NO. | 30000.01.29 |
| FACILITY ID (API) | | EDD FORMAT | |
| COMPANY NAME | Western Water + Land | PURCHASE ORDER | |
| SEND REPORT TO | Brock Smith | BILL TO COMPANY | WPX Energy |
| ADDRESS | 743 Horizon Ct Suite 330 | INVOICE ATTN TO | Brandon Darforth |
| CITY / STATE / ZIP | Grand Jct, CO 81506 | ADDRESS | 1058 CR 215 |
| PHONE | 970-242-0170 | CITY / STATE / ZIP | Parachute, CO 81635 |
| FAX | | PHONE | 970-263-2792 |
| E-MAIL | bsmith@westernwaterandland.com | FAX | |
| | | E-MAIL | |

DATE 8-8-13

TURNAROUND Standard

| Lab ID | Field ID | Matrix | Sample Date | Sample Time | # Bottles | Pres. | QC | NG1 | BART | BTEX | GRO | Dissolved Gases (MEP) | DRO | Dissolved metals (lab filtered) | Anions, alk, tds, | TH, Cond. Total Phosphorus |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | GM 11-28-185834 | W | 8-8-13 | 1100 | 15 | 1,5 | N | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| | TB1, TB2 | | | | | | | | | | | | | | | | |

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

**For metals or anions, please detail analytes below.**

**Comments:**
Dissolved metals need to be lab filtered. Sample was effervescent (highly) - will find bubbles in samples

| QC PACKAGE (check below) | |
|---|---|
| | LEVEL II (Standard QC) |
| | LEVEL III (Std QC + forms) |
| X | LEVEL IV (Std QC + forms + raw data) |
| | |

**Preservative Key:** 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

| | SIGNATURE | PRINTED NAME | DATE | TIME |
|---|---|---|---|---|
| RELINQUISHED BY | | Shelby Goodwin | 8-8-13 | 1540 |
| RECEIVED BY | | Lauren Schmitz | 8/9/13 | 1010 |
| RELINQUISHED BY | | | | |
| RECEIVED BY | | | | |
| RELINQUISHED BY | | | | |
| RECEIVED BY | | | | |

**ALS Environmental - Fort Collins**
**CONDITION OF SAMPLE UPON RECEIPT FORM**

Client: W. Water Workorder No: 1308154

Project Manager: ARW Initials: LAS Date: 8/9/13

| | | | |
|---|---|---|---|
| 1. Does this project require any special handling in addition to standard ALS procedures? | | YES | (NO) |
| 2. Are custody seals on shipping containers intact? | NONE | (YES) | NO |
| 3. Are Custody seals on sample containers intact? | (NONE) | YES | NO |
| 4. Is there a COC (Chain-of-Custody) present or other representative documents? | | (YES) | NO |
| 5. Are the COC and bottle labels complete and legible? | | (YES) | NO |
| (6.) Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.) | | YES | (NO) * |
| 7. Were airbills / shipping documents present and/or removable? | DROP OFF | (YES) | NO |
| 8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles) | N/A | (YES) | NO |
| 9. Are all aqueous non-preserved samples pH 4-9? | N/A | (YES) | NO |
| 10. Is there sufficient sample for the requested analyses? | | (YES) | NO |
| 11. Were all samples placed in the proper containers for the requested analyses? | | (YES) | NO |
| 12. Are all samples within holding times for the requested analyses? | | (YES) | NO |
| 13. Were all sample containers received intact? (not broken or leaking, etc.) | | (YES) | NO |
| (14.) Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ✓ < green pea ____ > green pea | N/A | YES | (NO) * |
| 15. Do any water samples contain sediment? Amount<br>Amount of sediment: ____ dusting ____ moderate ____ heavy | N/A | YES | (NO) |
| 16. Were the samples shipped on ice? | | (YES) | NO |
| 17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: (#2) #4 | RAD ONLY | (YES) | NO |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Cooler #: | 1 | | | | | | | |
| Temperature (°C): | 2.0 | | | | | | | |
| No. of custody seals on cooler: | 2 | | | | | | | |
| DOT Survey/ Acceptance Information — External µR/hr reading: | 13 | | | | | | | |
| Background µR/hr reading: | 10 | | | | | | | |

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? (YES) / NO / NA (If no, see Form 008.)

