Examination of Leachate, Drill Cuttings and Related Environmental, Economic and Technical Aspects Associated with Solid Waste Facilities in West Virginia

Appendix E: Analytical Results of Drill Cuttings

-Reports as received from the laboratory

393865

CHAIN OF CUSTODY RECORD

REIC
Research Environmental & Industrial Consultants, Inc.
MAIN LABORATORY & CORPORATE HEADQUARTERS:
P.O. Box 286 • 225 Industrial Park Rd, Beaver, WV 25813
800-999-0105 • 304-255-2500 • www.reiclabs.com

MID-OHIO VALLEY Service Center
101 17th Street
Ashland, KY 41101
606-393-5027

SHENANDOAH Service Center
1557 Commerce Rd., Ste 201
Verona, VA 24482
540-248-0183

ROANOKE Service Center
3029-C Peters Creek Rd
Roanoke, VA 24019
540-777-1276

MORGANTOWN Service Center
16 Commerce Drive
Westover, WV 26501
304-241-5861

Client: Marshall University CEGAS
Contact Person George Carico
QUOTE # ____ Fax: ____
Address 1 John Marshall Drive City Huntington State WV Zip 25755-2585
Billing Address (if different) ____ City ____ State ____ Zip ____
Site ID & State Sheep Run Unit 2H Project ID Drill Cutting Anal. Sampler G. Carico/J. Wolfe
PO # ____
Phone 304/696-5456
Email: carico@marshall.edu

SAMPLE LOG & ANALYSIS REQUEST

TURNAROUND TIME: [X] NORMAL
RUSH TURNAROUND: [ ] 5 DAY [ ] 3 DAY [ ] 2 DAY [ ] 1 DAY
*Rush work needs prior laboratory approval and will incur additional charges

ANALYSIS & METHOD REQUESTED: *See Attachment (per Jason Clark, REIC)

SAMPLE ID	No. & Type of Containers	Sampling Date/Time	Matrix	Sample Comp/Grab
Sheep Run Unit 2H (Vertical - ~~air~~)	(3-16oz.) (3-4oz.)	~~4/16/15~~ 4/17/15	Drill Cuttings	Grab

ENTER PRESERVATIVE CODE:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA
8 Ascorbic Acid

COMMENTS:
Sheep Run 2H,
Fritz Pad
API 47-017-06658

All analytical requests are subject to REIC's Standard Terms and Conditions.

Temperature at arrival: 3 °C ICED? Y ✓ N ____

1			2		
Relinquished by (signature) George Carico	Date/Time 4/21/15 10:03		Relinquished by (signature)	Date/Time 4-22-15 1457	
Received by (signature)	Date/Time 4/21/15 10:03		Received by (signature)	Date/Time	

FAX RESULTS [ ] EMAIL RESULTS [ ]
SHIPMENT ____ Hand Delivered ✓ Courier ____ UPS ____ FEDEX ____ USPS ____ OTHER

COC-NCR-061312

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

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1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Friday, May 01, 2015

GEORGE CARICO
MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE
1 JOHN MARSHALL DRIVE
HUNTINGTON, WV 25755-2585

TEL: (304) 696-6042
FAX:

RE: DRILL CUTTING ANAL

Work Order #: 1504Q01

Dear GEORGE CARICO:

REI Consultants, Inc. received 1 sample(s) on 4/22/2015 for the analyses presented in the following report.

Sincerely,

Kathy Berry

REI Consultants, Inc. - Case Narrative

WO#: 1504Q01

Date Reported: 5/1/2015

Client: MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE

Project: DRILL CUTTING ANAL

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be consider estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1504Q01

Date Reported: 5/1/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	4/17/2015 12:00:00 AM
Project:	DRILL CUTTING ANAL	**Date Received:**	4/22/2015
Lab ID:	1504Q01-01A	**Matrix:**	Solid
Client Sample ID:	SHEEP RUN UNIT 2H (VERTICAL-AIR)	**Site ID:**	SHEEP RUN UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS by ICP			**Method: SW6010C (2007)**				**Analyst: JD**	
Aluminum	9,950	3.00	25.0	NA		mg/Kg	4/23/2015 5:07 PM	PA/VA
Antimony	ND	2.00	5.00	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Arsenic	4.10	1.00	5.00	NA	J	mg/Kg	4/23/2015 5:03 PM	PA/VA
Barium	378	0.200	2.50	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Beryllium	0.755	0.0500	0.250	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Boron	6.30	1.00	2.50	NA		mg/Kg	4/27/2015 10:38 AM	PA/VA
Cadmium	0.399	0.100	0.500	NA	J	mg/Kg	4/23/2015 5:03 PM	PA/VA
Chromium	16.9	0.200	2.50	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Copper	23.4	0.200	2.50	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Iron	20,000	50.0	250	NA		mg/Kg	4/23/2015 5:10 PM	PA/VA
Lead	12.0	1.00	5.00	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Lithium	18.9	0.100	5.00	NA		mg/Kg	4/24/2015 2:40 PM	
Manganese	419	0.200	2.50	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Nickel	20.2	0.200	2.50	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Selenium	ND	1.00	5.00	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Silver	ND	0.100	1.25	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Strontium	120	0.100	2.50	NA		mg/Kg	4/24/2015 2:40 PM	PA/VA
Vanadium	15.9	0.200	2.50	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
Zinc	44.0	0.500	2.50	NA		mg/Kg	4/23/2015 5:03 PM	PA/VA
MERCURY, Total SW7417B			**Method: SW7471B (2/07)**				**Analyst: CR**	
Mercury	0.021	0.020	0.100	NA	J	mg/Kg	4/27/2015 12:04 PM	PA/VA
HEXAVALENT CHROMIUM, WATER SOLUBLE			**Method: SW7196A (1992)**				**Analyst: JB**	
Chromium, Hexavalent	0.120	0.100	0.200	NA	J	mg/kg	4/24/2015 12:00 PM	PA/VA
PERCENT MOISTURE			**Method: SM2540 B-1997**				**Analyst: TS**	
Percent Moisture	17	0.010	0.50	NA		wt%	4/28/2015 10:33 AM	
Oil and Grease			**Method: SW9071B (4/98)**				**Analyst: NC**	
Oil & Grease, Total Recoverable	0.100	0.030	0.060	NA		wt%-dry	4/25/2015 1:42 PM	
SEMIVOLATILE ORGANIC COMPOUNDS			**Method: SW8270D (2007)**				**Analyst: JC**	
1,4-Dinitrobenzene	ND	0.167	0.333	NA		mg/Kg	4/29/2015 3:04 PM	
1,4-Napthoquinone	ND	NA	0.333	NA		mg/Kg	4/29/2015 3:04 PM	
4-Nitroquinoline-1-oxide	ND	NA	0.333	NA		mg/Kg	4/30/2015 7:06 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1504Q01

