

COVER LETTER

Wednesday, April 02, 2008

Rick Beauheim  
Sandia National Lab  
4100 National Parks Hwy.  
MS1395  
Carlsbad, NM 88220

TEL: (505) 234-0006

FAX (505) 234-0061

RE: WIPP/H-15 (M)

Order No.: 0803246

Dear Rick Beauheim:

Hall Environmental Analysis Laboratory, Inc. received 1 sample(s) on 3/25/2008 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,



Andy Freeman, Business Manager  
Nancy McDuffie, Laboratory Manager

NM Lab # NM9425

AZ license # AZ0682

ORELAP Lab # NM100001



**Hall Environmental Analysis Laboratory, Inc.**

Date: 02-Apr-08

**CLIENT:** Sandia National Lab  
**Lab Order:** 0803246  
**Project:** WIPP/H-15 (M)  
**Lab ID:** 0803246-01

**Client Sample ID:** H-15(M)\_031908  
**Collection Date:** 3/19/2008 11:30:00 PM  
**Date Received:** 3/25/2008  
**Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
<b>EPA METHOD 300.0: ANIONS</b>						Analyst: SLB
Fluoride	ND	10		mg/L	100	4/1/2008 2:14:32 AM
Chloride	65000	500		mg/L	5000	4/1/2008 5:35:39 PM
Bromide	26	10		mg/L	100	4/1/2008 2:14:32 AM
Nitrate (As N)+Nitrite (As N)	ND	200		mg/L	1000	4/1/2008 1:14:28 PM
Phosphorus, Orthophosphate (As P)	ND	50	H	mg/L	100	4/1/2008 2:14:32 AM
Sulfate	4100	50		mg/L	100	4/1/2008 2:14:32 AM
<b>EPA METHOD 6010B: DISSOLVED METALS</b>						Analyst: TES
Calcium	2500	50		mg/L	50	4/1/2008 5:52:59 PM
Magnesium	880	50		mg/L	50	4/1/2008 5:52:59 PM
Potassium	180	50		mg/L	50	4/1/2008 5:52:59 PM
Sodium	39000	500		mg/L	500	4/1/2008 5:57:41 PM
Strontium	46	1.2		mg/L	200	4/1/2008 10:34:48 AM
<b>SM 2320B: ALKALINITY</b>						Analyst: TES
Alkalinity, Total (As CaCO3)	39	20		mg/L CaCO3	1	3/26/2008
Carbonate	ND	2.0		mg/L CaCO3	1	3/26/2008
Bicarbonate	39	20		mg/L CaCO3	1	3/26/2008
<b>EPA 120.1: SPECIFIC CONDUCTANCE</b>						Analyst: TAF
Specific Conductance	190000	0.50		µmhos/cm	50	3/31/2008
<b>SM4500-H+B: PH</b>						Analyst: TES
pH	7.79	0.1		pH units	1	3/26/2008
<b>SM 2540C: TDS</b>						Analyst: TAF
Total Dissolved Solids	100000	20		mg/L	1	3/26/2008

**Qualifiers:**  
 \* Value exceeds Maximum Contaminant Level  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit  
 S Spike recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 MCL Maximum Contaminant Level  
 RL Reporting Limit

CATION/ANION BALANCE SHEET FOR WATER ANALYSES

<b>HEAL LAB NUMBER</b>	H-15 (M)_031908 0803246-1									
<b>CATIONS</b>	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L
Sodium	39000 1696.39									
Potassium	180 4.60									
Calcium	2500 124.75									
Magnesium	880 72.43									
<b>Total Cations</b>	1898.17									
<b>ANIONS</b>	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L	mg/L meq/L
Sulfate	4100 85.36									
Chloride	65000 1833.57									
Bicarbonate (CaCO3)	39 0.78									
Carbonate (CaCO3)	ND *									
Phosphate (P)	ND *									
Nitrite (N)	ND *									
Nitrate (N)	ND *									
Fluoride	ND *									
Bromide	26 0.33									
<b>Total Anions</b>	1920.04									
Elect. Cond. (µMhos/cm)	190000									
<b>CATION/ANION RATIO</b>	0.99									
% Difference	1									
<b>TOTAL DISSOLVED SOLIDS RATIOS</b>										
TDS (measured)	100000									
TDS (calculated)	111709									
Ratio meas TDS:calc TDS	0.9									
Ratio Meas. TDS:EC	0.53									
Ratio Calc. TDS:EC	0.59									
Ratio of anion sum:EC	1.0									
Ratio of cation sum:EC	1.0									

\* 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-15 (M)

