

COVER LETTER

Tuesday, May 03, 2011

Michael Schuhen
Sandia National Lab
4100 National Parks Hwy.
MS1395
Carlsbad, NM 88220

TEL: (505) 234-0006

FAX (505) 234-0061

RE: WIPP/H-9c (M)

Order No.: 1104933

Dear Michael Schuhen:

Hall Environmental Analysis Laboratory, Inc. received 2 sample(s) on 4/26/2011 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag.

Please do not hesitate to contact HEAL for any additional information or clarifications.

Sincerely,



Andy Freeman, Laboratory Manager

NM Lab # NM9425 NM0901

AZ license # AZ0682

ORELAP Lab # NM100001

Texas Lab# T104704424-08-TX



Hall Environmental Analysis Laboratory, Inc.

Date: 03-May-11

CLIENT: Sandia National Lab
 Lab Order: 1104933
 Project: WIPP/H-9c (M)
 Lab ID: 1104933-01

Client Sample ID: H-9c(M)_042111
 Collection Date: 4/21/2011 8:47:00 AM
 Date Received: 4/26/2011
 Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SRM
Fluoride	1.9	0.50		mg/L	5	4/27/2011 1:56:49 PM
Chloride	880	50		mg/L	100	4/29/2011 1:46:30 PM
Bromide	3.3	0.50		mg/L	5	4/27/2011 1:56:49 PM
Nitrate (As N)+Nitrite (As N)	ND	2.0		mg/L	10	4/28/2011 11:26:55 AM
Phosphorus, Orthophosphate (As P)	ND	2.5	H	mg/L	5	4/27/2011 1:56:49 PM
Sulfate	3100	50		mg/L	100	4/29/2011 1:46:30 PM
EPA METHOD 6010B: DISSOLVED METALS						Analyst: RAGS
Calcium	600	100		mg/L	100	5/2/2011 2:41:12 PM
Magnesium	170	100		mg/L	100	5/2/2011 2:41:12 PM
Potassium	26	10		mg/L	10	5/2/2011 3:48:05 PM
Sodium	860	100		mg/L	100	5/2/2011 2:41:12 PM
Strontium	10	0.60		mg/L	100	5/2/2011 2:41:12 PM
SM 2320B: ALKALINITY						Analyst: LJB
Alkalinity, Total (As CaCO ₃)	50	20		mg/L CaCO ₃	1	4/27/2011 6:06:00 PM
Carbonate	ND	2.0		mg/L CaCO ₃	1	4/27/2011 6:06:00 PM
Bicarbonate	50	20		mg/L CaCO ₃	1	4/27/2011 6:06:00 PM
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: LJB
Specific Conductance	5900	0.010		µmhos/cm	1	4/27/2011 6:06:00 PM
SM4500-H+B: PH						Analyst: LJB
pH	7.76	0.100		pH units	1	4/27/2011 6:06:00 PM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: KS
Total Dissolved Solids	5650	20.0		mg/L	1	5/1/2011 5:27:00 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- NC Non-Chlorinated
- PQL Practical Quantitation Limit

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Date: 03-May-11

CLIENT: Sandia National Lab
Lab Order: 1104933
Project: WIPP/H-9c (M)
Lab ID: 1104933-02

Client Sample ID: H-9C(M)_042111
Collection Date: 4/21/2011 8:47:00 AM
Date Received: 4/26/2011
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 7470: MERCURY						Analyst: ELS
Mercury	ND	0.00020		mg/L	1	5/2/2011 1:28:11 PM
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: ELS
Arsenic	ND	0.10		mg/L	1	5/2/2011 9:23:08 AM
Barium	ND	0.10		mg/L	1	5/2/2011 9:23:08 AM
Cadmium	ND	0.010		mg/L	1	5/2/2011 9:23:08 AM
Chromium	ND	0.030		mg/L	1	5/2/2011 11:25:00 AM
Lead	ND	0.025		mg/L	1	5/2/2011 9:23:08 AM
Selenium	ND	0.25		mg/L	1	5/2/2011 9:23:08 AM
Silver	ND	0.025		mg/L	1	5/2/2011 9:23:08 AM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- NC Non-Chlorinated
- PQL Practical Quantitation Limit

