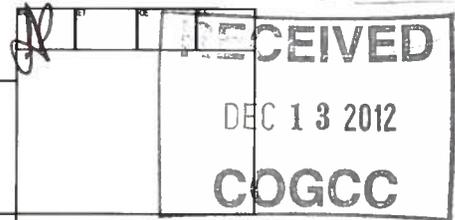




Form 14 # 2597032  
Form 27 # 6787  
NOAV # 200332643

State of Colorado  
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 Phone: (303)894-2100 Fax: (303)894-2109



SUNDRY NOTICE

Submit original plus one copy. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full on Technical Information Page (Page 2 of this form.) Identify well or other facility by API Number or by OGCC Facility ID. Operator shall send an informational copy of all sundry notices for wells located in High Density Areas to the Local Government Designee (Rule 603b.)

1. OGCC Operator Number: 10079	4. Contact Name: Cole Kilstrom	Complete the Attachment Checklist
2. Name of Operator: Antero Resources Piceance Corporation	Phone: 303-357-6709	
3. Address: 1625 17th St STE 300 ATTN: Cole Kilstrom	Fax: 303-357-7315	OP OGCC
City: Denver State: CO Zip: 80202		
5. API Number 05-N/A	OGCC Facility ID Number 336037	Survey Plat
6. Well/Facility Name: Gypsum Ranch B Pad	7. Well/Facility Number: Produced water flow line	Directional Survey
8. Location (Qtr/Sec, Twp, Rng, Meridian): NWNE 14 6S 93W 6		Surface Eqmpt Diagram
9. County: Garfield	10. Field Name: Mamm Creek	Technical Info Page <input checked="" type="checkbox"/>
11. Federal, Indian or State Lease Number:		Other

General Notice

CHANGE OF LOCATION: Attach New Survey Plat (a change of surface qtr/qtr is substantive and requires a new permit)

Change of Surface Footage from Exterior Section Lines:  FNU/FSL  FEL/FWL

Change of Surface Footage to Exterior Section Lines:

Change of Bottomhole Footage from Exterior Section Lines:

Change of Bottomhole Footage to Exterior Section Lines:  attach directional survey

Bottomhole location Qtr/Sec, Twp, Rng, Mer \_\_\_\_\_

Latitude \_\_\_\_\_ Distance to nearest property line \_\_\_\_\_ Distance to nearest bldg, public rd, utility or RR \_\_\_\_\_

Longitude \_\_\_\_\_ Distance to nearest lease line \_\_\_\_\_ Is location in a High Density Area (rule 603b)? Yes/No

Ground Elevation \_\_\_\_\_ Distance to nearest well same formation \_\_\_\_\_ Surface owner consultation date: \_\_\_\_\_

GPS DATA: Date of Measurement \_\_\_\_\_ PDOP Reading \_\_\_\_\_ Instrument Operator's Name \_\_\_\_\_

CHANGE SPACING UNIT

Formation	Formation Code	Spacing order number	Unit Acreage	Unit configuration

Remove from surface bond  
Signed surface use agreement attached

CHANGE OF OPERATOR (prior to drilling):  
Effective Date: \_\_\_\_\_  
Plugging Bond:  Blanket  Individual

CHANGE WELL NAME NUMBER  
From: \_\_\_\_\_  
To: \_\_\_\_\_  
Effective Date: \_\_\_\_\_

ABANDONED LOCATION:  
Was location ever built?  Yes  No  
Is site ready for inspection?  Yes  No  
Date Ready for inspection: \_\_\_\_\_

NOTICE OF CONTINUED SHUT IN STATUS  
Date well shut in or temporarily abandoned: \_\_\_\_\_  
Has Production Equipment been removed from site?  Yes  No  
MIT required if shut in longer than two years. Date of last MIT: \_\_\_\_\_

SPUD DATE: \_\_\_\_\_

REQUEST FOR CONFIDENTIAL STATUS (6 mos from date casing set)

SUBSEQUENT REPORT OF STAGE, SQUEEZE OR REMEDIAL CEMENT WORK \*submit cbl and cement job summaries

Method used	Cementing tool setting/perf depth	Cement volume	Cement top	Cement bottom	Date

RECLAMATION: Attach technical page describing final reclamation procedures per Rule 1004.  
Final reclamation will commence on approximately \_\_\_\_\_  Final reclamation is completed and site is ready for inspection.

Technical Engineering/Environmental Notice

Notice of Intent Approximate Start Date: \_\_\_\_\_

Report of Work Done Date Work Completed: \_\_\_\_\_

Details of work must be described in full on Technical Information Page (Page 2 must be submitted.)

<input type="checkbox"/> Intent to Recomplete (submit form 2)	<input type="checkbox"/> Request to Vent or Flare	<input type="checkbox"/> E&P Waste Disposal
<input type="checkbox"/> Change Drilling Plans	<input type="checkbox"/> Repair Well	<input type="checkbox"/> Beneficial Reuse of E&P Waste
<input type="checkbox"/> Gross Interval Changed?	<input type="checkbox"/> Rule 502 variance requested	<input checked="" type="checkbox"/> Status Update/Change of Remediation Plans
<input type="checkbox"/> Casing/Cementing Program Change	<input type="checkbox"/> Other: _____	for Spills and Releases

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct and complete.

Signed: Cole Kilstrom Date: 12/12/12 Email: ckilstrom@anteroresources.com  
Print Name: Cole Kilstrom Title: ENV specialist

COGCC Approved: [Signature] Title: Env. Supv Date: 1/9/13  
CONDITIONS OF APPROVAL IF ANY:

See Attached comments.

TECHNICAL INFORMATION PAGE



1. OGCC Operator Number: 10079 API Number: N/A  
 2. Name of Operator: Antero Resources Piceance OGCC Facility ID # 336037  
 3. Well/Facility Name: Gypsum Ranch B Pad Well/Facility Number: Water Line  
 4. Location (QtrQtr, Sec, Twp, Rng, Meridian): NWNE 14 6S 93W 6

This form is to be completed whenever a Sundry Notice is submitted requiring detailed report of work to be performed or completed. This form shall be transmitted within 30 days of work completed as a "subsequent" report and must accompany Form 4, page 1.

5. DESCRIBE PROPOSED OR COMPLETED OPERATIONS

Summary of Corrective Actions and Request for NOAV Closure:

On December 6, 2011, a frozen valve ruptured resulting in the release of produced water near Antero's Gypsum Ranch B Pad. The produced water flowed down the access road and pooled atop the ice on a frozen pond. The unauthorized release resulted in the COGCC's issuance of NOAV # 200332643.

COGCC NOAV # 200332643 required the following corrective actions from Antero:

1. Perform engineering evaluation of failure per Rule 906.e;
2. Develop a Form 27 Site Investigation and Remediation Work Plan (Rule 906.d) for approval prior to implementation to delineate the horizontal and vertical extent of the impact in soil and ice;
3. Collect analytical samples of impacted soil and ice/water at pond entry point for Table 910-1 constituents plus TDS, CL analysis for pond ice/water sample;
4. Provide chemical analysis of produced water that was in gathering line;
5. Provide pipeline design and integrity testing records for the pipeline;
6. Inform landowners of ongoing work and subsequent results of the work being conducted and provide regular status updates;
7. Provide chemical inventory sheets for all wells on gathering line per Rule 205; and
8. Provide written copy of Post-Construction Stormwater Program in compliance with Rule 1002.f.(1).

Antero responded to the NOAV on January 16, 2012 with a submittal to the COGCC. Antero's response included the following:

1. An engineering evaluation of the water line failure;
2. Antero's remediation response;
3. Confirmation samples within COGCC Table 910-1 standards;
4. Chemical analysis of the produced water in the water line;
5. Pipeline integrity test records;
6. A response to COGCC's request for chemical inventory records; and
7. A description and copies of Antero's Post Construction Stormwater Program and Work Orders.

Antero also requested that the COGCC agree that further remediation at the site would be unnecessary, based upon the analytical data.

In a letter dated July 10, 2012, Linda Spry O'Rourke, on behalf of the COGCC, wrote Antero and approved the closure of Remediation Project # 6787 (assigned to this matter). The letter stated that "COGCC agrees that no further action relative to the spill is required at this site until final reclamation activities." In regards to evaluating the closure of the NOAV, Ms. O'Rourke wrote that the COGCC required further information regarding items 6 and 8 of the NOAV.

In regards to item 6 involving landowner consultation, Kip Constanzo, a contractor for Antero, contacted Mr. Scott Balcom, the surface owner, via phone on or about January 20, 2012 to inform him of Antero's remediation plan. The excavation (ice removal) was completed on January 30, 2012.

Regarding item 8, Antero provided the COGCC with a narrative of its Post Construction Stormwater Program in its January 16, 2012 Form 27 (Remediation Project # 6787), attached hereto. Please also find Antero's original, and renewed CDPS Stormwater Discharge permits attached.

Antero has performed and completed all of the requested corrective action stated in the NOAV, and thus respectfully requests final COGCC closure of NOAV # 200332643 in accordance with COGCC Rule 522(b).

*See Attached Comments.*

*No documentation re: phone conversation. However, Kip Constanzo has had several conversations w/ Mr. Balcom per (note Kip's name) Antero's conversation w/ COGCC 1/13/12*

Based on review of information presented on data presented it appears that no further action is necessary at this time, and COGCC approves the closure request. However, should future conditions at the site indicate contaminant concentrations in soils exceeding COGCC standards or if ground water is found to be significantly impacted, then further investigation and/or remediation activities may be required at the site.

*1/4/13*

FORM  
NOAV  
Rev 6/99

State of Colorado  
Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax: (303) 894-2109



FOR OGCC USE ONLY  
12/12/2011  
200332648

RECEIVED  
DEC 13 2012  
Date Notice Issued:  
12/12/2011  
COGCC

\*\*\* NOTICE OF ALLEGED VIOLATION \*\*\*  
OGCC Operator Number: 10079  
Name of Operator: ANTERO RESOURCES PICEANCE CORPORATION  
Address: 1625 17TH ST STE 300 ATTN: TERRELL A DOBKINS  
City: DENVER State: CO Zip: 80202  
Company Representative: JERRY ALBERTS

Well Name: Well Number: Facility Number: 336037  
Location (QtrQtr, Sec, Twp, Rng, Meridian): NWNE 14 6S 93W 6 County: GARFIELD  
API Number: 05 Lease Number:

COGCC Representative: SPRY OROURKE LINDA Phone Number: 970 625-2497

THE FOLLOWING ALLEGED VIOLATION WAS FOUND BY THE COGCC REPRESENTATIVE FOR THE SITE LISTED  
Date of Alleged Violation: 12/06/2011 Approximate Time of Violation: 2:46PM  
Description of Alleged Violation:  
A ruptured frozen valve resulted in a release of produced water which pooled on the pad, then flowed down the access road and impacted the gravel pit pond which is adjacent to the pad access road. The pond entry point lies approximately 1044 feet from the Colorado River channel. Conditions of Approval placed on all permitted wells on this location state "If fluids are conveyed via pipeline, operator must implement best management practices to contain any unintentional release of fluids". Adequate stormwater controls were not in place between road and pond to contain the pipeline release. The release to waters of the state was first reported to the COGCC on 12/7/2011 @ 17:37, more than 24 hours after the release occurred.

Act, Order, Regulation, Permit Conditions Cited:  
324.A.a, 324.A.b, 901.f, 906.b.(3), 907.a.(1), 907.a.(2), 1002.f.(2)

Abatement or Corrective Action Required to be Performed by Operator:  
1. Perform engineering evaluation of failure per Rule 906.e.(2). Develop a Form 27 Site Investigation and Remediation Work Plan (Rule 906.d) for approval prior to implementation to delineate the horizontal and vertical extent of the impact in soil and ice. 4. Collect analytical samples of impacted soil and ice/water at pond entry point for Table 910-1 constituents plus TDS, CL analysis for pond ice/water sample. 4. Provide chemical analysis of produced water that was in gathering line. 5. Provide pipeline design and integrity testing records for the pipeline. 6. Inform landowners of ongoing work and subsequent results of the work being conducted and provide regular status updates. 7. Provide chemical inventory sheets for all wells on gathering line per Rule 205. 8. Provide written copy of Post-Construction Stormwater Program in compliance with Rule 1002.f.(1).  
Abatement or Corrective Action to be Completed by (date): 01/15/2011  
\* Proper and timely abatement does not necessarily preclude the assessment of penalties and an Order Finding Violation.

TO BE COMPLETED BY OPERATOR - When alleged violation is corrected, sign this notice and return to above address:  
Company Representative Name: Cole Kilstrom Title: ENV specialist  
Signature: [Signature] Date: 12/12/12  
Company Comments: See attached Form 4 for additional information

\*\*\* THIS NOTICE CONSTITUTES A SEPARATE NOTICE OF ALLEGED VIOLATION FOR EACH VIOLATION LISTED \*\*\*

WARNING  
Abatement and reporting time frames for Notices of Alleged Violation begin upon receipt of the Notice or five days after the date it is mailed, whichever is earlier. Each violation must be abated within the prescribed time upon receipt of this Notice, reported to the Colorado Oil and Gas Conservation Commission at the address shown above, and postmarked no later than the next business day after the prescribed time for abatement. Should abatement or corrective action fail to occur, the Director may make application to the Commission for an Order Finding Violation. Proper and timely abatement does not necessarily preclude the assessment of penalties and an Order Finding Violation.

PENALTY PROPOSED BY THE DIRECTOR PER RULE 523  
The Director may propose a penalty as listed in the table below. The maximum penalty amount will be limited to \$10,000.00 per violation if the violation does not result in significant waste of oil and gas resources; damage to correlative rights, or a significant adverse impact on public health, safety, or welfare. Such proposed penalty amount may be increased if aggravating factors indicate the violation: was intentional or reckless; had, or threatened to have, a significant negative impact on public health, safety, or welfare; resulted in significant waste of oil and gas resources; had a significant negative impact on correlative rights of other parties; resulted in, or threatened to result in, significant loss or damage to public or private property; involved recalcitrance or recidivism upon the part of the violator; involved intentional false reporting or record keeping; resulted in economic benefit to the violator. Such proposed penalty amount may be decreased if mitigating factors indicate the violator: self-reported; promptly, effectively and proactively responded to the violation; cooperated with the Commission or other agencies with respect to the violation; could not reasonably control, or be responsible for, the cause of the violation; made a good faith effort to comply with applicable requirements prior to the Commission learning of the violation; had any economic benefit reduced or eliminated due to the cost of correcting the violation; has demonstrated a history of compliance with Commission rules, regulations and orders. The Commission has final authority over the penalty amount assessed.  
The Commission or other agencies with respect to the violation; could not reasonably control, or be responsible for, the cause of the violation; made a good faith effort to comply with applicable requirements prior to the Commission learning of the violation; had any economic benefit reduced or eliminated due to the cost of correcting the violation; has demonstrated a history of compliance with Commission rules, regulations, and orders. The  
BASE FINE \$250.00 PER DAY PER VIOLATION: RULES 210, 307, 311, 312, 313, 314A, 315, 403, 405, 603, 604  
BASE FINE \$500.00 PER DAY PER VIOLATION: RULES 205, 206, 207, 208, 302, 306, 309, 310, 316A, 321, 322, 326, 329, 330, 331, 332, 401  
BASE FINE \$750.00 PER DAY PER VIOLATION: RULES 805, 806A, 906B, 907  
BASE FINE \$1,000.00 PER DAY PER VIOLATION: RULES 209, 301, 303, 305, 306, 316B, 317, 317A, 318, 319, 320, 323, 324, 325, 326, 327, 333, 404, 602, 603, 604, 703, 704, 705, 706, 707, 708, 709, 711, 802, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 1002, 1003, 1004, 1101, 1102, 1103  
In accordance with Rule 523.a.(4), fines for violations for which no base fine is listed shall be determined by the Commission at its discretion.

Signature of COGCC Representative: [Signature] Date: 12/12/2011 Time: 16:25  
Resolution Approved by: [Signature] Date: 1/4/13  
See REM 6787  
Form 19 2597032  
WON FACILITY ID: 426957

# **Antero Resources**

## **Gypsum Ranch B Pad Response to NOAV 200332643**

January 16<sup>th</sup> 2012



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4.0 Chemical Analysis of Produced Water in the Water Line.....	2
5.0 Gypsum Ranch B Pad Chemical Inventory.....	2
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**Appendices**

- Appendix A: Gypsum Ranch B Pad Form 19
- Appendix B: Pad Sampling Analytical Results
- Appendix C: Example Drawing of Failure
- Appendix D: Integrity Test Records
- Appendix E: Produced Water Analysis
- Appendix F: Gypsum Ranch B Pad Storm Water Work Orders
- Appendix G: Sensitive Area Determination

**Antero Resources**  
**Gypsum Ranch B Pad: Response to NOAV 200332643**  
Spill/Release Tracking Number 2597032

**Introduction**

On December 6, 2011 a produced water spill occurred at Antero Resources' ("Antero") Gypsum Ranch B Pad. The details of this spill were provided to the COGCC in a Form 19 on December 12, 2011. The information provided in the Form 19 contained among other things; Antero's detailed description of the cause of the spill, Antero's emergency spill response and Antero's proposed actions to prevent the problem from reoccurring. The submitted Form 19 is provided with this submittal in Appendix A, "Gypsum Ranch B Pad Form 19."

The produced water spill impacted approximately 11,758 total square feet. The majority of the spill was limited to the Gypsum Ranch B pad and access road, however approximately 1 bbl of produced water impacted the adjacent gravel pit pond. A map of the impacted area is provided in Appendix A.

At the time of the incident the temperature was significantly below freezing and the impacted pond was frozen. Based on Antero's investigation of the spill, the produced water that impacted the pond was limited to a thin layer on top of the frozen pond surface and the produced water soon froze to the ponds surface.

**Section 1: Remediation Plan**

Antero implemented a strategy to remediate the impacted area of the frozen pond by removing the ice with a track hoe. The area of pond impacted by the spill is approximately 15 feet by 15 feet starting at the point of entry. Antero utilized a track hoe with a 27 foot reach to break the impacted ice and store the ice at the Gypsum Ranch B Pad. A confirmation water sample was collected from the water surface once the impacted ice was removed. The removed ice was placed in a metal trough located within the Gypsum Ranch B pad perimeter berm. When the ice melted, the water was transported to Antero's Wasatch Bench Water Management Facility to be re-used in Antero's water recycling system.

Immediately upon the spill discovery, Vac Trucks were sent to the location to remove the free standing liquids. Microblaze was applied to the impacted areas soon after the liquids were removed with a Vac Truck. Soil samples were collected two days later on December 8, 2011 by a third party and analyzed for compliance with the Table 910-1 constituents. Analytical summary tables, the lab results, and the soil and water sample location map are provided in Appendix B "Pad Sampling Analytical Results." The results show that the impacted areas do not exceed Table 910-1 standards for soil and water. Antero had deemed the site as in compliance with the COGCC cleanup standards and therefore is not planning to conduct additional pad and access road remediation work.

**Section 2: Engineering Evaluation of the Water Line Failure**

The spill was located at an above ground pipeline manifold at the Gypsum Ranch B Pad of Antero's Phase V of the Piceance water network. The well pads connected by Phase V of the water network are the Snyder C Pad, Snyder D Pad, Snyder A Pad, Gypsum Ranch B Pad, and the Gypsum Ranch A Pad. The purpose of Phase V of the network was to extend the pipeline infrastructure from the Dever A Pad to the Snyder C Pad and continue it west to the Gypsum Ranch A Pad. The pipeline is design with 12 inch PE-4710, SDR 9.0 pipeline. The material pressure rating is 252 psi, with a design pressure of 200 psi.

The cause of the spill was due to the insufficient closing of the gate valve on the pipeline manifold. Since the gate valve wasn't completely closed, there was a small space for produced water to slowly move from the main water line into the valve cap space. The cap area slowly filled with water and when temperatures were well below freezing for a significant period of time, the water expanded by 10% in volume by converting to ice. Due to the increase in volume, pressure built up inside the valve cap and caused it to release at the point of least resistance, the metal cap. A typical drawing of what occurred and a picture of the rupture is provided in Appendix C.

Three direct measures are being taken to prevent this problem from re-occurring, as stated in the submitted Form 19. The measures include the following; 1) insulate above ground pipeline manifolds, 2) drain the production water from isolated pipeline sections that are not used daily, and 3) conduct monthly field wide maintenance/housekeeping visits during the winter months (e.g. checking gate valves).

Integrity testing of this specific section of the Phase V pipeline network was conducted most recently on November 22, 2011. The original integrity test conducted after installation was completed on February 18, 2009. These two integrity tests are included in Appendix D, "Integrity Testing Records."

### **Section 3: Ice/Water Samples of the Impacted Pond at Entry Point**

Antero engaged a third party consulting firm to assess the spill impacts and to collect water quality data to support this analysis. As such, a water sample was collected at the pond entry point on December 8, 2011. At the time of collection, the water sample was collected by chipping ice from the surface of the pond until a representative sample of produced water at the impact point was collected. The results from this sampling are included in Appendix B and show small traces of diesel range organics, benzene, and toluene, but all the parameters analyzed meet Table 910-1 standards.

A confirmation water sample was taken on January 31, 2012 by a third party consulting firm. This sample was taken after the impacted frozen surface layers of the pond were removed. The results of the sampling are including in Appendix B. The results show no detectable traces of hydrocarbons and a pH in the normal range. All other sampled parameters tested for meet Table 910-1 standards. Based on the analytical results obtained from the pond sample, Antero requests that no further pond remediation is necessary

### **Section 4: Chemical Analysis of the Produced Water in the Water Line**

After the spill incident, Phase V of Antero's water pipeline was drained and a produced water sample could not be collected straight from the waterline at the spill origin. However, a representative sample of the produced water that was in the water pipeline was collected at the Wasatch Bench Pond on December 21, 2011. This sample is similar to the produced water that spilled on December 6, 2011. The water line produced water results are provided in Appendix E.

### **Section 5: Gypsum Ranch B Pad Chemical Inventory**

Condition number seven of NOAV 200332643 requests that Antero provide the chemical inventory sheets for all wells on the gathering line. The most recent wells in this area were drilled and completed in 2007 and 2008. As such, Antero does not have chemical inventory records for these wells. However, Antero is maintaining chemical inventory records for its wells drilled and completed after the effective date of the chemical inventory rule.

### **Section 6: Antero's Post Construction Stormwater Program**

Antero's stormwater program commences prior to pad construction with the installation of proposed stormwater Best Management Practices ("BMP's") as designed by a third party survey company. The BMPs are identified on the pad plat package and are designed by a water engineer or stormwater specialist employed or contracted by the survey company. The BMPs are maintained during the active life of the well pad. Antero engaged LT Environmental (LTE) to perform routine stormwater inspections at all of its pads and pipelines. Pads and pipelines are inspected on a 14-day schedule until the ground is stabilized by erosion blankets or by vegetation cover. Stabilized sites are subject to a 30-day inspection schedule until the site is fully reclaimed (80% or greater relative cover of surrounding vegetation). The focus of the stormwater inspections is to prevent discharges of sediment offsite. The LTE inspections are followed by an "Antero Daily Stormwater Contractor Work Order." The work order reports include instructions on the maintenance required and the location of each stormwater corrective action. Antero routinely follows-up on each work order until they have been closed out by our field personnel. These stormwater work orders are passed on to Stampfel Construction Company, a construction company that carries out the BMP maintenance.

A copy of the November and December 2011 stormwater inspection work orders for the Gypsum Ranch B Pad are provided in Appendix F, "Gypsum Ranch B Pad Stormwater Work Orders." A copy of Antero's Stormwater Management Plan is available upon request.

**Conclusion**

The purpose of this submittal is to provide the COGCC with an update regarding the remediation work following the Gypsum Ranch B Pad spill that occurred on December 6, 2011. Remediation of the spill was completed early this year and a confirmation water sample was taken on January 31, 2012. The confirmation water sample shows compliance with Table 910-1 standards. Based on the analytical data Antero requests your concurrence that further remediation at this site is not necessary. Antero has identified the cause of the spill and has taken direct measures to address the problem to prevent future spills.

Appendix B: Soil Sample Results

Sample ID	Sample Date	Metals													Moisture & pH		Organic Compounds	
		Chromium, Hexavalent (mg/Kg-dry)	Chromium, Trivalent (mg/Kg-dry)	Mercury (mg/Kg-dry)	Arsenic (mg/Kg-dry)	Barium (mg/Kg-dry)	Cadmium (mg/Kg-dry)	Chromium (mg/Kg-dry)	Copper (mg/Kg-dry)	Lead (mg/Kg-dry)	Nickel (mg/Kg-dry)	Selenium (mg/Kg-dry)	Silver (mg/Kg-dry)	Zinc (mg/Kg-dry)	Moisture (% of sample)	pH	Diesel Range Organics - DRO (C10-C28) (mg/Kg-dry)	Gasoline Range Organics - GRO (C6-C10) (mg/Kg-dry)
Table 910-1 Standards	12/8/2011	23	120,000	23	0.39	15,000	70		3,100	400	1,600	390	390	23,000			500	500
Point of Origin	12/8/2011	< 0.57	9.6	< 0.018	3.0	500	0.99	9.6	9.1	82	9.7	0.96	< 0.88	140	14	7.96	27	< 5.8
Sample Pt 1	12/8/2011	< 0.56	7.9	< 0.022	2.8	290	1.2	7.9	7.8	79	7.8	< 0.74	< 0.74	140	13	8.79	39	< 5.8
Sample Pt 2	12/8/2011	< 0.54	7.0	< 0.019	1.3	910	< 0.35	7.0	6.5	8.0	6.2	< 0.88	< 0.88	59	8.7	8.90	33	< 5.5
Sample Pt 3	12/8/2011	< 0.55	8.2	< 0.019	2.8	290	1.0	8.2	7.3	84	8.3	< 0.68	< 0.68	130	11	8.45	110	< 5.6
Sample Pt 4	12/8/2011	< 0.55	8.9	< 0.021	2.6	650	0.55	8.9	8.2	32	8.5	< 0.77	< 0.77	79	11	8.61	39	< 5.6
BKGD 1	12/8/2011				2.4										34			
BKGD 2	12/8/2011				4.2										8.6			
BKGD 3	12/8/2011				3.4										5.8	8.73		

Sample ID	Sample Date	Volatile Organic Compounds						Sodium Absorption Ratio
		Benzene (µg/Kg-dry)	Ethylbenzene (µg/Kg-dry)	m,p-Xylene (µg/Kg-dry)	o-Xylene (µg/Kg-dry)	Toluene (µg/Kg-dry)	Xylenes, Total (µg/Kg-dry)	SAR
Table 910-1 Standards	12/8/2011	170	100,000	175,000	175,000	85,000	175,000	<12
Point of Origin	12/8/2011	< 120	< 230	< 230	< 120	< 170	< 350	89.9
Sample Pt 1	12/8/2011	< 120	< 230	< 230	< 120	< 170	< 350	78.5
Sample Pt 2	12/8/2011	< 110	< 220	< 220	< 110	< 160	< 330	55
Sample Pt 3	12/8/2011	< 110	< 220	< 220	< 110	< 170	< 340	78.3
Sample Pt 4	12/8/2011	< 110	< 220	< 220	< 110	< 170	< 340	41.5
BKGD 1	12/8/2011							
BKGD 2	12/8/2011							
BKGD 3	12/8/2011							40.5

Sample ID	Sample Date	Semi-Volatile Organic Compounds													
		Acenaphthene (µg/Kg-dry)	Anthracene (µg/Kg-dry)	Benzo(a)anthracene (µg/Kg-dry)	Benzo(a)pyrene (µg/Kg-dry)	Benzo(b)fluoranthene (µg/Kg-dry)	Benzo(g,h,i)perylene (µg/Kg-dry)	Benzo(k)fluoranthene (µg/Kg-dry)	Chrysene (µg/Kg-dry)	Dibenzo(a,h)anthracene (µg/Kg-dry)	Fluoranthene (µg/Kg-dry)	Fluorene (µg/Kg-dry)	Indeno(1,2,3-cd)pyrene (µg/Kg-dry)	Naphthalene (µg/Kg-dry)	Pyrene (µg/Kg-dry)
Table 910-1 Standards	12/8/2011	1,000,000	1,000,000	220	22	220		2200	22,000	22	1,000,000	1,000,000	220	23,000	1,000,000
Point of Origin	12/8/2011	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34
Sample Pt 1	12/8/2011	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	< 34	74	< 34
Sample Pt 2	12/8/2011	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33
Sample Pt 3	12/8/2011	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	72	< 33
Sample Pt 4	12/8/2011	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33

Confirmation Water Sample

Sample ID	Sample Date	Volatile Organic Compounds					
		Benzene (µg/Kg-dry)	Ethylbenzene (µg/Kg-dry)	m,p-Xylene (µg/Kg-dry)	o-Xylene (µg/Kg-dry)	Toluene (µg/Kg-dry)	Xylenes, Total (µg/Kg-dry)
Table 910-1 Standards	1/31/2012	<1.0	<1.0	<2.0	<1.0	<1.0	<3.0
Pond Sample	1/31/2012	ND	ND	ND	ND	ND	ND

Sample ID	Sample Date	Anions by Ion Chromatograph	
		Chloride	Sulfate
Table 910-1 Standards	1/31/2012	<1.25 x background	<1.25 x background
Pond Sample	1/31/2012	170	350

Sample ID	Sample Date	PH
		PH
Table 910-1 Standards	1/31/2012	6-9
Pond Sample	1/31/2012	7.77

Sample ID	Sample Date	Total Dissolved Solids
		TDS
Table 910-1 Standards	1/31/2012	<1.25 x background
Pond Sample	1/31/2012	1,100

# STATE OF COLORADO

Bill Ritter, Jr., Governor  
James B. Martin, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.      Laboratory Services Division  
Denver, Colorado 80246-1530      8100 Lowry Blvd.  
Phone (303) 692-2000      Denver, Colorado 80230-6928  
TDD Line (303) 691-7700      (303) 692-3090  
Located in Glendale, Colorado

<http://www.cdphe.state.co.us>



Colorado Department  
of Public Health  
and Environment

July 1, 2007

Terrell A. Dobkins, VP of Production  
Antero Resources Piceance Corp,  
1625 - 17 St Ste 300  
Denver, CO 80202  
303/357-7318

RE: Final Permit, Colorado Discharge Permit System – Stormwater  
Certification No: COR-038500  
Antero Resources Piceance Basin Project  
Garfield County

Local Contact: Robert Mueller, Chief Geologist  
303/ 357-7317

Dear Sir or Madam:

Enclosed please find a copy of the new permit and certification which have been re-issued to you under the Colorado Water Quality Control Act.

Your old permit expired on June 30, 2007. This is a renewal to the permit, and replaces the old one. See page 2 of the Rationale (the pages in italics) for a summary of the changes to the permit.

Your Certification under the permit requires that specific actions be performed at designated times. You are legally obligated to comply with all terms and conditions of the permit.

Please read the permit and certification. If you have any questions please visit our website at : [www.cdphe.state.co.us/wq/permitsunit/stormwater](http://www.cdphe.state.co.us/wq/permitsunit/stormwater) or contact Matt Czahor at (303) 692-3517.

Sincerely,

Kathryn Dolan  
Stormwater Program Coordinator  
Permits Unit  
WATER QUALITY CONTROL DIVISION  
xc: Regional Council of Governments  
Local County Health Department  
District Engineer, Technical Services, WQCD  
Permit File

# STATE OF COLORADO

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT  
WATER QUALITY CONTROL DIVISION  
TELEPHONE: (303) 692-3500



**CERTIFICATION TO DISCHARGE  
UNDER  
CDPS GENERAL PERMIT COR-030000  
STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION**

Certification Number **COR038500**

This Certification to Discharge specifically authorizes:

***Antero Resources Piceance Corp***

LEGAL CONTACT:

***Terrell A. Dobkins, VP of Production  
Antero Resources Piceance Corp  
1625 - 17 St Ste 300  
Denver, CO 80202  
Phone # 303/357-7318***

LOCAL CONTACT:

***Robert Mueller, Chief Geologist,  
Phone # 303/ 357-7317  
rmueller@anteroresources.com***

During the Construction Activity: **Gas/Oil Field Exploration and/or  
Development**

to discharge stormwater from the facility identified as **Antero Resources Piceance  
Basin Project**  
which is located at:

**170 Exit 94 & Frontage Rd  
Rifle, CO**

Latitude **39/32/27**, Longitude **107/42/01**  
In **Garfield County**

to: -- **Colorado River**

Anticipated Activity begins **07/01/2005** continuing through **09/30/2009**  
On **69.68** acres (**69.68** acres disturbed)

Certification is effective: **07/01/2007**

Certification Expires: **06/30/2012**

Annual Fee: \$245.00 (**DO NOT PAY NOW** – A prorated bill will be sent shortly.)