**Additional Information:** PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

(*6) No trip blank bottles arrived in shipment

(*14) 1308154-1-3 voa
1-4 gro
1-5
1-6
} all arrived with headspace ≤ pea-size

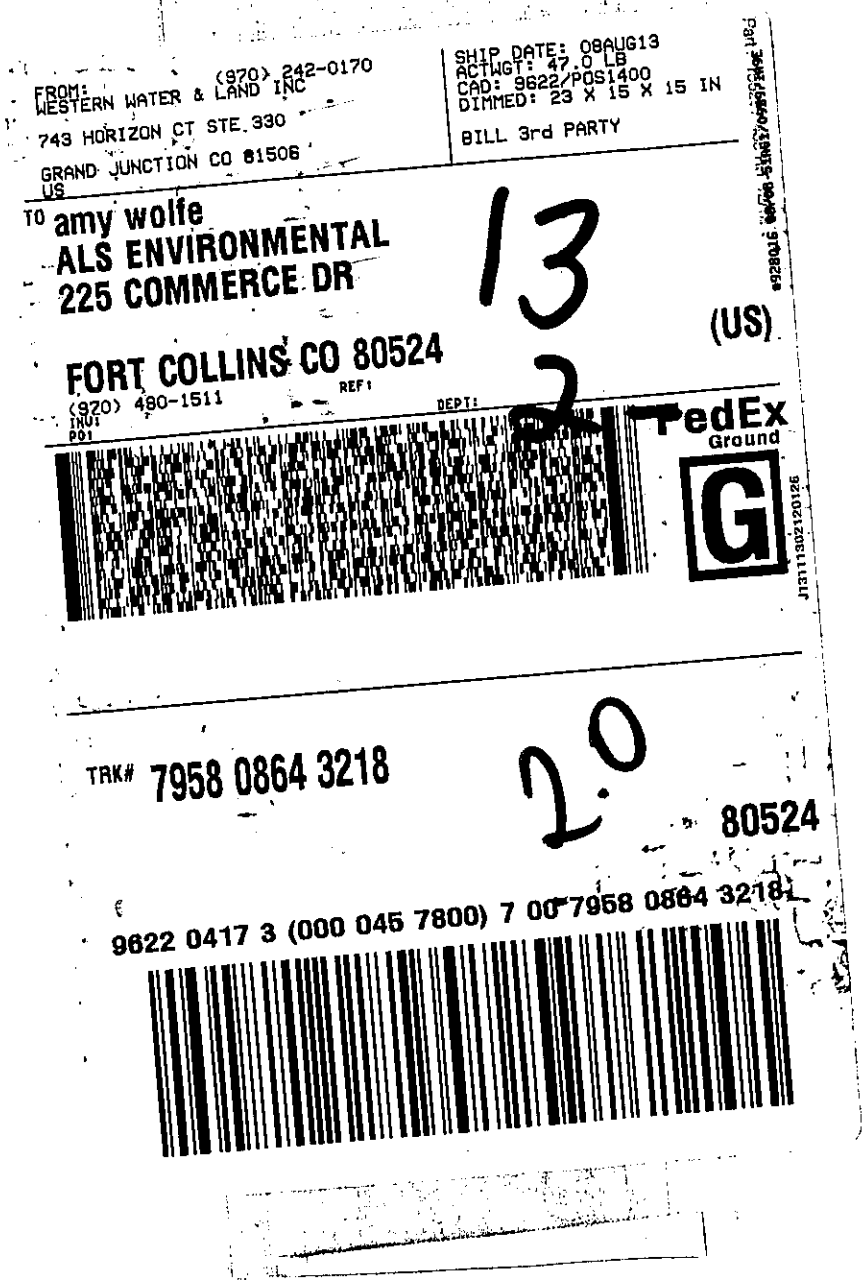
If applicable, was the client contacted? (YES) NO / NA Contact: Bruce Smith Date/Time: 8/13/13 email