Work Order: 0803246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Method: EPA Method 300.0: Anions

Sample ID: MB MBLK Batch ID: R27927 Analysis Date: 3/31/2008 9:42:11 AM

Fluoride	ND	mg/L	0.10
Chloride	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: R27942 Analysis Date: 4/1/2008 9:10:46 AM

Fluoride	ND	mg/L	0.10
Chloride	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: LCS LCS Batch ID: R27927 Analysis Date: 3/31/2008 9:59:36 AM

Fluoride	0.5140	mg/L	0.10	103	90	110
Chloride	4.918	mg/L	0.10	98.4	90	110
Bromide	2.570	mg/L	0.10	103	90	110
Nitrate (As N)+Nitrite (As N)	3.477	mg/L	0.20	99.3	90	110
Phosphorus, Orthophosphate (As P)	5.076	mg/L	0.50	102	90	110
Sulfate	10.07	mg/L	0.50	101	90	110

Sample ID: LCS LCS Batch ID: R27942 Analysis Date: 4/1/2008 9:28:10 AM

Fluoride	0.5172	mg/L	0.10	103	90	110
Chloride	5.118	mg/L	0.10	102	90	110
Bromide	2.627	mg/L	0.10	105	90	110
Nitrate (As N)+Nitrite (As N)	3.543	mg/L	0.20	101	90	110
Phosphorus, Orthophosphate (As P)	5.239	mg/L	0.50	105	90	110
Sulfate	10.24	mg/L	0.50	102	90	110

Method: SM 2320B: Alkalinity

Sample ID: MBLK MBLK Batch ID: R27875 Analysis Date: 3/26/2008

Alkalinity, Total (As CaCO3)	ND	mg/L CaC	20
Carbonate	ND	mg/L CaC	2.0
Bicarbonate	ND	mg/L CaC	20

Sample ID: LCS LCS Batch ID: R27875 Analysis Date: 3/26/2008

Alkalinity, Total (As CaCO3)	82.00	mg/L CaC	20	101	80	120
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Qualifiers:

- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

**QA/QC SUMMARY REPORT**

Client: Sandia National Lab  
 Project: WIPP/H-15 (M)

Work Order: 0803246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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**Method: EPA Method 6010B: Dissolved Metals**

Sample ID: MB		MBLK								Batch ID: R27930	Analysis Date: 4/1/2008 10:23:00 AM
Strontium	ND	mg/L	0.0060								
Sample ID: MB		MBLK								Batch ID: R27943	Analysis Date: 4/1/2008 5:46:23 PM
Calcium	ND	mg/L	1.0								
Magnesium	ND	mg/L	1.0								
Potassium	ND	mg/L	1.0								
Sodium	ND	mg/L	1.0								
Sample ID: LCS		LCS								Batch ID: R27930	Analysis Date: 4/1/2008 10:25:10 AM
Strontium	0.09738	mg/L	0.0060	97.4	80	120					
Sample ID: LCS		LCS								Batch ID: R27943	Analysis Date: 4/1/2008 5:49:46 PM
Calcium	45.66	mg/L	1.0	90.4	80	120					
Magnesium	50.30	mg/L	1.0	99.6	80	120					
Potassium	53.44	mg/L	1.0	97.2	80	120					
Sodium	55.50	mg/L	1.0	110	80	120					

**Method: SM 2540C: TDS**

Sample ID: MB-15480		MBLK								Batch ID: 15480	Analysis Date: 3/26/2008
Total Dissolved Solids	ND	mg/L	20								
Sample ID: LCS-15480		LCS								Batch ID: 15480	Analysis Date: 3/26/2008
Total Dissolved Solids	1034	mg/L	20	103	80	120					

**Qualifiers:**

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name SANDIA CARLSBAD

Date Received:

3/25/2008

Work Order Number 0803246

Received by: AT

Checklist completed by:

*[Handwritten Signature]*  
Signature

3/25/08  
Date

Sample ID labels checked by

*[Handwritten Initials AT]*  
Initials

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? 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
- Container/Temp Blank temperature? 1° <6° C Acceptable

If given sufficient time to cool.