Date Reported: 5/1/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	4/17/2015 12:00:00 AM
Project:	DRILL CUTTING ANAL	**Date Received:**	4/22/2015
Lab ID:	1504Q01-01A	**Matrix:**	Solid
Client Sample ID:	SHEEP RUN UNIT 2H (VERTICAL-AIR)	**Site ID:**	SHEEP RUN UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Pentachloronitrobenzene	ND	NA	0.333	NA		mg/Kg	4/29/2015 3:04 PM	
Bis(2-ethylhexyl)phthalate	ND	0.167	0.333	NA		mg/Kg	4/29/2015 3:04 PM	PA/VA
Butyl benzyl phthalate	ND	0.167	0.333	NA		mg/Kg	4/29/2015 3:04 PM	
Di-n-butyl phthalate	ND	0.167	0.333	NA		mg/Kg	4/29/2015 3:04 PM	PA/VA
Diethyl phthalate	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:04 PM	PA/VA
Dimethyl phthalate	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:04 PM	PA/VA
2,4-Dinitrotoluene	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:04 PM	PA/VA
2,6-Dinitrotoluene	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:04 PM	PA/VA
Di-n-octyl phthalate	ND	0.167	0.333	NA		mg/Kg	4/29/2015 3:04 PM	PA/VA
Fluoranthene	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:04 PM	PA/VA
Nitrobenzene	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:04 PM	PA/VA
Surr: 2-Fluorophenol	13.2	NA	54.1-110	NA	S	%REC	4/29/2015 3:04 PM	
Surr: Phenol-d5	66.2	NA	60.1-110	NA		%REC	4/29/2015 3:04 PM	
Surr: 2,4,6-Tribromophenol	0	NA	58.8-128	NA	S	%REC	4/29/2015 3:04 PM	
Surr: Nitrobenzene-d5	108	NA	68.2-123	NA		%REC	4/29/2015 3:04 PM	
Surr: 2-Fluorobiphenyl	98.4	NA	68.4-116	NA		%REC	4/29/2015 3:04 PM	
Surr: 4-Terphenyl-d14	96.8	NA	52.2-121	NA		%REC	4/29/2015 3:04 PM	
VOLATILE ORGANIC COMPOUNDS-8260			**Method: SW8260B (1996)**				**Analyst: JM**	
Benzene	19.5	1.64	3.28	NA		µg/Kg	4/27/2015 3:28 PM	PA/VA
Bromodichloromethane	ND	1.64	3.28	NA		µg/Kg	4/27/2015 3:28 PM	PA/VA
Chlorobenzene	ND	1.64	3.28	NA		µg/Kg	4/27/2015 3:28 PM	PA/VA
1,2-Dichlorobenzene	ND	1.64	3.28	NA		µg/Kg	4/27/2015 3:28 PM	PA/VA
1,3-Dichlorobenzene	ND	1.64	3.28	NA		µg/Kg	4/27/2015 3:28 PM	PA/VA
1,4-Dichlorobenzene	ND	1.64	3.28	NA		µg/Kg	4/27/2015 3:28 PM	PA/VA
Surr: 1,2-Dichloroethane-d4	109	NA	70-130	NA		%REC	4/27/2015 3:28 PM	
Surr: 4-Bromofluorobenzene	106	NA	70-130	NA		%REC	4/27/2015 3:28 PM	
Surr: Dibromofluoromethane	99.9	NA	70-130	NA		%REC	4/27/2015 3:28 PM	
Surr: Toluene-d8	97.0	NA	70-130	NA		%REC	4/27/2015 3:28 PM	

Notes:

Sample was received at the laboratory in a container that is not in accordance with method 5035 field sampling techniques.

ANIONS by IC, WATER SOLUBLE			**Method: SW9056A (2000)**				**Analyst: CF**	
Chloride	347	4.00	20.0	NA		mg/Kg	4/24/2015 4:38 PM	
Fluoride	11.0	0.800	4.00	NA		mg/Kg	4/24/2015 4:38 PM	
Nitrogen, Nitrate	0.600	0.400	2.00	NA	J	mg/Kg	4/24/2015 4:38 PM	
Nitrogen, Nitrite	1.00	1.00	10.0	NA	J	mg/Kg	4/24/2015 4:38 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1504Q01

Date Reported: 5/1/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	4/17/2015 12:00:00 AM
Project:	DRILL CUTTING ANAL	**Date Received:**	4/22/2015
Lab ID:	1504Q01-01A	**Matrix:**	Solid
Client Sample ID:	SHEEP RUN UNIT 2H (VERTICAL-AIR)	**Site ID:**	SHEEP RUN UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Sulfate	253	20.0	100	NA		mg/Kg	4/24/2015 4:38 PM	

Notes:

Matrix spike recoveries were not within method criteria due to matrix interference. LCS recoveries indicate method was in control.

AMMONIA NITROGEN			**Method: SM4500-NH3 B-C-1997**				**Analyst: CC**	
Nitrogen, Ammonia	ND	8.00	10.0	NA		mg/Kg	4/28/2015 5:08 PM	
TOTAL KJELDAHL NITROGEN (TKN)			**Method: EPA 351.2, Rev. 2.0 (1993)**				**Analyst: JH**	
Nitrogen, Kjeldahl, Total	234	25.2	126	NA		mg/Kg	4/24/2015 10:43 AM	PA/VA
CYANIDE, FREE			**Method: SM4500-CN I-1997**				**Analyst: JH**	
Cyanide, Free	ND	0.250	1.00	NA		mg/Kg	4/24/2015 1:56 PM	
CONDUCTIVITY			**Method: SM2510 B-1997**				**Analyst: KY**	
Specific Conductivity	14,000	NA	NA	NA		µmhos/cm	4/27/2015 10:30 AM	

Notes:

Conductivity result was estimated based on measuring a 1:10 dilution.

ALKALINITY			**Method: SM2320 B-1997**				**Analyst: DSD**	
Alkalinity, Total (As CaCO3)	16,400	100	2,000	NA		mg/Kg	4/23/2015 11:25 AM	
pH			**Method: SW9045D (2002)**				**Analyst: DSD**	
pH	12.1	NA	NA	NA		SU	4/27/2015 11:30 AM	PA/VA

REIC
Improving the environment, one client at a time...