**Project Manager Signature / Date:** 8/13/13

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

1308154


FROM:
(970) 242-0170
WESTERN WATER & LAND INC
743 HORIZON CT STE 330
GRAND JUNCTION CO 81506
US
SHIP DATE: 08AUG13
ACTWGT: 47.0 LB
CAD: 9622/POS1400
DIMMED: 23 X 15 X 15 IN
BILL 3rd PARTY
TO amy wolfe
ALS ENVIRONMENTAL
225 COMMERCE DR
FORT COLLINS CO 80524
(970) 480-1511
REF:
DEPT:
INV:
PO:
(US)
FedEx
Ground
TRK# 7958 0864 3218
80524
9622 0417 3 (000 045 7800) 7 00 7958 0864 3218

**Client:** Western Water and Land, Inc. **Date:** *22-Aug-13*
**Project:** 30000.01.29 GM 11-28 BWQ **Work Order:** 1308154
**Sample ID:** GM 11-28-185334 **Lab ID:** 1308154-1
**Legal Location:** **Matrix:** WATER
**Collection Date:** 8/8/2013 11:00 **Percent Moisture:**

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|
| **ALKALINITY AS CALCIUM CARBONATE** | | | **SM2320B** | | Prep Date: **8/12/2013** | PrepBy: **AJD** |
| **BICARBONATE AS CaCO3** | **450** | | **20** | **MG/L** | 1 | 8/12/2013 |
| CARBONATE AS CaCO3 | ND | | 20 | MG/L | 1 | 8/12/2013 |
| **TOTAL ALKALINITY AS CaCO3** | **450** | | **20** | **MG/L** | 1 | 8/12/2013 |
| **BIOLOGICAL ACTIVITY REACTION TEST** | | | **BART** | | Prep Date: **8/12/2013** | PrepBy: **BAS** |
| **IRON RELATED BACTERIA** | **1** | | **1** | **NU** | 1 | 8/20/2013 |
| **SLIME FORMING BACTERIA** | **1** | | **1** | **NU** | 1 | 8/20/2013 |
| **SULFATE REDUCING BACTERIA** | **1** | | **1** | **NU** | 1 | 8/20/2013 |
| **DIESEL RANGE ORGANICS** | | | **SW8015M** | | Prep Date: **8/13/2013** | PrepBy: **BCH** |
| Diesel Range Organics | ND | | 0.5 | MG/L | 1 | 8/16/2013 11:41 |
| *Surr: O-TERPHENYL* | *89* | | *51-97* | *%REC* | 1 | 8/16/2013 11:41 |
| **DISSOLVED GASSES** | | | **RSK175** | | Prep Date: **8/10/2013** | PrepBy: **JFN** |
| METHANE | ND | | 1 | UG/L | 1 | 8/10/2013 21:55 |
| ETHANE | ND | | 2 | UG/L | 1 | 8/10/2013 21:55 |
| PROPANE | ND | | 1 | UG/L | 1 | 8/10/2013 21:55 |
| **GC/MS VOLATILES** | | | **SW8260_25** | | Prep Date: **8/13/2013** | PrepBy: **SDW** |
| BENZENE | ND | | 1 | UG/L | 1 | 8/13/2013 21:59 |
| TOLUENE | ND | | 1 | UG/L | 1 | 8/13/2013 21:59 |
| ETHYLBENZENE | ND | | 1 | UG/L | 1 | 8/13/2013 21:59 |
| M+P-XYLENE | ND | | 1 | UG/L | 1 | 8/13/2013 21:59 |
| O-XYLENE | ND | | 1 | UG/L | 1 | 8/13/2013 21:59 |
| GASOLINE RANGE ORGANICS | ND | | 100 | UG/L | 1 | 8/13/2013 21:59 |
| *Surr: DIBROMOFLUOROMETHANE* | *105* | | *84-118* | *%REC* | 1 | 8/13/2013 21:59 |