COMMENTS:



Client contacted \_\_\_\_\_ Date contacted: \_\_\_\_\_ Person contacted \_\_\_\_\_

Contacted by: \_\_\_\_\_ Regarding \_\_\_\_\_

Comments: *Rec'd NO<sup>3</sup> & PO<sup>4</sup> out of field / AT 3/25/08*

Corrective Action \_\_\_\_\_

## Appendix A

ACTIVITY/ PROJECT SPECIFIC PROCEDURE <small>Sandia National Laboratories</small>		<h1>Chain of Custody</h1>				Form Number: SP 13-1-1	
1. Initial Sample Custodian <u>Wes F. DeYonge</u> <small>Printed Name</small>		Organization: <u>6712</u>		Date: <u>03/24/08</u>		Page <u>1</u> of <u>1</u> <small>Attach more forms as needed</small>	
2. Sample Collection or Creation Information		Scientific Notebook ID: <u>Magenta Hydrology #8</u>		Sample Team Members/Organization.			
Test Plan ID: <u>TP 00-03</u>		Field Log ID: <u>N/A</u>		<u>Wes DeYonge/ 6712-RESPEC</u>			
Sample Location: <u>WIPP Monitoring Well H-15 Magenta</u> <small>i.e. borehole/core no./lab bldg. no./etc...</small>				<u>Dirk O'Daniel/ 6712-Orion</u> <small>enter n/a if none</small>			
3. Sample Identification	Date Collected	Container Type	Volume	Preservative	Analysis Request	Sample Description	
H-15(M) 031908	03/19/08	PE Bottle	500 ml	None	Anions, pH, TDS, Cond., Alk.	H-15 Magenta water unpreserved	
H-15(M) 031908	03/19/08	PE Bottle	125 ml	H2SO4	NO2+NO3	H-15 Magenta water preserved w/ sulfuric acid	
H-15(M) 031908	03/19/08	PE Bottle	125 ml	HNO3	Cations, Metals	H-15 Magenta water filtered & preserved w/ nitric acid	
H-15(M) 031908	03/19/08	PE Bottle	125 ml	HNO3	Strontium	H-15 Magenta water filtered & preserved w/ nitric acid	
-End of Sample List-							
<small>enter n/a if none</small>							
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>04/19/08</u>							
5. Custody Transfer		Printed Name		Signature		Organization/Company	
a. Relinquished by:		<u>Wesley F. DeYonge</u>				<u>6712 / RESPEC</u>	
a. Received by:		<u>Anne Thorne</u>				<u>3/25/08 0855</u> <small>sealed</small> <u>intact / 1°C</u>	
b. Relinquished by:							
b. Received by:							
c. Relinquished by:							
c. Received by:							
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 6800 ES&H Coordinator or see SNL ES&H Manual, Chpt. 12.							

# CHAIN-OF-CUSTODY RECORD

Client: Sandia National Labs

Address: 4100 National Parks  
Carlsbad, NM 88220

Phone #: 575 234-0107

Fax #: 575 234-0061

Project Name: WIPP / H-15(M)

Project #: 98806 / 1.4.2.3

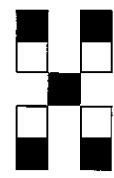
Project Manager: Rich Beaurhein

Sampler: Wes DeYonge

Sample Temperature: \_\_\_\_\_

QA / QC Package:  
Std  Level 4

Other: \_\_\_\_\_



**HALL ENVIRONMENTAL ANALYSIS LABORATORY**  
4901 Hawkins NE, Suite D  
Albuquerque, New Mexico 87109  
Tel. 505.345.3975 Fax 505.345.4107  
www.hallenvironmental.com

## ANALYSIS REQUEST

Date	Time	Matrix	Sample I.O. No.	Number/Volume	Preservative			HEAL No.
					<del>None</del> H <sub>2</sub> O <sub>2</sub>	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	
3/19/08	2330	H <sub>2</sub> O	H-15(M)-031908	1/500 mL	X			0803246
3/19/08	2330	H <sub>2</sub> O	H-15(M)-031908	2/125 mL			X	
3/19/08	2330	H <sub>2</sub> O	H-15(M)-031908	3/125 mL		X		
3/19/08	2330	H <sub>2</sub> O	H-15(M)-031908	4/125 mL		X		

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	PCRA 8 Metals	Anions (F, Cl, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub> )	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)	pH, Cond, TDS, Alkalinity	NO <sub>2</sub> + NO <sub>3</sub>	Calcium / Magnesium	Strontium	Air Bubbles or Headspace (Y or N)
								X				X				
													X			
														X		
															X	

*OK 3/19/08*

Date: 3/27/08 Time: 1440 Relinquished By: (Signature) Wesley E. DeYonge

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Relinquished By: (Signature) \_\_\_\_\_

Received By: (Signature) [Signature] 3/25/08

Received By: (Signature) [Signature] 0855

Remarks:

- Samples 3+4 Filtered
- Samples may contain high levels of silt
- 48 hr Holding Time for P