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

CATION/ANION BALANCE SHEET FOR WATER ANALYSES

HEAL LAB NUMBER	H-9c (M)_042111 1104933-1									
CATIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sodium	860	37.41								
Potassium	26	0.66								
Calcium	600	29.94								
Magnesium	170	13.99								
Total Cations		82.00								
ANIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sulfate	3100	64.54								
Chloride	880	24.82								
Bicarbonate (CaCO3)	50	1.00								
Carbonate (CaCO3)	ND	*								
Phosphate (P)	ND	*								
Nitrite (N)	ND	*								
Nitrate (N)	ND	*								
Fluoride	1.9	0.10								
Bromide	3.3	0.04								
Total Anions		90.51								
Elect. Cond. (µMhos/cm)	5900									
CATION/ANION RATIO		0.91								
% Difference		5								
TOTAL DISSOLVED SOLIDS RATIOS										
TDS (measured)	5650									
TDS (calculated)	5671									
Ratio meas TDS:calc TDS		1.0								
Ratio Meas. TDS:EC		0.96								
Ratio Calc. TDS:EC		0.96								
Ratio of anion sum:EC		1.5								
Ratio of cation sum:EC		1.4								

* Analyte not detected (below method detection limit).

** Values below 0.55 can be obtained in waters containing appreciable concentrations of free acid or alkalinity, or not within pH 6 to 9. Values much higher than 0.7 are possible in highly saline waters.

GENERALLY ACCEPTED RANGES

Cation/Anion balance: 0-3 meq/L- 0.2 meq/L, 3-10 meq/L- 2%, >10 meq/L - 5%

Ratio measured TDS:calculated TDS -- 1.0-1.2. Ratio Calculated TDS:EC -- 0.55-0.7. Ratio Measured TDS:EC--0.55-0.7. Ratio of anion sum:EC -- 0.9-1.1.

Ratio of cation sum:EC -- 0.9-1.1

QA/QC SUMMARY REPORT

Client: Sandia National Lab
Project: WIPP/H-9c (M)

Work Order: 1104933

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 300.0: Anions											
Sample ID: MB		MBLK									
Batch ID:	R45012	Analysis Date:	4/28/2011 4:29:01 AM								
Fluoride	ND	mg/L	0.10								
Bromide	ND	mg/L	0.10								
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.20								
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50								
Sulfate	ND	mg/L	0.50								
Sample ID: MB		MBLK									
Batch ID:	R45049	Analysis Date:	4/29/2011 12:07:13 PM								
Fluoride	ND	mg/L	0.10								
Chloride	ND	mg/L	0.50								
Bromide	ND	mg/L	0.10								
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.20								
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50								
Sulfate	ND	mg/L	0.50								
Sample ID: LCS		LCS									
Batch ID:	R45012	Analysis Date:	4/28/2011 4:46:26 AM								
Fluoride	0.5141	mg/L	0.10	0.5	0	103	90	110			
Chloride	4.993	mg/L	0.50	5	0	99.9	90	110			
Bromide	2.514	mg/L	0.10	2.5	0	101	90	110			
Nitrate (As N)+Nitrite (As N)	3.507	mg/L	0.20	3.5	0	100	90	110			
Phosphorus, Orthophosphate (As P)	4.815	mg/L	0.50	5	0	96.3	90	110			
Sulfate	10.21	mg/L	0.50	10	0	102	90	110			
Sample ID: LCS		LCS									
Batch ID:	R45049	Analysis Date:	4/29/2011 12:19:38 PM								
Fluoride	0.5094	mg/L	0.10	0.5	0	102	90	110			
Chloride	4.860	mg/L	0.50	5	0.1625	94.0	90	110			
Bromide	2.505	mg/L	0.10	2.5	0	100	90	110			
Nitrate (As N)+Nitrite (As N)	3.490	mg/L	0.20	3.5	0	99.7	90	110			
Phosphorus, Orthophosphate (As P)	4.950	mg/L	0.50	5	0	99.0	90	110			
Sulfate	10.10	mg/L	0.50	10	0	101	90	110			
Method: SM 2320B: Alkalinity											
Sample ID: MB-1		MBLK									
Batch ID:	R45006	Analysis Date:	4/27/2011 4:59:00 PM								
Alkalinity, Total (As CaCO3)	ND	mg/L Ca	20								
Carbonate	ND	mg/L Ca	2.0								
Bicarbonate	ND	mg/L Ca	20								
Sample ID: LCS-1		LCS									
Batch ID:	R45006	Analysis Date:	4/27/2011 5:05:00 PM								
Alkalinity, Total (As CaCO3)	80.68	mg/L Ca	20	80	0	101	98.7	102			
Method: EPA Method 7470: Mercury											
Sample ID: MB-26625		MBLK									
Batch ID:	26625	Analysis Date:	5/2/2011 12:53:58 PM								
Mercury	ND	mg/L	0.00020								
Sample ID: LCS-26625		LCS									
Batch ID:	26625	Analysis Date:	5/2/2011 12:55:43 PM								
Mercury	0.004834	mg/L	0.00020	0.005	0	96.7	80	120			
Sample ID: LCS-26625		LCS									
Batch ID:	26625	Analysis Date:	5/2/2011 12:57:28 PM								
Mercury	0.004854	mg/L	0.00020	0.005	0	97.1	80	120			