| *Surr: TOLUENE-D8* | *102* | | *85-115* | *%REC* | 1 | 8/13/2013 21:59 |
| *Surr: 4-BROMOFLUOROBENZENE* | *103* | | *85-115* | *%REC* | 1 | 8/13/2013 21:59 |
| **ION CHROMATOGRAPHY** | | | **EPA300.0** | | Prep Date: **8/9/2013** | PrepBy: **AJD** |
| BROMIDE | ND | | 0.2 | MG/L | 1 | 8/9/2013 17:19 |
| **CHLORIDE** | **27** | | **2** | **MG/L** | 10 | 8/9/2013 17:33 |
| **FLUORIDE** | **1.6** | | **0.1** | **MG/L** | 1 | 8/9/2013 17:19 |
| **NITRATE AS N** | **0.28** | | **0.2** | **MG/L** | 1 | 8/9/2013 17:19 |
| NITRITE AS N | ND | | 0.1 | MG/L | 1 | 8/9/2013 17:19 |
| **SULFATE** | **200** | | **10** | **MG/L** | 10 | 8/9/2013 17:33 |
| **METALS BY 200.8** | | | **EPA200.8** | | Prep Date: **8/12/2013** | PrepBy: **BAS** |
| **BORON** | **180** | | **50** | **UG/L** | 10 | 8/13/2013 13:55 |
| **BARIUM** | **27** | | **1** | **UG/L** | 10 | 8/13/2013 13:55 |
| **CALCIUM** | **120000** | | **1000** | **UG/L** | 10 | 8/13/2013 13:55 |
| IRON | ND | | 100 | UG/L | 10 | 8/13/2013 13:55 |
| **POTASSIUM** | **5800** | | **1000** | **UG/L** | 10 | 8/13/2013 13:55 |
| **MAGNESIUM** | **47000** | | **100** | **UG/L** | 10 | 8/13/2013 13:55 |
| **MANGANESE** | **100** | | **2** | **UG/L** | 10 | 8/13/2013 13:55 |
| **SODIUM** | **110000** | | **1000** | **UG/L** | 10 | 8/13/2013 13:55 |

| | | | |
|---|---|---|---|
| **Client:** | Western Water and Land, Inc. | **Date:** | *22-Aug-13* |
| **Project:** | 30000.01.29 GM 11-28 BWQ | **Work Order:** | 1308154 |
| **Sample ID:** | GM 11-28-185334 | **Lab ID:** | 1308154-1 |
| **Legal Location:** | | **Matrix:** | WATER |
| **Collection Date:** | 8/8/2013 11:00 | **Percent Moisture:** | |

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|
| **SELENIUM** | **2.5** | | **1** | **UG/L** | 10 | 8/13/2013 13:55 |
| **STRONTIUM** | **1500** | | **1** | **UG/L** | 10 | 8/13/2013 13:55 |
| **PH** | | | **SM4500-H** | | Prep Date: **8/13/2013** | PrepBy: **KLR** |
| **PH** | **7.58** | | **0.1** | **pH** | 1 | 8/13/2013 |
| **SPECIFIC CONDUCTANCE IN WATER** | | | **SM2510B** | | Prep Date: **8/13/2013** | PrepBy: **KLR** |
| **SPECIFIC CONDUCTIVITY** | **1249** | | **1** | **umhos/cm** | 1 | 8/13/2013 |
| **TOTAL DISSOLVED SOLIDS** | | | **SM2540C** | | Prep Date: **8/13/2013** | PrepBy: **KLR** |
| **TOTAL DISSOLVED SOLIDS** | **820** | | **20** | **MG/L** | 1 | 8/14/2013 |
| **TOTAL PHOSPHORUS AS P** | | | **EPA365.2** | | Prep Date: **8/15/2013** | PrepBy: **TWK** |
| TOTAL PHOSPHORUS | ND | | 0.05 | MG/L | 1 | 8/15/2013 |