# STATE OF COLORADO

John W. Hickenlooper, Governor  
Christopher E. Urbina, MD, MPH  
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.      Laboratory Services Division  
Denver, Colorado 80246-1530      8100 Lowry Blvd.  
Phone (303) 692-2000      Denver, Colorado 80230-6928  
Located in Glendale, Colorado      (303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department  
of Public Health  
and Environment

June 21, 2012

Gerard G Alberts, Mgr Env & Reg  
Antero Resources Piceance Corp  
1625 17 St Ste 300  
Denver, CO 80202

**RE:    Renewal of Permit/Certification  
      Administrative Continuation  
      For: Antero Resources Piceance Basin Project  
      Located at: I-70 Exit 94 & Frontage Rd, Rifle, Garfield County  
      Permit No.: **COR038500****

Dear Mr. Alberts;

The Division has received an application to renew the above permit/certification. It has been determined that there is sufficient information to make this permit/certification eligible for renewal. More information may be requested by the Division as progress is made in developing a new permit/certification for the above listed facility. This information must be made available to the Division when requested to complete the permit process.

The Division is currently in the process of developing a new permit or master general permit and associated certification for the above permitted facility. The development and review procedures required by law have not yet been completed. When the discharge permit issued to you for your facility expired on **June 30, 2012** your permit is administratively continued and remains in effect under Section 104(7) of the Administrative Procedures Act, C.R.S. 1973, 24-4-101, et seq (1982 repl. vol. 10) until the new permit/certification is issued and effective.

All effluent permit terms and conditions in your current permit will remain in effect until your new permit/certification is issued and effective.

**PLEASE KEEP THIS LETTER WITH YOUR PERMIT AND SWMP TO SHOW  
CONTINUATION OF PERMIT COVERAGE.**

Sincerely,

Debbie Jessop  
Permits Section  
WATER QUALITY CONTROL DIVISION

xc:    Permit File

## **PRIOR HISTORY**



DEPARTMENT OF NATURAL RESOURCES

*John W. Hickenlooper, Governor*

707 Wapiti Ct. Suite 204

Rifle, CO 81650

Phone: (970) 625-2497

FAX: (970) 625-5682

[www.colorado.gov/cogcc](http://www.colorado.gov/cogcc)

July 10, 2012

Mr. Jerry Alberts  
Antero Resources  
Manager, Environmental & Regulatory  
1625 17th Street  
Suite 300  
Denver, CO 80202

Re: Facility ID Number 336037, Gypsum Ranch B Pad  
Site Investigation and Remediation Plan # 6787  
No Further Action Request  
NOAV# 200332643  
NWNE Section 14, 6S 93W  
Garfield County, Colorado

Dear Mr. Alberts,

This letter is in response to Antero Resources' July 10, 2012 "Response to NOAV 200332643" submitted to the Colorado Oil and Gas Conservation Commission (COGCC) in regard to the site investigation and remediation required by the referenced NOAV. A Site Investigation and Remediation Plan for this project was previously submitted and assigned remediation number #6787. Based on the information provided, the COGCC staff approves the closure of the remediation project #6787. The COGCC agrees that no further action relative to this spill is required at this site until final reclamation activities. However, should future conditions at the site be discovered of contaminant concentrations in soils exceeding COGCC standards or if ground or surface water is found to be significantly impacted, then Antero may be required to conduct further investigation and/or remediation at the site.

I have also reviewed the status of NOAV 200332643 and accompanying documents. At this time, Antero has conducted and submitted documentation for corrective action items 1, 2, 3, 4, 5, and 7 listed in the NOAV, which have been met. The COGCC has not received information satisfying NOAV corrective action items 6 or 8. When corrective actions are complete, and all required information has been submitted to the COGCC, the NOAV must be signed and returned to the COGCC.

DEPARTMENT OF NATURAL RESOURCES: Mike King, Executive Director

COGCC COMMISSION: Richard Alward – John Benton – Thomas L. Compton – DeAnn Craig – Tommy Holton – W. Perry Pearce — Andrew Spielman – Mike King – Chris Urbina  
COGCC STAFF: Thom Kerr, Acting Director – Margaret Ash, Field Inspection Manager – Karen Spray, Acting Environmental Manager – Stuart Ellsworth, Engineering Manager

The NOAV 200332643 cannot be closed at this time for the reasons above. Additionally, an “Answer for NOAV” form and instructions as to its use were emailed and mailed to Antero with the NOAV on December 12, 2011. As outlined in the transmittal letter, the Answer for NOAV needed to be returned to Mr. Peter Gowen, COGCC Acting Hearings Manager with 20 days of receipt of the letter. The COGCC has no record of having received a completed “Answer for NOAV 200332643” from Antero to date.

When the remaining abatement action documentation and the Answer for NOAV have been received, the COGCC will evaluate the closure of the NOAV at that time.

Regards,

Linda Spry O'Rourke  
Environmental Protection Specialist, Northwest Region

Cc: Thom Kerr – Acting COGCC Director  
Karen Spray – Acting Environmental Manager  
Alex Fischer – Western Environmental Manager  
Patrick Patton – Antero Resources  
Cole Kilstrom – Antero Resources Environmental

State of Colorado Oil and Gas Conservation Commission



1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

FOR OGCC USE ONLY
Received 1/16/2012 Rifle COGCC
OGCC Employee:
[ ] Spill [ ] Complaint
[ ] Inspection [X] NOAV
Tracking No: 200332643

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

- [X] Spill or Release [ ] Plug & Abandon [ ] Central Facility Closure [ ] Site/Facility Closure [ ] Other (describe):

OGCC Operator Number: 10079
Name of Operator: Antero Resources
Address: 1625 17th Street
City: Denver State: CO Zip: 80202
Contact Name and Telephone: Cole Kilstrom
No: 303-357-6709
Fax: 303-357-7314

API Number: N/A County: Garfield
Facility Name: Gypsum Ranch B Pad Facility Number: N/A - Flow line Loc# 426957
Well Name: N/A Well Number: N/A
Location: (QtrQtr, Sec, Twp, Rng, Meridian): NENW, Section 14, T6S, R93W Latitude: 39.53102 Longitude: -107.740032

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): produced water
Site Conditions: Is location within a sensitive area (according to Rule 901e)? [X] Y [ ] N If yes, attach evaluation.
Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Gravel Pit, Oil & Gas, grazing
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Torrifluvents
Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water (50 ft), wetlands (50 ft), Water well (1000 ft)
Description of Impact (if previously provided, refer to that form or document):
Impacted Media (check): [X] Soils [ ] Vegetation [ ] Groundwater [X] Surface Water
Extent of Impact: 11,758 Sq Feet, approx 1.25 inches of depth
How Determined: Third Party GPS Impact Mapping
1 bbl of produced fluid impacted the surface of pond visual estimation - approximately 225 sq feet

REMEDATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
Please see Form 19 Submitted to the COGCC on December 12, 2011. Doc# 02597032
Describe how source is to be removed:
Please see Attachment : Gypsum Ranch B Pad: Response to NOAV 200332643, Section 1: Remediation Plan.
Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:
Please see Attachment: Gypsum Ranch B Pad Response to NOAV 200332643, Section 1: Remediation Plan.



Tracking Number: Name of Operator: OGCC Operator No: Received Date: Well Name & No: Facility Name & No:

REMEDIATION WORKPLAN (Cont.)

OGCC Employee:

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

No groundwater has been impacted.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

The spill impacted gravel on the surface of the Gypsum Ranch B Pad and the gravel on the access road. Since the pad and access road are used daily for operations, there is no proposed reclamation plan associated with this spill. Prior to interim reclamation, Antero will investigate the sodium absorption ratios, but Antero anticipates the SAR values will decrease through natural attenuation prior to commencing interim or final reclamation.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? [X] Y [ ] N If yes, describe:

Further site investigation will be conducted after the produced water impacts associated with the pond are removed. Further site investigation will be taking confirmatory samples of the water underneath the frozen pond surface. Samples will be analyzed for Table 910-1 constituents.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

Ice/water recovered will be re-used for fracing operations on future wells.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 12/6/2011 Date Site Investigation Completed: TBD Date Remediation Plan Submitted: 1/14/2012 Remediation Start Date: TBD Anticipated Completion Date: 2/28/2012 Actual Completion Date: TBD

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Cole Kilstrom Signed: [Signature] Title: Environmental Specialist Date: 1/16/12

OGCC Approved: Linda Sory Bourke Title: NW EPS II Date: 1/18/2012

COA: include TDS and CL analysis on confirmation water sample collected from the water underneath the frozen surface once the impacted ice is removed. - and COAs -

# **Antero Resources**

## **Gypsum Ranch B Pad Response to NOAV 200332643**

January 16<sup>th</sup> 2012



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4.0 Chemical Analysis of Produced Water in the Water Line.....	2
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6.0 Antero's Post Construction Stormwater Program.....	2

### **Appendices**

- Appendix A: Gypsum Ranch B Pad Form 19
- Appendix B: Pad Sampling Analytical Results
- Appendix C: Example Drawing of Failure
- Appendix D: Integrity Test Records
- Appendix E: Produced Water Analysis
- Appendix F: Gypsum Ranch B Pad Storm Water Work Orders
- Appendix G: Sensitive Area Determination

**Antero Resources**  
**Gypsum Ranch B Pad: Response to NOAV 200332643**  
Spill/Release Tracking Number 2597032

**Introduction**

On December 6, 2011 a produced water spill occurred at Antero Resources' ("Antero") Gypsum Ranch B Pad. The details of this spill were provided to the COGCC in a Form 19 on December 12, 2011. The information provided in the Form 19 contained among other things; Antero's detailed description of the cause of the spill, Antero's emergency spill response and Antero's proposed actions to prevent the problem from reoccurring. The submitted Form 19 is provided with this submittal in Appendix A, "Gypsum Ranch B Pad Form 19."

The produced water spill impacted approximately 11,758 total square feet. The majority of the spill was limited to the Gypsum Ranch B pad and access road, however approximately 1 bbl of produced water impacted the adjacent gravel pit pond. A map of the impacted area is provided in Appendix A.

At the time of the incident the temperature was significantly below freezing and the impacted pond was frozen. Based on Antero's investigation of the spill, the produced water that impacted the pond was limited to a thin layer on top of the frozen pond surface and the produced water soon froze to the ponds surface. The current pond conditions have not changed and to date the pond remains frozen with approximately 10 to 12 inches of frozen ice and some snow on its surface.

**Section 1: Remediation Plan**

Antero is proposing to remediate the impacted area of the frozen pond by removing the ice with a track hoe. The area of pond impacted by the spill is approximately 15 feet by 15 feet starting at the point of entry. Antero is proposing to utilize a track hoe with a 27 foot reach to break the impacted ice and store the ice at the Gypsum Ranch B Pad. A confirmation water sample will be collected from the water underneath the frozen surface once the impacted ice is removed. The removed ice will be placed in a metal trough located within the Gypsum Ranch B pad perimeter berm. When the ice melts, the water will be transported to Antero's Wasatch Bench Water Management Facility to be re-used in Antero's water recycling system.

Immediately upon the spill discovery, Vac Trucks were sent to the location to remove the free standing liquids. Microblaze was applied to the impacted areas soon after the liquids were removed with a Vac Truck. Soil samples were collected two days later on December 8, 2011 by a third party and analyzed for compliance with the Table 910-1 constituents. Analytical summary tables, the lab results, and the soil sample location map are provided in Appendix B "Pad Sampling Analytical Results." The results show that the impacted areas do not exceed Table 910-1 standards for soil. Antero had deemed the site as in compliance with the COGCC cleanup standards and therefore is not planning to conduct additional pad and access road remediation work.

**Section 2: Engineering Evaluation of the Water Line Failure**

The spill was located at an above ground pipeline manifold at the Gypsum Ranch B Pad of Antero's Phase V of the Piceance water network. The well pads connected by Phase V of the water network are the Snyder C Pad, Snyder D Pad, Snyder A Pad, Gypsum Ranch B Pad, and the Gypsum Ranch A Pad. The purpose of Phase V of the network was to extend the pipeline infrastructure from the Dever A Pad to the Snyder C Pad and continue it west to the Gypsum Ranch A Pad. The pipeline is design with 12 inch PE-4710, SDR 9.0 pipeline. The material pressure rating is 252 psi, with a design pressure of 200 psi.

The cause of the spill was due to the insufficient closing of the gate valve on the pipeline manifold. Since the gate valve wasn't completely closed, there was a small space for produced water to slowly move from the main water line into the valve cap space. The cap area slowly filled with water and when temperatures were well below freezing for a significant period of time, the water expanded by 10% in volume by converting to ice. Due to the

increase in volume, pressure built up inside the valve cap and caused it to release at the point of least resistance, the metal cap. A typical drawing of what occurred and a picture of the rupture is provided in Appendix C.

Three direct measures are being taken to prevent this problem from re-occurring, as stated in the submitted Form 19. The measures include the following; 1) insulate above ground pipeline manifolds, 2) drain the production water from isolated pipeline sections that are not used daily, and 3) conduct monthly field wide maintenance/housekeeping visits during the winter months (e.g. checking gate valves).

Integrity testing of this specific section of the Phase V pipeline network was conducted most recently on November 22, 2011. The original integrity test conducted after installation was completed on February 18, 2009. These two integrity tests are included in Appendix D, "Integrity Testing Records."

### **Section 3: Ice/Water Samples of the Impacted Pond at Entry Point**

Antero engaged a third party consulting firm to assess the spill impacts and to collect water quality data to support this analysis. As such, a water sample was collected at the pond entry point on December 8, 2011. At the time of collection, the water sample was collected by chipping ice from the surface of the pond until a representative sample of produced water at the impact point was collected. The results from this sampling are included in Appendix B and show small traces of diesel range organics, benzene, and toluene, but all the parameters analyzed meet Table 910-1 standards.

### **Section 4: Chemical Analysis of the Produced Water in the Water Line**

After the spill incident, Phase V of Antero's water pipeline was drained and a produced water sample could not be collected straight from the waterline at the spill origin. However, a representative sample of the produced water that was in the water pipeline was collected at the Wasatch Bench Pond on December 21, 2011. This sample is similar to the produced water that spilled on December 6, 2011. The water line produced water results are provided in Appendix E.

### **Section 5: Gypsum Ranch B Pad Chemical Inventory**

Condition number seven of NOAV 200332643 requests that Antero provide the chemical inventory sheets for all wells on the gathering line. The most recent wells in this area were drilled and completed in 2007 and 2008. As such, Antero does not have chemical inventory records for these wells. However, Antero is maintaining chemical inventory records for its wells drilled and completed after the effective date of the chemical inventory rule.

### **Section 6: Antero's Post Construction Stormwater Program**

Antero's stormwater program commences prior to pad construction with the installation of proposed stormwater Best Management Practices ("BMP's") as designed by a third party survey company. The BMPs are identified on the pad plat package and are designed by a water engineer or stormwater specialist employed or contracted by the survey company. The BMPs are maintained during the active life of the well pad. Antero engaged LT Environmental (LTE) to perform routine stormwater inspections at all of its pads and pipelines. Pads and pipelines are inspected on a 14-day schedule until the ground is stabilized by erosion blankets or by vegetation cover. Stabilized sites are subject to a 30-day inspection schedule until the site is fully reclaimed (80% or greater relative cover of surrounding vegetation). The focus of the stormwater inspections is to prevent discharges of sediment offsite. The LTE inspections are followed by an "Antero Daily Stormwater Contractor Work Order." The work order reports include instructions on the maintenance required and the location of each stormwater corrective action. Antero routinely follows-up on each work order until they have been closed out by our field personnel. These stormwater work orders are passed on to Stampfel Construction Company, a construction company that carries out the BMP maintenance.

A copy of the November and December 2011 stormwater inspection work orders for the Gypsum Ranch B Pad are provided in Appendix F, "Gypsum Ranch B Pad Stormwater Work Orders." A copy of Antero's Stormwater Management Plan is available upon request.

# Appendix A

---

Gypsum Ranch B Pad Form 19 Submittal

State of Colorado  
**Oil and Gas Conservation Commission**

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109



FOR OGCC USE ONLY

---

Spill report taken by:

FACILITY ID:

This form is to be submitted by the party responsible for the oil and gas spill or release. Any spill or release which may impact waters of the State must be reported as soon as practicable; any spill over 20 bbls must be reported within 24 hours and all spills over five bbls must be reported within ten days. Submit a Site Investigation and Remediation Workplan (Form 27) when requested by the Director.

**OPERATOR INFORMATION**

Name of Operator: <u>Antero Resources</u> OGCC Operator No: <u>10079</u>	Phone Numbers
Address: <u>1625 17th Street</u>	No: <u>3033576709</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80202</u>	Fax: <u>3033577315</u>
Contact Person: <u>Cole Kilstrom</u>	E-Mail: <u>ckilstrom@anteroresources.com</u>

**DESCRIPTION OF SPILL OR RELEASE**

Date of Incident: <u>12/6/2011</u> Facility Name & No.: <u>Gypsum Ranch B Pad</u>	County: <u>Garfield</u>
Type of Facility (well, tank battery, flow line, pit): <u>Flow line</u>	QtrQtr: <u>NE1/4NW1/4</u> Section: <u>14</u>
Well Name and Number: <u>N/A: Produced water pipeline at the Gypsum Ranch B Pad</u>	Township: <u>6 South</u> Range: <u>93 West</u>
API Number: <u>N/A</u>	Meridian: <u>6th</u>
Specify volume spilled and recovered (in bbls) for the following materials:	
Oil spilled: <u>~0.312</u> Oil recov'd: <u>~0.311</u> Water spilled: <u>~390.7</u> Water recov'd: <u>389.7</u> Other spilled: <u>n/a</u> Other recov'd: <u>n/a</u>	
Ground Water impacted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Surface Water impacted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Contained within berm? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Area and vertical extent of spill: <u>11,758 sq ft</u> x <u>1.25 inch depth (gravel)</u>
Current land use: <u>Gravel pit, Oil &amp; gas, grazing</u>	Weather conditions: <u>Clear, cold - 7 degrees F, ground frozen, pond frozen</u>
Soil/geology description: <u>Torrifluvents, nearly level</u>	
IF LESS THAN A MILE, report distance IN FEET to nearest... Surface water: <u>~50 ft</u> wetlands: <u>~50 ft</u> buildings: <u>~2,400 ft</u>	
Livestock: <u>&gt; 500 ft</u> water wells: <u>~1000 ft</u> Depth to shallowest ground water: <u>~20 ft</u>	
Cause of spill (e.g., equipment failure, human error, etc.): <u>Equipment Failure - frozen water inside valve broke the cap</u> Detailed description of the spill/release incident:	
<b>Please see Attachment A for complete details of the spill.</b>	

**CORRECTIVE ACTION**

Describe immediate response (how stopped, contained and recovered):  
Booms and absorbent pads were placed at strategic locations along the access road and at the entrance to the pad to divert the spill from the pond. A vac truck was sent to the location to suck up the free flowing liquids. The spill was stopped after the frozen water had thawed, allowing the gate valve to close.

Describe any emergency pits constructed:  
No emergency pits were constructed. Absorbent booms and pads were placed in locations to prevent the migration of the spill.  
How was the extent of contamination determined:  
A third party mapped the impacted area with a GPS device. Please see Attachment B "Spill Location Map."  
Further remediation activities proposed (attach separate sheet if needed):  
Antero will submit a Form 27 to the COGCC detailing the proposed remediation strategies.  
Describe measures taken to prevent problem from reoccurring:  
1) Insulate above ground pipeline manifolds. 2) Drain production water from isolated pipeline sections that are not used daily. 3) Monthly fieldwide maintenance/housekeeping visits during winter months (e.g. checking gate valves).

**OTHER NOTIFICATIONS**

List the parties and agencies notified (County, BLM, EPA, DOT, Local Emergency Planning Coordinator or other).

Date	Agency	Contact	Phone	Response
12/7/2011	COGCC	Linda Spry O'Rourke	970-625-2487	Voicemail
12/7/2011	CDPHE	CDPHE Spill Reporting Hotline	877-518-5608	Voicemail, follow up conversation. Report #2011-0875
12/7/2011	EPA National Response Center	Spill Report Hotline	800-424-8802	Filed a Report - #997468
12/7/2011	Rifle Watershed Program	Michael Erion	970-945-6777	Voicemail. Follow up conversation on 12/8/11
12/7/2011	see attached	See attached list for additional contacts		

Spill/Release Tracking No: \_\_\_\_\_

## ATTACHMENT A

### **Detailed Description of the Spill/Release Incident:**

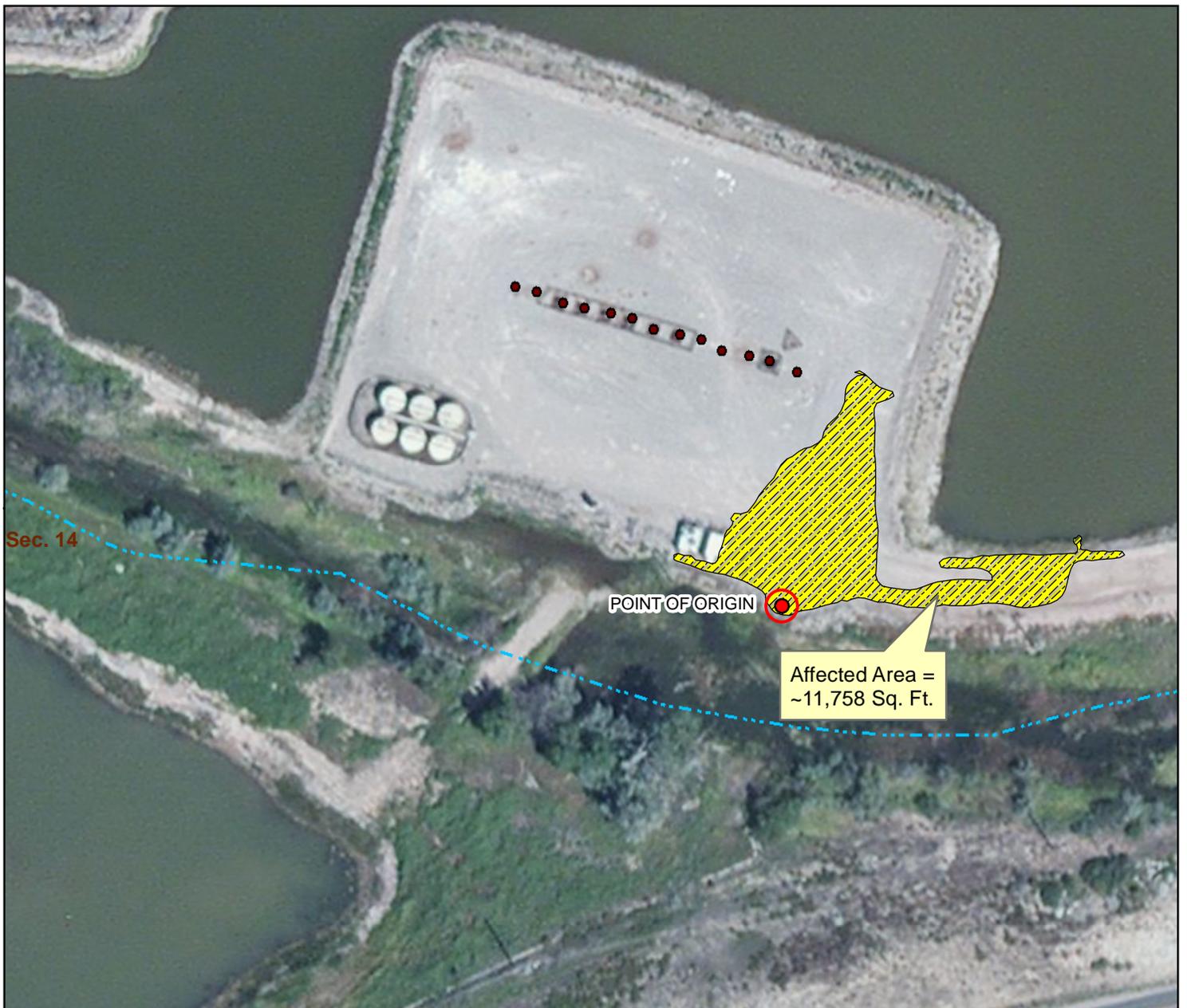
At approximately 2:46 p.m. on December 6, 2011 an Antero water hauling contractor noticed produced water escaping from a broken cap on the water pipeline at the Gypsum Ranch B pad. Antero was immediately contacted and implemented its emergency spill response plan. The emergency response plan involved placing absorbent pads and booms along the access road and at the pad entrance to divert the spill from the adjacent pond and keep the majority of the spill contained on the pad. A vac truck was also sent to the location to suck up the pooling water.

During the spill, the "gate" valve on the pipeline manifold was not completely closed due to ice buildup and could not be immediately closed to stop the spill. The ice in the pipeline manifold thawed and at approximately 5:00 p.m. water line "gate" valve was closed and the spill ceased. The majority of the spill was contained on the pad site and the access road, however approximately 1 bbl of produced water impacted the adjacent gravel pit pond. The pond was frozen at the time and the produced water that impacted the pond was frozen on the surface of pond. Further remediation strategies will be provided to the COGCC via a Form 27.

### **Notification List:**

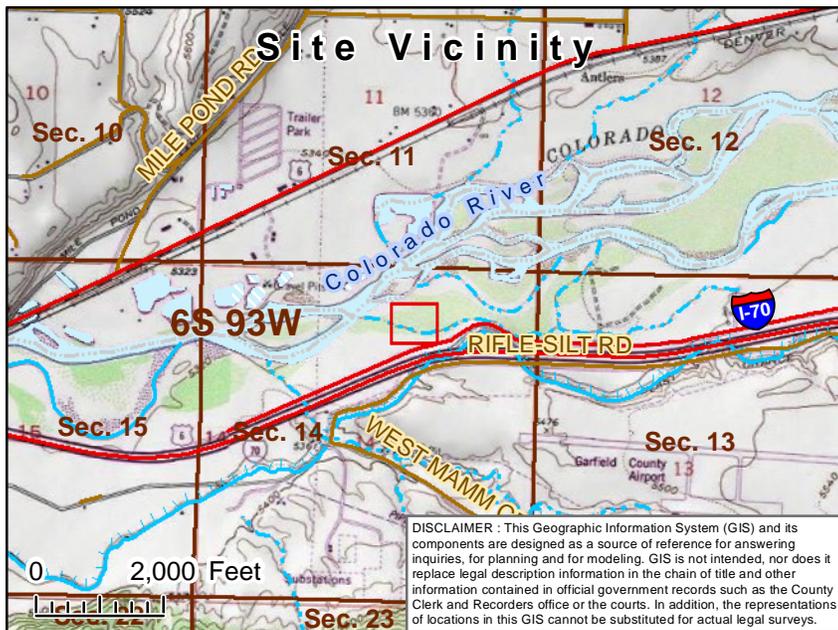
12/7/2011 – Rifle Public Water Supply – 970-625-2353 – Voicemail

12/7/2011 – Colorado Division of Wildlife – 970-255-4261 - Voicemail



POINT OF ORIGIN

Affected Area =  
~11,758 Sq. Ft.



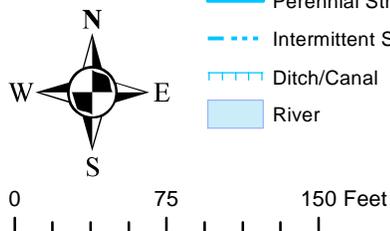
**Site Vicinity**

DISCLAIMER: This Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended, nor does it replace legal description information in the chain of title and other information contained in official government records such as the County Clerk and Recorders office or the courts. In addition, the representations of locations in this GIS cannot be substituted for actual legal surveys.

**Attachment B--Spill Location Map**  
**Location: Gypsum Ranch B**  
*Antero Resources Piceance Corp.*

**Legend**

- |                              |                                |
|------------------------------|--------------------------------|
| <b>PLSS</b>                  | <b>Transportation Features</b> |
| Township                     | Highways                       |
| Section                      | Public Roads                   |
| <b>Hydrographic Features</b> |                                |
|                              | Perennial Stream               |
|                              | Intermittent Stream            |
|                              | Ditch/Canal                    |
|                              | River                          |

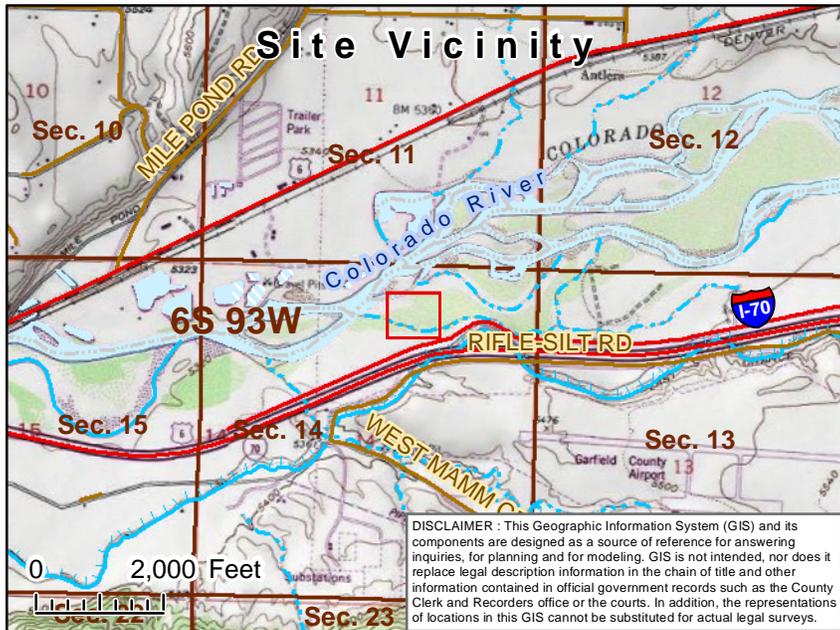
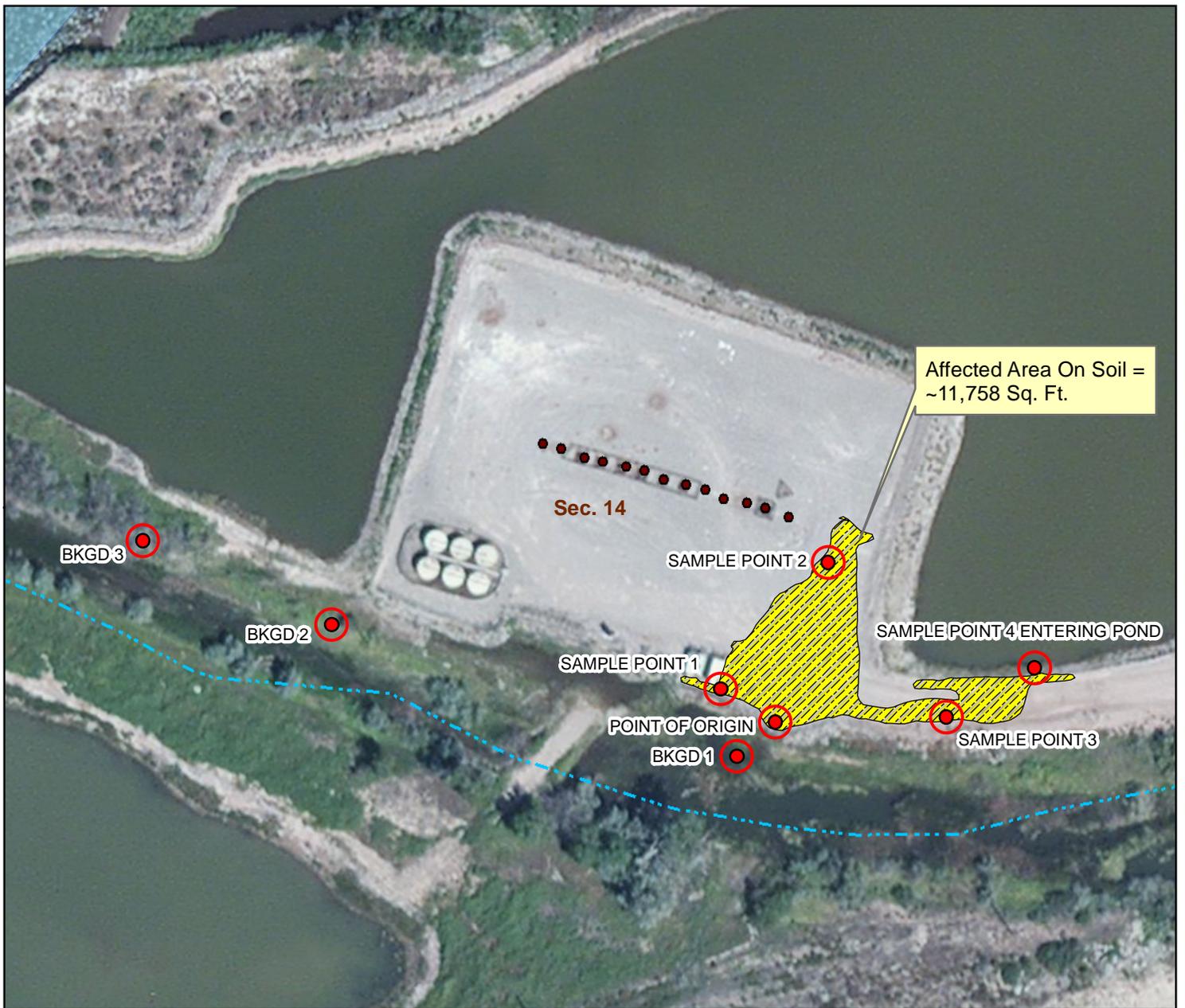


# Appendix B

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Pad Sampling Analytical Results





Soil Sample Location Map  
 Location: Gypsum Ranch B  
 Antero Resources Piceance Corp.