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304)255-2500
Website: www.reiclabs.com

Sample Receipt Checklist

Client Name:	**MAR071**			Work Order Number:	**1504Q01**
RCPNo:	**1**	Date and Time Received:	**4/22/2015 4:13:35 PM**	Received by:	**Anthony Sisk**
Completed By:	**Anthony Sisk**		Reviewed By:	**Kathy Berry**	
Completed Date:	**4/22/2015 4:16:25 PM**		Reviewed Date:	**4/23/2015 10:48 AM**	

Carrier Name: REIC

1.	Chain of custody present?	Yes [x]	No [ ]		
2.	Chain of custody signed when relinquished and received?	Yes [ ]	No [x]		
3.	Are matrices correctly identified on Chain of custody?	Yes [x]	No [ ]		
4.	Is it clear what analyses were requested?	Yes [x]	No [ ]		
5.	Custody seals intact?	Yes [ ]	No [ ]	Not Present [x]	
6.	Samples in proper container type and preservative?	Yes [x]	No [ ]		
7.	Were correct preservatives noted on COC?	Yes [x]	No [ ]	NA [ ]	
8.	Sample containers intact?	Yes [x]	No [ ]		
9.	Sufficient sample volume for indicated test?	Yes [x]	No [ ]		
10.	Were container lables complete?	Yes [ ]	No [x]		
11.	All samples received within holding time?	Yes [x]	No [ ]		
12.	Was an attempt made to cool the samples?	Yes [x]	No [ ]	NA [ ]	
13.	Sample Temp. taken and recorded upon receipt?	Yes [x]	No [ ]	To 3	ºC
14.	Water - Were bubbles absent in VOC vials?	Yes [ ]	No [ ]	No Vials [x]	
15.	Are Samples considered acceptable?	Yes [x]	No [ ]		

Client Notification/Response

Client Name:	**MAR071**			Work Order Number:	**1504Q01**
Comment:	No preservative codes				
Client Contacted:	Yes [x]	No [ ]	NA [ ]	Person Contacted:	George Carico
Contact Mode:	Phone [ ]	Fax: [ ]	Email: [x]	In Person: [ ]	
Date Contacted:	**4/23/2015 10:18:00 AM**		Contacted By:	**Kathy Berry**	
Regarding:	No preservative codes listed				
Client Instructions:					

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

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1557 Commerce Road, Suite 201
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TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Monday, June 01, 2015

GEORGE CARICO
MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE
1 JOHN MARSHALL DRIVE
HUNTINGTON, WV 25755-2585

TEL: (304) 696-6042
FAX:

RE: DRILL CUTTING ANAL

Work Order #: 1504Q04

Dear GEORGE CARICO:

REI Consultants, Inc. received 1 sample(s) on 4/22/2015 for the analyses presented in the following report.

Sincerely,

Kathy Berry

REI Consultants, Inc. - Case Narrative

WO#: 1504Q04

Date Reported: 6/1/2015

Client: MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE

Project: DRILL CUTTING ANAL

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
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MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
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PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
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TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
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QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be consider estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1504Q04

Date Reported: 6/1/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	4/17/2015 12:00:00 AM
Project:	DRILL CUTTING ANAL	**Date Received:**	4/22/2015
Lab ID:	1504Q04-01A	**Matrix:**	Solid
Client Sample ID:	SHEEP RUN UNIT 2H (VERTICAL-AIR)	**Site ID:**	SHEEP RUN UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
GROSS ALPHA			**Method: EPA 900.0**				**Analyst: Sub**	
Gross Alpha	see attached	NA	NA	NA				
GROSS BETA			**Method: EPA 900.0**				**Analyst: Sub**	
Gross Beta	see attached	NA	NA	NA				
RADIUM-226			**Method: EPA 903.1**				**Analyst: Sub**	
Radium-226	see attached	NA	NA	NA				
RADIUM-228			**Method: EPA 904.0**				**Analyst: Sub**	
Radium-228	see attached	NA	NA	NA				
STRONTIUM-90			**Method: EPA 905.0**				**Analyst: Sub**	
Strontium-90	see attached	NA	NA	NA				

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REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304)255-2500
Website: www.reiclabs.com

Sample Receipt Checklist

Client Name:	**MAR071**			Work Order Number:	**1504Q04**
RCPNo:	**1**	Date and Time Received:	**4/22/2015 4:20:55 PM**	Received by:	**Anthony Sisk**
Completed By:	**Anthony Sisk**		Reviewed By:	**Kathy Berry**	
Completed Date:	**4/22/2015 4:22:19 PM**		Reviewed Date:	**4/23/2015 10:55 AM**	

Carrier Name: REIC

1.	Chain of custody present?	Yes [x]	No [ ]		
2.	Chain of custody signed when relinquished and received?	Yes [x]	No [ ]		
3.	Are matrices correctly identified on Chain of custody?	Yes [ ]	No [x]		
4.	Is it clear what analyses were requested?	Yes [x]	No [ ]		
5.	Custody seals intact?	Yes [ ]	No [ ]	Not Present [x]	
6.	Samples in proper container type and preservative?	Yes [x]	No [ ]		
7.	Were correct preservatives noted on COC?	Yes [x]	No [ ]	NA [ ]	
8.	Sample containers intact?	Yes [x]	No [ ]		
9.	Sufficient sample volume for indicated test?	Yes [x]	No [ ]		
10.	Were container labels complete?	Yes [ ]	No [x]		
11.	All samples received within holding time?	Yes [x]	No [ ]		
12.	Was an attempt made to cool the samples?	Yes [x]	No [ ]	NA [ ]	
13.	Sample Temp. taken and recorded upon receipt?	Yes [x]	No [ ]	To 3	ºC
14.	Water - Were bubbles absent in VOC vials?	Yes [ ]	No [ ]	No Vials [x]	
15.	Are Samples considered acceptable?	Yes [x]	No [ ]		
16.	COC filled out properly?	Yes [x]	No [ ]		

Client Notification/Response

Client Name: **MAR071** Work Order Number: **1504Q04**

Comment: No preservative codes listed

Client Contacted: Yes [x] No [ ] NA [ ] Person Contacted: George Carico

Contact Mode: Phone [ ] Fax: [ ] Email: [x] In Person: [ ]

Date Contacted: **4/23/2015 10:55:00 AM** Contacted By: **Kathy Berry**

Regarding: No preservative codes listed

Client Instructions:

Corrective Action:

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

May 28, 2015

Ms. Kathy Berry
REI Consultants, Inc.
225 Industrial Park Drive
PO Box 286
Beaver, WV 25813

RE: Project: 1504P81
Pace Project No.: 30146856

Dear Ms. Berry:
Enclosed are the analytical results for sample(s) received by the laboratory on April 29, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 1504P81
Pace Project No.: 30146856

Pennsylvania Certification IDs
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ACLASS DOD-ELAP Accreditation #: ADE-1544
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California/TNI Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Guam/PADEP Certification
Hawaii/PADEP Certification
Idaho Certification
Illinois/PADEP Certification
Indiana/PADEP Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188
Utah/TNI Certification #: PA014572014-4
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin/PADEP Certification
Wyoming Certification #: 8TMS-Q

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 1504P81
Pace Project No.: 30146856

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30146856001	**1504P81-01A**	Solid	04/20/15 00:01	04/29/15 15:10

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 1504P81
Pace Project No.: 30146856

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30146856001	**1504P81-01A**	EPA 901.1	MAH	2
		ASTM D5811-95	LAL	1
		EPA 9310	FCC	2

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1504P81
Pace Project No.: 30146856

Method: **EPA 901.1**
Description: 901.1 Gamma Spec INGROWTH
Client: REI Consultants, Inc.
Date: May 28, 2015

General Information:
1 sample was analyzed for EPA 901.1. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1504P81
Pace Project No.: 30146856

Method: **ASTM D5811-95**
Description: ASTM D5811 Sr 89/90 Eichrom
Client: REI Consultants, Inc.
Date: May 28, 2015

General Information:
1 sample was analyzed for ASTM D5811-95. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: RADC/24356

N2: The lab does not hold TNI accreditation for this parameter.