| | | | |
|---|---|---|---|
| **Client:** | Western Water and Land, Inc. | **Date:** | *22-Aug-13* |
| **Project:** | 30000.01.29 GM 11-28 BWQ | **Work Order:** | 1308154 |
| **Sample ID:** | GM 11-28-185334 | **Lab ID:** | 1308154-1 |
| **Legal Location:** | | **Matrix:** | WATER |
| **Collection Date:** | 8/8/2013 11:00 | **Percent Moisture:** | |

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|

## Explanation of Qualifiers

**Radiochemistry:**

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

# - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

**Inorganics:**

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

**Organics:**

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

**Diesel Range Organics:**

| | | | |
|---|---|---|---|
| **Client:** | Western Water and Land, Inc. | **Date:** | *22-Aug-13* |
| **Project:** | 30000.01.29 GM 11-28 BWQ | **Work Order:** | 1308154 |
| **Sample ID:** | GM 11-28-185334 | **Lab ID:** | 1308154-1 |
| **Legal Location:** | | **Matrix:** | WATER |
| **Collection Date:** | 8/8/2013 11:00 | **Percent Moisture:** | |

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

Batch ID: **HC130810-9-2** Instrument ID: **MEE-1** Method: **RSK175**

**LCS** Sample ID: **HC130810-9** Units: **UG/L** Analysis Date: **8/10/2013 21:08**

Client ID: Run ID: **HC130810-9A** Prep Date: **8/10/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| METHANE | 123 | 1 | 142 | | 86 | 80-120 | | | 25 | |
| ETHANE | 227 | 2 | 267 | | 85 | 80-120 | | | 25 | |
| PROPANE | 321 | 1 | 391 | | 82 | 80-120 | | | 25 | |

**LCSD** Sample ID: **HC130810-9** Units: **UG/L** Analysis Date: **8/10/2013 22:03**

Client ID: Run ID: **HC130810-9A** Prep Date: **8/10/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| METHANE | 139 | 1 | 142 | | 98 | 80-120 | 123 | 13 | 25 | |
| ETHANE | 254 | 2 | 267 | | 95 | 80-120 | 227 | 11 | 25 | |
| PROPANE | 356 | 1 | 391 | | 91 | 80-120 | 321 | 10 | 25 | |

**MB** Sample ID: **HC130810-9** Units: **UG/L** Analysis Date: **8/10/2013 21:12**

Client ID: Run ID: **HC130810-9A** Prep Date: **8/10/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| METHANE | ND | 1 | | | | | | | | |
| ETHANE | ND | 2 | | | | | | | | |
| PROPANE | ND | 1 | | | | | | | | |

**The following samples were analyzed in this batch:** 1308154-1

# QC BATCH REPORT

Batch ID: **EX130813-4-1** Instrument ID: **FUELS-1** Method: **SW8015M**

**LCS** Sample ID: **EX130813-4** Units: **MG/L** Analysis Date: **8/16/2013 02:10**
Client ID: Run ID: **HC130815-33A** Prep Date: **8/13/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 9.83 | 0.5 | 10 | | 98 | 36-150 | | | 20 | |
| Surr: O-TERPHENYL | 1.26 | | 1.25 | | 100 | 51-97 | | | | * |

**LCSD** Sample ID: **EX130813-4** Units: **MG/L** Analysis Date: **8/16/2013 02:40**
Client ID: Run ID: **HC130815-33A** Prep Date: **8/13/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | 10.3 | 0.5 | 10 | | 103 | 36-150 | 9.83 | 5 | 20 | |
| Surr: O-TERPHENYL | 1.36 | | 1.25 | | 109 | 51-97 | | 8 | | * |