**Legend**

**PLSS**

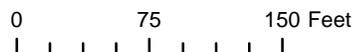
- Township
- Section

**Transportation Features**

- Highways
- Public Roads

**Hydrographic Features**

- Perennial Stream
- Intermittent Stream
- Ditch/Canal
- River





19-Dec-2011

Mark Mumby  
HRL Compliance Solutions  
744 Horizon Ct. Suite 140  
Grand Junction, CO 81506

Re: **Gypsum Ranch B Pad 12/8/11**

Work Order: **1112376**

Dear Mark,

ALS Environmental received 9 samples on 12-Dec-2011 09:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 51.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Ann Preston".

Electronically approved by: Ann Preston

Ann Preston  
Project Manager



Certificate No: MN331938

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185

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Environmental ALS Environmental logo icon consisting of a stylized green leaf or flame shape.

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RIGHT SOLUTIONS RIGHT PARTNER

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Work Order:** 1112376

**Work Order Sample Summary**

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1112376-01	BKGD 1	Soil		12/8/2011 11:50	12/12/2011 09:00	<input type="checkbox"/>
1112376-02	BKGD 2	Soil		12/8/2011 11:55	12/12/2011 09:00	<input type="checkbox"/>
1112376-03	BKGD 3	Soil		12/8/2011 12:00	12/12/2011 09:00	<input type="checkbox"/>
1112376-04	Point of Origin	Soil		12/8/2011 12:10	12/12/2011 09:00	<input type="checkbox"/>
1112376-05	Sample Pt 1	Soil		12/8/2011 12:15	12/12/2011 09:00	<input type="checkbox"/>
1112376-06	Sample Pt 2	Soil		12/8/2011 12:20	12/12/2011 09:00	<input type="checkbox"/>
1112376-07	Sample Pt 3	Soil		12/8/2011 12:25	12/12/2011 09:00	<input type="checkbox"/>
1112376-08	Sample Pt 4	Soil		12/8/2011 12:30	12/12/2011 09:00	<input type="checkbox"/>
1112376-09	Pond sample	Water		12/8/2011 12:45	12/12/2011 09:00	<input type="checkbox"/>

---

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Work Order:** 1112376

---

**Case Narrative**

At the client's request, Metals were not analyzed for the Pond sample.

Batch 38160MS/MSD data for Metals is not related to this project's samples.

Batch 38197 sample BKGD 3 MS/MSD recoveries for Barium and inc were outside control limits, however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for these elements.

Batch 38205 MS/MSD data for Hexavalent Chromium is not related to this project's samples.

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**WorkOrder:** 1112376

**QUALIFIERS,  
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

<u>Units Reported</u>	<u>Description</u>
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
µg/L	Micrograms per Liter
as noted	
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
s.u.	Standard Units

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** BKGD 1  
**Collection Date:** 12/8/2011 11:50 AM

**Work Order:** 1112376  
**Lab ID:** 1112376-01  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>METALS BY ICP-MS</b>			<b>SW6020A</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>CES</b>
Arsenic	2.4		1.0	mg/Kg-dry	2	12/15/2011 07:06 PM
<b>MOISTURE</b>			<b>A2540 G</b>			Analyst: <b>CG</b>
Moisture	34		0.050	% of sample	1	12/14/2011 03:17 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** BKGD 2  
**Collection Date:** 12/8/2011 11:55 AM

**Work Order:** 1112376  
**Lab ID:** 1112376-02  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>METALS BY ICP-MS</b>			<b>SW6020A</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>CES</b>
Arsenic	4.2		0.74	mg/Kg-dry	2	12/15/2011 07:11 PM
<b>MOISTURE</b>			<b>A2540 G</b>			Analyst: <b>CG</b>
Moisture	8.6		0.050	% of sample	1	12/14/2011 03:17 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** BKGD 3  
**Collection Date:** 12/8/2011 12:00 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-03  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>METALS BY ICP-MS</b>						
Arsenic	3.4		SW6020A 0.91	mg/Kg-dry	Prep Date: 12/14/2011 2	Analyst: CES 12/15/2011 07:58 PM
<b>SUBCONTRACTED ANALYSES</b>						
Subcontracted Analyses	Rcvd 12/15/11		SUBCONTRACT	as noted	1	Analyst: A&LGL 12/15/2011
<b>MOISTURE</b>						
Moisture	5.8		A2540 G 0.050	% of sample	1	Analyst: CG 12/14/2011 03:17 PM
<b>PH</b>						
pH	8.73		SW9045D	s.u.	1	Analyst: JJG 12/12/2011 10:15 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Point of Origin  
**Collection Date:** 12/8/2011 12:10 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-04  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>			<b>SW8015M</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>RM</b>
<b>DRO (C10-C28)</b>	<b>27</b>		<b>4.8</b>	<b>mg/Kg-dry</b>	1	12/15/2011 11:58 AM
<i>Surr: 4-Terphenyl-d14</i>	<i>77.1</i>		<i>39-115</i>	<i>%REC</i>	1	12/15/2011 11:58 AM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>			<b>SW8015</b>			Analyst: <b>RM</b>
<b>GRO (C6-C10)</b>	<b>ND</b>		<b>5.8</b>	<b>mg/Kg-dry</b>	100	12/15/2011 10:55 PM
<i>Surr: Toluene-d8</i>	<i>108</i>		<i>50-150</i>	<i>%REC</i>	100	12/15/2011 10:55 PM
<b>MERCURY BY CVAA</b>			<b>SW7471</b>		Prep Date: <b>12/15/2011</b>	Analyst: <b>LR</b>
<b>Mercury</b>	<b>ND</b>		<b>0.018</b>	<b>mg/Kg-dry</b>	1	12/15/2011 01:25 PM
<b>METALS BY ICP-MS</b>			<b>SW6020A</b>		Prep Date: <b>12/14/2011</b>	Analyst: <b>CES</b>
<b>Arsenic</b>	<b>3.0</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:24 PM
<b>Barium</b>	<b>500</b>		<b>8.8</b>	<b>mg/Kg-dry</b>	20	12/16/2011 12:23 PM
<b>Cadmium</b>	<b>0.99</b>		<b>0.35</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:24 PM
<b>Chromium</b>	<b>9.6</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:24 PM
<b>Copper</b>	<b>9.1</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:24 PM
<b>Lead</b>	<b>82</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:24 PM
<b>Nickel</b>	<b>9.7</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:24 PM
<b>Selenium</b>	<b>0.96</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:24 PM
<b>Silver</b>	<b>ND</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:24 PM
<b>Zinc</b>	<b>140</b>		<b>1.8</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:24 PM
<b>SUBCONTRACTED ANALYSES</b>			<b>SUBCONTRACT</b>			Analyst: <b>A&amp;LGL</b>
<b>Subcontracted Analyses</b>	<b>Rcvd 12/15/11</b>		<b>as noted</b>		1	12/15/2011
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8270</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>HL</b>
<b>Acenaphthene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Anthracene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Benzo(a)anthracene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Benzo(a)pyrene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Benzo(b)fluoranthene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Benzo(g,h,i)perylene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Benzo(k)fluoranthene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Chrysene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Dibenzo(a,h)anthracene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Fluoranthene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Fluorene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Indeno(1,2,3-cd)pyrene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Naphthalene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<b>Pyrene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/17/2011 11:51 PM
<i>Surr: 2,4,6-Tribromophenol</i>	<i>79.1</i>		<i>34-140</i>	<i>%REC</i>	1	12/17/2011 11:51 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Point of Origin  
**Collection Date:** 12/8/2011 12:10 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-04  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<i>Surr: 2-Fluorobiphenyl</i>	69.0		12-100	%REC	1	12/17/2011 11:51 PM
<i>Surr: 2-Fluorophenol</i>	92.2		33-117	%REC	1	12/17/2011 11:51 PM
<i>Surr: 4-Terphenyl-d14</i>	108		25-137	%REC	1	12/17/2011 11:51 PM
<i>Surr: Nitrobenzene-d5</i>	67.5		37-107	%REC	1	12/17/2011 11:51 PM
<i>Surr: Phenol-d6</i>	87.7		40-106	%REC	1	12/17/2011 11:51 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260</b>			Analyst: <b>MK</b>
Benzene	ND		120	µg/Kg-dry	100	12/18/2011 08:04 PM
Ethylbenzene	ND		230	µg/Kg-dry	100	12/18/2011 08:04 PM
m,p-Xylene	ND		230	µg/Kg-dry	100	12/18/2011 08:04 PM
o-Xylene	ND		120	µg/Kg-dry	100	12/18/2011 08:04 PM
Toluene	ND		170	µg/Kg-dry	100	12/18/2011 08:04 PM
Xylenes, Total	ND		350	µg/Kg-dry	100	12/18/2011 08:04 PM
<i>Surr: 1,2-Dichloroethane-d4</i>	112		70-120	%REC	100	12/18/2011 08:04 PM
<i>Surr: 4-Bromofluorobenzene</i>	100		75-120	%REC	100	12/18/2011 08:04 PM
<i>Surr: Dibromofluoromethane</i>	96.2		85-115	%REC	100	12/18/2011 08:04 PM
<i>Surr: Toluene-d8</i>	102		85-115	%REC	100	12/18/2011 08:04 PM
<b>CHROMIUM, TRIVALENT</b>			<b>CALCULATION</b>			Analyst: <b>JJG</b>
Chromium, Trivalent	9.6		0.58	mg/Kg-dry	1	12/19/2011 08:03 AM
<b>CHROMIUM, HEXAVALENT</b>			<b>SW7196A</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>MB</b>
Chromium, Hexavalent	ND		0.57	mg/Kg-dry	1	12/14/2011 02:50 PM
<b>MOISTURE</b>			<b>A2540 G</b>			Analyst: <b>CG</b>
Moisture	14		0.050	% of sample	1	12/14/2011 03:17 PM
<b>PH</b>			<b>SW9045D</b>			Analyst: <b>JJG</b>
pH	7.96			s.u.	1	12/12/2011 10:15 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Sample Pt 1  
**Collection Date:** 12/8/2011 12:15 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-05  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>			<b>SW8015M</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>RM</b>
<b>DRO (C10-C28)</b>	<b>39</b>		<b>4.8</b>	<b>mg/Kg-dry</b>	1	12/15/2011 12:20 PM
<i>Surr: 4-Terphenyl-d14</i>	<i>71.8</i>		<i>39-115</i>	<i>%REC</i>	1	12/15/2011 12:20 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>			<b>SW8015</b>			Analyst: <b>RM</b>
<b>GRO (C6-C10)</b>	<b>ND</b>		<b>5.8</b>	<b>mg/Kg-dry</b>	100	12/15/2011 11:20 PM
<i>Surr: Toluene-d8</i>	<i>109</i>		<i>50-150</i>	<i>%REC</i>	100	12/15/2011 11:20 PM
<b>MERCURY BY CVAA</b>			<b>SW7471</b>		Prep Date: <b>12/15/2011</b>	Analyst: <b>LR</b>
<b>Mercury</b>	<b>ND</b>		<b>0.022</b>	<b>mg/Kg-dry</b>	1	12/15/2011 01:27 PM
<b>METALS BY ICP-MS</b>			<b>SW6020A</b>		Prep Date: <b>12/14/2011</b>	Analyst: <b>CES</b>
<b>Arsenic</b>	<b>2.8</b>		<b>0.74</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:29 PM
<b>Barium</b>	<b>290</b>		<b>7.4</b>	<b>mg/Kg-dry</b>	20	12/16/2011 12:28 PM
<b>Cadmium</b>	<b>1.2</b>		<b>0.29</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:29 PM
<b>Chromium</b>	<b>7.9</b>		<b>0.74</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:29 PM
<b>Copper</b>	<b>7.8</b>		<b>0.74</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:29 PM
<b>Lead</b>	<b>79</b>		<b>0.74</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:29 PM
<b>Nickel</b>	<b>7.8</b>		<b>0.74</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:29 PM
<b>Selenium</b>	<b>ND</b>		<b>0.74</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:29 PM
<b>Silver</b>	<b>ND</b>		<b>0.74</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:29 PM
<b>Zinc</b>	<b>140</b>		<b>1.5</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:29 PM
<b>SUBCONTRACTED ANALYSES</b>			<b>SUBCONTRACT</b>			Analyst: <b>A&amp;LGL</b>
<b>Subcontracted Analyses</b>	<b>Rcvd 12/15/11</b>		<b>as noted</b>		1	12/15/2011
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8270</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>HL</b>
<b>Acenaphthene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Anthracene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Benzo(a)anthracene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Benzo(a)pyrene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Benzo(b)fluoranthene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Benzo(g,h,i)perylene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Benzo(k)fluoranthene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Chrysene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Dibenzo(a,h)anthracene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Fluoranthene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Fluorene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Indeno(1,2,3-cd)pyrene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Naphthalene</b>	<b>74</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<b>Pyrene</b>	<b>ND</b>		<b>34</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:17 PM
<i>Surr: 2,4,6-Tribromophenol</i>	<i>81.8</i>		<i>34-140</i>	<i>%REC</i>	1	12/18/2011 12:17 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group USA, Corp

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Sample Pt 1  
**Collection Date:** 12/8/2011 12:15 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-05  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<i>Surr: 2-Fluorobiphenyl</i>	64.7		12-100	%REC	1	12/18/2011 12:17 PM
<i>Surr: 2-Fluorophenol</i>	82.7		33-117	%REC	1	12/18/2011 12:17 PM
<i>Surr: 4-Terphenyl-d14</i>	111		25-137	%REC	1	12/18/2011 12:17 PM
<i>Surr: Nitrobenzene-d5</i>	60.6		37-107	%REC	1	12/18/2011 12:17 PM
<i>Surr: Phenol-d6</i>	81.6		40-106	%REC	1	12/18/2011 12:17 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260</b>			Analyst: <b>MK</b>
Benzene	ND		120	µg/Kg-dry	100	12/18/2011 08:30 PM
Ethylbenzene	ND		230	µg/Kg-dry	100	12/18/2011 08:30 PM
m,p-Xylene	ND		230	µg/Kg-dry	100	12/18/2011 08:30 PM
o-Xylene	ND		120	µg/Kg-dry	100	12/18/2011 08:30 PM
Toluene	ND		170	µg/Kg-dry	100	12/18/2011 08:30 PM
Xylenes, Total	ND		350	µg/Kg-dry	100	12/18/2011 08:30 PM
<i>Surr: 1,2-Dichloroethane-d4</i>	115		70-120	%REC	100	12/18/2011 08:30 PM
<i>Surr: 4-Bromofluorobenzene</i>	101		75-120	%REC	100	12/18/2011 08:30 PM
<i>Surr: Dibromofluoromethane</i>	94.7		85-115	%REC	100	12/18/2011 08:30 PM
<i>Surr: Toluene-d8</i>	102		85-115	%REC	100	12/18/2011 08:30 PM
<b>CHROMIUM, TRIVALENT</b>			<b>CALCULATION</b>			Analyst: <b>JJG</b>
Chromium, Trivalent	7.9		0.58	mg/Kg-dry	1	12/19/2011 08:03 AM
<b>CHROMIUM, HEXAVALENT</b>			<b>SW7196A</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>MB</b>
Chromium, Hexavalent	ND		0.56	mg/Kg-dry	1	12/14/2011 02:50 PM
<b>MOISTURE</b>			<b>A2540 G</b>			Analyst: <b>CG</b>
Moisture	13		0.050	% of sample	1	12/14/2011 03:17 PM
<b>PH</b>			<b>SW9045D</b>			Analyst: <b>JJG</b>
pH	8.79			s.u.	1	12/12/2011 10:15 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Sample Pt 2  
**Collection Date:** 12/8/2011 12:20 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-06  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>			<b>SW8015M</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>RM</b>
<b>DRO (C10-C28)</b>	<b>33</b>		<b>4.5</b>	<b>mg/Kg-dry</b>	1	12/15/2011 12:20 PM
<i>Surr: 4-Terphenyl-d14</i>	<i>81.5</i>		<i>39-115</i>	<i>%REC</i>	1	12/15/2011 12:20 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>			<b>SW8015</b>			Analyst: <b>RM</b>
<b>GRO (C6-C10)</b>	<b>ND</b>		<b>5.5</b>	<b>mg/Kg-dry</b>	100	12/15/2011 11:45 PM
<i>Surr: Toluene-d8</i>	<i>108</i>		<i>50-150</i>	<i>%REC</i>	100	12/15/2011 11:45 PM
<b>MERCURY BY CVAA</b>			<b>SW7471</b>		Prep Date: <b>12/15/2011</b>	Analyst: <b>LR</b>
<b>Mercury</b>	<b>ND</b>		<b>0.019</b>	<b>mg/Kg-dry</b>	1	12/15/2011 01:30 PM
<b>METALS BY ICP-MS</b>			<b>SW6020A</b>		Prep Date: <b>12/14/2011</b>	Analyst: <b>CES</b>
<b>Arsenic</b>	<b>1.3</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:55 PM
<b>Barium</b>	<b>910</b>		<b>8.8</b>	<b>mg/Kg-dry</b>	20	12/16/2011 12:33 PM
<b>Cadmium</b>	<b>ND</b>		<b>0.35</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:55 PM
<b>Chromium</b>	<b>7.0</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:55 PM
<b>Copper</b>	<b>6.5</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:55 PM
<b>Lead</b>	<b>8.0</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:55 PM
<b>Nickel</b>	<b>6.2</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:55 PM
<b>Selenium</b>	<b>ND</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:55 PM
<b>Silver</b>	<b>ND</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:55 PM
<b>Zinc</b>	<b>59</b>		<b>1.8</b>	<b>mg/Kg-dry</b>	2	12/15/2011 08:55 PM
<b>SUBCONTRACTED ANALYSES</b>			<b>SUBCONTRACT</b>			Analyst: <b>A&amp;LGL</b>
<b>Subcontracted Analyses</b>	<b>Rcvd 12/15/11</b>		<b>as noted</b>		1	12/15/2011
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8270</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>HL</b>
<b>Acenaphthene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Anthracene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Benzo(a)anthracene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Benzo(a)pyrene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Benzo(b)fluoranthene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Benzo(g,h,i)perylene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Benzo(k)fluoranthene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Chrysene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Dibenzo(a,h)anthracene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Fluoranthene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Fluorene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Indeno(1,2,3-cd)pyrene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Naphthalene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<b>Pyrene</b>	<b>ND</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 12:44 PM
<i>Surr: 2,4,6-Tribromophenol</i>	<i>81.1</i>		<i>34-140</i>	<i>%REC</i>	1	12/18/2011 12:44 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Sample Pt 2  
**Collection Date:** 12/8/2011 12:20 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-06  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<i>Surr: 2-Fluorobiphenyl</i>	70.4		12-100	%REC	1	12/18/2011 12:44 PM
<i>Surr: 2-Fluorophenol</i>	91.5		33-117	%REC	1	12/18/2011 12:44 PM
<i>Surr: 4-Terphenyl-d14</i>	109		25-137	%REC	1	12/18/2011 12:44 PM
<i>Surr: Nitrobenzene-d5</i>	66.9		37-107	%REC	1	12/18/2011 12:44 PM
<i>Surr: Phenol-d6</i>	85.4		40-106	%REC	1	12/18/2011 12:44 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260</b>		Analyst: <b>BG</b>	
Benzene	ND		110	µg/Kg-dry	100	12/16/2011 07:16 AM
Ethylbenzene	ND		220	µg/Kg-dry	100	12/16/2011 07:16 AM
m,p-Xylene	ND		220	µg/Kg-dry	100	12/16/2011 07:16 AM
o-Xylene	ND		110	µg/Kg-dry	100	12/16/2011 07:16 AM
Toluene	ND		160	µg/Kg-dry	100	12/16/2011 07:16 AM
Xylenes, Total	ND		330	µg/Kg-dry	100	12/16/2011 07:16 AM
<i>Surr: 1,2-Dichloroethane-d4</i>	97.1		70-120	%REC	100	12/16/2011 07:16 AM
<i>Surr: 4-Bromofluorobenzene</i>	95.2		75-120	%REC	100	12/16/2011 07:16 AM
<i>Surr: Dibromofluoromethane</i>	94.4		85-115	%REC	100	12/16/2011 07:16 AM
<i>Surr: Toluene-d8</i>	100		85-115	%REC	100	12/16/2011 07:16 AM
<b>CHROMIUM, TRIVALENT</b>			<b>CALCULATION</b>		Analyst: <b>JJG</b>	
Chromium, Trivalent	7.0		0.55	mg/Kg-dry	1	12/19/2011 08:03 AM
<b>CHROMIUM, HEXAVALENT</b>			<b>SW7196A</b>		Prep Date: <b>12/13/2011</b> Analyst: <b>MB</b>	
Chromium, Hexavalent	ND		0.54	mg/Kg-dry	1	12/14/2011 02:50 PM
<b>MOISTURE</b>			<b>A2540 G</b>		Analyst: <b>CG</b>	
Moisture	8.7		0.050	% of sample	1	12/14/2011 03:17 PM
<b>PH</b>			<b>SW9045D</b>		Analyst: <b>JJG</b>	
pH	8.90			s.u.	1	12/12/2011 10:15 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Sample Pt 3  
**Collection Date:** 12/8/2011 12:25 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-07  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>			<b>SW8015M</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>RM</b>
<b>DRO (C10-C28)</b>	<b>110</b>		<b>4.6</b>	<b>mg/Kg-dry</b>	1	12/15/2011 12:42 PM
<i>Surr: 4-Terphenyl-d14</i>	<i>64.4</i>		<i>39-115</i>	<i>%REC</i>	1	12/15/2011 12:42 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>			<b>SW8015</b>			Analyst: <b>RM</b>
<b>GRO (C6-C10)</b>	<b>ND</b>		<b>5.6</b>	<b>mg/Kg-dry</b>	100	12/16/2011 12:10 PM
<i>Surr: Toluene-d8</i>	<i>107</i>		<i>50-150</i>	<i>%REC</i>	100	12/16/2011 12:10 PM
<b>MERCURY BY CVAA</b>			<b>SW7471</b>		Prep Date: <b>12/15/2011</b>	Analyst: <b>LR</b>
Mercury	ND		0.019	mg/Kg-dry	1	12/15/2011 01:32 PM
<b>METALS BY ICP-MS</b>			<b>SW6020A</b>		Prep Date: <b>12/14/2011</b>	Analyst: <b>CES</b>
Arsenic	2.8		0.68	mg/Kg-dry	2	12/15/2011 09:00 PM
Barium	290		6.8	mg/Kg-dry	20	12/16/2011 12:39 PM
Cadmium	1.0		0.27	mg/Kg-dry	2	12/15/2011 09:00 PM
Chromium	8.2		0.68	mg/Kg-dry	2	12/15/2011 09:00 PM
Copper	7.3		0.68	mg/Kg-dry	2	12/15/2011 09:00 PM
Lead	84		0.68	mg/Kg-dry	2	12/15/2011 09:00 PM
Nickel	8.3		0.68	mg/Kg-dry	2	12/15/2011 09:00 PM
Selenium	ND		0.68	mg/Kg-dry	2	12/15/2011 09:00 PM
Silver	ND		0.68	mg/Kg-dry	2	12/15/2011 09:00 PM
Zinc	130		1.4	mg/Kg-dry	2	12/15/2011 09:00 PM
<b>SUBCONTRACTED ANALYSES</b>			<b>SUBCONTRACT</b>			Analyst: <b>A&amp;LGL</b>
Subcontracted Analyses		Rcvd 12/15/11		as noted	1	12/15/2011
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8270</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>HL</b>
Acenaphthene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Anthracene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Benzo(a)anthracene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Benzo(a)pyrene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Benzo(b)fluoranthene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Benzo(g,h,i)perylene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Benzo(k)fluoranthene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Chrysene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Dibenzo(a,h)anthracene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Fluoranthene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Fluorene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
Indeno(1,2,3-cd)pyrene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
<b>Naphthalene</b>	<b>72</b>		<b>33</b>	<b>µg/Kg-dry</b>	1	12/18/2011 01:10 AM
Pyrene	ND		33	µg/Kg-dry	1	12/18/2011 01:10 AM
<i>Surr: 2,4,6-Tribromophenol</i>	<i>79.7</i>		<i>34-140</i>	<i>%REC</i>	1	12/18/2011 01:10 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group USA, Corp

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Sample Pt 3  
**Collection Date:** 12/8/2011 12:25 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-07  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<i>Surr: 2-Fluorobiphenyl</i>	75.2		12-100	%REC	1	12/18/2011 01:10 AM
<i>Surr: 2-Fluorophenol</i>	95.3		33-117	%REC	1	12/18/2011 01:10 AM
<i>Surr: 4-Terphenyl-d14</i>	106		25-137	%REC	1	12/18/2011 01:10 AM
<i>Surr: Nitrobenzene-d5</i>	71.1		37-107	%REC	1	12/18/2011 01:10 AM
<i>Surr: Phenol-d6</i>	92.4		40-106	%REC	1	12/18/2011 01:10 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260</b>		Analyst: <b>MK</b>	
Benzene	ND		110	µg/Kg-dry	100	12/17/2011 07:16 AM
Ethylbenzene	ND		220	µg/Kg-dry	100	12/17/2011 07:16 AM
m,p-Xylene	ND		220	µg/Kg-dry	100	12/17/2011 07:16 AM
o-Xylene	ND		110	µg/Kg-dry	100	12/17/2011 07:16 AM
Toluene	ND		170	µg/Kg-dry	100	12/17/2011 07:16 AM
Xylenes, Total	ND		340	µg/Kg-dry	100	12/17/2011 07:16 AM
<i>Surr: 1,2-Dichloroethane-d4</i>	110		70-120	%REC	100	12/17/2011 07:16 AM
<i>Surr: 4-Bromofluorobenzene</i>	94.0		75-120	%REC	100	12/17/2011 07:16 AM
<i>Surr: Dibromofluoromethane</i>	99.9		85-115	%REC	100	12/17/2011 07:16 AM
<i>Surr: Toluene-d8</i>	99.9		85-115	%REC	100	12/17/2011 07:16 AM
<b>CHROMIUM, TRIVALENT</b>			<b>CALCULATION</b>		Analyst: <b>JJG</b>	
Chromium, Trivalent	8.2		0.56	mg/Kg-dry	1	12/19/2011 08:03 AM
<b>CHROMIUM, HEXAVALENT</b>			<b>SW7196A</b>		Prep Date: <b>12/13/2011</b> Analyst: <b>MB</b>	
Chromium, Hexavalent	ND		0.55	mg/Kg-dry	1	12/14/2011 02:50 PM
<b>MOISTURE</b>			<b>A2540 G</b>		Analyst: <b>CG</b>	
Moisture	11		0.050	% of sample	1	12/14/2011 03:17 PM
<b>PH</b>			<b>SW9045D</b>		Analyst: <b>JJG</b>	
pH	8.45			s.u.	1	12/12/2011 10:15 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Sample Pt 4  
**Collection Date:** 12/8/2011 12:30 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-08  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>			<b>SW8015M</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>RM</b>
<b>DRO (C10-C28)</b>	<b>39</b>		<b>4.6</b>	<b>mg/Kg-dry</b>	1	12/15/2011 12:42 PM
<i>Surr: 4-Terphenyl-d14</i>	66.3		39-115	%REC	1	12/15/2011 12:42 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>			<b>SW8015</b>			Analyst: <b>RM</b>
<b>GRO (C6-C10)</b>	ND		5.6	mg/Kg-dry	100	12/16/2011 12:35 PM
<i>Surr: Toluene-d8</i>	109		50-150	%REC	100	12/16/2011 12:35 PM
<b>MERCURY BY CVAA</b>			<b>SW7471</b>		Prep Date: <b>12/15/2011</b>	Analyst: <b>LR</b>
Mercury	ND		0.021	mg/Kg-dry	1	12/15/2011 01:34 PM
<b>METALS BY ICP-MS</b>			<b>SW6020A</b>		Prep Date: <b>12/14/2011</b>	Analyst: <b>CES</b>
<b>Arsenic</b>	<b>2.6</b>		<b>0.77</b>	<b>mg/Kg-dry</b>	2	12/15/2011 09:05 PM
<b>Barium</b>	<b>650</b>		<b>7.7</b>	<b>mg/Kg-dry</b>	20	12/16/2011 12:44 PM
<b>Cadmium</b>	<b>0.55</b>		<b>0.31</b>	<b>mg/Kg-dry</b>	2	12/15/2011 09:05 PM
<b>Chromium</b>	<b>8.9</b>		<b>0.77</b>	<b>mg/Kg-dry</b>	2	12/15/2011 09:05 PM
<b>Copper</b>	<b>8.2</b>		<b>0.77</b>	<b>mg/Kg-dry</b>	2	12/15/2011 09:05 PM
<b>Lead</b>	<b>32</b>		<b>0.77</b>	<b>mg/Kg-dry</b>	2	12/15/2011 09:05 PM
<b>Nickel</b>	<b>8.5</b>		<b>0.77</b>	<b>mg/Kg-dry</b>	2	12/15/2011 09:05 PM
Selenium	ND		0.77	mg/Kg-dry	2	12/15/2011 09:05 PM
Silver	ND		0.77	mg/Kg-dry	2	12/15/2011 09:05 PM
<b>Zinc</b>	<b>79</b>		<b>1.5</b>	<b>mg/Kg-dry</b>	2	12/15/2011 09:05 PM
<b>SUBCONTRACTED ANALYSES</b>			<b>SUBCONTRACT</b>			Analyst: <b>A&amp;LGL</b>
Subcontracted Analyses	Rcvd 12/15/11		as noted		1	12/15/2011
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8270</b>		Prep Date: <b>12/13/2011</b>	Analyst: <b>HL</b>
Acenaphthene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Anthracene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Benzo(a)anthracene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Benzo(a)pyrene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Benzo(b)fluoranthene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Benzo(g,h,i)perylene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Benzo(k)fluoranthene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Chrysene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Dibenzo(a,h)anthracene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Fluoranthene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Fluorene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Indeno(1,2,3-cd)pyrene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Naphthalene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
Pyrene	ND		33	µg/Kg-dry	1	12/18/2011 01:36 AM
<i>Surr: 2,4,6-Tribromophenol</i>	78.4		34-140	%REC	1	12/18/2011 01:36 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group USA, Corp