- 1504P81-01A (Lab ID: 30146856001)
  - Strontium-90
- BLANK (Lab ID: 889793)
  - Strontium-90

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1504P81
Pace Project No.: 30146856

Method: **EPA 9310**
Description: 9310 Gross Alpha/Beta
Client: REI Consultants, Inc.
Date: May 28, 2015

General Information:
1 sample was analyzed for EPA 9310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1504P81
Pace Project No.: 30146856

Sample: 1504P81-01A **Lab ID: 30146856001** Collected: 04/20/15 00:01 Received: 04/29/15 15:10 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis
Comments: • Sample collection times were not present on the sample containers or COC.
• Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.996 ± 0.427 (0.217) C:NA T:NA**	pCi/g	05/27/15 09:13	13982-63-3	
Radium-228	EPA 901.1	**2.112 ± 0.472 (0.234) C:NA T:NA**	pCi/g	05/27/15 09:13	15262-20-1	
Strontium-90	ASTM D5811-95	**0.0130 ± 0.0794 (0.195) C:112% T:NA**	pCi/g	05/09/15 13:14	10098-97-2	N2
Gross Alpha	EPA 9310	**17.8 ± 8.09 (11.0) C:NA T:NA**	pCi/g	05/13/15 19:44	12587-46-1	
Gross Beta	EPA 9310	**18.5 ± 4.92 (4.70) C:NA T:NA**	pCi/g	05/13/15 19:44	12587-47-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1504P81
Pace Project No.: 30146856

QC Batch: RADC/24366
QC Batch Method: EPA 901.1
Analysis Method: EPA 901.1
Analysis Description: 901.1 Gamma Spec Ingrowth
Associated Lab Samples: 30146856001

METHOD BLANK: 890150
Matrix: Solid
Associated Lab Samples: 30146856001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.112 ± 0.120 (0.250) C:NA T:NA	pCi/g	05/26/15 08:51	
Radium-228	0.069 ± 0.075 (0.434) C:NA T:NA	pCi/g	05/26/15 08:51	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1504P81
Pace Project No.: 30146856

QC Batch: RADC/24356
QC Batch Method: ASTM D5811-95
Analysis Method: ASTM D5811-95
Analysis Description: ASTM D5811 Sr 89/90 Eichrom
Associated Lab Samples: 30146856001

METHOD BLANK: 889793
Matrix: Solid
Associated Lab Samples: 30146856001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Strontium-90	-0.0168 ± 0.0968 (0.250) C:96% T:NA	pCi/g	05/09/15 13:14	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1504P81
Pace Project No.: 30146856

QC Batch: RADC/24426
QC Batch Method: EPA 9310
Analysis Method: EPA 9310
Analysis Description: 9310 Gross Alpha/Beta
Associated Lab Samples: 30146856001

METHOD BLANK: 892476
Matrix: Solid
Associated Lab Samples: 30146856001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.024 ± 0.0812 (0.219) C:NA T:NA	pCi/g	05/13/15 19:44	
Gross Beta	-0.012 ± 0.108 (0.255) C:NA T:NA	pCi/g	05/13/15 19:44	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1504P81
Pace Project No.: 30146856

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2 The lab does not hold TNI accreditation for this parameter.

REPORT OF LABORATORY ANALYSIS

REIC

Improving the environment, one client at a time...

CHAIN OF CUSTODY RECORD

COC ID: 3929	PAGE: 1	OF: 1

30146856

ADDRESS
REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
FAX: (304) 255-2572
Website: www.reiclabs.com

Please Include Email Address of Report Recipient Whenever Possible!!!

SUB CONTRATOR: **PACE_PA** COMPANY: **PACE ANALYTICAL SERVIC**

ADDRESS: **1638 ROSEYTOWN ROAD**

CITY, STATE, ZIP: **GREENSBURG, PA 15601**

PHONE: **(724) 850-5600** FAX:

ACCOUNT #: **050719EVF1** EMAIL:

SPECIAL INSTRUCTIONS / COMMENTS:

State Code: WV Please use SampleID as purchase order number.
After analysis, the samples do not need to be returned and can be disposed per your standard laboratory practices. Results to Kathy Berry at kberry@reiclabs.com

ITEM	SAMPLE ID	Client Sample ID	Bottle Type	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	GROSS_ALPHA_SUB (EPA 900.0)	GROSS_BETA_SUB (EPA 900.0)	RADIUM_226_SUB (EPA 903.1)	RADIUM_228_SUB (EPA 904.0)	STRONTIUM_90_SUB (EPA 905.0)
						*	0	0	0	0	0
1	1504P81-01A	BIERSTADT 2H (VERTICAL MUD)		Solid	4/20/2015	1	√	√	√	√	√

ANALYTICAL PARAMETERS

* Preservation Codes:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide/ Sodium Arsenite
6 Sodium Hydroxide
7 Ascorbic Acid
8 Sodium Sulfite/HCL
9 Potassium Dihydrogen Citrate
10 Bromium Chloride
11 CR6 Buffer Solution
COMMENTS:

Relinquished By:	Date: 4-23-15	Time: 16:00	Received By:	Date: 4/23/15	Time: 16:00
Relinquished By:	Date: 4/29/15	Time: 08:10	Received By: Cliff Mt by Pace	Date: 4/29/15	Time: 9:10
Relinquished By: Cliff Mt by Pace	Date: 4/29/15	Time: 3:10	Received By: Alma R. Mudrone	Date: 4/29/15	Time: 1510

TAT: Standard ☐ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☑ EMAIL ☐ ONLINE

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool ? _____

Comments: _____

Sample Condition Upon Receipt

Pace Analytical

Client Name: REIC

Project # 30146856

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap ___ Bubble Bags ___ None ✓ Other _____

Thermometer Used 8 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 4.1 °C Correction Factor: -0.3 °C Final Temp: 3.8 °C

Date and initials of person examining contents: ARM 4/29/15

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☑No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☑No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☐Yes ☑No ☐N/A	12 No times on sample bottles of COC
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	Initial when completed ARM Lot # of added preservative
exceptions: VOA, coliform, TOC, O&G, Phenols	☐Yes ☑No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Carino Serna **Date:** 4/30/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical

page 2

Project Number: 30146856

Client Name: REI

Item No.	001												
Matrix Code	SL												
Glass Jar (4oz / 250 / 500 / 1L)	2												
Soil Kit (2 SB, 1M, soil jar)													
Chemistry (250 / 500 / 1L)													
Organics (1L)													
Nutrient (250 / 500)													
Phenolics (250 ml)													
TOC (40 ml / 250 ml)													
TOX (250 ml)													
Total Metals													
Dissolved Metals preserved Y N													
O & G (1L)													
TPH (1L)													
VOA (40 ml 30 ml)													
Cyanide (250 ml)													
Sulfide (500 ml)													
Bacteria (120 ml)													
Wipes / swipe/ smear/ filter													
Radchem Nalgene (125 / 250 / 500 / 1L)													
Radchem Nalgene (1/2 gal. / 1 gal.L)													
Cubitainer (500 ml / 4L)													
Ziploc													
Other													
Other													