**MB** Sample ID: **EX130813-4** Units: **MG/L** Analysis Date: **8/16/2013 01:39**
Client ID: Run ID: **HC130815-33A** Prep Date: **8/13/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics | ND | 0.5 | | | | | | | | |
| Surr: O-TERPHENYL | 1.29 | | 1.25 | | 103 | 51-97 | | | | * |

**The following samples were analyzed in this batch:** 1308154-1

# QC BATCH REPORT

Batch ID: **IP130812-2-5** Instrument ID: **ICPMS2** Method: **EPA200.8**

**LCS** Sample ID: **FM130809-1** Units: **UG/L** Analysis Date: **8/13/2013 13:42**

Client ID: Run ID: **IM130813-10A3** Prep Date: **8/12/2013** DF: **10**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BARIUM | 94.8 | 1 | 100 | | 95 | 85-115 | | | 20 | |
| BORON | 897 | 50 | 1000 | | 90 | 85-115 | | | 20 | |
| CALCIUM | 9890 | 1000 | 10000 | | 99 | 85-115 | | | 20 | |
| IRON | 5080 | 100 | 5000 | | 102 | 85-115 | | | 20 | |
| MAGNESIUM | 9500 | 100 | 10000 | | 95 | 85-115 | | | 20 | |
| MANGANESE | 196 | 2 | 200 | | 98 | 85-115 | | | 20 | |
| POTASSIUM | 5140 | 1000 | 5000 | | 103 | 85-115 | | | 20 | |
| SELENIUM | 100 | 1 | 100 | | 100 | 85-115 | | | 20 | |
| SODIUM | 10400 | 1000 | 10000 | | 104 | 85-115 | | | 20 | |
| STRONTIUM | 99.3 | 1 | 100 | | 99 | 85-115 | | | 20 | |

**MB** Sample ID: **F130809-1** Units: **UG/L** Analysis Date: **8/13/2013 13:38**

Client ID: Run ID: **IM130813-10A3** Prep Date: **8/12/2013** DF: **10**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BARIUM | ND | 1 | | | | | | | | |
| BORON | ND | 50 | | | | | | | | |
| CALCIUM | ND | 1000 | | | | | | | | |
| IRON | ND | 100 | | | | | | | | |
| MAGNESIUM | ND | 100 | | | | | | | | |
| MANGANESE | ND | 2 | | | | | | | | |
| POTASSIUM | ND | 1000 | | | | | | | | |
| SELENIUM | ND | 1 | | | | | | | | |
| SODIUM | ND | 1000 | | | | | | | | |
| STRONTIUM | ND | 1 | | | | | | | | |

**The following samples were analyzed in this batch:** 1308154-1

Batch ID: **VL130813-4-1** Instrument ID: **HPV1** Method: **SW8260_25**

**LCS** Sample ID: **VL130813-4** Units: **UG/L** Analysis Date: **8/13/2013 17:47**

Client ID: Run ID: **VL130813-4A** Prep Date: **8/13/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BENZENE | 9.91 | 1 | 10 | | 99 | 83-117 | | | 20 | |
| TOLUENE | 9.41 | 1 | 10 | | 94 | 82-113 | | | 20 | |
| ETHYLBENZENE | 10.1 | 1 | 10 | | 101 | 81-113 | | | 20 | |
| M+P-XYLENE | 21.5 | 1 | 20 | | 108 | 82-115 | | | 20 | |
| O-XYLENE | 10.7 | 1 | 10 | | 107 | 81-115 | | | 20 | |
| GASOLINE RANGE ORGANICS | 452 | 100 | 500 | | 90.382 | 80-120 | | 1 | 20 | |
| Surr: DIBROMOFLUOROMETHA | 26.9 | | 25 | | 108 | 84-118 | | | | |
| Surr: TOLUENE-D8 | 25.6 | | 25 | | 103 | 85-115 | | | | |
| Surr: 4-BROMOFLUOROBENZE | 24.7 | | 25 | | 99 | 85-115 | | | | |