Qualifiers:

E Estimated value
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
H Holding times for preparation or analysis exceeded
NC Non-Chlorinated
R RPD outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Sandia National Lab
 Project: WIPP/H-9c (M)

Work Order: 1104933

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA 8010B: Total Recoverable Metals											
Sample ID: MB-26619		MBLK									
Batch ID:	26619	Analysis Date:	5/2/2011 8:27:38 AM								
Arsenic	ND	mg/L	0.020								
Barium	ND	mg/L	0.020								
Cadmium	ND	mg/L	0.0020								
Chromium	ND	mg/L	0.0060								
Selenium	ND	mg/L	0.050								
Silver	ND	mg/L	0.0050								
Sample ID: MB-26619		MBLK									
Batch ID:	26619	Analysis Date:	5/2/2011 10:37:52 AM								
Lead	ND	mg/L	0.0050								
Sample ID: LCS-26619		LCS									
Batch ID:	26619	Analysis Date:	5/2/2011 8:30:48 AM								
Arsenic	0.5485	mg/L	0.020	0.5	0	110	80	120			
Barium	0.4829	mg/L	0.020	0.5	0	96.6	80	120			
Cadmium	0.5038	mg/L	0.0020	0.5	0	101	80	120			
Chromium	0.5274	mg/L	0.0060	0.5	0	105	80	120			
Selenium	0.5210	mg/L	0.050	0.5	0	104	80	120			
Silver	0.5060	mg/L	0.0050	0.5	0.0007	101	80	120			
Sample ID: LCS-26619		LCS									
Batch ID:	26619	Analysis Date:	5/2/2011 8:33:46 AM								
Arsenic	0.5533	mg/L	0.020	0.5	0	111	80	120			
Barium	0.4810	mg/L	0.020	0.5	0	96.2	80	120			
Cadmium	0.5055	mg/L	0.0020	0.5	0	101	80	120			
Chromium	0.5275	mg/L	0.0060	0.5	0	105	80	120			
Selenium	0.5244	mg/L	0.050	0.5	0	105	80	120			
Silver	0.5055	mg/L	0.0050	0.5	0.0007	101	80	120			
Sample ID: LCS-26619		LCS									
Batch ID:	26619	Analysis Date:	5/2/2011 10:41:03 AM								
Lead	0.4873	mg/L	0.0050	0.5	0	97.5	80	120			
Sample ID: LCS-26619		LCS									
Batch ID:	26619	Analysis Date:	5/2/2011 10:44:00 AM								
Lead	0.4836	mg/L	0.0050	0.5	0	96.7	80	120	0.755	0	

Method: SM2540C MOD: Total Dissolved Solids											
Sample ID: MB-26598		MBLK									
Batch ID:	26598	Analysis Date:	5/1/2011 5:27:00 PM								
Total Dissolved Solids	ND	mg/L	20.0								
Sample ID: LCS-26598		LCS									
Batch ID:	26598	Analysis Date:	5/1/2011 5:27:00 PM								
Total Dissolved Solids	1028	mg/L	20.0	1000	0	103	80	120			

Qualifiers:
 E Estimated value
 J Analyte detected below quantitation limits
 ND Not Detected at the Reporting Limit
 H Holding times for preparation or analysis exceeded
 NC Non-Chlorinated
 R RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name SANDIA CARLSBAD

Date Received:

4/26/2011

Work Order Number 1104933

Received by: AMG

Checklist completed by:

Signature

Date

Sample ID labels checked by:

Initials

[Handwritten Signature]

04/26/11

A/NG

Matrix:

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present Not Shipped
- Custody seals intact on sample bottles? Yes No N/A
- 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
- Water - VOA vials have zero headspace? Yes No VOA vials submitted Yes No
- Water - Preservation labels on bottle and cap match? Yes No N/A
- Water - pH acceptable upon receipt? Yes No N/A

Number of preserved bottles checked for pH:

3
<2 >12 unless noted below.

Container/Temp Blank temperature?

1.9°

<6° C Acceptable

If given sufficient time to cool.