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Sample Pt 4  
**Collection Date:** 12/8/2011 12:30 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-08  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<i>Surr: 2-Fluorobiphenyl</i>	70.4		12-100	%REC	1	12/18/2011 01:36 AM
<i>Surr: 2-Fluorophenol</i>	94.0		33-117	%REC	1	12/18/2011 01:36 AM
<i>Surr: 4-Terphenyl-d14</i>	101		25-137	%REC	1	12/18/2011 01:36 AM
<i>Surr: Nitrobenzene-d5</i>	68.0		37-107	%REC	1	12/18/2011 01:36 AM
<i>Surr: Phenol-d6</i>	89.9		40-106	%REC	1	12/18/2011 01:36 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260</b>		Analyst: <b>MK</b>	
Benzene	ND		110	µg/Kg-dry	100	12/17/2011 07:42 AM
Ethylbenzene	ND		220	µg/Kg-dry	100	12/17/2011 07:42 AM
m,p-Xylene	ND		220	µg/Kg-dry	100	12/17/2011 07:42 AM
o-Xylene	ND		110	µg/Kg-dry	100	12/17/2011 07:42 AM
Toluene	ND		170	µg/Kg-dry	100	12/17/2011 07:42 AM
Xylenes, Total	ND		340	µg/Kg-dry	100	12/17/2011 07:42 AM
<i>Surr: 1,2-Dichloroethane-d4</i>	109		70-120	%REC	100	12/17/2011 07:42 AM
<i>Surr: 4-Bromofluorobenzene</i>	95.8		75-120	%REC	100	12/17/2011 07:42 AM
<i>Surr: Dibromofluoromethane</i>	99.7		85-115	%REC	100	12/17/2011 07:42 AM
<i>Surr: Toluene-d8</i>	99.6		85-115	%REC	100	12/17/2011 07:42 AM
<b>CHROMIUM, TRIVALENT</b>			<b>CALCULATION</b>		Analyst: <b>JJG</b>	
Chromium, Trivalent	8.9		0.56	mg/Kg-dry	1	12/19/2011 08:03 AM
<b>CHROMIUM, HEXAVALENT</b>			<b>SW7196A</b>		Prep Date: <b>12/13/2011</b> Analyst: <b>MB</b>	
Chromium, Hexavalent	ND		0.55	mg/Kg-dry	1	12/14/2011 02:50 PM
<b>MOISTURE</b>			<b>A2540 G</b>		Analyst: <b>CG</b>	
Moisture	11		0.050	% of sample	1	12/14/2011 03:17 PM
<b>PH</b>			<b>SW9045D</b>		Analyst: <b>JJG</b>	
pH	8.61			s.u.	1	12/12/2011 10:15 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Pond sample  
**Collection Date:** 12/8/2011 12:45 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-09  
**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>			<b>SW8015M</b>		Prep Date: <b>12/12/2011</b>	Analyst: <b>RM</b>
<b>DRO (C10-C28)</b>	<b>0.20</b>		<b>0.10</b>	<b>mg/L</b>	1	12/13/2011 09:01 PM
Surr: 4-Terphenyl-d14	31.0		26-109	%REC	1	12/13/2011 09:01 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>			<b>SW8015</b>			Analyst: <b>JD</b>
<b>GRO (C6-C10)</b>	ND		0.20	mg/L	1	12/16/2011 10:11 AM
Surr: Toluene-d8	97.5		70-130	%REC	1	12/16/2011 10:11 AM
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8270</b>		Prep Date: <b>12/12/2011</b>	Analyst: <b>CW</b>
Acenaphthene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Acenaphthylene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Anthracene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Benzo(a)anthracene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Benzo(a)pyrene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Benzo(b)fluoranthene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Benzo(g,h,i)perylene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Benzo(k)fluoranthene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Chrysene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Dibenzo(a,h)anthracene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Fluoranthene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Fluorene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Indeno(1,2,3-cd)pyrene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Naphthalene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Phenanthrene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Pyrene	ND		5.0	µg/L	1	12/18/2011 01:49 AM
Surr: 2,4,6-Tribromophenol	73.3		21-125	%REC	1	12/18/2011 01:49 AM
Surr: 2-Fluorobiphenyl	70.6		36-94	%REC	1	12/18/2011 01:49 AM
Surr: 2-Fluorophenol	42.0		10-75	%REC	1	12/18/2011 01:49 AM
Surr: 4-Terphenyl-d14	68.8		26-119	%REC	1	12/18/2011 01:49 AM
Surr: Nitrobenzene-d5	76.3		41-104	%REC	1	12/18/2011 01:49 AM
Surr: Phenol-d6	29.5		11-50	%REC	1	12/18/2011 01:49 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260</b>			Analyst: <b>MK</b>
<b>Benzene</b>	<b>1.7</b>		<b>1.0</b>	<b>µg/L</b>	1	12/18/2011 04:09 PM
Ethylbenzene	ND		1.0	µg/L	1	12/18/2011 04:09 PM
m,p-Xylene	ND		2.0	µg/L	1	12/18/2011 04:09 PM
o-Xylene	ND		1.0	µg/L	1	12/18/2011 04:09 PM
<b>Toluene</b>	<b>4.0</b>		<b>1.0</b>	<b>µg/L</b>	1	12/18/2011 04:09 PM
Xylenes, Total	ND		3.0	µg/L	1	12/18/2011 04:09 PM
Surr: 1,2-Dichloroethane-d4	118		70-120	%REC	1	12/18/2011 04:09 PM
Surr: 4-Bromofluorobenzene	89.3		75-120	%REC	1	12/18/2011 04:09 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group USA, Corp

Date: 19-Dec-11

**Client:** HRL Compliance Solutions  
**Project:** Gypsum Ranch B Pad 12/8/11  
**Sample ID:** Pond sample  
**Collection Date:** 12/8/2011 12:45 PM

**Work Order:** 1112376  
**Lab ID:** 1112376-09  
**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: Dibromofluoromethane	101		85-115	%REC	1	12/18/2011 04:09 PM
Surr: Toluene-d8	101		85-120	%REC	1	12/18/2011 04:09 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

Report Number: F11347-0396

Account Number: 91000

# A & L GREAT LAKES LABORATORIES, INC.

3505 Conestoga Drive • Fort Wayne, Indiana 46808-4413 • Phone 260-483-4759 • Fax 260-483-5274

www.algreatlakes.com • lab@algreatlakes.com



QUALITY ANALYSES FOR INFORMED DECISIONS

TO: ALS LABORATORY GROUP  
3352 128TH AVE  
HOLLAND, MI 49424-9263

RE: 1112376

DATE RECEIVED: 12/13/2011

DATE REPORTED: 12/15/2011

PAGE: 1

P.O. NUMBER: 20-1112376

ATTN: ANN PRESTON

## REPORT OF ANALYSIS

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
64728	03B	Sat'd Paste Extraction with DIW	1		USDA Handbook 60
		Conductivity (ECe)	3.86	mmho/cm	USDA Handbook 60
		Calcium (Sat'd Paste)	248	ppm	USDA Handbook 60
		Magnesium (Sat'd Paste)	91	ppm	USDA Handbook 60
		Sodium (Sat'd Paste)	2978	ppm	USDA Handbook 60
		Sodium Adsorption Ratio (SAR)	40.5	-	USDA Handbook 60
64729	04C	Sat'd Paste Extraction with DIW	1		USDA Handbook 60
		Conductivity (ECe)	50.80	mmho/cm	USDA Handbook 60
		Calcium (Sat'd Paste)	1758	ppm	USDA Handbook 60
		Magnesium (Sat'd Paste)	3786	ppm	USDA Handbook 60
		Sodium (Sat'd Paste)	29355	ppm	USDA Handbook 60
		Sodium Adsorption Ratio (SAR)	89.9	-	USDA Handbook 60
64730	05C	Sat'd Paste Extraction with DIW	1		USDA Handbook 60
		Conductivity (ECe)	4.79	mmho/cm	USDA Handbook 60
		Calcium (Sat'd Paste)	173	ppm	USDA Handbook 60
		Magnesium (Sat'd Paste)	46	ppm	USDA Handbook 60
		Sodium (Sat'd Paste)	4508	ppm	USDA Handbook 60
		Sodium Adsorption Ratio (SAR)	78.5	-	USDA Handbook 60
64731	06C	Sat'd Paste Extraction with DIW	1		USDA Handbook 60
		Conductivity (ECe)	4.43	mmho/cm	USDA Handbook 60
		Calcium (Sat'd Paste)	208	ppm	USDA Handbook 60
		Magnesium (Sat'd Paste)	63	ppm	USDA Handbook 60
		Sodium (Sat'd Paste)	3538	ppm	USDA Handbook 60
		Sodium Adsorption Ratio (SAR)	55.0	-	USDA Handbook 60

Report Number: F11347-0396

Account Number: 91000

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3505 Conestoga Drive • Fort Wayne, Indiana 46808-4413 • Phone 260-483-4759 • Fax 260-483-5274  
www.algreatlakes.com • lab@algreatlakes.com



QUALITY ANALYSES FOR INFORMED DECISIONS

TO: ALS LABORATORY GROUP  
3352 128TH AVE  
HOLLAND, MI 49424-9263

RE: 1112376

DATE RECEIVED: 12/13/2011  
DATE REPORTED: 12/15/2011  
PAGE: 2  
P.O. NUMBER: 20-1112376

ATTN: ANN PRESTON

## REPORT OF ANALYSIS

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
64732	07C	Sat'd Paste Extraction with DIW	1		USDA Handbook 60
		Conductivity (ECe)	5.29	mmho/cm	USDA Handbook 60
		Calcium (Sat'd Paste)	171	ppm	USDA Handbook 60
		Magnesium (Sat'd Paste)	40	ppm	USDA Handbook 60
		Sodium (Sat'd Paste)	4387	ppm	USDA Handbook 60
		Sodium Adsorption Ratio (SAR)	78.3	-	USDA Handbook 60
64733	08C	Sat'd Paste Extraction with DIW	1		USDA Handbook 60
		Conductivity (ECe)	4.13	mmho/cm	USDA Handbook 60
		Calcium (Sat'd Paste)	231	ppm	USDA Handbook 60
		Magnesium (Sat'd Paste)	67	ppm	USDA Handbook 60
		Sodium (Sat'd Paste)	2796	ppm	USDA Handbook 60
		Sodium Adsorption Ratio (SAR)	41.5	-	USDA Handbook 60

Client: HRL Compliance Solutions

**QC BATCH REPORT**

Work Order: 1112376

Project: Gypsum Ranch B Pad 12/8/11

Batch ID: **38100** Instrument ID **GC8** Method: **SW8015M**

MBLK		Sample ID: <b>DBLKW1-38100-38100</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/13/2011 06:25 PM</b>			
Client ID:		Run ID: <b>GC8_111213A</b>				SeqNo: <b>1852138</b>		Prep Date: <b>12/12/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	ND	0.10									
<i>Surr: 4-Terphenyl-d14</i>	<i>0.01642</i>	<i>0</i>	<i>0.05</i>	<i>0</i>	<i>32.8</i>	<i>26-109</i>	<i>0</i>				

LCS		Sample ID: <b>DLCSW1-38100-38100</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/13/2011 05:19 PM</b>			
Client ID:		Run ID: <b>GC8_111213A</b>				SeqNo: <b>1852136</b>		Prep Date: <b>12/12/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	3.785	0.10	5	0	75.7	60-130	0				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.01844</i>	<i>0</i>	<i>0.05</i>	<i>0</i>	<i>36.9</i>	<i>26-109</i>	<i>0</i>				

LCSD		Sample ID: <b>DLCSDW1-38100-38100</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/13/2011 05:19 PM</b>			
Client ID:		Run ID: <b>GC8_111213A</b>				SeqNo: <b>1852145</b>		Prep Date: <b>12/12/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	4.933	0.10	5	0	98.7	60-130	3.785	26.3	30		
<i>Surr: 4-Terphenyl-d14</i>	<i>0.01989</i>	<i>0</i>	<i>0.05</i>	<i>0</i>	<i>39.8</i>	<i>26-109</i>	<i>0.01844</i>	<i>7.57</i>	<i>30</i>		

MS		Sample ID: <b>1112358-04C MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/13/2011 05:41 PM</b>			
Client ID:		Run ID: <b>GC8_111213A</b>				SeqNo: <b>1852137</b>		Prep Date: <b>12/12/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	41.11	1.0	50	0	82.2	60-130	0				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.2016</i>	<i>0</i>	<i>0.5</i>	<i>0</i>	<i>40.3</i>	<i>26-109</i>	<i>0</i>				

MSD		Sample ID: <b>1112358-04C MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/13/2011 05:41 PM</b>			
Client ID:		Run ID: <b>GC8_111213A</b>				SeqNo: <b>1852146</b>		Prep Date: <b>12/12/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	47.51	1.0	50	0	95	60-130	41.11	14.4	30		
<i>Surr: 4-Terphenyl-d14</i>	<i>0.2103</i>	<i>0</i>	<i>0.5</i>	<i>0</i>	<i>42.1</i>	<i>26-109</i>	<i>0.2016</i>	<i>4.22</i>	<i>30</i>		

The following samples were analyzed in this batch:

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38138** Instrument ID **GC8** Method: **SW8015M**

MBLK		Sample ID: <b>DBLKS1-38138-38138</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>12/15/2011 11:36 AM</b>			
Client ID:		Run ID: <b>GC8_111215A</b>				SeqNo: <b>1853460</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	ND	4.2									
<i>Surr: 4-Terphenyl-d14</i>	1.066	0	1.667	0	64	39-115	0				

LCS		Sample ID: <b>DLCSS1-38138-38138</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>12/15/2011 10:31 AM</b>			
Client ID:		Run ID: <b>GC8_111215A</b>				SeqNo: <b>1853458</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	138.2	4.2	166.7	0	82.9	60-130	0				
<i>Surr: 4-Terphenyl-d14</i>	0.912	0	1.667	0	54.7	39-115	0				

LCSD		Sample ID: <b>DLCSDS1-38138-38138</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>12/15/2011 10:31 AM</b>			
Client ID:		Run ID: <b>GC8_111215A</b>				SeqNo: <b>1853464</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	148	4.2	166.7	0	88.8	60-130	138.2	6.87	30		
<i>Surr: 4-Terphenyl-d14</i>	0.9177	0	1.667	0	55.1	39-115	0.912	0.619	30		

MS		Sample ID: <b>1112352-05B MS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>12/15/2011 10:52 AM</b>			
Client ID:		Run ID: <b>GC8_111215A</b>				SeqNo: <b>1853459</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	491.1	12	482.7	0	102	60-130	0				
<i>Surr: 4-Terphenyl-d14</i>	3.019	0	4.827	0	62.5	39-115	0				

MSD		Sample ID: <b>1112352-05B MSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>12/15/2011 10:52 AM</b>			
Client ID:		Run ID: <b>GC8_111215A</b>				SeqNo: <b>1853465</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	397.5	12	484.4	0	82.1	60-130	491.1	21.1	30		
<i>Surr: 4-Terphenyl-d14</i>	3.021	0	4.844	0	62.4	39-115	3.019	0.0696	30		

The following samples were analyzed in this batch:

1112376-04B	1112376-05B	1112376-06B
1112376-07B	1112376-08B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **R99138** Instrument ID **GC10** Method: **SW8015**

MBLK		Sample ID: <b>MBLK-R99138-R99138</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/16/2011 02:00 AM</b>		
Client ID:		Run ID: <b>GC10_111216A</b>				SeqNo: <b>1854681</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	200								
<i>Surr: Toluene-d8</i>	103.6	0	100	0	104	70-130	0			

LCS		Sample ID: <b>LCS-R99138-R99138</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/16/2011 12:46 PM</b>		
Client ID:		Run ID: <b>GC10_111216A</b>				SeqNo: <b>1854684</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	27400	200	25000	0	110	70-130	0			
<i>Surr: Toluene-d8</i>	96.55	0	100	0	96.6	70-130	0			

LCSD		Sample ID: <b>LCSD-R99138-R99138</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/16/2011 01:11 AM</b>		
Client ID:		Run ID: <b>GC10_111216A</b>				SeqNo: <b>1854680</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	26800	200	25000	0	107	70-130	27400	2.23	30	
<i>Surr: Toluene-d8</i>	98.49	0	100	0	98.5	70-130	96.55	1.99	30	

MS		Sample ID: <b>1112352-05A MS</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>12/16/2011 10:36 AM</b>		
Client ID:		Run ID: <b>GC10_111216A</b>				SeqNo: <b>1854703</b>		Prep Date:		DF: <b>50</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	1362000	2,500	1250000	0	109	70-130	0			
<i>Surr: Toluene-d8</i>	4581	0	5000	0	91.6	50-150	0			

MSD		Sample ID: <b>1112352-05A MSD</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>12/16/2011 11:01 AM</b>		
Client ID:		Run ID: <b>GC10_111216A</b>				SeqNo: <b>1854704</b>		Prep Date:		DF: <b>50</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	1342000	2,500	1250000	0	107	70-130	1362000	1.43	30	
<i>Surr: Toluene-d8</i>	4824	0	5000	0	96.5	50-150	4581	5.18	30	

The following samples were analyzed in this batch: | 1112376-09A |

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **R99165** Instrument ID **GC9** Method: **SW8015**

MBLK		Sample ID: <b>MBLK-R99165-R99165</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/15/2011 06:43 PM</b>		
Client ID:		Run ID: <b>GC9_111215A</b>				SeqNo: <b>1855588</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	200								
<i>Surr: Toluene-d8</i>	112	0	100	0	112	70-130	0			

LCS		Sample ID: <b>LCS-R99165-R99165</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/15/2011 05:28 PM</b>		
Client ID:		Run ID: <b>GC9_111215A</b>				SeqNo: <b>1855586</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	21850	200	25000	0	87.4	70-130	0			
<i>Surr: Toluene-d8</i>	105.6	0	100	0	106	70-130	0			

LCSD		Sample ID: <b>LCSD-R99165-R99165</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/15/2011 05:53 PM</b>		
Client ID:		Run ID: <b>GC9_111215A</b>				SeqNo: <b>1855587</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	24070	200	25000	0	96.3	70-130	21850	9.67	30	
<i>Surr: Toluene-d8</i>	107.3	0	100	0	107	70-130	105.6	1.65	30	

MS		Sample ID: <b>1112406-01A MS</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/16/2011 03:31 AM</b>		
Client ID:		Run ID: <b>GC9_111215A</b>				SeqNo: <b>1855595</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	18970	200	25000	0	75.9	70-130	0			
<i>Surr: Toluene-d8</i>	92.92	0	100	0	92.9	70-130	0			

MSD		Sample ID: <b>1112406-01A MSD</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/16/2011 03:56 AM</b>		
Client ID:		Run ID: <b>GC9_111215A</b>				SeqNo: <b>1855596</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	19400	200	25000	0	77.6	70-130	18970	2.22	30	
<i>Surr: Toluene-d8</i>	85.92	0	100	0	85.9	70-130	92.92	7.83	30	

The following samples were analyzed in this batch:

1112376-04A	1112376-05A	1112376-06A
1112376-07A	1112376-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38209** Instrument ID **HG1** Method: **SW7471**

<b>MBLK</b>	Sample ID: <b>MBLK-38209-38209</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/15/2011 12:59 PM</b>				
Client ID:	Run ID: <b>HG1_111215A</b>	SeqNo: <b>1853150</b>		Prep Date: <b>12/15/2011</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury ND 0.020

<b>LCS</b>	Sample ID: <b>LCS-38209-38209</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/15/2011 01:01 PM</b>				
Client ID:	Run ID: <b>HG1_111215A</b>	SeqNo: <b>1853151</b>		Prep Date: <b>12/15/2011</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.174 0.020 0.1665 0 105 80-120 0

<b>LCSD</b>	Sample ID: <b>LCSD-38209-38209</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/15/2011 01:03 PM</b>				
Client ID:	Run ID: <b>HG1_111215A</b>	SeqNo: <b>1853152</b>		Prep Date: <b>12/15/2011</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.1726 0.020 0.1665 0 104 80-120 0.174 0.818 20

<b>MS</b>	Sample ID: <b>1112337-07AMS</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/15/2011 01:10 PM</b>				
Client ID:	Run ID: <b>HG1_111215A</b>	SeqNo: <b>1853155</b>		Prep Date: <b>12/15/2011</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.1414 0.016 0.1311 -0.0005529 108 75-125 0

<b>MSD</b>	Sample ID: <b>1112337-07AMSD</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/15/2011 01:12 PM</b>				
Client ID:	Run ID: <b>HG1_111215A</b>	SeqNo: <b>1853156</b>		Prep Date: <b>12/15/2011</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.1378 0.015 0.1273 -0.0005529 109 75-125 0.1414 2.6 35

The following samples were analyzed in this batch:

1112376-04B	1112376-05B	1112376-06B
1112376-07B	1112376-08B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38160** Instrument ID **ICPMS1** Method: **SW6020A**

<b>MBLK</b>	Sample ID: <b>MBLK-38160-38160</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/15/2011 04:14 PM</b>				
Client ID:	Run ID: <b>ICPMS1_111214A</b>	SeqNo: <b>1853903</b>			Prep Date: <b>12/13/2011</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic ND 0.25

<b>LCS</b>	Sample ID: <b>LCS-38160-38160</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/15/2011 04:20 PM</b>				
Client ID:	Run ID: <b>ICPMS1_111214A</b>	SeqNo: <b>1853904</b>			Prep Date: <b>12/13/2011</b>		DF: <b>2</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic 4.801 0.50 5 0 96 80-120 0

<b>LCSD</b>	Sample ID: <b>LCSD-38160-38160</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/15/2011 04:25 PM</b>				
Client ID:	Run ID: <b>ICPMS1_111214A</b>	SeqNo: <b>1853905</b>			Prep Date: <b>12/13/2011</b>		DF: <b>2</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic 4.768 0.50 5 0 95.4 80-120 4.801 0.69 20

<b>MS</b>	Sample ID: <b>1112295-53AMS</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/15/2011 04:40 PM</b>				
Client ID:	Run ID: <b>ICPMS1_111214A</b>	SeqNo: <b>1853908</b>			Prep Date: <b>12/13/2011</b>		DF: <b>10</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic 17.12 3.6 7.102 11.66 76.9 80-120 0 S

<b>MSD</b>	Sample ID: <b>1112295-53AMSD</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/15/2011 04:45 PM</b>				
Client ID:	Run ID: <b>ICPMS1_111214A</b>	SeqNo: <b>1853909</b>			Prep Date: <b>12/13/2011</b>		DF: <b>10</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic 16.06 3.6 7.194 11.66 61.2 80-120 17.12 6.38 25 S

The following samples were analyzed in this batch: 1112376-01A 1112376-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38197** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK		Sample ID: <b>MBLK-38197-38197</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>12/15/2011 07:43 PM</b>			
Client ID:		Run ID: <b>ICPMS1_111214A</b>				SeqNo: <b>1853942</b>		Prep Date: <b>12/14/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Arsenic	ND	0.25									
Barium	0.0455	0.25								J	
Cadmium	ND	0.10									
Chromium	0.0086	0.25								J	
Copper	ND	0.25									
Lead	0.0551	0.25								J	
Nickel	ND	0.25									
Selenium	ND	0.25									
Silver	ND	0.25									
Zinc	0.1658	0.50								J	

LCS		Sample ID: <b>LCS-38197-38197</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>12/15/2011 07:48 PM</b>			
Client ID:		Run ID: <b>ICPMS1_111214A</b>				SeqNo: <b>1853943</b>		Prep Date: <b>12/14/2011</b>		DF: <b>2</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Arsenic	4.925	0.50	5	0	98.5	80-120	0				
Barium	5.227	0.50	5	0	105	80-120	0				
Cadmium	5.125	0.20	5	0	102	80-120	0				
Chromium	5.053	0.50	5	0	101	80-120	0				
Copper	5.207	0.50	5	0	104	80-120	0				
Lead	5.197	0.50	5	0	104	80-120	0				
Nickel	5.204	0.50	5	0	104	80-120	0				
Selenium	4.473	0.50	5	0	89.5	80-120	0				
Silver	4.835	0.50	5	0	96.7	80-120	0				
Zinc	5.107	1.0	5	0	102	80-120	0				

LCSD		Sample ID: <b>LCSD-38197-38197</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>12/15/2011 07:53 PM</b>			
Client ID:		Run ID: <b>ICPMS1_111214A</b>				SeqNo: <b>1853944</b>		Prep Date: <b>12/14/2011</b>		DF: <b>2</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Arsenic	4.902	0.50	5	0	98	80-120	4.925	0.468	20		
Barium	5.189	0.50	5	0	104	80-120	5.227	0.73	20		
Cadmium	5.088	0.20	5	0	102	80-120	5.125	0.725	20		
Chromium	5.128	0.50	5	0	103	80-120	5.053	1.47	20		
Copper	5.188	0.50	5	0	104	80-120	5.207	0.366	20		
Lead	5.136	0.50	5	0	103	80-120	5.197	1.18	20		
Nickel	5.17	0.50	5	0	103	80-120	5.204	0.655	20		
Selenium	4.5	0.50	5	0	90	80-120	4.473	0.602	20		
Silver	4.833	0.50	5	0	96.7	80-120	4.835	0.0414	20		
Zinc	5.071	1.0	5	0	101	80-120	5.107	0.707	20		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: 38197 Instrument ID ICPMS1 Method: SW6020A

MS		Sample ID: 1112376-03AMS				Units: mg/Kg		Analysis Date: 12/15/2011 08:09 PM		
Client ID: BKGD 3		Run ID: ICPMS1_111214A				SeqNo: 1853947		Prep Date: 12/14/2011		DF: 2
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	11.51	0.92	9.174	3.224	90.3	80-120	0			
Barium	203.7	0.92	9.174	167.1	399	80-120	0			SO
Cadmium	9.534	0.37	9.174	0.4402	99.1	80-120	0			
Chromium	19.91	0.92	9.174	11.24	94.4	80-120	0			
Copper	17.3	0.92	9.174	8.861	92	80-120	0			
Lead	25.52	0.92	9.174	17.05	92.4	80-120	0			
Nickel	19.98	0.92	9.174	11.61	91.2	80-120	0			
Selenium	8.488	0.92	9.174	0.8829	82.9	80-120	0			
Silver	8.011	0.92	9.174	0.07685	86.5	80-120	0			
Zinc	62.29	1.8	9.174	56.03	68.3	80-120	0			SO

MSD		Sample ID: 1112376-03AMSD				Units: mg/Kg		Analysis Date: 12/15/2011 08:14 PM		
Client ID: BKGD 3		Run ID: ICPMS1_111214A				SeqNo: 1853948		Prep Date: 12/14/2011		DF: 2
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	10.95	0.83	8.264	3.224	93.4	80-120	11.51	5.03	25	
Barium	195.5	0.83	8.264	167.1	344	80-120	203.7	4.07	25	SO
Cadmium	8.46	0.33	8.264	0.4402	97	80-120	9.534	11.9	25	
Chromium	19.12	0.83	8.264	11.24	95.3	80-120	19.91	4.02	25	
Copper	15.99	0.83	8.264	8.861	86.2	80-120	17.3	7.92	25	
Lead	23.8	0.83	8.264	17.05	81.7	80-120	25.52	6.98	25	
Nickel	19.29	0.83	8.264	11.61	92.9	80-120	19.98	3.53	25	
Selenium	7.83	0.83	8.264	0.8829	84.1	80-120	8.488	8.07	25	
Silver	7.026	0.83	8.264	0.07685	84.1	80-120	8.011	13.1	25	
Zinc	61.74	1.7	8.264	56.03	69.1	80-120	62.29	0.9	25	SO

The following samples were analyzed in this batch:

1112376-03A	1112376-04B	1112376-05B
1112376-06B	1112376-07B	1112376-08B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38099** Instrument ID **SVMS7** Method: **SW8270**

MBLK		Sample ID: <b>SBLKW1-38099-38099</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/16/2011 04:17 PM</b>			
Client ID:		Run ID: <b>SVMS7_111216A</b>			SeqNo: <b>1854946</b>		Prep Date: <b>12/12/2011</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Acenaphthene	1.18	5.0								J	
Acenaphthylene	ND	5.0									
Anthracene	ND	5.0									
Benzo(a)anthracene	ND	5.0									
Benzo(a)pyrene	ND	5.0									
Benzo(b)fluoranthene	ND	5.0									
Benzo(g,h,i)perylene	ND	5.0									
Benzo(k)fluoranthene	ND	5.0									
Chrysene	ND	5.0									
Dibenzo(a,h)anthracene	ND	5.0									
Fluoranthene	1.1	5.0								J	
Fluorene	0.95	5.0								J	
Indeno(1,2,3-cd)pyrene	ND	5.0									
Naphthalene	ND	5.0									
Phenanthrene	3.85	5.0								J	
Pyrene	1.1	5.0								J	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>37.09</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>74.2</i>	<i>21-125</i>	<i>0</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>35.7</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>71.4</i>	<i>36-94</i>	<i>0</i>				
<i>Surr: 2-Fluorophenol</i>	<i>23.52</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>47</i>	<i>10-75</i>	<i>0</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>39.46</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>78.9</i>	<i>26-119</i>	<i>0</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>38.65</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>77.3</i>	<i>41-104</i>	<i>0</i>				
<i>Surr: Phenol-d6</i>	<i>15.46</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>30.9</i>	<i>11-50</i>	<i>0</i>				

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38099** Instrument ID **SVMS7** Method: **SW8270**

LCS		Sample ID: <b>SLCSW1-38099-38099</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/16/2011 04:46 PM</b>		
Client ID:		Run ID: <b>SVMS7_111216A</b>			SeqNo: <b>1854947</b>		Prep Date: <b>12/12/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	33.86	5.0	40	0	84.6	45-110	0			
Acenaphthylene	35.64	5.0	40	0	89.1	50-105	0			
Anthracene	37.75	5.0	40	0	94.4	55-110	0			
Benzo(a)anthracene	37.08	5.0	40	0	92.7	55-110	0			
Benzo(a)pyrene	39.79	5.0	40	0	99.5	55-110	0			
Benzo(b)fluoranthene	37.9	5.0	40	0	94.8	45-120	0			
Benzo(g,h,i)perylene	39.83	5.0	40	0	99.6	40-125	0			
Benzo(k)fluoranthene	35.84	5.0	40	0	89.6	45-125	0			
Chrysene	36.91	5.0	40	0	92.3	55-110	0			
Dibenzo(a,h)anthracene	43.04	5.0	40	0	108	40-125	0			
Fluoranthene	36.79	5.0	40	0	92	55-115	0			
Fluorene	35.72	5.0	40	0	89.3	50-110	0			
Indeno(1,2,3-cd)pyrene	41.48	5.0	40	0	104	45-125	0			
Naphthalene	32.18	5.0	40	0	80.4	40-100	0			
Phenanthrene	36.86	5.0	40	0	92.2	50-115	0			
Pyrene	37.23	5.0	40	0	93.1	50-130	0			
<i>Surr: 2,4,6-Tribromophenol</i>	<i>46.65</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>93.3</i>	<i>21-125</i>	<i>0</i>			
<i>Surr: 2-Fluorobiphenyl</i>	<i>39.6</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>79.2</i>	<i>36-94</i>	<i>0</i>			
<i>Surr: 2-Fluorophenol</i>	<i>22.28</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>44.6</i>	<i>10-75</i>	<i>0</i>			
<i>Surr: 4-Terphenyl-d14</i>	<i>32.17</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>64.3</i>	<i>26-119</i>	<i>0</i>			
<i>Surr: Nitrobenzene-d5</i>	<i>40.64</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>81.3</i>	<i>41-104</i>	<i>0</i>			
<i>Surr: Phenol-d6</i>	<i>14.53</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>29.1</i>	<i>11-50</i>	<i>0</i>			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38099** Instrument ID **SVMS7** Method: **SW8270**

LCSD		Sample ID: <b>SLCSDW1-38099-38099</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/16/2011 05:15 PM</b>		
Client ID:		Run ID: <b>SVMS7_111216A</b>			SeqNo: <b>1854948</b>		Prep Date: <b>12/12/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	34.11	5.0	40	0	85.3	45-110	33.86	0.736	30	
Acenaphthylene	35.65	5.0	40	0	89.1	50-105	35.64	0.0281	30	
Anthracene	37.53	5.0	40	0	93.8	55-110	37.75	0.584	30	
Benzo(a)anthracene	37.21	5.0	40	0	93	55-110	37.08	0.35	30	
Benzo(a)pyrene	39.71	5.0	40	0	99.3	55-110	39.79	0.201	30	
Benzo(b)fluoranthene	37.4	5.0	40	0	93.5	45-120	37.9	1.33	30	
Benzo(g,h,i)perylene	39.61	5.0	40	0	99	40-125	39.83	0.554	30	
Benzo(k)fluoranthene	36.27	5.0	40	0	90.7	45-125	35.84	1.19	30	
Chrysene	36.99	5.0	40	0	92.5	55-110	36.91	0.217	30	
Dibenzo(a,h)anthracene	43.12	5.0	40	0	108	40-125	43.04	0.186	30	
Fluoranthene	36.47	5.0	40	0	91.2	55-115	36.79	0.874	30	
Fluorene	35.66	5.0	40	0	89.2	50-110	35.72	0.168	30	
Indeno(1,2,3-cd)pyrene	41.59	5.0	40	0	104	45-125	41.48	0.265	30	
Naphthalene	33.14	5.0	40	0	82.8	40-100	32.18	2.94	30	
Phenanthrene	36.66	5.0	40	0	91.6	50-115	36.86	0.544	30	
Pyrene	37.27	5.0	40	0	93.2	50-130	37.23	0.107	30	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>47.81</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>95.6</i>	<i>21-125</i>	<i>46.65</i>	<i>2.46</i>	<i>40</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>41.04</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>82.1</i>	<i>36-94</i>	<i>39.6</i>	<i>3.57</i>	<i>40</i>	
<i>Surr: 2-Fluorophenol</i>	<i>24.64</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>49.3</i>	<i>10-75</i>	<i>22.28</i>	<i>10.1</i>	<i>40</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>42.41</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>84.8</i>	<i>26-119</i>	<i>32.17</i>	<i>27.5</i>	<i>40</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>42.83</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>85.7</i>	<i>41-104</i>	<i>40.64</i>	<i>5.25</i>	<i>40</i>	
<i>Surr: Phenol-d6</i>	<i>16.04</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>32.1</i>	<i>11-50</i>	<i>14.53</i>	<i>9.88</i>	<i>40</i>	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38099** Instrument ID **SVMS7** Method: **SW8270**

