

COVER LETTER

Tuesday, February 22, 2011

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

TEL: (505) 234-0006
FAX (505) 234-0061

RE: WIPP / H-2b1 (M)

Order No.: 1102238

Dear Mike Schuhen:

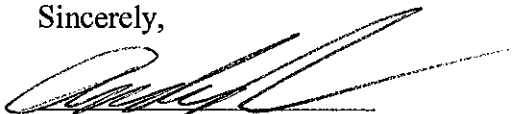
Hall Environmental Analysis Laboratory, Inc. received 1 sample(s) on 2/9/2011 for the analyses presented in the following report.

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.

Reporting limits are determined by EPA methodology.

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: 22-Feb-11

CLIENT: Sandia National Lab
 Lab Order: 1102238
 Project: WIPP / H-2b1 (M)
 Lab ID: 1102238-01

Client Sample ID: H-2b1(M)_020811
 Collection Date: 2/8/2011 12:50:00 PM
 Date Received: 2/9/2011
 Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SRM
Fluoride	3.2	0.50		mg/L	5	2/10/2011 12:08:59 PM
Chloride	2300	100		mg/L	200	2/10/2011 12:20:14 PM
Nitrogen, Nitrite (As N)	ND	2.0		mg/L	20	2/10/2011 11:57:46 AM
Bromide	8.2	0.50		mg/L	5	2/10/2011 12:08:59 PM
Nitrogen, Nitrate (As N)	ND	0.50		mg/L	5	2/10/2011 12:08:59 PM
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	2/10/2011 11:57:46 AM
Sulfate	2800	100		mg/L	200	2/10/2011 12:20:14 PM
EPA METHOD 6010B: DISSOLVED METALS						Analyst: RAGS
Calcium	760	50		mg/L	50	2/18/2011 9:23:49 AM
Magnesium	210	50		mg/L	50	2/18/2011 9:23:49 AM
Potassium	33	20		mg/L	20	2/18/2011 9:50:06 AM
Sodium	1500	50		mg/L	50	2/18/2011 9:23:49 AM
Strontium	13	0.60		mg/L	100	2/18/2011 9:53:02 AM
SM 2320B: ALKALINITY						Analyst: IC
Alkalinity, Total (As CaCO ₃)	27	20		mg/L CaCO ₃	1	2/10/2011 5:53:00 PM
Carbonate	18	2.0		mg/L CaCO ₃	1	2/10/2011 5:53:00 PM
Bicarbonate	ND	20		mg/L CaCO ₃	1	2/10/2011 5:53:00 PM
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: IC
Specific Conductance	9500	0.010		µmhos/cm	1	2/10/2011 5:53:00 PM
SM4500-H+B: PH						Analyst: IC
pH	8.96	0.100		pH units	1	2/10/2011 5:53:00 PM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: KS
Total Dissolved Solids	7200	100		mg/L	1	2/11/2011 1:55:00 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

CATION/ANION BALANCE SHEET FOR WATER ANALYSES

HEAL LAB NUMBER	H-2bl(M)_020811 1102238-02									
CATIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sodium	1500	65.25								
Potassium	33.0	0.84								
Calcium	760	37.92								
Magnesium	210	17.28								
Total Cations		121.30								
ANIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sulfate	2800	58.30								
Chloride	2300	64.88								
Bicarbonate (CaCO ₃)										
Carbonate (CaCO ₃)	18	0.36								
Phosphate (P)										
Nitrite (N)										
Nitrate (N)										
Fluoride	3.20	0.17								
Bromide	8.20	0.10								
Total Anions		123.81								
Elect. Cond. (µMhos/cm)	9500									
CATION/ANION RATIO		0.98								
% Difference		1								
TOTAL DISSOLVED SOLIDS RATIOS										
TDS (measured)	7200									
TDS (calculated)	7625									
Ratio meas TDS:calc TDS		0.9								
Ratio Meas. TDS:EC		0.76								
Ratio Calc. TDS:EC		0.80								
Ratio of anion sum:EC		1.3								
Ratio of cation sum:EC		1.3								

* 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-2b1 (M)