**LCSD** Sample ID: **VL130813-4** Units: **UG/L** Analysis Date: **8/13/2013 18:10**

Client ID: Run ID: **VL130813-4A** Prep Date: **8/13/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BENZENE | 9.34 | 1 | 10 | | 93 | 83-117 | 9.91 | 6 | 20 | |
| TOLUENE | 8.84 | 1 | 10 | | 88 | 82-113 | 9.41 | 6 | 20 | |
| ETHYLBENZENE | 9.43 | 1 | 10 | | 94 | 81-113 | 10.1 | 7 | 20 | |
| M+P-XYLENE | 20.1 | 1 | 20 | | 100 | 82-115 | 21.5 | 7 | 20 | |
| O-XYLENE | 10.1 | 1 | 10 | | 101 | 81-115 | 10.7 | 6 | 20 | |
| GASOLINE RANGE ORGANICS | 446 | 100 | 500 | | 89.254 | 80-120 | 452 | 1 | 20 | |
| Surr: DIBROMOFLUOROMETHA | 27.3 | | 25 | | 109 | 84-118 | | 1 | | |
| Surr: TOLUENE-D8 | 25.5 | | 25 | | 102 | 85-115 | | 1 | | |
| Surr: 4-BROMOFLUOROBENZE | 24.6 | | 25 | | 98 | 85-115 | | 1 | | |

**MB** Sample ID: **VL130813-4** Units: **UG/L** Analysis Date: **8/13/2013 18:56**

Client ID: Run ID: **VL130813-4A** Prep Date: **8/13/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BENZENE | ND | 1 | | | | | | | | |
| TOLUENE | ND | 1 | | | | | | | | |
| ETHYLBENZENE | ND | 1 | | | | | | | | |
| M+P-XYLENE | ND | 1 | | | | | | | | |
| O-XYLENE | ND | 1 | | | | | | | | |
| GASOLINE RANGE ORGANICS | ND | 100 | | | | | | | | |
| Surr: DIBROMOFLUOROMETHA | 26.5 | | 25 | | 106 | 84-118 | | | | |
| Surr: TOLUENE-D8 | 25.8 | | 25 | | 103 | 85-115 | | | | |
| Surr: 4-BROMOFLUOROBENZE | 25.4 | | 25 | | 102 | 85-115 | | | | |

**The following samples were analyzed in this batch:** 1308154-1

# QC BATCH REPORT

Batch ID: **AK130812-2-1** Instrument ID: **NONE** Method: **SM2320B**

**LCS** Sample ID: **AK130812-2** Units: **MG/L** Analysis Date: **8/12/2013**
Client ID: Run ID: **ak130812-2a** Prep Date: **8/12/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL ALKALINITY AS CaCO3 | 96.7 | 5 | 100 | | 97 | 85-115 | | | 15 | |

**MB** Sample ID: **AK130812-2** Units: **MG/L** Analysis Date: **8/12/2013**
Client ID: Run ID: **ak130812-2a** Prep Date: **8/12/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| BICARBONATE AS CaCO3 | ND | 5 | | | | | | | | |
| CARBONATE AS CaCO3 | ND | 5 | | | | | | | | |
| TOTAL ALKALINITY AS CaCO3 | ND | 5 | | | | | | | | |