SCURF Back (C016-4 15May2012).xls

393864

CHAIN OF CUSTODY RECORD

REIC
Research Environmental & Industrial Consultants, Inc.
MAIN LABORATORY & CORPORATE HEADQUARTERS:
P.O. Box 286 • 225 Industrial Park Rd, Beaver, WV 25813
800-999-0105 • 304-255-2500 • www.reiclabs.com

Client: Marshall University CEGAS
Contact Person George Carico
QUOTE # _____ Fax: _____
Address 1 John Marshall Drive City Huntington State WV Zip 25755-2585
Billing Address (if different) _____
City _____ State _____ Zip _____
Site ID & State Bierstadt Unit 2H Project ID Drill Cutting Anal. Sampler Carico / Wolfe
PO # _____
Phone 304/696-5456
Email: carico@marshall.edu

MID-OHIO VALLEY Service Center
101 17th Street
Ashland, KY 41101
606-393-5027

SHENANDOAH Service Center
1557 Commerce Rd., Ste 201
Verona, VA 24482
540-248-0183

ROANOKE Service Center
3029-C Peters Creek Rd
Roanoke, VA 24019
540-777-1276

MORGANTOWN Service Center
16 Commerce Drive
Westover, WV 26501
304-241-5861

SAMPLE LOG & ANALYSIS REQUEST

TURNAROUND TIME
[X] NORMAL
RUSH TURNAROUND
[ ] 5 DAY [ ] 3 DAY [ ] 2 DAY [ ] 1 DAY
*Rush work needs prior laboratory approval and will incur additional charges

ANALYSIS & METHOD REQUESTED: X See Attachment (per Jason Clark, REIC)

SAMPLE ID	No. & Type of Containers	Sampling Date/Time	Matrix	Sample Comp/Grab
Bierstadt 2H (Vertical-Mud)	3-16 oz. 3-4 oz.	4/20/15	Drill Cuttings	Grab

ENTER PRESERVATIVE CODE:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA
8 Ascorbic Acid

COMMENTS:
Bierstadt 2H,
Primm Pad
API 47-017-06562

All analytical requests are subject to REIC's Standard Terms and Conditions.

Temperature at arrival: 2.0 °C ICED? Y ✓ N ___

1			2		
Relinquished by (signature) George Carico	Date/Time 4/21/15 10:03		Relinquished by (signature)	Date/Time	
Received by (signature)	Date/Time 4/21/15 18:03		Relinquished by (signature) Blane Will	Date/Time 4-22-15 14:50	

FAX RESULTS [ ] EMAIL RESULTS [ ]
SHIPMENT [X] Hand Delivered [ ] Courier [ ] UPS [ ] FEDEX [ ] USPS [ ] OTHER

COC-NCR-061312

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

Improving the environment, one client at a time...

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

101 17th Street
Ashland, KY 41101
TEL: 606.393.5027

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Tuesday, May 05, 2015

GEORGE CARICO
MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE
1 JOHN MARSHALL DRIVE
HUNTINGTON, WV 25755-2585

TEL: (304) 696-6042
FAX:

RE: DRILL CUTTING ANAL

Work Order #: 1504P75

Dear GEORGE CARICO:

REI Consultants, Inc. received 1 sample(s) on 4/22/2015 for the analyses presented in the following report.

Sincerely,

Kathy Berry

REI Consultants, Inc. - Case Narrative

WO#: 1504P75

Date Reported: 5/5/2015

Client: MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE

Project: DRILL CUTTING ANAL

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be consider estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1504P75

Date Reported: 5/5/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	4/20/2015 12:00:00 AM
Project:	DRILL CUTTING ANAL	**Date Received:**	4/22/2015
Lab ID:	1504P75-01A	**Matrix:**	Solid
Client Sample ID:	BIERSTADT 2H (VERTICAL-MUD)	**Site ID:**	BIERSTADT UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS by ICP			**Method: SW6010C (2007)**				**Analyst: JD**	
Aluminum	11,000	3.00	25.0	NA		mg/Kg	4/23/2015 4:43 PM	PA/VA
Antimony	ND	2.00	5.00	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Arsenic	10.4	1.00	5.00	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Barium	754	0.200	2.50	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Beryllium	0.605	0.0500	0.250	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Boron	8.22	1.00	2.50	NA		mg/Kg	4/27/2015 10:41 AM	PA/VA
Cadmium	0.524	0.100	0.500	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Chromium	20.3	0.200	2.50	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Copper	19.8	0.200	2.50	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Iron	23,000	50.0	250	NA		mg/Kg	4/23/2015 4:47 PM	PA/VA
Lead	15.8	1.00	5.00	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Lithium	25.2	0.100	5.00	NA		mg/Kg	4/24/2015 2:33 PM	
Manganese	221	0.200	2.50	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Nickel	22.4	0.200	2.50	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Selenium	ND	1.00	5.00	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Silver	0.180	0.100	1.25	NA	J	mg/Kg	4/23/2015 4:40 PM	PA/VA
Strontium	2,270	1.00	25.0	NA		mg/Kg	4/24/2015 2:36 PM	PA/VA
Vanadium	21.1	0.200	2.50	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
Zinc	66.2	0.500	2.50	NA		mg/Kg	4/23/2015 4:40 PM	PA/VA
MERCURY, Total SW7417B			**Method: SW7471B (2/07)**				**Analyst: CR**	
Mercury	0.028	0.020	0.100	NA	J	mg/Kg	5/1/2015 11:55 AM	PA/VA
HEXAVALENT CHROMIUM, WATER SOLUBLE			**Method: SW7196A (1992)**				**Analyst: JB**	
Chromium, Hexavalent	0.280	0.100	0.200	NA		mg/kg	4/24/2015 12:00 PM	PA/VA
PERCENT MOISTURE			**Method: SM2540 B-1997**				**Analyst: TS**	
Percent Moisture	25	0.010	0.50	NA		wt%	4/28/2015 10:33 AM	
Oil and Grease			**Method: SW9071B (4/98)**				**Analyst: NC**	
Oil & Grease, Total Recoverable	0.143	0.033	0.067	NA		wt%-dry	4/25/2015 1:42 PM	
SEMIVOLATILE ORGANIC COMPOUNDS			**Method: SW8270D (2007)**				**Analyst: JC**	
1,4-Dinitrobenzene	ND	0.167	0.333	NA		mg/Kg	4/29/2015 3:33 PM	
1,4-Napthoquinone	ND	NA	0.333	NA		mg/Kg	4/29/2015 3:33 PM	
4-Nitroquinoline-1-oxide	ND	NA	0.333	NA		mg/Kg	4/30/2015 7:32 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1504P75