Work Order: 1102238

Analyte	Result	Units	PQL	SPK Val	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 300.0: Anions											
Sample ID: MB		MBLK				Batch ID: R43607	Analysis Date: 2/10/2011 10:50:22 AM				
Fluoride	ND	mg/L	0.10								
Chloride	ND	mg/L	0.50								
Nitrogen, Nitrite (As N)	ND	mg/L	0.10								
Bromide	ND	mg/L	0.10								
Nitrogen, Nitrate (As N)	ND	mg/L	0.10								
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50								
Sulfate	ND	mg/L	0.50								
Sample ID: LCS		LCS				Batch ID: R43607	Analysis Date: 2/10/2011 11:01:36 AM				
Fluoride	0.5049	mg/L	0.10	0.5	0	101	90	110			
Chloride	4.907	mg/L	0.50	5	0	98.1	90	110			
Nitrogen, Nitrite (As N)	0.9955	mg/L	0.10	1	0	99.5	90	110			
Bromide	2.393	mg/L	0.10	2.5	0	95.7	90	110			
Nitrogen, Nitrate (As N)	2.510	mg/L	0.10	2.5	0	100	90	110			
Phosphorus, Orthophosphate (As P)	4.946	mg/L	0.50	5	0	98.9	90	110			
Sulfate	9.864	mg/L	0.50	10	0	98.6	90	110			
Method: SM 2320B: Alkalinity											
Sample ID: MB-R43610		MBLK				Batch ID: R43610	Analysis Date: 2/10/2011 2:08:00 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-R43610		LCS				Batch ID: R43610	Analysis Date: 2/10/2011 2:14:00 PM				
Alkalinity, Total (As CaCO3)	80.40	mg/L Ca	20	80	0	101	96.5	104			
Method: EPA Method 8010B: Dissolved Metals											
Sample ID: MB		MBLK				Batch ID: R43719	Analysis Date: 2/18/2011 9:01:07 AM				
Calcium	ND	mg/L	1.0								
Magnesium	ND	mg/L	1.0								
Potassium	ND	mg/L	1.0								
Sodium	ND	mg/L	1.0								
Strontium	ND	mg/L	0.0060								
Sample ID: LCS		LCS				Batch ID: R43719	Analysis Date: 2/18/2011 9:04:02 AM				
Calcium	57.15	mg/L	1.0	50.5	0	113	80	120			
Magnesium	56.87	mg/L	1.0	50.5	0	113	80	120			
Potassium	60.59	mg/L	1.0	55	0	110	80	120			
Sodium	55.03	mg/L	1.0	50.5	0	109	80	120			
Strontium	0.09298	mg/L	0.0060	0.1	0	93.0	80	120			
Method: SM2540C MOD: Total Dissolved Solids											
Sample ID: MB-25585		MBLK				Batch ID: 25585	Analysis Date: 2/11/2011 1:55:00 PM				
Total Dissolved Solids	ND	mg/L	20.0								
Sample ID: LCS-25585		LCS				Batch ID: 25585	Analysis Date: 2/11/2011 1:55:00 PM				
Total Dissolved Solids	1032	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:

2/9/11

Work Order Number 1102238

Received by: AMG

Checklist completed by:

[Signature] 2/9/11

Sample ID labels checked by:

[Signature]
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? 1.3° <6° C Acceptable
If given sufficient time to cool.

Number of preserved bottles checked for pH:

2
<2 > 12 unless noted below.

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

Turn-Around Time:
 Standard Rush

Project Name:
WIPP / H-2b1 (M)

Project #:
98806 / 1.4.2.3

Project Manager:
Mike Schuhen

Sampler: W. DeYonge, D. Bowman

On Ice: Yes No

Sample Temperature: 13



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

QA/QC Package:
 Standard Level 4 (Full Validation)
 Other _____
 EDD (Type) _____

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No
2/8/11	12:50	H ₂ O	H-2b1(M)_020811	#1: 500 mL	NONE	1102238
2/8/11	12:50	H ₂ O	H-2b1(M)_020811	#2: 125 mL	H ₂ SO ₄	
2/8/11	12:50	H ₂ O	H-2b1(M)_020811	#3: 125 mL	HNO ₃	

END OF SAMPLE LIST

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 / Cation	Air Bubbles (Y or N)
											X	X			
													X		
														X	

2/8/2011 Time: 2:30 PM Relinquished by: Wesley F. DeYonge
 Received by: [Signature] Date: 2/9/11 Time: 9:25

Date: _____ Time: _____ Relinquished by: _____
 Received by: _____ Date: _____ Time: _____

Remarks:
Container #3 was filtered.
Samples may contain high levels of salts.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Appendix A

ACTIVITY/ PROJECT SPECIFIC PROCEDURE <small>Sandia National Laboratories</small>	Chain of Custody					Form Number: SP 13-1-1 Page <u>1</u> of <u>1</u> <small>Attach more forms as needed</small>
1. Initial Sample Custodian <u>Wesley F. DeYonge</u> Organization: <u>6212</u> Date: <u>2/8/2011</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-2b1</u> <small>i.e. borehole/core no./lab bldg. no./etc.</small>					Sample Team Members/Organization. <u>Wes DeYonge/ 6212</u> <u>Dale Bowman/ 6212</u> <small>enter n/a if none</small>	
3. Sample Identification	Date Collected	Container Type	Volume	Preser-Vative	Analysis Request	Sample Description
H-2b1(M)_020811	02/08/11	PE Bottle	500 ml	None	Anions, pH, TDS, Cond., Alk.	H-2b1 Magenta water unpreserved
H-2b1(M)_020811	02/08/11	PE Bottle	125 ml	H2SO4	NO2+NO3	H-2b1 Magenta water preserved w/ sulfuric acid
H-2b1(M)_020811	02/08/11	PE Bottle	125 ml	HNO3	Cations, Metals	H-2b1 Magenta water filtered & preserved w/ nitric acid
--End of Sample List--					Strontium	
<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>03/08/11</u>						
5. Custody Transfer						
a. Relinquished by: <u>Wesley F. DeYonge</u>		Signature <u><i>Wesley F. DeYonge</i></u>		Organization/Company <u>6212 / RESPEC</u>		Date-Time <u>02/08/11 14:30</u>
a. Received by:						
b. Relinquished by:						
b. Received by:						
c. Relinquished by:						
c. Received by:						
<p>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.</p>						