MS		Sample ID: 1112358-04C MS				Units: µg/L		Analysis Date: 12/16/2011 05:44 PM		
Client ID:		Run ID: SVMS7_111216A			SeqNo: 1854949		Prep Date: 12/12/2011		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	314.3	50	400	0	78.6	45-110	0			
Acenaphthylene	342.1	50	400	0	85.5	50-105	0			
Anthracene	360.4	50	400	0	90.1	55-110	0			
Benzo(a)anthracene	349	50	400	0	87.2	55-110	0			
Benzo(a)pyrene	376.4	50	400	0	94.1	55-110	0			
Benzo(b)fluoranthene	358	50	400	0	89.5	45-120	0			
Benzo(g,h,i)perylene	375.4	50	400	0	93.8	40-125	0			
Benzo(k)fluoranthene	344	50	400	0	86	45-125	0			
Chrysene	348.6	50	400	0	87.2	55-110	0			
Dibenzo(a,h)anthracene	405.8	50	400	0	101	40-125	0			
Fluoranthene	352.1	50	400	0	88	55-115	0			
Fluorene	344.3	50	400	0	86.1	50-110	0			
Indeno(1,2,3-cd)pyrene	391.6	50	400	0	97.9	45-125	0			
Naphthalene	307.4	50	400	0	76.8	40-100	0			
Phenanthrene	350.5	50	400	0	87.6	50-115	0			
Pyrene	353.2	50	400	0	88.3	50-130	0			
<i>Surr: 2,4,6-Tribromophenol</i>	<i>434.1</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>86.8</i>	<i>21-125</i>	<i>0</i>			
<i>Surr: 2-Fluorobiphenyl</i>	<i>378.2</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>75.6</i>	<i>36-94</i>	<i>0</i>			
<i>Surr: 2-Fluorophenol</i>	<i>193.4</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>38.7</i>	<i>10-75</i>	<i>0</i>			
<i>Surr: 4-Terphenyl-d14</i>	<i>367.7</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>73.5</i>	<i>26-119</i>	<i>0</i>			
<i>Surr: Nitrobenzene-d5</i>	<i>389.5</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>77.9</i>	<i>41-104</i>	<i>0</i>			
<i>Surr: Phenol-d6</i>	<i>129.5</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>25.9</i>	<i>11-50</i>	<i>0</i>			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38099** Instrument ID **SVMS7** Method: **SW8270**

MSD		Sample ID: 1112358-04C MSD				Units: µg/L		Analysis Date: 12/16/2011 06:13 PM		
Client ID:		Run ID: SVMS7_111216A			SeqNo: 1854950		Prep Date: 12/12/2011		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	319.4	50	400	0	79.8	45-110	314.3	1.61	30	
Acenaphthylene	342.9	50	400	0	85.7	50-105	342.1	0.234	30	
Anthracene	368.1	50	400	0	92	55-110	360.4	2.11	30	
Benzo(a)anthracene	361.5	50	400	0	90.4	55-110	349	3.52	30	
Benzo(a)pyrene	386.3	50	400	0	96.6	55-110	376.4	2.6	30	
Benzo(b)fluoranthene	360.8	50	400	0	90.2	45-120	358	0.779	30	
Benzo(g,h,i)perylene	385.4	50	400	0	96.4	40-125	375.4	2.63	30	
Benzo(k)fluoranthene	362.1	50	400	0	90.5	45-125	344	5.13	30	
Chrysene	362.5	50	400	0	90.6	55-110	348.6	3.91	30	
Dibenzo(a,h)anthracene	418.7	50	400	0	105	40-125	405.8	3.13	30	
Fluoranthene	353.5	50	400	0	88.4	55-115	352.1	0.397	30	
Fluorene	349.6	50	400	0	87.4	50-110	344.3	1.53	30	
Indeno(1,2,3-cd)pyrene	403.1	50	400	0	101	45-125	391.6	2.89	30	
Naphthalene	315.2	50	400	0	78.8	40-100	307.4	2.51	30	
Phenanthrene	359.6	50	400	0	89.9	50-115	350.5	2.56	30	
Pyrene	376.9	50	400	0	94.2	50-130	353.2	6.49	30	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>451.4</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>90.3</i>	<i>21-125</i>	<i>434.1</i>	<i>3.91</i>	<i>40</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>387.4</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>77.5</i>	<i>36-94</i>	<i>378.2</i>	<i>2.4</i>	<i>40</i>	
<i>Surr: 2-Fluorophenol</i>	<i>200.5</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>40.1</i>	<i>10-75</i>	<i>193.4</i>	<i>3.6</i>	<i>40</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>437.2</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>87.4</i>	<i>26-119</i>	<i>367.7</i>	<i>17.3</i>	<i>40</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>404.5</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>80.9</i>	<i>41-104</i>	<i>389.5</i>	<i>3.78</i>	<i>40</i>	
<i>Surr: Phenol-d6</i>	<i>139.6</i>	<i>0</i>	<i>500</i>	<i>0</i>	<i>27.9</i>	<i>11-50</i>	<i>129.5</i>	<i>7.51</i>	<i>40</i>	

The following samples were analyzed in this batch:

1112376-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38137** Instrument ID **SVMS7** Method: **SW8270**

MBLK		Sample ID: <b>SBLKS1-38137-38137</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>12/14/2011 09:15 AM</b>		
Client ID:		Run ID: <b>SVMS7_111214A</b>			SeqNo: <b>1851481</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	ND	30								
Anthracene	ND	30								
Benzo(a)anthracene	ND	30								
Benzo(a)pyrene	ND	30								
Benzo(b)fluoranthene	ND	30								
Benzo(g,h,i)perylene	ND	30								
Benzo(k)fluoranthene	ND	30								
Chrysene	ND	30								
Dibenzo(a,h)anthracene	ND	30								
Fluoranthene	ND	30								
Fluorene	ND	30								
Indeno(1,2,3-cd)pyrene	ND	30								
Naphthalene	ND	30								
Pyrene	ND	30								
<i>Surr: 2,4,6-Tribromophenol</i>	687	0	1667	0	41.2	34-140	0			
<i>Surr: 2-Fluorobiphenyl</i>	749.7	0	1667	0	45	12-100	0			
<i>Surr: 2-Fluorophenol</i>	815.7	0	1667	0	48.9	33-117	0			
<i>Surr: 4-Terphenyl-d14</i>	932	0	1667	0	55.9	25-137	0			
<i>Surr: Nitrobenzene-d5</i>	772.3	0	1667	0	46.3	37-107	0			
<i>Surr: Phenol-d6</i>	825	0	1667	0	49.5	40-106	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38137** Instrument ID **SVMS7** Method: **SW8270**

LCS		Sample ID: <b>SLCSS1-38137-38137</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>12/14/2011 09:44 AM</b>		
Client ID:		Run ID: <b>SVMS7_111214A</b>			SeqNo: <b>1851482</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	871.7	30	1333	0	65.4	45-110	0			
Anthracene	984.7	30	1333	0	73.9	55-105	0			
Benzo(a)anthracene	973	30	1333	0	73	50-110	0			
Benzo(a)pyrene	991.7	30	1333	0	74.4	50-110	0			
Benzo(b)fluoranthene	956.7	30	1333	0	71.8	45-115	0			
Benzo(g,h,i)perylene	990	30	1333	0	74.3	40-125	0			
Benzo(k)fluoranthene	984.3	30	1333	0	73.8	45-115	0			
Chrysene	949.7	30	1333	0	71.2	55-110	0			
Dibenzo(a,h)anthracene	1011	30	1333	0	75.8	40-125	0			
Fluoranthene	1069	30	1333	0	80.2	55-115	0			
Fluorene	979.7	30	1333	0	73.5	50-110	0			
Indeno(1,2,3-cd)pyrene	1006	30	1333	0	75.5	40-120	0			
Naphthalene	763.7	30	1333	0	57.3	40-105	0			
Pyrene	968.3	30	1333	0	72.6	45-125	0			
<i>Surr: 2,4,6-Tribromophenol</i>	<i>1102</i>	<i>0</i>	<i>1667</i>	<i>0</i>	<i>66.1</i>	<i>34-140</i>	<i>0</i>			
<i>Surr: 2-Fluorobiphenyl</i>	<i>938.3</i>	<i>0</i>	<i>1667</i>	<i>0</i>	<i>56.3</i>	<i>12-100</i>	<i>0</i>			
<i>Surr: 2-Fluorophenol</i>	<i>878.3</i>	<i>0</i>	<i>1667</i>	<i>0</i>	<i>52.7</i>	<i>33-117</i>	<i>0</i>			
<i>Surr: 4-Terphenyl-d14</i>	<i>1207</i>	<i>0</i>	<i>1667</i>	<i>0</i>	<i>72.4</i>	<i>25-137</i>	<i>0</i>			
<i>Surr: Nitrobenzene-d5</i>	<i>903.3</i>	<i>0</i>	<i>1667</i>	<i>0</i>	<i>54.2</i>	<i>37-107</i>	<i>0</i>			
<i>Surr: Phenol-d6</i>	<i>896</i>	<i>0</i>	<i>1667</i>	<i>0</i>	<i>53.8</i>	<i>40-106</i>	<i>0</i>			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38137** Instrument ID **SVMS7** Method: **SW8270**

LCSD		Sample ID: <b>SLCSDS1-38137-38137</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>12/14/2011 10:13 AM</b>		
Client ID:		Run ID: <b>SVMS7_111214A</b>		SeqNo: <b>1851483</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	772	30	1333	0	57.9	45-110	871.7	12.1	25	
Anthracene	903.7	30	1333	0	67.8	55-105	984.7	8.58	25	
Benzo(a)anthracene	881	30	1333	0	66.1	50-110	973	9.92	25	
Benzo(a)pyrene	906.7	30	1333	0	68	50-110	991.7	8.96	25	
Benzo(b)fluoranthene	900.7	30	1333	0	67.6	45-115	956.7	6.03	25	
Benzo(g,h,i)perylene	943	30	1333	0	70.7	40-125	990	4.86	25	
Benzo(k)fluoranthene	868.3	30	1333	0	65.1	45-115	984.3	12.5	25	
Chrysene	883	30	1333	0	66.2	55-110	949.7	7.28	25	
Dibenzo(a,h)anthracene	947.7	30	1333	0	71.1	40-125	1011	6.47	25	
Fluoranthene	989	30	1333	0	74.2	55-115	1069	7.77	25	
Fluorene	866.3	30	1333	0	65	50-110	979.7	12.3	25	
Indeno(1,2,3-cd)pyrene	943	30	1333	0	70.7	40-120	1006	6.46	25	
Naphthalene	734.3	30	1333	0	55.1	40-105	763.7	3.92	25	
Pyrene	890.7	30	1333	0	66.8	45-125	968.3	8.36	25	
<i>Surr: 2,4,6-Tribromophenol</i>	992	0	1667	0	59.5	34-140	1102	10.5	40	
<i>Surr: 2-Fluorobiphenyl</i>	870	0	1667	0	52.2	12-100	938.3	7.56	40	
<i>Surr: 2-Fluorophenol</i>	854.3	0	1667	0	51.3	33-117	878.3	2.77	40	
<i>Surr: 4-Terphenyl-d14</i>	1095	0	1667	0	65.7	25-137	1207	9.7	40	
<i>Surr: Nitrobenzene-d5</i>	858.7	0	1667	0	51.5	37-107	903.3	5.07	40	
<i>Surr: Phenol-d6</i>	863.7	0	1667	0	51.8	40-106	896	3.67	40	

The following samples were analyzed in this batch:

1112376-04B	1112376-05B	1112376-06B
1112376-07B	1112376-08B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **R99089** Instrument ID **VMS6** Method: **SW8260**

MBLK		Sample ID: <b>VBLKW2-111215-R99089</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/16/2011 12:33 PM</b>		
Client ID:		Run ID: <b>VMS6_111215B</b>				SeqNo: <b>1854315</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	1.0								
Ethylbenzene	ND	1.0								
m,p-Xylene	ND	2.0								
o-Xylene	ND	1.0								
Toluene	ND	1.0								
Xylenes, Total	ND	3.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	101.5	0	100	0	102	70-120	0			
<i>Surr: 4-Bromofluorobenzene</i>	96.75	0	100	0	96.8	75-120	0			
<i>Surr: Dibromofluoromethane</i>	101.5	0	100	0	102	85-115	0			
<i>Surr: Toluene-d8</i>	99.59	0	100	0	99.6	85-120	0			

LCS		Sample ID: <b>VLCSW2-111215-R99089</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/15/2011 11:19 PM</b>		
Client ID:		Run ID: <b>VMS6_111215B</b>				SeqNo: <b>1854313</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.49	1.0	20	0	107	80-120	0			
Ethylbenzene	22.47	1.0	20	0	112	75-125	0			
m,p-Xylene	44.61	2.0	40	0	112	75-130	0			
o-Xylene	22.09	1.0	20	0	110	80-120	0			
Toluene	23.02	1.0	20	0	115	75-120	0			
Xylenes, Total	66.7	3.0	60	0	111	75-130	0			
<i>Surr: 1,2-Dichloroethane-d4</i>	101.3	0	100	0	101	70-120	0			
<i>Surr: 4-Bromofluorobenzene</i>	98.27	0	100	0	98.3	75-120	0			
<i>Surr: Dibromofluoromethane</i>	102.2	0	100	0	102	85-115	0			
<i>Surr: Toluene-d8</i>	99.73	0	100	0	99.7	85-120	0			

LCSD		Sample ID: <b>VLCSDW2-111215-R99089</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/15/2011 11:44 PM</b>		
Client ID:		Run ID: <b>VMS6_111215B</b>				SeqNo: <b>1854314</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.26	1.0	20	0	101	80-120	21.49	5.89	30	
Ethylbenzene	20.62	1.0	20	0	103	75-125	22.47	8.59	30	
m,p-Xylene	41.08	2.0	40	0	103	75-130	44.61	8.24	30	
o-Xylene	20.68	1.0	20	0	103	80-120	22.09	6.59	30	
Toluene	21.4	1.0	20	0	107	75-120	23.02	7.29	30	
Xylenes, Total	61.76	3.0	60	0	103	75-130	66.7	7.69	30	
<i>Surr: 1,2-Dichloroethane-d4</i>	99.5	0	100	0	99.5	70-120	101.3	1.78	30	
<i>Surr: 4-Bromofluorobenzene</i>	96.93	0	100	0	96.9	75-120	98.27	1.37	30	
<i>Surr: Dibromofluoromethane</i>	100.6	0	100	0	101	85-115	102.2	1.55	30	
<i>Surr: Toluene-d8</i>	99.2	0	100	0	99.2	85-120	99.73	0.533	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **R99089** Instrument ID **VMS6** Method: **SW8260**

MS				Sample ID: 1112293-12A MS			Units: µg/L		Analysis Date: 12/16/2011 09:02 AM		
Client ID:				Run ID: VMS6_111215B			SeqNo: 1854367		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	17.97	1.0	20	0	89.8	80-120	0				
Ethylbenzene	18.39	1.0	20	0	92	75-125	0				
m,p-Xylene	36.39	2.0	40	0	91	75-130	0				
o-Xylene	18.12	1.0	20	0	90.6	80-120	0				
Toluene	19.06	1.0	20	0	95.3	75-120	0				
Xylenes, Total	54.51	3.0	60	0	90.8	75-130	0				
<i>Surr: 1,2-Dichloroethane-d4</i>	99.21	0	100	0	99.2	70-120	0				
<i>Surr: 4-Bromofluorobenzene</i>	98.11	0	100	0	98.1	75-120	0				
<i>Surr: Dibromofluoromethane</i>	100.9	0	100	0	101	85-115	0				
<i>Surr: Toluene-d8</i>	98.01	0	100	0	98	85-120	0				

MSD				Sample ID: 1112293-12A MSD			Units: µg/L		Analysis Date: 12/16/2011 09:27 AM		
Client ID:				Run ID: VMS6_111215B			SeqNo: 1854368		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	18.64	1.0	20	0	93.2	80-120	17.97	3.66	30		
Ethylbenzene	18.6	1.0	20	0	93	75-125	18.39	1.14	30		
m,p-Xylene	36.45	2.0	40	0	91.1	75-130	36.39	0.165	30		
o-Xylene	20.34	1.0	20	0	102	80-120	18.12	11.5	30		
Toluene	19.33	1.0	20	0	96.6	75-120	19.06	1.41	30		
Xylenes, Total	56.79	3.0	60	0	94.6	75-130	54.51	4.1	30		
<i>Surr: 1,2-Dichloroethane-d4</i>	98.97	0	100	0	99	70-120	99.21	0.242	30		
<i>Surr: 4-Bromofluorobenzene</i>	108.4	0	100	0	108	75-120	98.11	9.97	30		
<i>Surr: Dibromofluoromethane</i>	101	0	100	0	101	85-115	100.9	0.0694	30		
<i>Surr: Toluene-d8</i>	97.02	0	100	0	97	85-120	98.01	1.02	30		

The following samples were analyzed in this batch: 1112376-06A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **R99147** Instrument ID **VMS5** Method: **SW8260**

MBLK		Sample ID: <b>VBLKW2-111216-R99147</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/17/2011 04:15 AM</b>		
Client ID:		Run ID: <b>VMS5_111216B</b>				SeqNo: <b>1854808</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	1.0								
Ethylbenzene	ND	1.0								
m,p-Xylene	ND	2.0								
o-Xylene	ND	1.0								
Toluene	ND	1.0								
Xylenes, Total	ND	3.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>105.1</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>105</i>	<i>70-120</i>	<i>0</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>94.19</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>94.2</i>	<i>75-120</i>	<i>0</i>			
<i>Surr: Dibromofluoromethane</i>	<i>98.6</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>98.6</i>	<i>85-115</i>	<i>0</i>			
<i>Surr: Toluene-d8</i>	<i>98.62</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>98.6</i>	<i>85-120</i>	<i>0</i>			

LCS		Sample ID: <b>VLCSW2-111216-R99147</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/17/2011 02:57 AM</b>		
Client ID:		Run ID: <b>VMS5_111216B</b>				SeqNo: <b>1854806</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.12	1.0	20	0	101	80-120	0			
Ethylbenzene	21.27	1.0	20	0	106	75-125	0			
m,p-Xylene	39.37	2.0	40	0	98.4	75-130	0			
o-Xylene	19.63	1.0	20	0	98.2	80-120	0			
Toluene	19.73	1.0	20	0	98.6	75-120	0			
Xylenes, Total	59	3.0	60	0	98.3	75-130	0			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>103.7</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>104</i>	<i>70-120</i>	<i>0</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>96.64</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>96.6</i>	<i>75-120</i>	<i>0</i>			
<i>Surr: Dibromofluoromethane</i>	<i>101.7</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>102</i>	<i>85-115</i>	<i>0</i>			
<i>Surr: Toluene-d8</i>	<i>98.51</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>98.5</i>	<i>85-120</i>	<i>0</i>			

LCSD		Sample ID: <b>VLCSDW2-111216-R99147</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/17/2011 03:22 AM</b>		
Client ID:		Run ID: <b>VMS5_111216B</b>				SeqNo: <b>1854807</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.6	1.0	20	0	103	80-120	20.12	2.36	30	
Ethylbenzene	21.54	1.0	20	0	108	75-125	21.27	1.26	30	
m,p-Xylene	39.64	2.0	40	0	99.1	75-130	39.37	0.683	30	
o-Xylene	19.96	1.0	20	0	99.8	80-120	19.63	1.67	30	
Toluene	19.89	1.0	20	0	99.4	75-120	19.73	0.808	30	
Xylenes, Total	59.6	3.0	60	0	99.3	75-130	59	1.01	30	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>105.7</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>106</i>	<i>70-120</i>	<i>103.7</i>	<i>1.87</i>	<i>30</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.64</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>97.6</i>	<i>75-120</i>	<i>96.64</i>	<i>1.03</i>	<i>30</i>	
<i>Surr: Dibromofluoromethane</i>	<i>102</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>102</i>	<i>85-115</i>	<i>101.7</i>	<i>0.344</i>	<i>30</i>	
<i>Surr: Toluene-d8</i>	<i>98.8</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>98.8</i>	<i>85-120</i>	<i>98.51</i>	<i>0.294</i>	<i>30</i>	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **R99147** Instrument ID **VMS5** Method: **SW8260**

MS				Sample ID: 1112293-09A MS			Units: µg/L		Analysis Date: 12/17/2011 01:23 PM		
Client ID:		Run ID: VMS5_111216B			SeqNo: 1855067		Prep Date:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	163.7	5.0	100	66.9	96.8	80-120		0			
Ethylbenzene	175.8	5.0	100	68.3	108	75-125		0			
m,p-Xylene	232	10	200	26.15	103	75-130		0			
o-Xylene	120.1	5.0	100	14.45	106	80-120		0			
Toluene	120	5.0	100	19.05	101	75-120		0			
Xylenes, Total	352.1	15	300	40.6	104	75-130		0			
<i>Surr: 1,2-Dichloroethane-d4</i>	533	0	500	0	107	70-120		0			
<i>Surr: 4-Bromofluorobenzene</i>	515.6	0	500	0	103	75-120		0			
<i>Surr: Dibromofluoromethane</i>	497	0	500	0	99.4	85-115		0			
<i>Surr: Toluene-d8</i>	502.8	0	500	0	101	85-120		0			

MSD				Sample ID: 1112293-09A MSD			Units: µg/L		Analysis Date: 12/17/2011 01:49 PM		
Client ID:		Run ID: VMS5_111216B			SeqNo: 1855068		Prep Date:		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	153	5.0	100	66.9	86	80-120	163.7	6.79	30		
Ethylbenzene	159.8	5.0	100	68.3	91.5	75-125	175.8	9.54	30		
m,p-Xylene	213.2	10	200	26.15	93.5	75-130	232	8.47	30		
o-Xylene	109.3	5.0	100	14.45	94.8	80-120	120.1	9.42	30		
Toluene	110.6	5.0	100	19.05	91.5	75-120	120	8.16	30		
Xylenes, Total	322.4	15	300	40.6	94	75-130	352.1	8.79	30		
<i>Surr: 1,2-Dichloroethane-d4</i>	539.9	0	500	0	108	70-120	533	1.3	30		
<i>Surr: 4-Bromofluorobenzene</i>	504.2	0	500	0	101	75-120	515.6	2.23	30		
<i>Surr: Dibromofluoromethane</i>	508.6	0	500	0	102	85-115	497	2.31	30		
<i>Surr: Toluene-d8</i>	497.7	0	500	0	99.5	85-120	502.8	1.02	30		

The following samples were analyzed in this batch: 1112376-07A 1112376-08A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **R99164A** Instrument ID **VMS5** Method: **SW8260**

MBLK		Sample ID: <b>VBLKW1-111218-R99164A</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/18/2011 02:51 PM</b>		
Client ID:		Run ID: <b>VMS5_111218A</b>				SeqNo: <b>1856003</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	1.0								
Ethylbenzene	ND	1.0								
m,p-Xylene	ND	2.0								
o-Xylene	ND	1.0								
Toluene	ND	1.0								
Xylenes, Total	ND	3.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>115.1</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>115</i>	<i>70-120</i>	<i>0</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>95.58</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>95.6</i>	<i>75-120</i>	<i>0</i>			
<i>Surr: Dibromofluoromethane</i>	<i>99.51</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>99.5</i>	<i>85-115</i>	<i>0</i>			
<i>Surr: Toluene-d8</i>	<i>101.1</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>101</i>	<i>85-120</i>	<i>0</i>			

LCS		Sample ID: <b>VLCSW1-111218-R99164A</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/18/2011 01:33 PM</b>		
Client ID:		Run ID: <b>VMS5_111218A</b>				SeqNo: <b>1855584</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.82	1.0	20	0	109	80-120	0			
Ethylbenzene	23.53	1.0	20	0	118	75-125	0			
m,p-Xylene	43.31	2.0	40	0	108	75-130	0			
o-Xylene	21.44	1.0	20	0	107	80-120	0			
Toluene	21.45	1.0	20	0	107	75-120	0			
Xylenes, Total	64.75	3.0	60	0	108	75-130	0			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>111.6</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>112</i>	<i>70-120</i>	<i>0</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.33</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>99.3</i>	<i>75-120</i>	<i>0</i>			
<i>Surr: Dibromofluoromethane</i>	<i>104.1</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>104</i>	<i>85-115</i>	<i>0</i>			
<i>Surr: Toluene-d8</i>	<i>99.64</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>99.6</i>	<i>85-120</i>	<i>0</i>			

LCSD		Sample ID: <b>VLCSW1-111218-R99164A</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/18/2011 01:59 PM</b>		
Client ID:		Run ID: <b>VMS5_111218A</b>				SeqNo: <b>1855585</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.9	1.0	20	0	104	80-120	21.82	4.31	30	
Ethylbenzene	22.26	1.0	20	0	111	75-125	23.53	5.55	30	
m,p-Xylene	41.61	2.0	40	0	104	75-130	43.31	4	30	
o-Xylene	20.74	1.0	20	0	104	80-120	21.44	3.32	30	
Toluene	20.43	1.0	20	0	102	75-120	21.45	4.87	30	
Xylenes, Total	62.35	3.0	60	0	104	75-130	64.75	3.78	30	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>112.2</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>112</i>	<i>70-120</i>	<i>111.6</i>	<i>0.509</i>	<i>30</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>102.1</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>102</i>	<i>75-120</i>	<i>99.33</i>	<i>2.72</i>	<i>30</i>	
<i>Surr: Dibromofluoromethane</i>	<i>101.2</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>101</i>	<i>85-115</i>	<i>104.1</i>	<i>2.81</i>	<i>30</i>	
<i>Surr: Toluene-d8</i>	<i>100.7</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>101</i>	<i>85-120</i>	<i>99.64</i>	<i>1.09</i>	<i>30</i>	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **R99164A** Instrument ID **VMS5** Method: **SW8260**

MS				Sample ID: 1112376-09A MS			Units: µg/L		Analysis Date: 12/19/2011 12:25 PM		
Client ID: Pond sample				Run ID: VMS5_111218A			SeqNo: 1856021		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	21.86	1.0	20	1.69	101	80-120		0			
Ethylbenzene	23.41	1.0	20	0	117	75-125		0			
m,p-Xylene	44.4	2.0	40	1.29	108	75-130		0			
o-Xylene	21.43	1.0	20	0	107	80-120		0			
Toluene	23.72	1.0	20	3.99	98.6	75-120		0			
Xylenes, Total	65.83	3.0	60	1.29	108	75-130		0			
<i>Surr: 1,2-Dichloroethane-d4</i>	106.9	0	100	0	107	70-120		0			
<i>Surr: 4-Bromofluorobenzene</i>	101.8	0	100	0	102	75-120		0			
<i>Surr: Dibromofluoromethane</i>	99.99	0	100	0	100	85-115		0			
<i>Surr: Toluene-d8</i>	102	0	100	0	102	85-120		0			

MSD				Sample ID: 1112376-09A MSD			Units: µg/L		Analysis Date: 12/19/2011 12:51 PM		
Client ID: Pond sample				Run ID: VMS5_111218A			SeqNo: 1856022		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	21.31	1.0	20	1.69	98.1	80-120	21.86	2.55	30		
Ethylbenzene	22.66	1.0	20	0	113	75-125	23.41	3.26	30		
m,p-Xylene	42.67	2.0	40	1.29	103	75-130	44.4	3.97	30		
o-Xylene	20.81	1.0	20	0	104	80-120	21.43	2.94	30		
Toluene	23.17	1.0	20	3.99	95.9	75-120	23.72	2.35	30		
Xylenes, Total	63.48	3.0	60	1.29	104	75-130	65.83	3.63	30		
<i>Surr: 1,2-Dichloroethane-d4</i>	105.9	0	100	0	106	70-120	106.9	0.987	30		
<i>Surr: 4-Bromofluorobenzene</i>	100.4	0	100	0	100	75-120	101.8	1.33	30		
<i>Surr: Dibromofluoromethane</i>	100.7	0	100	0	101	85-115	99.99	0.668	30		
<i>Surr: Toluene-d8</i>	104.5	0	100	0	104	85-120	102	2.35	30		

The following samples were analyzed in this batch:

1112376-04A	1112376-05A	1112376-09A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **38205** Instrument ID **WETCHEM** Method: **SW7196A**

<b>MBLK</b>	Sample ID: <b>MBLK-38205-38205</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/14/2011 02:50 PM</b>				
Client ID:	Run ID: <b>WETCHEM_111214C</b>	SeqNo: <b>1851838</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent ND 0.49

<b>LCS</b>	Sample ID: <b>LCS-38205-38205</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/14/2011 02:50 PM</b>				
Client ID:	Run ID: <b>WETCHEM_111214C</b>	SeqNo: <b>1851836</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 2.024 0.50 1.992 0 102 75-110 0

<b>LCSD</b>	Sample ID: <b>LCSD-38205-38205</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/14/2011 02:50 PM</b>				
Client ID:	Run ID: <b>WETCHEM_111214C</b>	SeqNo: <b>1851837</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 1.869 0.50 1.992 0 93.8 75-110 2.024 7.98 20

<b>MS</b>	Sample ID: <b>1112278-03A MS</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/14/2011 02:50 PM</b>				
Client ID:	Run ID: <b>WETCHEM_111214C</b>	SeqNo: <b>1851826</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 0.9283 0.50 1.992 0.1434 39.4 60-130 0 S

<b>MSD</b>	Sample ID: <b>1112278-03A MSD</b>	Units: <b>mg/Kg</b>				Analysis Date: <b>12/14/2011 02:50 PM</b>				
Client ID:	Run ID: <b>WETCHEM_111214C</b>	SeqNo: <b>1851827</b>		Prep Date: <b>12/13/2011</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 0.984 0.50 2 0.1434 42 60-130 0.9283 5.83 30 S

The following samples were analyzed in this batch:

1112376-04B	1112376-05B	1112376-06B
1112376-07B	1112376-08B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** HRL Compliance Solutions  
**Work Order:** 1112376  
**Project:** Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **R98893**      Instrument ID **WETCHEM**      Method: **SW9045D**

<b>LCS</b>	Sample ID: <b>LCS-R98893-R98893</b>		Units: <b>s.u.</b>		Analysis Date: <b>12/12/2011 10:15 AM</b>					
Client ID:	Run ID: <b>WETCHEM_111212C</b>		SeqNo: <b>1848751</b>		Prep Date:					
					DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

pH                                      4.32                      0                      4.4                      0                      98.2                      90-110                      0

<b>DUP</b>	Sample ID: <b>1112341-18A DUP</b>		Units: <b>s.u.</b>		Analysis Date: <b>12/12/2011 10:15 AM</b>					
Client ID:	Run ID: <b>WETCHEM_111212C</b>		SeqNo: <b>1848756</b>		Prep Date:					
					DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

pH                                      6.83                      0                      0                      0                      0                      0-0                      6.83                      0                      20

<b>DUP</b>	Sample ID: <b>1112376-03A DUP</b>		Units: <b>s.u.</b>		Analysis Date: <b>12/12/2011 10:15 AM</b>					
Client ID: <b>BKGD 3</b>	Run ID: <b>WETCHEM_111212C</b>		SeqNo: <b>1848768</b>		Prep Date:					
					DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

pH                                      8.73                      0                      0                      0                      0                      0-0                      8.73                      0                      20

The following samples were analyzed in this batch:

1112376-03A	1112376-04B	1112376-05B
1112376-06B	1112376-07B	1112376-08B

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112376  
 Project: Gypsum Ranch B Pad 12/8/11

# QC BATCH REPORT

Batch ID: **R99048** Instrument ID **MOIST** Method: **A2540 G**

<b>MBLK</b>	Sample ID: <b>WBLKS1-R99048</b>		Units: % of sample				Analysis Date: <b>12/14/2011 03:17 PM</b>			
Client ID:	Run ID: <b>MOIST_111214B</b>		SeqNo: <b>1852929</b>		Prep Date:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture ND 0.050

<b>LCS</b>	Sample ID: <b>LCS-R99048</b>		Units: % of sample				Analysis Date: <b>12/14/2011 03:17 PM</b>			
Client ID:	Run ID: <b>MOIST_111214B</b>		SeqNo: <b>1852927</b>		Prep Date:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 100 0.050 100 0 100 99.5-100.5 0

<b>DUP</b>	Sample ID: <b>1112338-10ADUP</b>		Units: % of sample				Analysis Date: <b>12/14/2011 03:17 PM</b>			
Client ID:	Run ID: <b>MOIST_111214B</b>		SeqNo: <b>1852897</b>		Prep Date:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 11.2 0.050 0 0 0 0-0 11.24 0.357 20

<b>DUP</b>	Sample ID: <b>1112376-03ADUP</b>		Units: % of sample				Analysis Date: <b>12/14/2011 03:17 PM</b>			
Client ID: <b>BKGD 3</b>	Run ID: <b>MOIST_111214B</b>		SeqNo: <b>1852903</b>		Prep Date:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 5.8 0.050 0 0 0 0-0 5.8 0 20

The following samples were analyzed in this batch:

1112376-01A	1112376-02A	1112376-03A
1112376-04B	1112376-05B	1112376-06B
1112376-07B	1112376-08B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Sample Receipt Checklist

Client Name: HRL

Date/Time Received: 12-Dec-11 09:00

Work Order: 1112376

Received by: DS

Checklist completed by *Diane Shaw* 12-Dec-11  
eSignature Date

Reviewed by: *Alex Csaszar* 12-Dec-11  
eSignature Date

Matrices: Soil, water

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>4.0 c</u> <input type="text"/>		
Cooler(s)/Kit(s):	<input type="text"/>		
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:	<input type="text"/>		

Login Notes:

-----

Client Contacted: HRL

Date Contacted: 12-Dec-11

Person Contacted: Mark Mumby

Contacted By: Alex Csaszar

Regarding: Insufficient Sample Volume

Comments: Contacted client concerning the Pond Sample on the COC. We did not receive a sample bottle for metals analysis and did not have enough sample volume to pour off from other containers for Pond sample.