Date Reported: 5/5/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	4/20/2015 12:00:00 AM
Project:	DRILL CUTTING ANAL	**Date Received:**	4/22/2015
Lab ID:	1504P75-01A	**Matrix:**	Solid
Client Sample ID:	BIERSTADT 2H (VERTICAL-MUD)	**Site ID:**	BIERSTADT UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Pentachloronitrobenzene	ND	NA	0.333	NA		mg/Kg	4/29/2015 3:33 PM	
Bis(2-ethylhexyl)phthalate	ND	0.167	0.333	NA		mg/Kg	4/29/2015 3:33 PM	PA/VA
Butyl benzyl phthalate	ND	0.167	0.333	NA		mg/Kg	4/29/2015 3:33 PM	
Di-n-butyl phthalate	ND	0.167	0.333	NA		mg/Kg	4/29/2015 3:33 PM	PA/VA
Diethyl phthalate	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:33 PM	PA/VA
Dimethyl phthalate	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:33 PM	PA/VA
2,4-Dinitrotoluene	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:33 PM	PA/VA
2,6-Dinitrotoluene	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:33 PM	PA/VA
Di-n-octyl phthalate	ND	0.167	0.333	NA		mg/Kg	4/29/2015 3:33 PM	PA/VA
Fluoranthene	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:33 PM	PA/VA
Nitrobenzene	ND	0.067	0.333	NA		mg/Kg	4/29/2015 3:33 PM	PA/VA
Surr: 2-Fluorophenol	66.5	NA	54.1-110	NA		%REC	4/29/2015 3:33 PM	
Surr: Phenol-d5	74.6	NA	60.1-110	NA		%REC	4/29/2015 3:33 PM	
Surr: 2,4,6-Tribromophenol	73.3	NA	58.8-128	NA		%REC	4/29/2015 3:33 PM	
Surr: Nitrobenzene-d5	95.0	NA	68.2-123	NA		%REC	4/29/2015 3:33 PM	
Surr: 2-Fluorobiphenyl	85.0	NA	68.4-116	NA		%REC	4/29/2015 3:33 PM	
Surr: 4-Terphenyl-d14	83.6	NA	52.2-121	NA		%REC	4/29/2015 3:33 PM	
VOLATILE ORGANIC COMPOUNDS-8260			**Method: SW8260B (1996)**				**Analyst: JM**	
Benzene	115	25.0	50.0	NA		µg/Kg	4/29/2015 5:00 PM	PA/VA
Bromodichloromethane	7.36	1.86	3.72	NA		µg/Kg	4/27/2015 4:03 PM	PA/VA
Chlorobenzene	ND	1.86	3.72	NA		µg/Kg	4/27/2015 4:03 PM	PA/VA
1,2-Dichlorobenzene	ND	1.86	3.72	NA		µg/Kg	4/27/2015 4:03 PM	PA/VA
1,3-Dichlorobenzene	ND	1.86	3.72	NA		µg/Kg	4/27/2015 4:03 PM	PA/VA
1,4-Dichlorobenzene	ND	1.86	3.72	NA		µg/Kg	4/27/2015 4:03 PM	PA/VA
Surr: 1,2-Dichloroethane-d4	78.0	NA	70-130	NA		%REC	4/29/2015 5:00 PM	
Surr: 4-Bromofluorobenzene	122	NA	70-130	NA		%REC	4/29/2015 5:00 PM	
Surr: Dibromofluoromethane	92.4	NA	70-130	NA		%REC	4/29/2015 5:00 PM	
Surr: Toluene-d8	103	NA	70-130	NA		%REC	4/29/2015 5:00 PM	

Notes:

Sample was received at the laboratory in a container that is not in accordance with method 5035 field sampling techniques.

ANIONS by IC, WATER SOLUBLE			**Method: SW9056A (2000)**				**Analyst: CF**
Chloride	43,800	400	2,000	NA		mg/Kg	4/24/2015 4:38 PM
Fluoride	72.2	1.00	8.00	NA		mg/Kg	4/24/2015 4:38 PM
Nitrogen, Nitrate	0.400	0.400	2.00	NA	J	mg/Kg	4/24/2015 4:38 PM
Nitrogen, Nitrite	ND	5.00	50.0	NA		mg/Kg	4/24/2015 4:38 PM

REI Consultants, Inc. - Analytical Report

WO#: 1504P75

Date Reported: 5/5/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	4/20/2015 12:00:00 AM
Project:	DRILL CUTTING ANAL	**Date Received:**	4/22/2015
Lab ID:	1504P75-01A	**Matrix:**	Solid
Client Sample ID:	BIERSTADT 2H (VERTICAL-MUD)	**Site ID:**	BIERSTADT UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Sulfate	758	20.0	100	NA		mg/Kg	4/24/2015 4:38 PM	

Notes:

Elevated PQLs are due to matrix interference.

AMMONIA NITROGEN — **Method: SM4500-NH3 B-C-1997** — **Analyst: CC**

Nitrogen, Ammonia	10.9	8.00	10.0	NA		mg/Kg	4/28/2015 5:08 PM	

TOTAL KJELDAHL NITROGEN (TKN) — **Method: EPA 351.2, Rev. 2.0 (1993)** — **Analyst: JH**

Nitrogen, Kjeldahl, Total	539	25.2	126	NA		mg/Kg	4/24/2015 10:42 AM	PA/VA

CYANIDE, FREE — **Method: SM4500-CN I-1997** — **Analyst: JH**

Cyanide, Free	ND	0.250	1.00	NA		mg/Kg	4/24/2015 1:56 PM	

CONDUCTIVITY — **Method: SM2510 B-1997** — **Analyst: KY**

Specific Conductivity	134,000	NA	NA	NA		µmhos/cm	4/27/2015 10:30 AM	

Notes:

Conductivity result was estimated based on measuring a 1:10 dilution.

ALKALINITY — **Method: SM2320 B-1997** — **Analyst: DSD**

Alkalinity, Total (As CaCO3)	7,590	100	2,000	NA		mg/Kg	4/23/2015 11:25 AM	

pH — **Method: SW9045D (2002)** — **Analyst: DSD**

pH	8.94	NA	NA	NA		SU	5/4/2015 11:25 AM	PA/VA

REIC
Improving the environment, one client at a time...