**The following samples were analyzed in this batch:** 1308154-1

# QC BATCH REPORT

Batch ID: **IC130809-1-1** Instrument ID: **IC** Method: **EPA300.0**

**LCS** Sample ID: **IC130809-1** Units: **MG/L** Analysis Date: **8/9/2013 13:48**

Client ID: Run ID: **IC130809-1A1** Prep Date: **8/9/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| FLUORIDE | 1.9 | 0.1 | 2 | | 95 | 90-110 | | | 15 | |
| CHLORIDE | 4.88 | 0.2 | 5 | | 98 | 90-110 | | | 15 | |
| NITRITE AS N | 1.81 | 0.1 | 2 | | 91 | 90-110 | | | 15 | |
| BROMIDE | 5.01 | 0.2 | 5 | | 100 | 90-110 | | | 15 | |
| NITRATE AS N | 5.08 | 0.2 | 5 | | 102 | 90-110 | | | 15 | |
| SULFATE | 19.2 | 1 | 20 | | 96 | 90-110 | | | 15 | |

**MB** Sample ID: **IC130809-1** Units: **MG/L** Analysis Date: **8/9/2013 14:02**

Client ID: Run ID: **IC130809-1A1** Prep Date: **8/9/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| FLUORIDE | ND | 0.1 | | | | | | | | |
| CHLORIDE | ND | 0.2 | | | | | | | | |
| NITRITE AS N | ND | 0.1 | | | | | | | | |
| BROMIDE | ND | 0.2 | | | | | | | | |
| NITRATE AS N | ND | 0.2 | | | | | | | | |
| SULFATE | ND | 1 | | | | | | | | |

**The following samples were analyzed in this batch:** 1308154-1

# QC BATCH REPORT

Batch ID: **PH130813-1-1** Instrument ID: **pH-1** Method: **SM4500-H**

**DUP** Sample ID: **1308154-1** Units: **pH** Analysis Date: **8/13/2013**

Client ID: **GM 11-28-185334** Run ID: **pH130813-1A1** Prep Date: **8/13/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| PH | 7.6 | 0.1 | | | | | 7.58 | | 0.2 | |

**The following samples were analyzed in this batch:** 1308154-1

# QC BATCH REPORT

Batch ID: **SC130813-1-1** Instrument ID: **pH-1** Method: **SM2510B**

**DUP** Sample ID: **1308154-1** Units: **umhos/cm** Analysis Date: **8/13/2013**

Client ID: **GM 11-28-185334** Run ID: **SC130813-1A** Prep Date: **8/13/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| SPECIFIC CONDUCTIVITY | 1261 | 1 | | | | | 1249 | 1 | 10 | |

**The following samples were analyzed in this batch:** 1308154-1

# QC BATCH REPORT

Batch ID: **TD130813-2-1** Instrument ID: **Balance** Method: **SM2540C**

**LCS** Sample ID: **TD130813-2** Units: **MG/L** Analysis Date: **8/14/2013**
Client ID: Run ID: **TD130814-2A** Prep Date: **8/13/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL DISSOLVED SOLIDS | 416 | 20 | 400 | | 104 | 85-115 | | | 5 | |

**MB** Sample ID: **TD130813-2** Units: **MG/L** Analysis Date: **8/14/2013**
Client ID: Run ID: **TD130814-2A** Prep Date: **8/13/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL DISSOLVED SOLIDS | ND | 20 | | | | | | | | |

**The following samples were analyzed in this batch:** 1308154-1

# QC BATCH REPORT

Batch ID: **TP130815-1-1** Instrument ID: **Spec** Method: **EPA365.2**

**LCS** Sample ID: **TP130815-1** Units: **MG/L** Analysis Date: **8/15/2013**
Client ID: Run ID: **TP130815-1A** Prep Date: **8/15/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL PHOSPHORUS | 0.572 | 0.05 | 0.5 | | 114 | 80-120 | | | 20 | |

**MB** Sample ID: **TP130815-1** Units: **MG/L** Analysis Date: **8/15/2013**
Client ID: Run ID: **TP130815-1A** Prep Date: **8/15/2013** DF: **1**

| Analyte | Result | ReportLimit | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL PHOSPHORUS | ND | 0.05 | | | | | | | | |

**The following samples were analyzed in this batch:** 1308154-1