CorrectiveAction: Client said to remove the metals analyses from the Pond sample.



# 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

WORKORDER #

1112376

Form 202/8

PROJECT NAME		Gypsum Ranch B Pad		SAMPLER		Reed Wold		DATE		12/9/2011		PAGE		1 of 1			
PROJECT No.				SITE ID		Gypsum Ranch B Pad		TURNAROUND		5 day		DISPOSAL		By Lab or Return to Client			
COMPANY NAME		HRL Compliance		BILL TO COMPANY		HCSI		BTEX/GRO DRO/PAH/ Metals (Per table 910-1) SAR/EC/ pH Arsenic									
SEND REPORT TO		Mark Mumby		INVOICE ATTN TO		Mark Mumby											
ADDRESS		744 Horizon Ct Ste. 140		ADDRESS													
CITY / STATE / ZIP		Grand Junction, CO 81506		CITY / STATE / ZIP													
PHONE		970-243-3271		PHONE													
FAX		970-243-3280		FAX													
E-MAIL		Mmumby@hrlcomp.com		E-MAIL													
Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC										
1	BKGD 1	SO	12/8/2011	11:50	1	8					X	-					
2	BKGD 2	SO	12/8/2011	11:55	1	8					X	-					
3	BKGD 3	SO	12/8/2011	12:00	2	8				X	X	-					
4	Point of Origin	SO	12/8/2011	12:10	3	8		X	X	X		-					
5	Sample Pt 1	SO	12/8/2011	12:15	3	8		X	X	X							
6	Sample Pt 2	SO	12/8/2011	12:20	3	8		X	X	X							
7	Sample Pt 3	SO	12/8/2011	12:25	3	8		X	X	X							
8	Sample Pt 4	SO	12/8/2011	12:30	3	8		X	X	X							
9	Pond sample	W	12/8/2011	12:45	6	1, 8		X	X								

\*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)	
	X	LEVEL II (Standard QC)
		LEVEL III (Std QC + forms)
		LEVEL IV (Std QC + forms + raw data)

4.0%  
*AW*

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	<i>Reed Wold</i>	Reed Wold	12/9/11	5:00
RECEIVED BY	<i>D. F. Shaw</i>	Diane F. Shaw	12/12/11	0900
RELINQUISHED BY				
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				



Subcontractor:  
A & L Great Lakes Agricultural La  
3505 Conestoga Dr  
Ft. Wayne, IN 46808

TEL: (260) 483-4759  
FAX: (260) 483-5274  
Acct #: 91000

# CHAIN-OF-CUSTODY RECORD

Date: **12-Dec-11**  
COC ID: **3350**  
Due Date: **16-Dec-11**

Environmental

Salesperson: **Debbie Fazio**

Customer Information		Project Information		Parameter/Method Request for Analysis											
Purchase Order:	20-1112376	Project Name:	1112376	A	Subcontracted Analyses (SUBCONTRACT) <b>SAR-EC</b>										
Work Order:		Project Number:		B											
Company Name:	ALS Group USA, Corp	Bill To Company:	ALS Group USA, Corp	C											
Send Report To:	Ann Preston	Inv Attn:	Accounts Payable	D											
Address:	3352 128th Avenue	Address:	3352 128th Avenue	E											
				F											
City/State/Zip:	Holland, Michigan 49424-9263	City/State/Zip:	Holland, Michigan 49424-9263	G											
Phone:	(616) 399-6070	Phone:	(616) 399-6070	H											
Fax:	(616) 399-6185	Fax:	(616) 399-6185	I											
eMail Address:	ann.preston@alsglobal.com	eMail CC:		J											

Sample ID	Matrix	Collection Date 24hr	Bottle	A	B	C	D	E	F	G	H	I	J
1112376-03B	Soil	8/Dec/2011 12:00	(1) MISC	X									
1112376-04C	Soil	8/Dec/2011 12:10	(1) MISC	X									
1112376-05C	Soil	8/Dec/2011 12:15	(1) MISC	X									
1112376-06C	Soil	8/Dec/2011 12:20	(1) MISC	X									
1112376-07C	Soil	8/Dec/2011 12:25	(1) MISC	X									
1112376-08C	Soil	8/Dec/2011 12:30	(1) MISC	X									

**Comments:**

Please analyze for SAR-EC. Email results to Ann Preston.

Relinquished by: <i>Ann Preston</i>	Date/Time: <i>12/21/11 13:00</i>	Received by:	Date/Time:	Cooler IDs:	Report/QC Level
					Std
Relinquished by:	Date/Time:	Received by:	Date/Time:		



FedEx

1 From **0200** Form ID No.

Date 12/19/11 Sender's FedEx Account Number  
Sender's Name Redwood Phone 970 243 3271  
Company WCS

Address 799 Holman Ct Ste 140  
City Windsor Junction State CO ZIP 80550  
Dept./Floor/Suite/Room

2 Your Internal Billing Reference

3 To Recipient's Name Sample Receiving Phone 616 359 6070  
Company AMS Group

Address 3350 1st Ave  
We cannot deliver to P.O. boxes or P.D. ZIP codes.  
Dept./Floor/Suite/Room

Address 1111 1st Ave  
Use this line for the HOLD location address or for continuation of your shipping address.  
City Windsor Junction State CO ZIP 80550



8769 1479 3059

FedEx Retrieval Copy

4 Express Package Service \*To most locations.  
NOTE: Service order has changed. Please select carefully. Packages up to 150 lbs.  
For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

- 06  Next Business Day
- 06  FedEx First Overnight  
Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- 01  FedEx Priority Overnight  
Next business morning.\* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- 05  FedEx Standard Overnight  
Next business afternoon. Saturday Delivery NOT available.
- 49  NEW FedEx 2Day A.M.  
Second business morning. Saturday Delivery NOT available.
- 03  FedEx 2Day  
Second business afternoon.\* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- 20  FedEx Express Saver  
Third business day. Saturday Delivery NOT available.

5 Packaging. \*Declared value limit (\$500).

- 06  FedEx Envelope\*
- 02  FedEx Pak\*
- 03  FedEx Box
- 04  FedEx Tube
- 01  Other

6 Special Handling and Delivery Signature Options

- SATURDAY DELIVERY
  - No Signature Required  
Package may be left without obtaining a signature for delivery.
  - 10  Direct Signature  
Someone at recipient's address may sign for delivery. Fee applies.
  - 34  Indirect Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.
- Does this shipment contain dangerous goods?  
One box must be checked.  
Yes  No  04  Yes  No  06  Dry Ice  
As per attached Shipper's Declaration. Shipper's Declaration not required. Dry Ice, 9, UN 1845  
Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.  Cargo Aircraft Only

7 Payment Bill to:

- 1  Sender Acct. No. in Section 2
- 2  Recipient
- 3  Third Party
- 4  Credit Card
- 5  Cash/Check

Total Packages 1 Total Weight 47 lbs. Credit Card Auth.

\*Our liability is limited to \$100 unless you declare a higher value. See the current FedEx Service Guide for details.

612

fedex.com 1.800.GoFedEx 1.800.463.3339

fedex.com 1.800.GoFedEx 1.800.463.3339

**FedEx** **NEW Package**  
Express **US Airbill**

FedEx  
Tracking  
Number

8769 1479 3118

0200 Form  
ID No.

**FedEx Retrieval Copy**

Packages up to 150 lbs.  
For packages over 150 lbs. use the new  
FedEx Express Freight US Airbill.

**1 From**

Date 12/19/11 Sender's FedEx Account Number \_\_\_\_\_

Sender's Name Reed Wilder Phone 970 243-2271

Company MCSI

Address 744 Helix Ave Ste 140 Dept./Floor/Suite/Room \_\_\_\_\_

City Grand Junction State CO ZIP 81506

**2 Your Internal Billing Reference**

**3 To**

Recipient's Name Summit Receiver Phone 616 379-6070

Company AKS Group

Address 3350 105th Ave Dept./Floor/Suite/Room \_\_\_\_\_

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address \_\_\_\_\_

Use this line for the HOLD location address or for continuation of your shipping address.

City Holland State MI ZIP 49424

**4 Express Package Service** \* To most locations.  
NOTE: Service order has changed. Please select carefully.

Next Business Day	2 or 3 Business Days
06 <input type="checkbox"/> FedEx First Overnight Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.	49 <input type="checkbox"/> NEW FedEx 2Day A.M. Second business morning. Saturday Delivery NOT available.
01 <input checked="" type="checkbox"/> FedEx Priority Overnight Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.	03 <input type="checkbox"/> FedEx 2Day Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
05 <input type="checkbox"/> FedEx Standard Overnight Next business afternoon.* Saturday Delivery NOT available.	20 <input type="checkbox"/> FedEx Express Saver Third business day. Saturday Delivery NOT available.

**5 Packaging** \* Declared value limit \$500.

06  FedEx Envelope\* 02  FedEx Pak\* 03  FedEx Box 04  FedEx Tube 01  Other

**6 Special Handling and Delivery Signature Options**

03  **SATURDAY DELIVERY**

No Signature Required  
Package may be left without obtaining a signature for delivery.

10  Direct Signature  
Someone at recipient's address may sign for delivery. Fee applies.

34  Indirect Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods?  
One box must be checked.

No 04  Yes - As per attached Shipper's Declaration.  Yes - Shipper's Declaration not required.

06  Dry Ice  
Dry ice, 9 UN 1845 x \_\_\_\_\_ kg

Cargo Aircraft Only

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

**7 Payment Bill to:** Enter FedEx Acct. No. or Credit Card No. below.

1  Sender Acct. No. in Section 1 will be billed. 2  Recipient 3  Third Party 4  Credit Card 5  Cash/Check

Total Packages 1 Total Weight 10.5 Credit Card Auth. \_\_\_\_\_

fedex.com 1.800.GoFedEx 1.800.463.3339

fedex.com 1.800.GoFedEx 1.800.463.3339



**CUSTODY SEAL**

DATE 12/19/11  
SIGNATURE Reed Wilder

**QEC**  
Quality Environmental Containers  
800-255-3950 • 304-255-3900

612



04-Jan-2012

Mark Mumby  
HRL Compliance Solutions  
744 Horizon Ct. Suite 140  
Grand Junction, CO 81506

Re: **Antero Gypsum Ranch B Pad 12/23/11**

Work Order: **1112850**

Dear Mark,

ALS Environmental received 1 sample on 29-Dec-2011 10:15 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 11.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Ann Preston".

Electronically approved by: Ann Preston

Ann Preston  
Project Manager



Certificate No: MN331938

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental ALS

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER

---

**Client:** HRL Compliance Solutions  
**Project:** Antero Gypsum Ranch B Pad 12/23/11  
**Work Order:** 1112850

**Work Order Sample Summary**

---

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1112850-01	Pond Sample	Water		12/23/2011 11:00	12/29/2011 10:15	<input type="checkbox"/>

---

**Client:** HRL Compliance Solutions  
**Project:** Antero Gypsum Ranch B Pad 12/23/11  
**Work Order:** 1112850

---

**Case Narrative**

Batch R99615 sample 1112850-01 for pH was received after the hold time had expired.

**Client:** HRL Compliance Solutions  
**Project:** Antero Gypsum Ranch B Pad 12/23/11  
**WorkOrder:** 1112850

**QUALIFIERS,  
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

<u>Units Reported</u>	<u>Description</u>
mg/L	Milligrams per Liter
s.u.	Standard Units

**ALS Group USA, Corp**

Date: 04-Jan-12

**Client:** HRL Compliance Solutions**Project:** Antero Gypsum Ranch B Pad 12/23/11**Work Order:** 1112850**Sample ID:** Pond Sample**Lab ID:** 1112850-01**Collection Date:** 12/23/2011 11:00 AM**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>ANIONS BY ION CHROMATOGRAPHY</b>			<b>SW9056</b>			Analyst: <b>ED</b>
Chloride	ND		1.0	mg/L	1	12/29/2011 03:41 PM
Sulfate	ND		1.0	mg/L	1	12/29/2011 03:41 PM
<b>PH</b>			<b>SW9040</b>			Analyst: <b>EE</b>
pH	6.32	H		s.u.	1	12/29/2011 10:30 AM
<b>TOTAL DISSOLVED SOLIDS</b>			<b>A2540 C</b>			Analyst: <b>JS</b>
Total Dissolved Solids	ND		10	mg/L	1	12/29/2011 12:53 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**Client:** HRL Compliance Solutions  
**Work Order:** 1112850  
**Project:** Antero Gypsum Ranch B Pad 12/23/11

**QC BATCH REPORT**

Batch ID: **R99615** Instrument ID **WETCHEM** Method: **SW9040**

<b>LCS</b>	Sample ID: <b>LCS-R99615-R99615</b>				Units: <b>s.u.</b>	Analysis Date: <b>12/29/2011 10:30 AM</b>				
Client ID:	Run ID: <b>WETCHEM_111229A</b>			SeqNo: <b>1867133</b>	Prep Date:	DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	4.37	0	4.4	0	99.3	90-110		0		

<b>DUP</b>	Sample ID: <b>1112842-02A DUP</b>				Units: <b>s.u.</b>	Analysis Date: <b>12/29/2011 10:30 AM</b>				
Client ID:	Run ID: <b>WETCHEM_111229A</b>			SeqNo: <b>1867135</b>	Prep Date:	DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	14	0	0	0	0	0-0		14	0	20

The following samples were analyzed in this batch:

Client: HRL Compliance Solutions  
 Work Order: 1112850  
 Project: Antero Gypsum Ranch B Pad 12/23/11

# QC BATCH REPORT

Batch ID: **R99636** Instrument ID **TDS** Method: **A2540 C**

<b>MBLK</b>	Sample ID: <b>BLANK-R99636</b>		Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 12:53 PM</b>					
Client ID:	Run ID: <b>TDS_111229A</b>		SeqNo: <b>1867401</b>		Prep Date:					
					DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids ND 10

<b>LCS</b>	Sample ID: <b>LCS-R99636</b>		Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 12:53 PM</b>					
Client ID:	Run ID: <b>TDS_111229A</b>		SeqNo: <b>1867402</b>		Prep Date:					
					DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids 460 10 495 0 92.9 80-120 0

<b>LCSD</b>	Sample ID: <b>LCSD-R99636</b>		Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 12:53 PM</b>					
Client ID:	Run ID: <b>TDS_111229A</b>		SeqNo: <b>1867410</b>		Prep Date:					
					DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids 476 10 495 0 96.2 80-120 460 3.42 20

<b>DUP</b>	Sample ID: <b>1112830-01ADUP</b>		Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 12:53 PM</b>					
Client ID:	Run ID: <b>TDS_111229A</b>		SeqNo: <b>1867405</b>		Prep Date:					
					DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids 452 10 0 0 0 0-0 457 1.1 20

The following samples were analyzed in this batch: 1112850-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112850  
 Project: Antero Gypsum Ranch B Pad 12/23/11

# QC BATCH REPORT

Batch ID: **R99639** Instrument ID **IC3** Method: **SW9056**

MBLK		Sample ID: <b>CCB/MBLK-R99639</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 02:38 PM</b>		
Client ID:		Run ID: <b>IC3_111229A</b>				SeqNo: <b>1867435</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.4742	1.0								J
Sulfate	ND	1.0								

LCS		Sample ID: <b>CCV/LCS-R99639</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 02:58 PM</b>		
Client ID:		Run ID: <b>IC3_111229A</b>				SeqNo: <b>1867436</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.578	1.0	10	0	95.8	88-107	0			
Sulfate	9.897	1.0	10	0	99	85-110	0			

LCSD		Sample ID: <b>CCV/LCSD-R99639</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 03:21 PM</b>		
Client ID:		Run ID: <b>IC3_111229A</b>				SeqNo: <b>1867437</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.736	1.0	10	0	97.4	88-107	9.578	1.63	20	
Sulfate	10.18	1.0	10	0	102	85-110	9.897	2.8	20	

MS		Sample ID: <b>1112850-01A MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 06:27 PM</b>		
Client ID: <b>Pond Sample</b>		Run ID: <b>IC3_111229A</b>				SeqNo: <b>1867442</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10.36	1.0	10	0.5409	98.2	75-125	0			
Sulfate	10.54	1.0	10	0.4582	101	75-125	0			

MSD		Sample ID: <b>1112850-01A MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 06:47 PM</b>		
Client ID: <b>Pond Sample</b>		Run ID: <b>IC3_111229A</b>				SeqNo: <b>1867443</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10.85	1.0	10	0.5409	103	75-125	10.36	4.58	20	
Sulfate	10.57	1.0	10	0.4582	101	75-125	10.54	0.256	20	

The following samples were analyzed in this batch: | 1112850-01A |

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



# 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 #	1112850
PAGE	1 of 1

PROJECT NAME	Gypsum Ranch B Pad	SAMPLER	RW	DATE	12/28/2011	TURNAROUND	5-Day	DISPOSAL	By Lab or Return to Client
PROJECT No.	HCSI Job# 11-312	SITE ID	Gypsum Ranch B Pad						
COMPANY NAME	HRH Compliance Solutions	EDD FORMAT							
SEND REPORT TO	Mark Mumbay	PURCHASE ORDER							
ADDRESS	744 Horizon Ct Suite 140	BILL TO COMPANY	Antero Resources						
CITY / STATE / ZIP	Grand Jct. CO 81506	INVOICE ATTN TO	Cole Kilstrom						
PHONE	970-243-3271	ADDRESS	1625 17th Street Suite 300						
FAX	970-243-3280	CITY / STATE / ZIP	Denver, CO 80202						
E-MAIL	mmumbay@hrcomp.com	PHONE	303-357-7310						
		E-MAIL	ckilstrom@anteroresources.com						

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC												
1	Pond Sample	U	12/23/11	11:00	1	8		X	X	X	X								

PH Sulfate  
 TDS Chloride

\*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:  3.8°C RW	QC PACKAGE (check below)
	<input checked="" type="checkbox"/> LEVEL II (Standard QC)
	<input type="checkbox"/> LEVEL III (Std QC + forms)
	<input type="checkbox"/> LEVEL IV (Std QC + forms + raw data)

SIGNATURE	PRINTED NAME	DATE	TIME
<i>Mark E. Mumbay</i>	Mark E. Mumbay	12/28/11	17:00
<i>Diane F. Shaw</i>	Diane F. Shaw	12/29/11	1015

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

**Sample Receipt Checklist**

Client Name: **HRL**

Date/Time Received: **29-Dec-11 10:15**

Work Order: **1112850**

Received by: **DS**

Checklist completed by *Diane Shaw* 29-Dec-11  
eSignature Date

Reviewed by: *Alex Coaszar* 29-Dec-11  
eSignature Date

Matrices: Water

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<input type="text" value="3.8 c"/> <input type="text"/>		
Cooler(s)/Kit(s):	<input type="text"/>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:	<input type="text"/>		

Login Notes:

-----

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

Quality Environmental Containers  
800-266-3980 • 304-266-3900

SIGNATURE

DATE

CUSTODY SEAL

FedEx Express

NEW US AIRMAIL

8769 1479 5750

0200

FedEx Retrieval Copy

Date: 11/10/10

Sender's Name: Mark Mumby Phone: 970 243-3271

Company: H2K Composite Solutions, Inc

Address: 7441 Hoover CA Suite 140

City: Grand Jct. State: CO ZIP: 81506

fedex.com 1.800.GoFedEx 1.800.463.3339

2 Your Internal Billing Reference

To Recipient's Name: Scope Recovery Phone: 416 399-1070

Company: A/S Group

Address: 3352 145th Ave

Address: Use this line for the HOLD location address or for continuation of your shipping address.

City: Montreal State: AQ ZIP: 499184

4 Package Service To most items. Packages up to 150 lbs. For packages over 150 lbs, use the new FedEx Express Freight US Airmail. NOTE: service order has changed. Please select carefully.

- 06 FedEx First Overnight Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
01 FedEx Priority Overnight Next business morning. Friday shipments to R/R will be delivered on Monday unless SATURDAY Delivery is selected.
05 FedEx Standard Overnight Next business afternoon. Saturday Delivery NOT available.
49 NEW FedEx 2Day A.M. Second business morning. Saturday Delivery NOT available.
03 FedEx 2Day Second business afternoon. Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
20 FedEx Express Saver Third business day. Saturday Delivery NOT available.

- 5 Packaging Declared value limit \$200.
06 FedEx Envelope
02 FedEx Pak
03 FedEx Box
04 FedEx Tube
07 Other

6 Special Handling and Delivery Signature Options

03 SATURDAY DELIVERY

- No Signature Required Package may be left without signature or signature for delivery.
Direct Signature Business or personal address and signature required. Fee applies.
Indirect Signature If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries, fee applies.

- Does this shipment contain dangerous goods? One box must be checked.
Yes No 04
Yes No 06
Dry Ice Dry Ice 9 1071 1645
Cargo Aircraft Only

7 Payment Bill to:

- Enter FedEx Acct. No. or Credit Card No. below.
Sender: 27 Recipient: 3 Third Party: 4 Credit Card: 5 Cash/Check

Total Packages: 157 Total Weight: [redacted]



8769 1479 5750

612

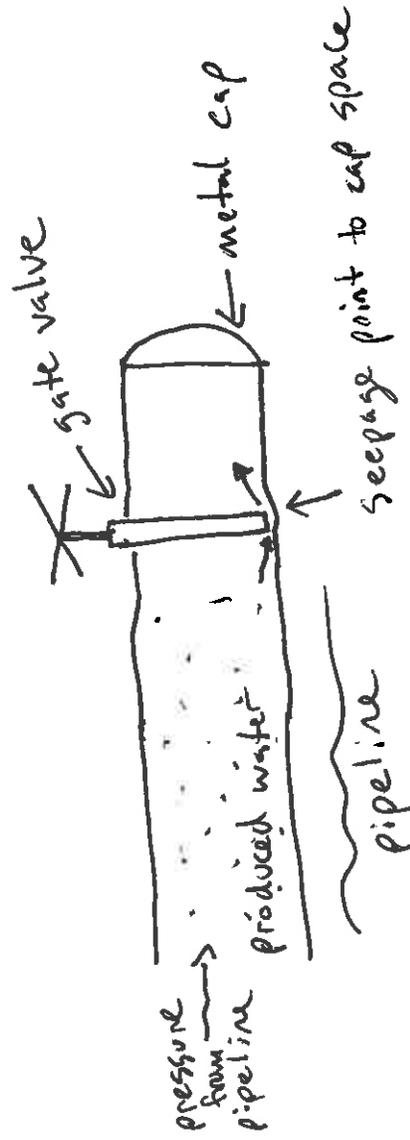
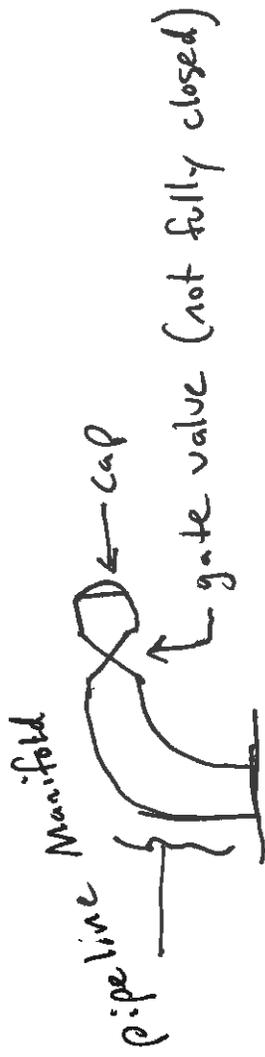
3.800

# Appendix C



Example Drawing of Failure

# Appendix C: Example Drawing





Picture of cap capture

# Appendix D

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Integrity Test Records

# PRESSURE PROOF TEST AND DEAD WEIGHT READINGS RECORD

PIPELINE OWNER'S NAME: Antero APR:

PROJECT LOCATION OR NAME: Gypsum Ranch A Pad

CONTRACTOR: \_\_\_\_\_ TESTING CONTRACTOR: \_\_\_\_\_

EMERGENCY STOCK: \_\_\_\_\_ NEW CONSTRUCTION: \_\_\_\_\_ REQUALIFICATION: \_\_\_\_\_

TESTING SECTION FROM STA: Gypsum Ranch A TO STA: Snyder C Isolation LENGTH: \_\_\_\_\_

PIPE DESCRIPTION: SIZE: \_\_\_\_\_ WALL THICKNESS: \_\_\_\_\_

DEAD WEIGHT SN: \_\_\_\_\_ RANGE: \_\_\_\_\_

TEMPERATURE RECORDER SN: \_\_\_\_\_ RANGE: \_\_\_\_\_

PRESSURE RECORDER SN: \_\_\_\_\_ RANGE: \_\_\_\_\_

MINIMUM ELEVATION: \_\_\_\_\_ MAXIMUM ELEVATION: \_\_\_\_\_

MINIMUM PRESSURE: 220 Supply line MAXIMUM PRESSURE: 220 Supply line

MINIMUM GAGE PRESSURE: 215 Return line MAXIMUM GAGE PRESSURE: 220 Return line

DATE AND TIME TEST STARTED: 1130 11-22-11

DATE AND TIME TEST COMPLETED: 1 1/2 test

TIME	DEAD WEIGHT PSIG		TEMPERATURE Degrees F.	MEDIUM (Water-Nitrogen-Gas-Air)
	Supply	Return		
11:30 am	220	220		
12:00 pm	220	220		
12:30	220	215		
1:00	220	215		

RESULTS OF TEST: ACCEPTABLE: \_\_\_\_\_ UNACCEPTABLE: \_\_\_\_\_

TEST RESULTS, MINIMUM PRESSURE: \_\_\_\_\_ DURATION: \_\_\_\_\_

REMARKS: Brit Long inspected Surface facilities

CONTRACTOR'S TEST REPRESENTATIVE: Terry D. [Signature] DATE: 11-22-11

Company's TEST REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_

# PRESSURE PROOF TEST AND DEAD WEIGHT READINGS RECORD

Page \_\_\_\_\_ of \_\_\_\_\_

PIPELINE OWNER'S NAME: Antero AFE: \_\_\_\_\_

PROJECT LOCATION OR NAME: Gypsum Ranch B Pad

CONTRACTOR: \_\_\_\_\_ TESTING CONTRACTOR: \_\_\_\_\_

EMERGENCY STOCK: \_\_\_\_\_ NEW CONSTRUCTION: \_\_\_\_\_ REQUALIFICATION: \_\_\_\_\_

TESTING SECTION FROM STA: Gypsum Ranch B TO STA: Snyder C Isolation LENGTH: \_\_\_\_\_

PIPE DESCRIPTION - SIZE: \_\_\_\_\_ WALL THICKNESS: \_\_\_\_\_

DEAD WEIGHT SN: \_\_\_\_\_ RANGE: \_\_\_\_\_

TEMPERATURE RECORDER SN: \_\_\_\_\_ RANGE: \_\_\_\_\_

PRESSURE RECORDER SN: \_\_\_\_\_ RANGE: \_\_\_\_\_

MINIMUM ELEVATION: \_\_\_\_\_ MAXIMUM ELEVATION: \_\_\_\_\_

MINIMUM PRESSURE: 220 Supply line MAXIMUM PRESSURE: 220 Supply line

MINIMUM GAGE PRESSURE: 210 Return line MAXIMUM GAGE PRESSURE: 215 Return line

DATE AND TIME TEST STARTED: 11-22-11 1:30pm

DATE AND TIME TEST COMPLETED: 1 1/2 hr Test

TIME	DEAD WEIGHT PSIG		TEMPERATURE Degree F.	MEDIUM (Water - Nitrogen - Gas - Air)
	Supply	Return		
1:30pm	220	215		
2:00	220	210		
2:30	220	210		
3:00	220	210		

RESULTS OF TEST      ACCEPTABLE: \_\_\_\_\_      UNACCEPTABLE: \_\_\_\_\_

TEST RESULTS, MINIMUM PRESSURE: \_\_\_\_\_ DURATION: \_\_\_\_\_

REMARKS: Brit Long inspected surface lines

CONTRACTOR'S TEST REPRESENTATIVE: Terry Doh      DATE: 11-22-11

Company's TEST REPRESENTATIVE: \_\_\_\_\_      DATE: \_\_\_\_\_





# PRESSURE PROOF TEST AND DEAD WEIGHT READINGS RECORD

PIPELINE OWNER'S NAME: Antero AFE: \_\_\_\_\_

PROJECT LOCATION OR NAME: Gate Entrance Isolation

CONTRACTOR: \_\_\_\_\_ TESTING CONTRACTOR: \_\_\_\_\_

EMERGENCY STOCK: \_\_\_\_\_ NEW CONSTRUCTION: \_\_\_\_\_ REQUALIFICATION: \_\_\_\_\_

TESTING SECTION FROM STA: Gate Entrance Isolation TO STA: Snyder C Isolation LENGTH: \_\_\_\_\_

PIPE DESCRIPTION - SIZE: \_\_\_\_\_ WALL THICKNESS: \_\_\_\_\_

DEAD WEIGHT SN: \_\_\_\_\_ RANGE: \_\_\_\_\_

TEMPERATURE RECORDER SN: \_\_\_\_\_ RANGE: \_\_\_\_\_

PRESSURE RECORDER SN: \_\_\_\_\_ RANGE: \_\_\_\_\_

MINIMUM ELEVATION: \_\_\_\_\_ MAXIMUM ELEVATION: \_\_\_\_\_

MINIMUM PRESSURE: 215 Supply line MAXIMUM PRESSURE: 226 Supply line

MINIMUM GAGE PRESSURE: 222 Return line MAXIMUM GAGE PRESSURE: 230 Return line

DATE AND TIME TEST STARTED: 11-23-11 3:30 pm

DATE AND TIME TEST COMPLETED: 3:15 hr test

TIME	DEAD WEIGHT PSIG		TEMPERATURE Degree F.	MEDIUM (Water-Nitrogen-Gas-Air)
	Supply	Return		
3:30 pm	226	230		
4:00	220	222		
4:30	215	222		
5:00	215	222		

RESULTS OF TEST:  ACCEPTABLE  UNACCEPTABLE

TEST RESULTS, MINIMUM PRESSURE: \_\_\_\_\_ DURATION: \_\_\_\_\_

REMARKS: Brit long inspected Surface Lines

CONTRACTOR'S TEST REPRESENTATIVE: Terry Duh DATE: 11-23-11

Company's TEST REPRESENTATIVE: \_\_\_\_\_ DATE: \_\_\_\_\_



**PRESSURE PROOF TEST AND  
DEAD WEIGHT READINGS RECORD**

PIPELINE OWNER'S NAME: <i>Antero Resources</i>			APR:	
PROJECT LOCATION OR NAME: <i>Dever A - Gypsum Ranch A</i>				
CONTRACTOR: <i>Ritter / Wehling</i>		TESTING CONTRACTOR: <i>Ritter / Wehling</i>		
EMERGENCY STOCK:		NEW CONSTRUCTION: <i>Yes</i>		REQUALIFICATION:
TESTING SECTION FROM STA.:		TO STA.:		LENGTH:
PIPE DESCRIPTION: SIZE: <i>12" SDR9</i>		WALL THICKNESS:		
DEAD WEIGHT STG:		RANGE:		
TEMPERATURE RECORDER SN		RANGE:		
PRESSURE RECORDER SN:		RANGE:		
MINIMUM ELEVATION:		MAXIMUM ELEVATION:		
MINIMUM PRESSURE:		MAXIMUM PRESSURE:		
MINIMUM GAGE PRESSURE:		MAXIMUM GAGE PRESSURE:		
DATE AND TIME TEST STARTED:				
DATE AND TIME TEST COMPLETED:				
TIME	DEAD WEIGHT PSIG		TEMPERATURE Degrees F.	MEDIUM (Water-Nitrogen-Gas-Air)
<i>9:45</i>	<i>supply: 280</i>	<i>Return 280</i>	<i>29°</i>	<i>Water</i>
<i>10:00</i>	<i>280</i>	<i>280</i>	<i>31°</i>	
<i>10:15</i>	<i>283</i>	<i>282</i>	<i>Bump pressure</i>	
<i>10:30</i>	<i>278</i>	<i>278</i>		
<i>10:45</i>	<i>280</i>	<i>280</i>	<i>Bump pressure</i>	
<i>11:00</i>	<i><del>280</del> 275</i>	<i>275</i>	<i>line equalizing</i>	
<i>11:15</i>	<i>280</i>	<i>280</i>	<i>Bump pressure</i>	
<i>11:30</i>	<i>279</i>	<i>279</i>	<i>34°</i>	
<i>11:45</i>	<i>278</i>	<i>278</i>		
<i>12:00</i>	<i>277</i>	<i>276</i>		
<i>12:15</i>	<i>285</i>	<i>285</i>	<i>Bump pressure</i>	
RESULTS OF TEST	ACCEPTABLE:		UNACCEPTABLE:	
TEST RESULTS, MINIMUM PRESSURE:			DURATION:	
REMARKS:				
CONTRACTOR'S TEST REPRESENTATIVE:				DATE:
<i>Company's</i>	TEST REPRESENTATIVE: <i>Mike Samitt</i>			DATE: <i>2-18-09</i>



# Appendix E

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Produced Water Analysis



03-Jan-2012

Mark Mumby  
HRL Compliance Solutions  
744 Horizon Ct. Suite 140  
Grand Junction, CO 81506

Re: **Antero Gypsum Ranch B Pad Water Rel. 12/21/11**

Work Order: **1112786**

Dear Mark,

ALS Environmental received 1 sample on 23-Dec-2011 11:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 25.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Ann Preston".