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304)255-2500
Website: www.reiclabs.com

Sample Receipt Checklist

Client Name:	**MAR071**			Work Order Number:	**1504P75**
RCPNo:	**1**	Date and Time Received:	**4/22/2015 3:29:03 PM**	Received by:	**Jeff Ginger**
Completed By:	**Anthony Sisk**		Reviewed By:		
Completed Date:	**4/22/2015 3:36:19 PM**		Reviewed Date:		

Carrier Name: REIC

1.	Chain of custody present?	Yes [x]	No [ ]		
2.	Chain of custody signed when relinquished and received?	Yes [x]	No [ ]		
3.	Are matrices correctly identified on Chain of custody?	Yes [x]	No [ ]		
4.	Is it clear what analyses were requested?	Yes [x]	No [ ]		
5.	Custody seals intact?	Yes [ ]	No [ ]	Not Present [x]	
6.	Samples in proper container type and preservative?	Yes [x]	No [ ]		
7.	Were correct preservatives noted on COC?	Yes [x]	No [ ]	NA [ ]	
8.	Sample containers intact?	Yes [x]	No [ ]		
9.	Sufficient sample volume for indicated test?	Yes [x]	No [ ]		
10.	Were container lables complete?	Yes [x]	No [ ]		
11.	All samples received within holding time?	Yes [x]	No [ ]		
12.	Was an attempt made to cool the samples?	Yes [x]	No [ ]	NA [ ]	
13.	Sample Temp. taken and recorded upon receipt?	Yes [x]	No [ ]	To 2	ºC
14.	Water - Were bubbles absent in VOC vials?	Yes [ ]	No [ ]	No Vials [x]	
15.	Are Samples considered acceptable?	Yes [x]	No [ ]		

Client Notification/Response

Client Name:	**MAR071**			Work Order Number:	**1504P75**
Comment:	No preservative codes listed on COC				
Client Contacted:	Yes [x]	No [ ]	NA [ ]	Person Contacted:	George Carico
Contact Mode:	Phone [ ]	Fax: [ ]	Email: [x]	In Person: [ ]	
Date Contacted:	**4/23/2015 10:34:00 AM**		Contacted By:	**Kathy Berry**	
Regarding:	No preservative codes listed				
Client Instructions:					

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

Improving the environment, one client at a time...

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

101 17th Street
Ashland, KY 41101
TEL: 606.393.5027

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Monday, June 01, 2015

GEORGE CARICO
MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE
1 JOHN MARSHALL DRIVE
HUNTINGTON, WV 25755-2585

TEL: (304) 696-6042
FAX:

RE: DRILL CUTTING ANAL

Work Order #: 1504P81

Dear GEORGE CARICO:

REI Consultants, Inc. received 1 sample(s) on 4/22/2015 for the analyses presented in the following report.

Sincerely,

Kathy Berry

REI Consultants, Inc. - Case Narrative

WO#: 1504P81

Date Reported: 6/1/2015

Client: MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE

Project: DRILL CUTTING ANAL

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be consider estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1504P81

Date Reported: 6/1/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	4/20/2015 12:00:00 AM
Project:	DRILL CUTTING ANAL	**Date Received:**	4/22/2015
Lab ID:	1504P81-01A	**Matrix:**	Solid
Client Sample ID:	BIERSTADT 2H (VERTICAL MUD)	**Site ID:**	BIERSTADT UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
GROSS ALPHA			**Method: EPA 900.0**				**Analyst: Sub**	
Gross Alpha	see attached	NA	NA	NA		pci/L		
GROSS BETA			**Method: EPA 900.0**				**Analyst: Sub**	
Gross Beta	see attached	NA	NA	NA		pci/L		
RADIUM-226			**Method: EPA 903.1**				**Analyst: Sub**	
Radium-226	see attached	NA	NA	NA		pci/L		
RADIUM-228			**Method: EPA 904.0**				**Analyst: Sub**	
Radium-228	see attached	NA	NA	NA		pci/L		
STRONTIUM-90			**Method: EPA 905.0**				**Analyst: Sub**	
Strontium-90	see attached	NA	NA	NA				

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REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304)255-2500
Website: www.reiclabs.com

Sample Receipt Checklist

Client Name:	**MAR071**			Work Order Number:	**1504P81**
RCPNo:	**1**	Date and Time Received:	**4/22/2015 3:40:04 PM**	Received by:	**Jeff Ginger**
Completed By:		Reviewed By:	**Kathy Berry**		
Completed Date:		Reviewed Date:	**4/23/2015 10:37 AM**		

Carrier Name: REIC

1.	Chain of custody present?	Yes [x]	No [ ]	
2.	Chain of custody signed when relinquished and received?	Yes [x]	No [ ]	
3.	Are matrices correctly identified on Chain of custody?	Yes [x]	No [ ]	
4.	Is it clear what analyses were requested?	Yes [x]	No [ ]	
5.	Custody seals intact?	Yes [ ]	No [ ]	Not Present [x]
6.	Samples in proper container type and preservative?	Yes [x]	No [ ]	
7.	Were correct preservatives noted on COC?	Yes [x]	No [ ]	NA [ ]
8.	Sample containers intact?	Yes [x]	No [ ]	
9.	Sufficient sample volume for indicated test?	Yes [x]	No [ ]	
10.	Were container labels complete?	Yes [ ]	No [x]	
11.	All samples received within holding time?	Yes [x]	No [ ]	
12.	Was an attempt made to cool the samples?	Yes [x]	No [ ]	NA [ ]
13.	Sample Temp. taken and recorded upon receipt?	Yes [x]	No [ ]	To 2 ºC
14.	Water - Were bubbles absent in VOC vials?	Yes [ ]	No [ ]	No Vials [x]
15.	Are Samples considered acceptable?	Yes [x]	No [ ]	
16.	COC filled out properly?	Yes [x]	No [ ]	

Client Notification/Response

Client Name: **MAR071** Work Order Number: **1504P81**

Comment:

Client Contacted: Yes [x] No [ ] NA [ ] Person Contacted: George Carico

Contact Mode: Phone [ ] Fax: [ ] Email: [x] In Person: [ ]

Date Contacted: **4/23/2015 10:45:00 AM** Contacted By: **Kathy Berry**

Regarding: No prservative codes on COC

Client Instructions:

Corrective Action:

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

May 28, 2015

Ms. Kathy Berry
REI Consultants, Inc.
225 Industrial Park Drive
PO Box 286
Beaver, WV 25813

RE: Project: 1504P81
Pace Project No.: 30146856

Dear Ms. Berry:
Enclosed are the analytical results for sample(s) received by the laboratory on April 29, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 1504P81
Pace Project No.: 30146856

Pennsylvania Certification IDs
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ACLASS DOD-ELAP Accreditation #: ADE-1544
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California/TNI Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Guam/PADEP Certification
Hawaii/PADEP Certification
Idaho Certification
Illinois/PADEP Certification
Indiana/PADEP Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188
Utah/TNI Certification #: PA014572014-4
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin/PADEP Certification
Wyoming Certification #: 8TMS-Q

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 1504P81
Pace Project No.: 30146856

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30146856001	**1504P81-01A**	Solid	04/20/15 00:01	04/29/15 15:10

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 1504P81
Pace Project No.: 30146856

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30146856001	**1504P81-01A**	EPA 901.1	MAH	2
		ASTM D5811-95	LAL	1
		EPA 9310	FCC	2

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1504P81
Pace Project No.: 30146856

Method: **EPA 901.1**
Description: 901.1 Gamma Spec INGROWTH
Client: REI Consultants, Inc.
Date: May 28, 2015

General Information:
1 sample was analyzed for EPA 901.1. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1504P81
Pace Project No.: 30146856

Method: **ASTM D5811-95**
Description: ASTM D5811 Sr 89/90 Eichrom
Client: REI Consultants, Inc.
Date: May 28, 2015

General Information:
1 sample was analyzed for ASTM D5811-95. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: RADC/24356

N2: The lab does not hold TNI accreditation for this parameter.