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Chain-of-Custody Record

Client: Sandia National Laboratories

Mailing Address: 4100 National Parks Highway
Carlsbad, NM 88220

Phone #: (575) 234-0107

email or Fax#: (575) 234-0061

QA/QC Package:

Standard Level 4 (Full Validation)

Other _____

EDD (Type) _____

Turn-Around Time:

Standard Rush

Project Name:

WIPP / H-9c (M)

Project #:

98806 / 1.4.2.3

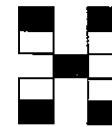
Project Manager:

Mike Schuhen

Sampler: Wesley DeYonge

On Ice: Yes No

Sample Temperature: 19



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cation / Anion Balance	pH, Cond, TDS, Alkalinity	NO ₂ + NO ₃	Metals / Strontium	Air Bubbles (Y or N)	
4/21/11	0847	H ₂ O	H-9c(M)_042111	#1: 500 mL	NONE	-1													X	X			
4/21/11	↓	H ₂ O	H-9c(M)_042111	#2: 125 mL	H ₂ SO ₄	-1															X		
4/21/11	↓	H ₂ O	H-9c(M)_042111	#3: 125 mL	HNO ₃	-1																X	
4/21/11	0847	H ₂ O	H-9c(M)_0421811	#4: 500 mL	HNO ₃	-2							X										
END OF SAMPLE LIST																							

Date: 4/25/11 Time: 09:35 Relinquished by: Wesley F. DeYonge
Wesley F. DeYonge

Received by: *[Signature]* Date: 4/26/11 Time: 1056
Date: _____ Time: _____

Remarks:
Container #3 was filtered.
Samples may contain high levels of salts.
Sample #4 (preserved, unfiltered) was collected for analysis of RCRA 8 total metals/nonmetals

Appendix A

ACTIVITY/ PROJECT SPECIFIC PROCEDURE Sandia National Laboratories	<h2 style="margin: 0;">Chain of Custody</h2> <p style="font-size: 1.2em; margin: 0;"><i>HEAL # 1104933</i></p>					Form Number: SP 13-1-1 Page <u>1</u> of <u>1</u> Attach more forms as needed
1. Initial Sample Custodian <u>Wesley F. DeYonge</u> Organization: <u>6212</u> Date: <u>4/21/2011</u> <small>Printed Name</small>						
2. Sample Collection or Creation Information Scientific Notebook ID: <u>WSWT-14</u> Test Plan ID: <u>TP 03-01</u> Field Log ID: <u>N/A</u> Sample Location: <u>WIPP Monitoring Well H-9c</u> <small>i.e. borehole/core no./lab bldg. no./etc.</small>					Sample Team Members/Organization. <u>Wes DeYonge/ 6212</u> <small>enter n/a if none</small>	
3. Sample Identification						
Sample/Sub-Sample #	Date Collected	Container Type	Volume	Preservative	Analysis Request	Sample Description
H-9c(M) 042111	04/21/11	PE Bottle	500 ml	None	Cation/Anions,pH TDS, Cond., Alk.	H-9c Magenta water unpreserved
H-9c(M) 042111	04/21/11	PE Bottle	125 ml	H2SO4	NO2+NO3	H-9c Magenta water preserved w/ sulfuric acid
H-9c(M) 042111	04/21/11	PE Bottle	125 ml	HNO3	Metals, Strontium	H-9c Magenta water filtered & preserved w/ nitric acid
H-9c(M) 042111	04/21/11	PE Bottle	500 ml	HNO3	RCRA 8 Metals	H-9c Magenta water unfiltered & preserved w/ nitric acid
--End of Sample List--						
enter n/a if none						
4. Sample Requirements						
Handling: <u>Keep sealed until use</u>						
Storage & Preservation: <u>Keep chilled/refrigerated</u>						
Shipping: <u>Hand carry/Fed Ex</u>						
Archive: <u>N/A</u>						
Disposition: <u>Discard samples upon completion of testing</u>						
Expiration Date: <u>05/21/11</u>						
5. Custody Transfer						
a. Relinquished by: <u>Wesley F. DeYonge</u>		Signature: <i>Wesley F. DeYonge</i>		Organization/Company: <u>6212 / RESPEC</u>		Date-Time: <u>4/25/11 - 09:35</u>
a. Received by: <u>Ashley Gallegos</u>		Signature: <i>Ashley Gallegos</i>		Organization/Company: <u>HEAL</u>		Date-Time: <u>4/26/11 1056</u>
b. Relinquished by:		Signature:		Organization/Company:		Date-Time:
b. Received by:		Signature:		Organization/Company:		Date-Time:
c. Relinquished by:		Signature:		Organization/Company:		Date-Time:
c. Received by:		Signature:		Organization/Company:		Date-Time:
Upon sample receipt, note condition. This form (copy for your records) shall follow samples through its life, until final disposition, then send original to WIPP Records Center. For samples that are potentially hazardous & require packaging and shipping, contact Center 6700 ES&H Coordinator or see SNL ES&H Manual, Chpt. 12.						