Electronically approved by: Ann Preston

Ann Preston  
Project Manager



Certificate No: MN331938

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185

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RIGHT SOLUTIONS RIGHT PARTNER

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**Client:** HRL Compliance Solutions  
**Project:** Antero Gypsum Ranch B Pad Water Rel. 12/21/11  
**Work Order:** 1112786

**Work Order Sample Summary**

---

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1112786-01	Water Line Water Sample	Water		12/21/2011 14:20	12/23/2011 11:30	<input type="checkbox"/>

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**Client:** HRL Compliance Solutions  
**Project:** Antero Gypsum Ranch B Pad Water Rel. 12/21/11  
**Work Order:** 1112786

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**Case Narrative**

Batch 38452 samples Water Line Water Sample MS recovery for ORO and MSD recovery for DRO were above control limits due to matrix interference. The surrogate recoveries are unavailable due to dilution below the calibration range. The MSD recovery for ORO and RPD and MS recovery for DRO and RPD met quality control criteria.

Batch R99530 sample Water Line Water Sample was analyzed outside of the holding time. There was not enough time to get the sample on the instrument after receipt. Sample reporting limits should be considered as estimated for Nitrate & Nitrite. The MS/MSD recoveries for Fluoride and Nitrate/Nitrite were below control limits. The results may be biased low in the parent sample for Fluoride and Nitrate/Nitrite. The MS/MSD recoveries for Chloride were below control limits, however, the result in the parent sample is greater than 4x the spiked amount. No qualification is required for Chloride.

Batch R99579A sample Water Line Water Sample MS/MSD recoveries for Sodium and Calcium were below control limits, however, the results in the parent sample is greater than 4x the spiked amount. No qualification is required for Sodium and Calcium. The MS/MSD recoveries for Manganese were below control limits. The result for Manganese in the parent sample may be biased low. The MSD recoveries for Magnesium and Potassium were below control limits, but both the MS recoveries and RPDs met quality control criteria. No data requires qualification for Magnesium and Potassium.

Batch 38451 sample Water Line Water Sample MS/MSD recoveries for Naphthalene were above control limits. The result for Naphthalene in the parent sample may be biased high due to matrix interference.

**Client:** HRL Compliance Solutions  
**Project:** Antero Gypsum Ranch B Pad Water Rel. 12/21/11  
**WorkOrder:** 1112786

**QUALIFIERS,  
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
SD	Serial Dilution
TDL	Target Detection Limit

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
s.u.	Standard Units

**ALS Group USA, Corp**

Date: 03-Jan-12

**Client:** HRL Compliance Solutions

**Project:** Antero Gypsum Ranch B Pad Water Rel. 12/21/11

**Work Order:** 1112786

**Sample ID:** Water Line Water Sample

**Lab ID:** 1112786-01

**Collection Date:** 12/21/2011 02:20 PM

**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>			<b>SW8015M</b>		Prep Date: <b>12/28/2011</b>	Analyst: <b>RM</b>
<b>DRO (C10-C28)</b>	<b>48</b>		<b>1.0</b>	<b>mg/L</b>	10	12/29/2011 12:19 PM
<b>ORO (C28-C40)</b>	<b>11</b>		<b>1.0</b>	<b>mg/L</b>	10	12/29/2011 12:19 PM
Surr: 4-Terphenyl-d14	0	S	26-109	%REC	10	12/29/2011 12:19 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>			<b>SW8015</b>			Analyst: <b>RM</b>
<b>GRO (C6-C10)</b>	<b>50</b>		<b>0.20</b>	<b>mg/L</b>	1	12/29/2011 04:52 PM
Surr: Toluene-d8	87.5		70-130	%REC	1	12/29/2011 04:52 PM
<b>METALS BY ICP-MS (DISSOLVED)</b>			<b>SW6020A</b>			Analyst: <b>RH</b>
<b>Calcium</b>	<b>100</b>		<b>0.50</b>	<b>mg/L</b>	1	12/28/2011 07:35 PM
<b>Iron</b>	<b>11</b>		<b>0.080</b>	<b>mg/L</b>	1	12/28/2011 07:35 PM
<b>Magnesium</b>	<b>17</b>		<b>0.20</b>	<b>mg/L</b>	1	12/28/2011 07:35 PM
<b>Manganese</b>	<b>0.31</b>		<b>0.0050</b>	<b>mg/L</b>	1	12/28/2011 07:35 PM
<b>Potassium</b>	<b>25</b>		<b>0.20</b>	<b>mg/L</b>	1	12/28/2011 07:35 PM
<b>Sodium</b>	<b>2,900</b>		<b>20</b>	<b>mg/L</b>	100	12/29/2011 10:24 AM
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8270</b>		Prep Date: <b>12/28/2011</b>	Analyst: <b>CW</b>
Acenaphthene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Acenaphthylene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Anthracene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Benzo(a)anthracene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Benzo(a)pyrene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Benzo(b)fluoranthene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Benzo(g,h,i)perylene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Benzo(k)fluoranthene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Chrysene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Dibenzo(a,h)anthracene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Fluoranthene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
<b>Fluorene</b>	<b>12</b>		<b>5.0</b>	<b>µg/L</b>	1	12/28/2011 08:32 PM
Indeno(1,2,3-cd)pyrene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
<b>Naphthalene</b>	<b>70</b>		<b>50</b>	<b>µg/L</b>	10	12/29/2011 10:43 AM
<b>Phenanthrene</b>	<b>13</b>		<b>5.0</b>	<b>µg/L</b>	1	12/28/2011 08:32 PM
Pyrene	ND		5.0	µg/L	1	12/28/2011 08:32 PM
Surr: 2,4,6-Tribromophenol	77.7		21-125	%REC	1	12/28/2011 08:32 PM
Surr: 2-Fluorobiphenyl	69.7		36-94	%REC	1	12/28/2011 08:32 PM
Surr: 2-Fluorophenol	36.2		10-75	%REC	1	12/28/2011 08:32 PM
Surr: 4-Terphenyl-d14	34.3		26-119	%REC	1	12/28/2011 08:32 PM
Surr: Nitrobenzene-d5	71.6		41-104	%REC	1	12/28/2011 08:32 PM
Surr: Phenol-d6	15.4		11-50	%REC	1	12/28/2011 08:32 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260</b>			Analyst: <b>AK</b>

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 03-Jan-12

**Client:** HRL Compliance Solutions

**Project:** Antero Gypsum Ranch B Pad Water Rel. 12/21/11

**Work Order:** 1112786

**Sample ID:** Water Line Water Sample

**Lab ID:** 1112786-01

**Collection Date:** 12/21/2011 02:20 PM

**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Benzene</b>	<b>3,400</b>		<b>50</b>	<b>µg/L</b>	50	12/30/2011 06:57 PM
<b>Ethylbenzene</b>	<b>350</b>		<b>50</b>	<b>µg/L</b>	50	12/30/2011 06:57 PM
<b>m,p-Xylene</b>	<b>3,900</b>		<b>100</b>	<b>µg/L</b>	50	12/30/2011 06:57 PM
<b>o-Xylene</b>	<b>820</b>		<b>50</b>	<b>µg/L</b>	50	12/30/2011 06:57 PM
<b>Toluene</b>	<b>9,100</b>		<b>5,000</b>	<b>µg/L</b>	5000	12/30/2011 12:35 PM
<b>Xylenes, Total</b>	<b>4,700</b>		<b>150</b>	<b>µg/L</b>	50	12/30/2011 06:57 PM
<i>Surr: 1,2-Dichloroethane-d4</i>	92.3		70-120	%REC	50	12/30/2011 06:57 PM
<i>Surr: 1,2-Dichloroethane-d4</i>	99.4		70-120	%REC	5000	12/30/2011 12:35 PM
<i>Surr: 4-Bromofluorobenzene</i>	102		75-120	%REC	50	12/30/2011 06:57 PM
<i>Surr: 4-Bromofluorobenzene</i>	97.2		75-120	%REC	5000	12/30/2011 12:35 PM
<i>Surr: Dibromofluoromethane</i>	98.4		85-115	%REC	50	12/30/2011 06:57 PM
<i>Surr: Dibromofluoromethane</i>	101		85-115	%REC	5000	12/30/2011 12:35 PM
<i>Surr: Toluene-d8</i>	97.3		85-120	%REC	50	12/30/2011 06:57 PM
<i>Surr: Toluene-d8</i>	98.3		85-120	%REC	5000	12/30/2011 12:35 PM
<b>ANIONS BY ION CHROMATOGRAPHY</b>			<b>SW9056</b>			Analyst: <b>ED</b>
<b>Bromide</b>	<b>25</b>		<b>1.0</b>	<b>mg/L</b>	10	12/27/2011 02:05 PM
<b>Chloride</b>	<b>3,800</b>		<b>200</b>	<b>mg/L</b>	200	12/27/2011 03:26 PM
<b>Fluoride</b>	<b>0.20</b>		<b>0.10</b>	<b>mg/L</b>	1	12/27/2011 12:48 PM
Nitrogen, Nitrate	ND	H	0.020	mg/L	1	12/27/2011 12:48 PM
Nitrogen, Nitrite	ND	H	0.020	mg/L	1	12/27/2011 12:48 PM
<b>Sulfate</b>	<b>47</b>		<b>10</b>	<b>mg/L</b>	10	12/27/2011 02:05 PM
Nitrogen, Nitrate-Nitrite	ND		0.020	mg/L	1	12/27/2011 12:48 PM
<b>PH</b>			<b>SW9040</b>			Analyst: <b>KV</b>
<b>pH</b>	<b>7.39</b>			<b>s.u.</b>	1	12/23/2011 12:30 PM
<b>TOTAL DISSOLVED SOLIDS</b>			<b>A2540 C</b>			Analyst: <b>JS</b>
<b>Total Dissolved Solids</b>	<b>9,100</b>		<b>10</b>	<b>mg/L</b>	1	12/27/2011 03:16 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

Client: HRL Compliance Solutions

**QC BATCH REPORT**

Work Order: 1112786

Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

Batch ID: **38452** Instrument ID **GC8** Method: **SW8015M**

MBLK		Sample ID: <b>DBLKW1-38452-38452</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 09:44 AM</b>			
Client ID:		Run ID: <b>GC8_111229B</b>				SeqNo: <b>1867140</b>		Prep Date: <b>12/28/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	ND	0.10									
ORO (C28-C40)	ND	0.10									
<i>Surr: 4-Terphenyl-d14</i>	<i>0.024</i>	<i>0</i>	<i>0.05</i>	<i>0</i>	<i>48</i>	<i>26-109</i>	<i>0</i>				

LCS		Sample ID: <b>DLCSW1-38452-38452</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 02:32 PM</b>			
Client ID:		Run ID: <b>GC8_111229B</b>				SeqNo: <b>1867147</b>		Prep Date: <b>12/28/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	4.753	0.10	5	0	95.1	60-130	0				
ORO (C28-C40)	5.142	0.10	5	0	103	60-130	0				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.0217</i>	<i>0</i>	<i>0.05</i>	<i>0</i>	<i>43.4</i>	<i>26-109</i>	<i>0</i>				

LCSD		Sample ID: <b>DLCSDW1-38452-38452</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 02:54 PM</b>			
Client ID:		Run ID: <b>GC8_111229B</b>				SeqNo: <b>1867142</b>		Prep Date: <b>12/28/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	5.418	0.10	5	0	108	60-130	4.753	13.1	30		
ORO (C28-C40)	5.303	0.10	5	0	106	60-130	5.142	3.09	30		
<i>Surr: 4-Terphenyl-d14</i>	<i>0.02341</i>	<i>0</i>	<i>0.05</i>	<i>0</i>	<i>46.8</i>	<i>26-109</i>	<i>0.0217</i>	<i>7.58</i>	<i>30</i>		

MS		Sample ID: <b>1112786-01B MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 01:03 PM</b>			
Client ID: <b>Water Line Water Sample</b>		Run ID: <b>GC8_111229B</b>				SeqNo: <b>1867146</b>		Prep Date: <b>12/28/2011</b>		DF: <b>10</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	106.5	10	50	47.71	118	60-130	0				
ORO (C28-C40)	109.1	10	50	11.44	195	60-130	0			S	
<i>Surr: 4-Terphenyl-d14</i>	<i>ND</i>	<i>0</i>	<i>0.5</i>	<i>0</i>	<i>0</i>	<i>26-109</i>	<i>0</i>			S	

MSD		Sample ID: <b>1112786-01B MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/29/2011 01:25 PM</b>			
Client ID: <b>Water Line Water Sample</b>		Run ID: <b>GC8_111229B</b>				SeqNo: <b>1867141</b>		Prep Date: <b>12/28/2011</b>		DF: <b>10</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C28)	126.4	10	50	47.71	157	60-130	106.5	17.1	30	S	
ORO (C28-C40)	123.5	10	50	11.44	224	60-1330	109.1	12.4	30		
<i>Surr: 4-Terphenyl-d14</i>	<i>ND</i>	<i>0</i>	<i>0.5</i>	<i>0</i>	<i>0</i>	<i>26-109</i>	<i>0</i>	<i>0</i>	<i>30</i>	<i>S</i>	

The following samples were analyzed in this batch: 1112786-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112786  
 Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **R99626** Instrument ID **GC9** Method: **SW8015**

MBLK		Sample ID: <b>MBLK-R99626-R99626</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/29/2011 11:36 AM</b>			
Client ID:		Run ID: <b>GC9_111229A</b>				SeqNo: <b>1867262</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
GRO (C6-C10)	ND	200									
<i>Surr: Toluene-d8</i>	111.6	0	100	0	112	70-130	0				

LCS		Sample ID: <b>LCS-R99626-R99626</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/29/2011 10:23 AM</b>			
Client ID:		Run ID: <b>GC9_111229A</b>				SeqNo: <b>1867260</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
GRO (C6-C10)	26520	200	25000	0	106	70-130	0				
<i>Surr: Toluene-d8</i>	110.1	0	100	0	110	70-130	0				

LCSD		Sample ID: <b>LCSD-R99626-R99626</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/29/2011 10:47 AM</b>			
Client ID:		Run ID: <b>GC9_111229A</b>				SeqNo: <b>1867261</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
GRO (C6-C10)	25790	200	25000	0	103	70-130	26520	2.79	30		
<i>Surr: Toluene-d8</i>	111.6	0	100	0	112	70-130	110.1	1.38	30		

The following samples were analyzed in this batch:

Client: HRL Compliance Solutions  
 Work Order: 1112786  
 Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **R99579A** Instrument ID **ICPMS2** Method: **SW6020A** (**Dissolve**)

MBLK		Sample ID: <b>MBLK-R99579A-R99579A</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/28/2011 07:10 PM</b>		
Client ID:		Run ID: <b>ICPMS2_111227C</b>				SeqNo: <b>1866227</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	0.02843	0.50								J
Iron	0.01216	0.080								J
Magnesium	0.01136	0.20								J
Manganese	ND	0.0050								
Potassium	0.02146	0.20								J
Sodium	ND	0.20								

LCS		Sample ID: <b>LCS-R99579A-R99579A</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/28/2011 07:05 PM</b>		
Client ID:		Run ID: <b>ICPMS2_111227C</b>				SeqNo: <b>1866226</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	10.47	0.50	10	0	105	80-120	0			
Iron	10.03	0.080	10	0	100	80-120	0			
Magnesium	10.98	0.20	10	0	110	80-120	0			
Manganese	0.1017	0.0050	0.1	0	102	80-120	0			
Potassium	10.83	0.20	10	0	108	80-120	0			
Sodium	10.81	0.20	10	0	108	80-120	0			

LCSD		Sample ID: <b>LCSD-R99579A-R99579A</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/28/2011 07:54 PM</b>		
Client ID:		Run ID: <b>ICPMS2_111227C</b>				SeqNo: <b>1866228</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	10.42	0.50	10	0	104	80-120	10.47	0.479	20	
Iron	9.94	0.080	10	0	99.4	80-120	10.03	0.901	20	
Magnesium	10.55	0.20	10	0	106	80-120	10.98	3.99	20	
Manganese	0.1018	0.0050	0.1	0	102	80-120	0.1017	0.0983	20	
Potassium	10.82	0.20	10	0	108	80-120	10.83	0.0924	20	
Sodium	10.4	0.20	10	0	104	80-120	10.81	3.87	20	

MS		Sample ID: <b>1112786-01CMS</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/28/2011 07:39 PM</b>		
Client ID: <b>Water Line Water Sample</b>		Run ID: <b>ICPMS2_111227C</b>				SeqNo: <b>1866221</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	108.5	0.50	10	103.2	53	80-120	0			SO
Iron	19.49	0.080	10	11.05	84.4	80-120	0			
Magnesium	24.75	0.20	10	16.63	81.2	80-120	0			
Manganese	0.3861	0.0050	0.1	0.3067	79.4	80-120	0			S
Potassium	33.96	0.20	10	25.36	86	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112786  
 Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **R99579A** Instrument ID **ICPMS2** Method: **SW6020A (Dissolve)**

**MS** Sample ID: **1112786-01CMS** Units: **mg/L** Analysis Date: **12/29/2011 10:29 AM**  
 Client ID: **Water Line Water Sample** Run ID: **ICPMS2\_111229A** SeqNo: **1866849** Prep Date: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	2850	20	10	2900	-500	80-120	0			SO

**MSD** Sample ID: **1112786-01CMSD** Units: **mg/L** Analysis Date: **12/28/2011 07:44 PM**  
 Client ID: **Water Line Water Sample** Run ID: **ICPMS2\_111227C** SeqNo: **1866222** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	106.7	0.50	10	103.2	35	80-120	108.5	1.67	20	SO
Iron	19.21	0.080	10	11.05	81.6	80-120	19.49	1.45	20	
Magnesium	23.93	0.20	10	16.63	73	80-120	24.75	3.37	20	S
Manganese	0.3819	0.0050	0.1	0.3067	75.2	80-120	0.3861	1.09	20	S
Potassium	33.29	0.20	10	25.36	79.3	80-120	33.96	1.99	20	S

**MSD** Sample ID: **1112786-01CMSD** Units: **mg/L** Analysis Date: **12/29/2011 10:34 AM**  
 Client ID: **Water Line Water Sample** Run ID: **ICPMS2\_111229A** SeqNo: **1866850** Prep Date: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	3223	20	10	2900	3230	80-120	2850	12.3	20	SO

The following samples were analyzed in this batch:

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** HRL Compliance Solutions  
**Work Order:** 1112786  
**Project:** Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **38451**      Instrument ID **SVMS5**      Method: **SW8270**

MBLK		Sample ID: <b>SBLKW1-38451-38451</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/28/2011 05:37 PM</b>		
Client ID:		Run ID: <b>SVMS5_111228A</b>			SeqNo: <b>1866289</b>		Prep Date: <b>12/28/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Anthracene	ND	5.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Chrysene	ND	5.0								
Dibenzo(a,h)anthracene	ND	5.0								
Fluoranthene	ND	5.0								
Fluorene	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	5.0								
Naphthalene	ND	5.0								
Phenanthrene	ND	5.0								
Pyrene	ND	5.0								
<i>Surr: 2,4,6-Tribromophenol</i>	35.55	0	50	0	71.1	21-125		0		
<i>Surr: 2-Fluorobiphenyl</i>	37.29	0	50	0	74.6	36-94		0		
<i>Surr: 2-Fluorophenol</i>	26.87	0	50	0	53.7	10-75		0		
<i>Surr: 4-Terphenyl-d14</i>	39.22	0	50	0	78.4	26-119		0		
<i>Surr: Nitrobenzene-d5</i>	41.61	0	50	0	83.2	41-104		0		
<i>Surr: Phenol-d6</i>	15.75	0	50	0	31.5	11-50		0		

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** HRL Compliance Solutions  
**Work Order:** 1112786  
**Project:** Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **38451**      Instrument ID **SVMS5**      Method: **SW8270**

LCS		Sample ID: <b>SLCSW1-38451-38451</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/28/2011 06:12 PM</b>		
Client ID:		Run ID: <b>SVMS5_111228A</b>			SeqNo: <b>1866292</b>		Prep Date: <b>12/28/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	31.19	5.0	40	0	78	45-110	0			
Acenaphthylene	31.64	5.0	40	0	79.1	50-105	0			
Anthracene	33.31	5.0	40	0	83.3	55-110	0			
Benzo(a)anthracene	34.38	5.0	40	0	86	55-110	0			
Benzo(a)pyrene	36.05	5.0	40	0	90.1	55-110	0			
Benzo(b)fluoranthene	39.71	5.0	40	0	99.3	45-120	0			
Benzo(g,h,i)perylene	31.46	5.0	40	0	78.6	40-125	0			
Benzo(k)fluoranthene	33.1	5.0	40	0	82.8	45-125	0			
Chrysene	31.87	5.0	40	0	79.7	55-110	0			
Dibenzo(a,h)anthracene	34.46	5.0	40	0	86.2	40-125	0			
Fluoranthene	33.58	5.0	40	0	84	55-115	0			
Fluorene	32.91	5.0	40	0	82.3	50-110	0			
Indeno(1,2,3-cd)pyrene	34.16	5.0	40	0	85.4	45-125	0			
Naphthalene	30.05	5.0	40	0	75.1	40-100	0			
Phenanthrene	34.03	5.0	40	0	85.1	50-115	0			
Pyrene	33.97	5.0	40	0	84.9	50-130	0			
<i>Surr: 2,4,6-Tribromophenol</i>	<i>42.24</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>84.5</i>	<i>21-125</i>	<i>0</i>			
<i>Surr: 2-Fluorobiphenyl</i>	<i>36.88</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>73.8</i>	<i>36-94</i>	<i>0</i>			
<i>Surr: 2-Fluorophenol</i>	<i>24.05</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>48.1</i>	<i>10-75</i>	<i>0</i>			
<i>Surr: 4-Terphenyl-d14</i>	<i>28.53</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>57.1</i>	<i>26-119</i>	<i>0</i>			
<i>Surr: Nitrobenzene-d5</i>	<i>39.18</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>78.4</i>	<i>41-104</i>	<i>0</i>			
<i>Surr: Phenol-d6</i>	<i>14.35</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>28.7</i>	<i>11-50</i>	<i>0</i>			

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112786  
 Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **38451** Instrument ID **SVMS5** Method: **SW8270**

LCSD		Sample ID: <b>SLCSDW1-38451-38451</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/28/2011 06:47 PM</b>		
Client ID:		Run ID: <b>SVMS5_111228A</b>			SeqNo: <b>1866293</b>		Prep Date: <b>12/28/2011</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	33.14	5.0	40	0	82.8	45-110	31.19	6.06	30	
Acenaphthylene	33.65	5.0	40	0	84.1	50-105	31.64	6.16	30	
Anthracene	34.3	5.0	40	0	85.8	55-110	33.31	2.93	30	
Benzo(a)anthracene	35.48	5.0	40	0	88.7	55-110	34.38	3.15	30	
Benzo(a)pyrene	37.49	5.0	40	0	93.7	55-110	36.05	3.92	30	
Benzo(b)fluoranthene	39.85	5.0	40	0	99.6	45-120	39.71	0.352	30	
Benzo(g,h,i)perylene	32.29	5.0	40	0	80.7	40-125	31.46	2.6	30	
Benzo(k)fluoranthene	35.6	5.0	40	0	89	45-125	33.1	7.28	30	
Chrysene	33.07	5.0	40	0	82.7	55-110	31.87	3.7	30	
Dibenzo(a,h)anthracene	35.45	5.0	40	0	88.6	40-125	34.46	2.83	30	
Fluoranthene	34.65	5.0	40	0	86.6	55-115	33.58	3.14	30	
Fluorene	34.65	5.0	40	0	86.6	50-110	32.91	5.15	30	
Indeno(1,2,3-cd)pyrene	35.21	5.0	40	0	88	45-125	34.16	3.03	30	
Naphthalene	32.98	5.0	40	0	82.4	40-100	30.05	9.3	30	
Phenanthrene	35.26	5.0	40	0	88.2	50-115	34.03	3.55	30	
Pyrene	34.52	5.0	40	0	86.3	50-130	33.97	1.61	30	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>44.18</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>88.4</i>	<i>21-125</i>	<i>42.24</i>	<i>4.49</i>	<i>40</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>39.19</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>78.4</i>	<i>36-94</i>	<i>36.88</i>	<i>6.07</i>	<i>40</i>	
<i>Surr: 2-Fluorophenol</i>	<i>25.41</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>50.8</i>	<i>10-75</i>	<i>24.05</i>	<i>5.5</i>	<i>40</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>28.43</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>56.9</i>	<i>26-119</i>	<i>28.53</i>	<i>0.351</i>	<i>40</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>42.58</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>85.2</i>	<i>41-104</i>	<i>39.18</i>	<i>8.32</i>	<i>40</i>	
<i>Surr: Phenol-d6</i>	<i>14.89</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>29.8</i>	<i>11-50</i>	<i>14.35</i>	<i>3.69</i>	<i>40</i>	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** HRL Compliance Solutions  
**Work Order:** 1112786  
**Project:** Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **38451**      Instrument ID **SVMS5**      Method: **SW8270**

MS		Sample ID: 1112786-01B MS				Units: µg/L		Analysis Date: 12/28/2011 07:22 PM		
Client ID: Water Line Water Sample		Run ID: SVMS5_111228A				SeqNo: 1866294		Prep Date: 12/28/2011		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	344.7	50	400	0	86.2	45-110	0			
Acenaphthylene	303.9	50	400	0	76	50-105	0			
Anthracene	362.6	50	400	0	90.6	55-110	0			
Benzo(a)anthracene	354.1	50	400	0	88.5	55-110	0			
Benzo(a)pyrene	366.8	50	400	0	91.7	55-110	0			
Benzo(b)fluoranthene	374.1	50	400	0	93.5	45-120	0			
Benzo(g,h,i)perylene	336.3	50	400	0	84.1	40-125	0			
Benzo(k)fluoranthene	391.3	50	400	0	97.8	45-125	0			
Chrysene	318.2	50	400	0	79.6	55-110	0			
Dibenzo(a,h)anthracene	348.3	50	400	0	87.1	40-125	0			
Fluoranthene	354.8	50	400	0	88.7	55-115	0			
Fluorene	384.8	50	400	11.7	93.3	50-110	0			
Indeno(1,2,3-cd)pyrene	353	50	400	0	88.2	45-125	0			
Naphthalene	485.9	50	400	62.24	106	40-100	0			S
Phenanthrene	382.1	50	400	12.74	92.3	50-115	0			
Pyrene	331.2	50	400	0	82.8	50-130	0			
<i>Surr: 2,4,6-Tribromophenol</i>	410.9	0	500	0	82.2	21-125	0			
<i>Surr: 2-Fluorobiphenyl</i>	436.9	0	500	0	87.4	36-94	0			
<i>Surr: 2-Fluorophenol</i>	232.4	0	500	0	46.5	10-75	0			
<i>Surr: 4-Terphenyl-d14</i>	340.4	0	500	0	68.1	26-119	0			
<i>Surr: Nitrobenzene-d5</i>	423.3	0	500	0	84.7	41-104	0			
<i>Surr: Phenol-d6</i>	153.8	0	500	0	30.8	11-50	0			

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112786  
 Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: 38451 Instrument ID SVMS5 Method: SW8270

MSD		Sample ID: 1112786-01B MSD				Units: µg/L		Analysis Date: 12/28/2011 07:57 PM		
Client ID: Water Line Water Sample		Run ID: SVMS5_111228A				SeqNo: 1866295		Prep Date: 12/28/2011		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	341.2	50	400	0	85.3	45-110	344.7	1.02	30	
Acenaphthylene	353.7	50	400	0	88.4	50-105	303.9	15.1	30	
Anthracene	363.8	50	400	0	91	55-110	362.6	0.33	30	
Benzo(a)anthracene	360.2	50	400	0	90	55-110	354.1	1.71	30	
Benzo(a)pyrene	296.7	50	400	0	74.2	55-110	366.8	21.1	30	
Benzo(b)fluoranthene	425.6	50	400	0	106	45-120	374.1	12.9	30	
Benzo(g,h,i)perylene	364	50	400	0	91	40-125	336.3	7.91	30	
Benzo(k)fluoranthene	423.2	50	400	0	106	45-125	391.3	7.83	30	
Chrysene	315.5	50	400	0	78.9	55-110	318.2	0.852	30	
Dibenzo(a,h)anthracene	382.9	50	400	0	95.7	40-125	348.3	9.46	30	
Fluoranthene	343.5	50	400	0	85.9	55-115	354.8	3.24	30	
Fluorene	371.8	50	400	11.7	90	50-110	384.8	3.44	30	
Indeno(1,2,3-cd)pyrene	384.4	50	400	0	96.1	45-125	353	8.52	30	
Naphthalene	489.1	50	400	62.24	107	40-100	485.9	0.656	30	S
Phenanthrene	381.8	50	400	12.74	92.3	50-115	382.1	0.0785	30	
Pyrene	323.2	50	400	0	80.8	50-130	331.2	2.44	30	
Surr: 2,4,6-Tribromophenol	423.6	0	500	0	84.7	21-125	410.9	3.04	40	
Surr: 2-Fluorobiphenyl	411.4	0	500	0	82.3	36-94	436.9	6.01	40	
Surr: 2-Fluorophenol	226.8	0	500	0	45.4	10-75	232.4	2.44	40	
Surr: 4-Terphenyl-d14	322.5	0	500	0	64.5	26-119	340.4	5.4	40	
Surr: Nitrobenzene-d5	420.9	0	500	0	84.2	41-104	423.3	0.569	40	
Surr: Phenol-d6	149.9	0	500	0	30	11-50	153.8	2.57	40	

The following samples were analyzed in this batch: 1112786-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112786  
 Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **R99644A** Instrument ID **VMS9** Method: **SW8260**

MBLK		Sample ID: <b>VBLKW1-111230-R99644A</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/30/2011 11:23 AM</b>		
Client ID:		Run ID: <b>VMS9_111230A</b>				SeqNo: <b>1867905</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	1.0								
Ethylbenzene	ND	1.0								
m,p-Xylene	ND	2.0								
o-Xylene	ND	1.0								
Toluene	ND	1.0								
Xylenes, Total	ND	3.0								
Surr: 1,2-Dichloroethane-d4	99.13	0	100	0	99.1	70-120	0			
Surr: 4-Bromofluorobenzene	98.83	0	100	0	98.8	75-120	0			
Surr: Dibromofluoromethane	102.6	0	100	0	103	85-115	0			
Surr: Toluene-d8	100.5	0	100	0	100	85-120	0			

LCS		Sample ID: <b>VLCSW1-111230-R99644A</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/30/2011 10:12 AM</b>		
Client ID:		Run ID: <b>VMS9_111230A</b>				SeqNo: <b>1867534</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.87	1.0	20	0	99.4	80-120	0			
Ethylbenzene	18.39	1.0	20	0	92	75-125	0			
m,p-Xylene	36.39	2.0	40	0	91	75-130	0			
o-Xylene	18.05	1.0	20	0	90.2	80-120	0			
Toluene	19.84	1.0	20	0	99.2	75-120	0			
Xylenes, Total	54.44	3.0	60	0	90.7	75-130	0			
Surr: 1,2-Dichloroethane-d4	99.2	0	100	0	99.2	70-120	0			
Surr: 4-Bromofluorobenzene	99.4	0	100	0	99.4	75-120	0			
Surr: Dibromofluoromethane	100.8	0	100	0	101	85-115	0			
Surr: Toluene-d8	100.2	0	100	0	100	85-120	0			

LCSD		Sample ID: <b>VLCSDW1-111230-R99644A</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/30/2011 10:36 AM</b>		
Client ID:		Run ID: <b>VMS9_111230A</b>				SeqNo: <b>1867594</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.7	1.0	20	0	98.5	80-120	19.87	0.859	30	
Ethylbenzene	18.38	1.0	20	0	91.9	75-125	18.39	0.0544	30	
m,p-Xylene	36.12	2.0	40	0	90.3	75-130	36.39	0.745	30	
o-Xylene	18.01	1.0	20	0	90	80-120	18.05	0.222	30	
Toluene	19.7	1.0	20	0	98.5	75-120	19.84	0.708	30	
Xylenes, Total	54.13	3.0	60	0	90.2	75-130	54.44	0.571	30	
Surr: 1,2-Dichloroethane-d4	98.57	0	100	0	98.6	70-120	99.2	0.637	30	
Surr: 4-Bromofluorobenzene	100	0	100	0	100	75-120	99.4	0.602	30	
Surr: Dibromofluoromethane	101.7	0	100	0	102	85-115	100.8	0.82	30	
Surr: Toluene-d8	101.3	0	100	0	101	85-120	100.2	1.14	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112786  
 Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **R99644A** Instrument ID **VMS9** Method: **SW8260**

MS				Sample ID: 1112796-15A MS			Units: µg/L		Analysis Date: 12/30/2011 07:45 PM		
Client ID:				Run ID: VMS9_111230A			SeqNo: 1868170		Prep Date:		DF: 10
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	201.2	10	200	0	101	80-120		0			
Ethylbenzene	188.4	10	200	0	94.2	75-125		0			
m,p-Xylene	368.1	20	400	0	92	75-130		0			
o-Xylene	182.1	10	200	0	91	80-120		0			
Toluene	205.9	10	200	0	103	75-120		0			
Xylenes, Total	550.2	30	600	0	91.7	75-130		0			
Surr: 1,2-Dichloroethane-d4	932	0	1000	0	93.2	70-120		0			
Surr: 4-Bromofluorobenzene	958.8	0	1000	0	95.9	75-120		0			
Surr: Dibromofluoromethane	985.3	0	1000	0	98.5	85-115		0			
Surr: Toluene-d8	1023	0	1000	0	102	85-120		0			

MSD				Sample ID: 1112796-15A MSD			Units: µg/L		Analysis Date: 12/30/2011 08:08 PM		
Client ID:				Run ID: VMS9_111230A			SeqNo: 1868171		Prep Date:		DF: 10
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	194	10	200	0	97	80-120	201.2	3.64	30		
Ethylbenzene	179.6	10	200	0	89.8	75-125	188.4	4.78	30		
m,p-Xylene	352	20	400	0	88	75-130	368.1	4.47	30		
o-Xylene	174.3	10	200	0	87.2	80-120	182.1	4.38	30		
Toluene	191.4	10	200	0	95.7	75-120	205.9	7.3	30		
Xylenes, Total	526.3	30	600	0	87.7	75-130	550.2	4.44	30		
Surr: 1,2-Dichloroethane-d4	938.6	0	1000	0	93.9	70-120	932	0.706	30		
Surr: 4-Bromofluorobenzene	936.4	0	1000	0	93.6	75-120	958.8	2.36	30		
Surr: Dibromofluoromethane	991.9	0	1000	0	99.2	85-115	985.3	0.668	30		
Surr: Toluene-d8	1000	0	1000	0	100	85-120	1023	2.24	30		

The following samples were analyzed in this batch: 1112786-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** HRL Compliance Solutions  
**Work Order:** 1112786  
**Project:** Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **R99444**      Instrument ID **WETCHEM**      Method: **SW9040**

<b>LCS</b>	Sample ID: <b>LCS-R99444-R99444</b>				Units: <b>s.u.</b>		Analysis Date: <b>12/23/2011 12:30 PM</b>			
Client ID:	Run ID: <b>WETCHEM_111223A</b>			SeqNo: <b>1863279</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	4.38	0	4.4	0	99.5	90-110	0			

<b>DUP</b>	Sample ID: <b>1112782-02A DUP</b>				Units: <b>s.u.</b>		Analysis Date: <b>12/23/2011 12:30 PM</b>			
Client ID:	Run ID: <b>WETCHEM_111223A</b>			SeqNo: <b>1863281</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	9.52	0	0	0	0	0-0	9.52	0	20	

**The following samples were analyzed in this batch:**     

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112786  
 Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **R99530** Instrument ID **IC4** Method: **SW9056**

MBLK		Sample ID: <b>CCB/MBLK-R99530</b>			Units: <b>mg/L</b>			Analysis Date: <b>12/27/2011 10:24 AM</b>		
Client ID:		Run ID: <b>IC4_111227A</b>			SeqNo: <b>1865151</b>			Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	ND	0.10								
Chloride	0.5055	1.0								J
Fluoride	ND	0.10								
Nitrogen, Nitrate	ND	0.020								
Nitrogen, Nitrite	ND	0.020								
Sulfate	ND	1.0								
Nitrogen, Nitrate-Nitrite	ND	0.020								

LCS		Sample ID: <b>CCV/LCS-R99530</b>			Units: <b>mg/L</b>			Analysis Date: <b>12/27/2011 10:44 AM</b>		
Client ID:		Run ID: <b>IC4_111227A</b>			SeqNo: <b>1865153</b>			Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.032	0.10	2	0	102	88-113		0		
Chloride	9.395	1.0	10	0	94	88-107		0		
Fluoride	1.918	0.10	2	0	95.9	86-111		0		
Nitrogen, Nitrate	0.2542	0.020	0.25	0	102	81-116		0		
Nitrogen, Nitrite	0.2531	0.020	0.25	0	101	84-115		0		
Sulfate	9.807	1.0	10	0	98.1	85-110		0		
Nitrogen, Nitrate-Nitrite	0.5073	0.020	0.5	0	101	90-110		0		

LCSD		Sample ID: <b>CCV/LCSD-R99530</b>			Units: <b>mg/L</b>			Analysis Date: <b>12/27/2011 12:25 PM</b>		
Client ID:		Run ID: <b>IC4_111227A</b>			SeqNo: <b>1865155</b>			Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.948	0.10	2	0	97.4	88-113	2.032	4.25	20	
Chloride	9.622	1.0	10	0	96.2	88-107	9.395	2.38	20	
Fluoride	1.893	0.10	2	0	94.6	86-111	1.918	1.29	20	
Nitrogen, Nitrate	0.2384	0.020	0.25	0	95.4	81-116	0.2542	6.41	20	
Nitrogen, Nitrite	0.2549	0.020	0.25	0	102	84-115	0.2531	0.709	20	
Sulfate	9.84	1.0	10	0	98.4	85-110	9.807	0.333	20	
Nitrogen, Nitrate-Nitrite	0.4933	0.020	0.5	0	98.7	90-110	0.5073	2.8	20	

MS		Sample ID: <b>1112786-01C MS</b>			Units: <b>mg/L</b>			Analysis Date: <b>12/27/2011 01:25 PM</b>		
Client ID: <b>Water Line Water Sample</b>		Run ID: <b>IC4_111227A</b>			SeqNo: <b>1865157</b>			Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluoride	0.6832	0.10	2	0.1967	24.3	75-125		0		S
Nitrogen, Nitrate	0.4055	0.020	0.5	0	81.1	75-125		0		H
Nitrogen, Nitrite	ND	0.020	0.5	0	0	75-125		0		SH
Nitrogen, Nitrate-Nitrite	0.4055	0.020	1	0	40.6	75-125		0		S

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112786  
 Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: R99530 Instrument ID IC4 Method: SW9056

MS		Sample ID: 1112786-01C MS				Units: mg/L		Analysis Date: 12/27/2011 02:25 PM		
Client ID: Water Line Water Sample		Run ID: IC4_111227A				SeqNo: 1865160		Prep Date:		DF: 10
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	27.25	1.0	2	25.4	92.3	75-125	0			O
Sulfate	55.56	10	10	47.16	84	75-125	0			O

MS		Sample ID: 1112786-01C MS				Units: mg/L		Analysis Date: 12/27/2011 03:46 PM		
Client ID: Water Line Water Sample		Run ID: IC4_111227A				SeqNo: 1865164		Prep Date:		DF: 200
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	3679	200	10	3751	-713	75-125	0			SO

MSD		Sample ID: 1112786-01C MSD				Units: mg/L		Analysis Date: 12/27/2011 01:45 PM		
Client ID: Water Line Water Sample		Run ID: IC4_111227A				SeqNo: 1865158		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Fluoride	0.6907	0.10	2	0.1967	24.7	75-125	0.6832	1.09	20	S
Nitrogen, Nitrate	0.4112	0.020	0.5	0	82.2	75-125	0.4055	1.4	20	H
Nitrogen, Nitrite	ND	0.020	0.5	0	0	75-125	0	0	20	SH
Nitrogen, Nitrate-Nitrite	0.4112	0.020	1	0	41.1	75-125	0.4055	1.4	20	S

MSD		Sample ID: 1112786-01C MSD				Units: mg/L		Analysis Date: 12/27/2011 02:45 PM		
Client ID: Water Line Water Sample		Run ID: IC4_111227A				SeqNo: 1865161		Prep Date:		DF: 10
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	27.28	1.0	2	25.4	93.8	75-125	27.25	0.114	20	O
Sulfate	55.39	10	10	47.16	82.3	75-125	55.56	0.308	20	O

MSD		Sample ID: 1112786-01C MSD				Units: mg/L		Analysis Date: 12/27/2011 04:06 PM		
Client ID: Water Line Water Sample		Run ID: IC4_111227A				SeqNo: 1865165		Prep Date:		DF: 200
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	3689	200	10	3751	-620	75-125	3679	0.254	20	SO

The following samples were analyzed in this batch: | 1112786-01C |

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions  
 Work Order: 1112786  
 Project: Antero Gypsum Ranch B Pad Water Rel. 12/21/11

# QC BATCH REPORT

Batch ID: **R99532** Instrument ID **TDS** Method: **A2540 C**

<b>MBLK</b>	Sample ID: <b>BLANK-R99532</b>		Units: <b>mg/L</b>		Analysis Date: <b>12/27/2011 03:16 PM</b>					
Client ID:	Run ID: <b>TDS_111227A</b>		SeqNo: <b>1865174</b>		Prep Date: DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids ND 10

<b>LCS</b>	Sample ID: <b>LCS-R99532</b>		Units: <b>mg/L</b>		Analysis Date: <b>12/27/2011 03:16 PM</b>					
Client ID:	Run ID: <b>TDS_111227A</b>		SeqNo: <b>1865175</b>		Prep Date: DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids 485 10 495 0 98 80-120 0

<b>LCSD</b>	Sample ID: <b>LCSD-R99532</b>		Units: <b>mg/L</b>		Analysis Date: <b>12/27/2011 03:16 PM</b>					
Client ID:	Run ID: <b>TDS_111227A</b>		SeqNo: <b>1865190</b>		Prep Date: DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids 484 10 495 0 97.8 80-120 485 0.206 20

<b>DUP</b>	Sample ID: <b>1112780-01BDUP</b>		Units: <b>mg/L</b>		Analysis Date: <b>12/27/2011 03:16 PM</b>					
Client ID:	Run ID: <b>TDS_111227A</b>		SeqNo: <b>1865184</b>		Prep Date: DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids 6295 10 0 0 0 0-0 6225 1.12 20

<b>DUP</b>	Sample ID: <b>1112780-04BDUP</b>		Units: <b>mg/L</b>		Analysis Date: <b>12/27/2011 03:16 PM</b>					
Client ID:	Run ID: <b>TDS_111227A</b>		SeqNo: <b>1865188</b>		Prep Date: DF: <b>1</b>					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids 4808 10 0 0 0 0-0 4759 1.02 20

The following samples were analyzed in this batch:

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



# 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 #	1112786
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PROJECT NAME		Antero Resources Gypsum Ranch B Pad Produced Water Release		SAMPLER		Dan Pinegar		DATE		12/21/2011		PAGE		1 of 1	
PROJECT No.		HRL Job # 11-312		SITE ID		Gypsum Ranch B Pad		TURNAROUND		Std. 5 day		DISPOSAL		By Lab or Return to Client	
COMPANY NAME		HRL Compliance Solutions, Inc.		BILL TO COMPANY		Antero Resources		BTEX GRO							
SEND REPORT TO		Mark Mumby		INVOICE ATTN TO		Cole Kilstrom		DRO/RO							
ADDRESS		744 Horizon Ct. Suite 140		ADDRESS		1625 17th Street Suite 300		PAH							
CITY/STATE/ZIP		Grand Junction, CO. 81506		CITY/STATE/ZIP		Denver, CO 80202		Dissolved Metals							
PHONE		970-243-3271		PHONE		303-357-7341		Anions/Cations							
FAX		970-243-3280		FAX		303-357-7315		pH							
E-MAIL		mmumby@hrlcomp.com		E-MAIL		ckilstrom@anteroresources.com		TDS							
Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC								
1	Water line Water sample	water	12/21/2011	2:20 PM	12	8&1		X	X	X	X	X	X	X	X

\*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)	
	<input checked="" type="checkbox"/>	LEVEL II (Standard QC)
	<input type="checkbox"/>	LEVEL III (Std QC + forms)
	<input type="checkbox"/>	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		

3.0°C  
M

SIGNATURE	PRINTED NAME	DATE	TIME
	Dan Pinegar	12/21/2011	1700
	Diane F. Shaw	12/23/11	1130
RELINQUISHED BY			
RECEIVED BY			
RELINQUISHED BY			
RECEIVED BY			
RELINQUISHED BY			
RECEIVED BY			

## Ann Preston

---

**From:** Mark Mumby [mmumby@hrlcomp.com]  
**Sent:** Thursday, December 22, 2011 6:09 PM  
**To:** Ann Preston  
**Subject:** Gypsum Ranch B Water Samples

Ann,

You should have received some water samples for Antero today. I need you to add one additional parameter. We sent an extra 1-Liter amber. If we have enough water left over I need you to run for sulfates please.

Let me know if you can.

Thanks

**Mark E. Mumby, RPG**  
**HRL Compliance Solutions, Inc.**  
**744 Horizon Ct., Suite 140**  
**Grand Junction, CO 81506**  
**970-243-3271 office**  
**970-260-1576 cell**  
**970-243-3280 fax**  
**mmumby@hrlcomp.com**

ALS Group: Click [here](#) to report this email as spam.

Sample Receipt Checklist

Client Name: **HRL**

Date/Time Received: **23-Dec-11 11:30**

Work Order: **1112786**

Received by: **DS**

Checklist completed by Diane Shaw 23-Dec-11  
eSignature Date

Reviewed by: Ann Preston 03-Jan-12  
eSignature Date

Matrices: Water

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes  No  Not Present
- Custody seals intact on shipping container/cooler? Yes  No  Not Present
- Custody seals intact on sample bottles? Yes  No  Not Present
- Chain of custody present? Yes  No
- Chain of custody signed when relinquished and received? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Samples in proper container/bottle? Yes  No
- Sample containers intact? Yes  No
- Sufficient sample volume for indicated test? Yes  No
- All samples received within holding time? Yes  No
- Container/Temp Blank temperature in compliance? Yes  No

Temperature(s)/Thermometer(s): 3.0 c

Cooler(s)/Kit(s):

Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted

Water - pH acceptable upon receipt? Yes  No  N/A

pH adjusted? Yes  No  N/A

pH adjusted by:

Login Notes:

-----

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

800-255-3950 • 304-255-3900  
Quality Environmental Containers



SIGNATURE  
DATE  
CUSTODY SEAL

**FedEx** Express **NEW Package US Airbill**

FedEx Tracking Number

8769 1479 9930

0200 Form ID No.

FedEx Retrieval Copy

Packages up to 150 lbs.  
For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

**1 From** R-21-11 Sender's FedEx Account Number

Date

Sender's Name DAN PINIGAR Phone 978 243-3271

Company HCSF

Address 744 HORIZON CT. STE. 140 Dept./Floor/Suite/Room

City GRAND JUNCTION CO. State ZIP 81506

**2 Your Internal Billing Reference**

**3 To** Recipient's Name SAMPLE RECLUING Phone 616.399-6076

Company ALC GROUP

Address 335 2 12874 AUL Dept./Floor/Suite/Room

Address Use this line for the HOLD location address or for continuation of your shipping address.  
City HOLLAND State MI ZIP 49427

**4 Express Package Service**

NOTE: Service order has changed. Please select carefully.

**Next Business Day**

06  FedEx First Overnight  
Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

01  FedEx Priority Overnight  
Next business morning. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

05  FedEx Standard Overnight  
Next business afternoon. Saturday Delivery NOT available.

**2 or 3 Business Days**

49  NEW FedEx 2Day A.M.  
Second business morning. Saturday Delivery NOT available.

03  FedEx 2Day  
Second business afternoon. Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

20  FedEx Express Saver  
Third business day. Saturday Delivery NOT available.

**5 Packaging** \*Declared value limit \$500.

06  FedEx Envelope\* 02  FedEx Pak\* 03  FedEx Box 04  FedEx Tube 01  Other

**6 Special Handling and Delivery Signature Options**

03  **SATURDAY DELIVERY**

No Signature Required  
Package may be left without obtaining a signature for delivery.

10  Direct Signature  
Someone at recipient's address may sign for delivery. Fee applies.

34  Indirect Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods?  
One box must be checked.

No 04  Yes  
Yes: As per attached Shipper's Declaration. Shipper's Declaration not required.

06  Dry Ice  
Dry Ice, 9, UN 1845 \_\_\_\_\_ kg

Cargo Aircraft Only

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

**7 Payment Bill to:**

Enter FedEx Acct. No. or Credit Card No. below.

1  Sender Acct. No. in Section 1 will be billed. 2  Recipient 3  Third Party 4  Credit Card 5  Cash/Check

Total Packages Total Weight lbs. Credit Card Auth.

Your liability is limited to \$100 unless you declare a higher value. See the current FedEx Service Guide for details.

fedex.com 1.800.GoFedEx 1.800.463.3339

fedex.com 1.800.GoFedEx 1.800.463.3339



8769 1479 9930

612

# Appendix F

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Gypsum Ranch B Pad Stormwater Work Orders

# Antero Daily Stormwater Contractor Work Order - GravelTrend

**Site ID:** 045-15762      **Inspection Date:** 12/16/2011  
**Area:** GravelTrend      **Site Name:** Gypsum Ranch B Pad

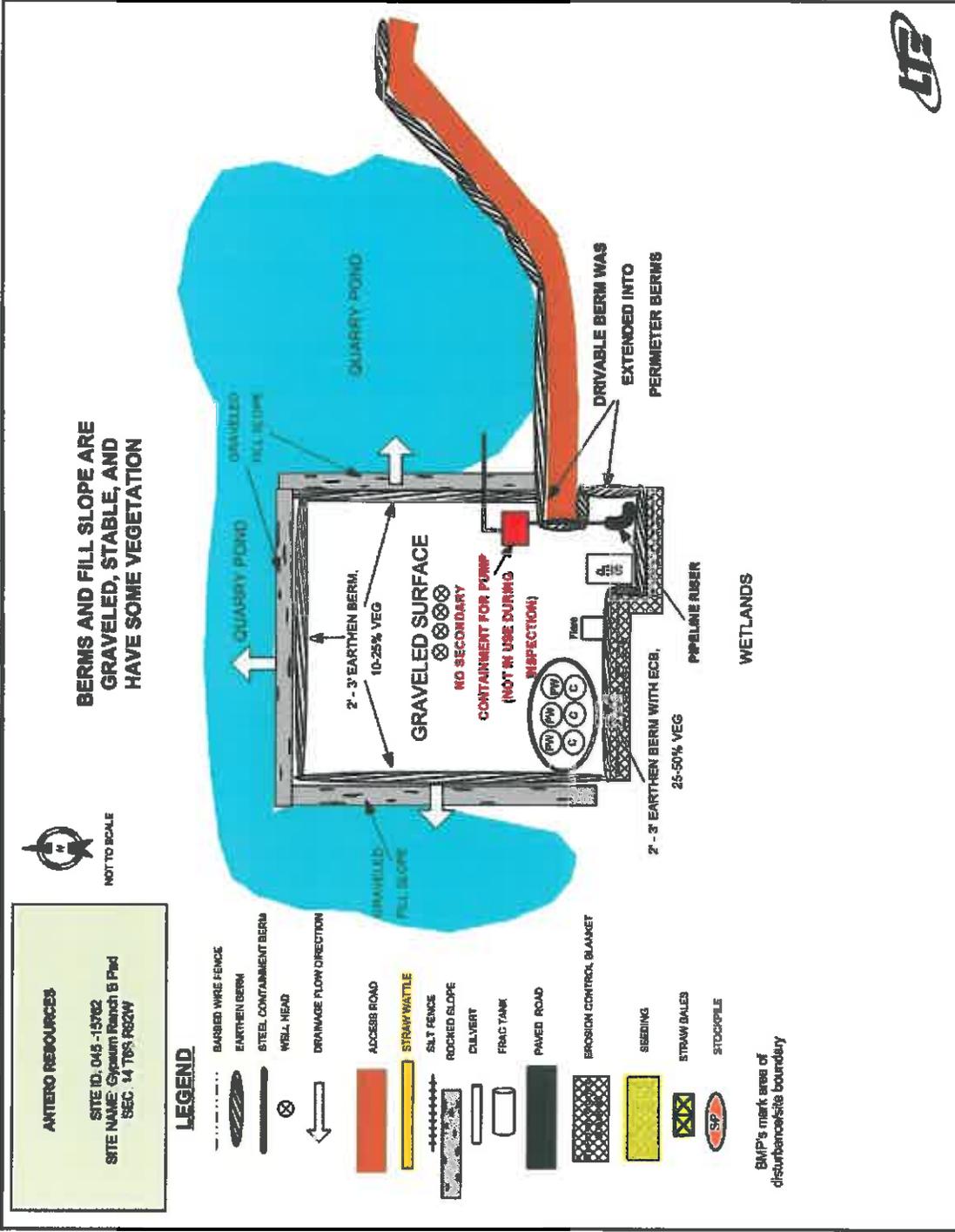
**Site Type:** Drill Pad  
**Location:** Garfield County, Sec 14 T6S R92W  
**LTE Inspector:** Steve Sivigliano

SPILLS AND LEAKS	Observed	Description of Problem	Assigned To	Status	Estimated Date	Completed
Other	Yes	Pump at pad entry does not have secondary containment. The perimeter berm was extended into drivable berm at pad entry and does serve as primary containment for pump.	Terry Dick			

**Overall Comment:** Drivable berm at pad entry was extended into perimeter berms. Pump at pad entry does not have secondary containment.

# Antero Daily Stormwater Contractor Work Order - GravelTrend

Site ID: 045-15762      Inspection Date: 12/16/2011  
 Area: GravelTrend      Site Name: Gypsum Ranch B Pad



# Antero Daily Stormwater Contractor Work Order - GravelTrend

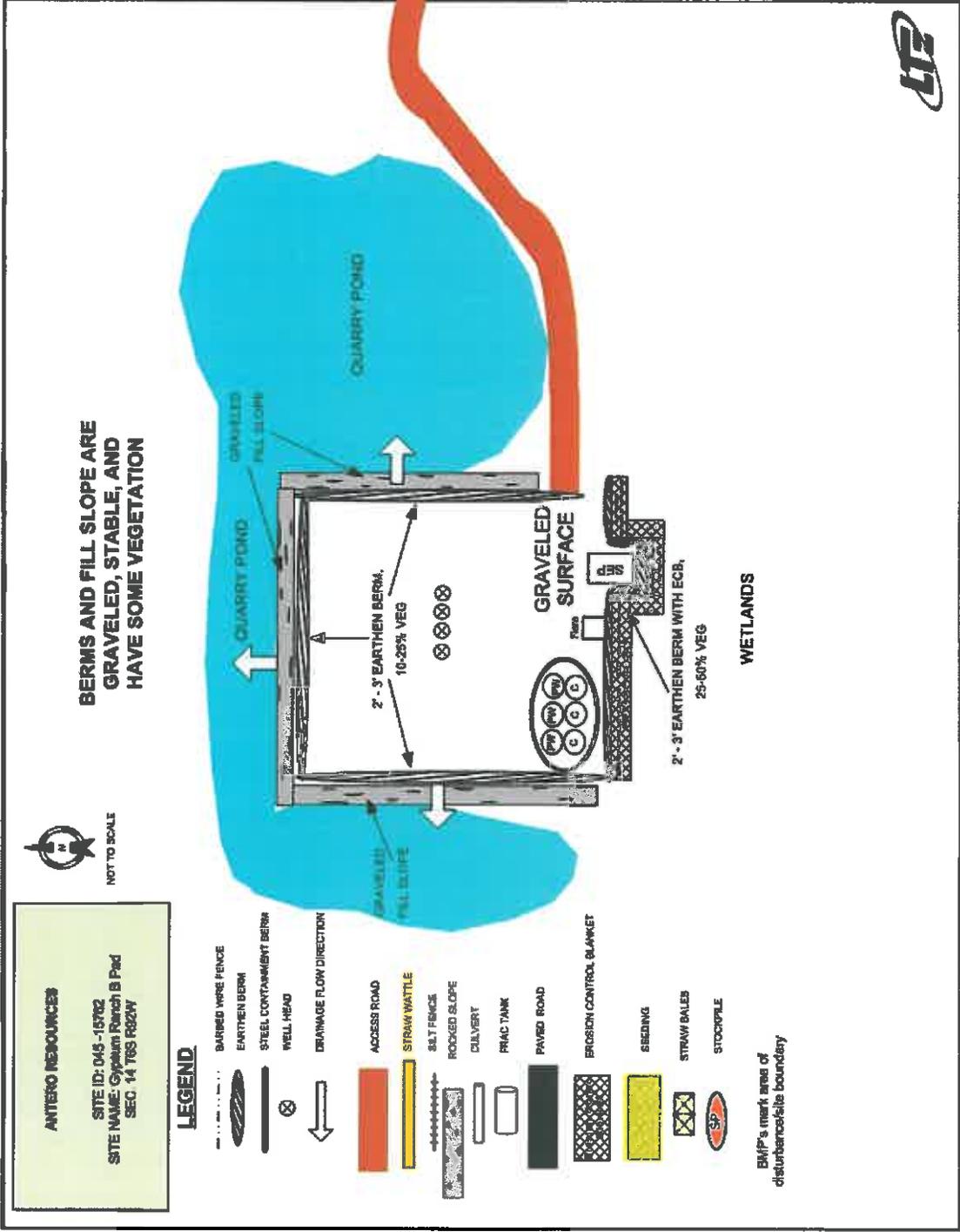
Site ID: 045-15762    Inspection Date: 11/21/2011  
Area: GravelTrend    Site Name: Gypsum Ranch B Pad

**SiteType:** Drill Pad  
**Location:** Garfield County, Sec 14 T6S R92W  
**LTE Inspector:** Steve Sivigliano

SPILLS AND LEAKS	Observed	Description of Problem	Assigned To	Status	Estimated Date	Completed
Leaking Valves	Yes	Slow drip observed from drain valve on tank C2 (middle condensate tank).	Terry Dick			

# Antero Daily Stormwater Contractor Work Order - GravelTrend

Site ID: 045-15762    Inspection Date: 11/21/2011  
 Area: GravelTrend    Site Name: Gypsum Ranch B Pad



# Appendix G

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Sensitive Area Determination

## Sensitive Area Determination Checklist

Antero Resources		
<b>Person(s) Conducting Field Inspection</b>	Mark E. Mumby	12/21/2011
<b>Site Information</b>		
Location:	Gypsum Ranch B Pad	Time: 16:00
Type of Facility:	Existing Well Pad	
<b>Environmental Conditions</b>	Clear, Cold, Freezing Conditions	
Temperature (°F)	~28	

Has the proposed, new or existing location been designated as a sensitive area?

Yes       No

### SURFACE WATER

1. Are there any surface water features or SWSAs adjacent to or within ¼ mile of the proposed/new or existing facility?

Yes       No

If yes, list type of surface water feature(s), i.e. rivers, creeks, streams, seeps, springs, wetlands: The Colorado River, two gravel pit ponds, and one USGS indetified unnamed intermittent drainage. All features possess hydraulic connectivity with one another.

If yes, describe location relative to facility: The Colorado River is located 500 feet to the northwest; one of the gravel pit ponds is adjacent to the east, west, and northern boundaries; the second is located approximately 187 feet to the southwest; and the unnamed intermittent drainage is located 228 feet to the southwest of the existing facility.

2. Could a potential release from the facility reach surface water features?

Yes       No

If yes, describe the pathway a release from the facility would likely follow to determine if the potential to impact surface water is high or low. A potential release, if it were to migrate off the facility, would tend to flow off the southeastern corner where the access road enters the facility.

3. Is the potential to impact surface water from a facility release high or low?

High       Low



## GROUNDWATER

1. Will the proposed/new or existing facility have any pits which will contain hydrocarbons and chlorides or other E&P wastes?  
 Yes       No  
If yes, List the pit type(s):
2. Is the site of the proposed facility underlain by an unconfined aquifer or recharge zone?  
 Yes       No
3. Is the hydraulic conductivity of the underlying soil or geologic material  $\leq 1.0 \times 10^{-7}$  cm/sec?  
 Yes       No
4. Is the proposed facility located within 1/8 mile of a domestic water well or 1/4 mile of a public water supply well which would use the same aquifer?  
 Yes       No
5. Is the proposed facility located within a 100 year floodplain?  
 Yes (*Sensitive Area*)       No (*If no, proceed to question #6.*)
6. Is the depth to groundwater known?  
 Yes (*If yes, follow instructions provided in 6(a) of this section.*)  
 No (*If no, follow instructions provided in 6(b) of this section.*)
  - (a) If yes, could a potential release from the proposed facility reach groundwater?  
 Yes       No  
If yes, explain: Based on visual observations, the depth to groundwater is less than 20 feet. If a large release were to infiltrate into the underlying soils, due to their high porosity and permeability, groundwater could potentially be impacted. Refer to the additional comments section of this SAD for further explanation.
  - (b) If no:
    - (i) Evaluate surrounding soils, topography, and vegetation which may suggest the presence of shallow groundwater.
    - (ii) Gather information from surrounding well data in order to determine a depth to groundwater, i.e. State Engineers Office.
7. Is the potential to impact ground water from the facility in the event of a release high or low?



High

Low

### **Additional Comments:**

As stated in the surface water section of this sensitive area determination, the existing facility is located adjacent to a former gravel pit which has previously been mined. The mined area has been allowed to flood back forming a pond adjacent to the facility. In addition, the facility is located less than 500 feet from an unnamed intermittent drainage, which is tributary to the Colorado River, and lies within the 100-year flood plain. By COGCC decision this would classify the facility as being in a sensitive area. It is not anticipated that the gravel pit pond to the southwest of the facility would be impacted by a potential overland release due to fact the unnamed intermittent drainage separates the facility from the pond. However, the pond could be impacted by a potential release that may impact groundwater due to the hydraulic connectivity of the surface water features in the immediate vicinity of the facility. The facility, as it is currently constructed, limits the direction of a potential release to primarily the southeastern corner where the access road enters the facility. A potential release, if it were to migrate off the facility, could flow down the access road and impact the pond adjacent to and east of the facility. Best management practices (BMPs) are currently installed in the form of an earthen perimeter berm around the entire of the facility with the exception of the access road. The perimeter berm is quite large and appears to have been well maintained. It would be recommended, however, that an earthen water bar be installed on the access road where it enters the facility. This would further aid in full containment within the facility boundary in the event of a release.

The State Engineers Office and USGS records were reviewed and it was revealed that there is one permitted monitoring well located on the pad itself. However review on the State Engineers records indicated the permit has been allowed to expire and thus no information is available on the depth to groundwater. It can be assumed the water levels in the adjacent and nearby ponds are representative of the water table indicating that the depth to groundwater is shallow (i.e. less than 20 feet). with sufficient BMPs installed, the greatest potential for impacts from a potential release would be to groundwater if the release was large and occurred over a longer period of time. Due to the high porosity and permeability of the underlying soils, impacts from a potential release if left unattended could migrate into the surrounding ponds and potentially the Colorado River.

Based on the information collected during the site visit and desktop review, the potential to impact both surface water and ground water is high. The potential for impacts to actual surface water features from an overland release is moderate due to the BMPs currently installed. In addition, if BMPs are installed on the southeastern corner complete site containment is feasible in the event of a release. The greatest potential for impacts would be to shallow groundwater if a



release were to migrate into the subsurface. If that were to occur, the probability would be high that impacts could migrate out into the surface water features (ponds) and potentially the Colorado River. With the potential to impact both surface water and groundwater having been deemed high and the fact that the facility lies within the 100-year floodplain of the Colorado River, the facility should be designated as being in a sensitive area.

Inspector Signature(s): Mark E. Mumby Date: 12/21/2011

Mark E. Mumby, *Project Manager/RPG*  
HRL Compliance Solutions, Inc.