- 1504P81-01A (Lab ID: 30146856001)
  - Strontium-90
- BLANK (Lab ID: 889793)
  - Strontium-90

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1504P81
Pace Project No.: 30146856

Method: **EPA 9310**
Description: 9310 Gross Alpha/Beta
Client: REI Consultants, Inc.
Date: May 28, 2015

General Information:
1 sample was analyzed for EPA 9310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1504P81
Pace Project No.: 30146856

Sample: 1504P81-01A **Lab ID: 30146856001** Collected: 04/20/15 00:01 Received: 04/29/15 15:10 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis
Comments: • Sample collection times were not present on the sample containers or COC.
• Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 901.1	**1.996 ± 0.427 (0.217) C:NA T:NA**	pCi/g	05/27/15 09:13	13982-63-3	
Radium-228	EPA 901.1	**2.112 ± 0.472 (0.234) C:NA T:NA**	pCi/g	05/27/15 09:13	15262-20-1	
Strontium-90	ASTM D5811-95	**0.0130 ± 0.0794 (0.195) C:112% T:NA**	pCi/g	05/09/15 13:14	10098-97-2	N2
Gross Alpha	EPA 9310	**17.8 ± 8.09 (11.0) C:NA T:NA**	pCi/g	05/13/15 19:44	12587-46-1	
Gross Beta	EPA 9310	**18.5 ± 4.92 (4.70) C:NA T:NA**	pCi/g	05/13/15 19:44	12587-47-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1504P81
Pace Project No.: 30146856

QC Batch: RADC/24366
QC Batch Method: EPA 901.1
Analysis Method: EPA 901.1
Analysis Description: 901.1 Gamma Spec Ingrowth
Associated Lab Samples: 30146856001

METHOD BLANK: 890150
Matrix: Solid
Associated Lab Samples: 30146856001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.112 ± 0.120 (0.250) C:NA T:NA	pCi/g	05/26/15 08:51	
Radium-228	0.069 ± 0.075 (0.434) C:NA T:NA	pCi/g	05/26/15 08:51	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1504P81
Pace Project No.: 30146856

QC Batch: RADC/24356
QC Batch Method: ASTM D5811-95
Analysis Method: ASTM D5811-95
Analysis Description: ASTM D5811 Sr 89/90 Eichrom
Associated Lab Samples: 30146856001

METHOD BLANK: 889793
Matrix: Solid
Associated Lab Samples: 30146856001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Strontium-90	-0.0168 ± 0.0968 (0.250) C:96% T:NA	pCi/g	05/09/15 13:14	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1504P81
Pace Project No.: 30146856

QC Batch: RADC/24426
QC Batch Method: EPA 9310
Analysis Method: EPA 9310
Analysis Description: 9310 Gross Alpha/Beta
Associated Lab Samples: 30146856001

METHOD BLANK: 892476
Matrix: Solid
Associated Lab Samples: 30146856001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.024 ± 0.0812 (0.219) C:NA T:NA	pCi/g	05/13/15 19:44	
Gross Beta	-0.012 ± 0.108 (0.255) C:NA T:NA	pCi/g	05/13/15 19:44	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1504P81
Pace Project No.: 30146856

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2 The lab does not hold TNI accreditation for this parameter.

REPORT OF LABORATORY ANALYSIS

REIC

Improving the environment, one client at a time...

CHAIN OF CUSTODY RECORD

COC ID: 3929	PAGE: 1	OF: 1

30146856

ADDRESS
REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
FAX: (304) 255-2572
Website: www.reiclabs.com

Please Include Email Address of Report Recipient Whenever Possible!!!

SUB CONTRATOR: **PACE_PA** COMPANY: **PACE ANALYTICAL SERVIC**

ADDRESS: **1638 ROSEYTOWN ROAD**

CITY, STATE, ZIP: **GREENSBURG, PA 15601**

PHONE: **(724) 850-5600** FAX:

ACCOUNT #: **050719EVF1** EMAIL:

SPECIAL INSTRUCTIONS / COMMENTS:

State Code: WV Please use SampleID as purchase order number.
After analysis, the samples do not need to be returned and can be disposed per your standard laboratory practices. Results to Kathy Berry at kberry@reiclabs.com

ITEM	SAMPLE ID	Client Sample ID	Bottle Type	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	GROSS_ALPHA_SUB (EPA 900.0)	GROSS_BETA_SUB (EPA 900.0)	RADIUM_226_SUB (EPA 903.1)	RADIUM_228_SUB (EPA 904.0)	STRONTIUM_90_SUB (EPA 905.0)
						*	0	0	0	0	0
1	1504P81-01A	BIERSTADT 2H (VERTICAL MUD)		Solid	4/20/2015	1	√	√	√	√	√

ANALYTICAL PARAMETERS

* Preservation Codes:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide/ Sodium Arsenite
6 Sodium Hydroxide
7 Ascorbic Acid
8 Sodium Sulfite/HCL
9 Potassium Dihydrogen Citrate
10 Bromium Chloride
11 CR6 Buffer Solution
COMMENTS:

Relinquished By:	Date: 4-23-15	Time: 16:00	Received By:	Date: 4/23/15	Time: 16:00
Relinquished By:	Date: 4/29/15	Time: 08:10	Received By: Cliff Mt by Pace	Date: 4/29/15	Time: 9:10
Relinquished By: Cliff Mt by Pace	Date: 4/29/15	Time: 3:10	Received By: Alma R. Mudrone	Date: 4/29/15	Time: 1510

TAT: Standard ☐ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☑ EMAIL ☐ ONLINE

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool ? _____

Comments: _____

Sample Condition Upon Receipt

Pace Analytical

Client Name: REIC

Project # 30146856

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap ___ Bubble Bags ___ None ✓ Other _____

Thermometer Used 8 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 4.1 °C Correction Factor: -0.3 °C Final Temp: 3.8 °C

Date and initials of person examining contents: ARM 4/29/15

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☑No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☑No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☐Yes ☑No ☐N/A	12 No times on sample bottles of COC
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	Initial when completed ARM Lot # of added preservative
exceptions: VOA, coliform, TOC, O&G, Phenols	☐Yes ☑No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Carino Serna **Date:** 4/30/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical

page 2

Project Number: 30146856

Client Name: REI

Item No.	001												
Matrix Code	SL												
Glass Jar (4oz / 250 / 500 / 1L)	2												
Soil Kit (2 SB, 1M, soil jar)													
Chemistry (250 / 500 / 1L)													
Organics (1L)													
Nutrient (250 / 500)													
Phenolics (250 ml)													
TOC (40 ml / 250 ml)													
TOX (250 ml)													
Total Metals													
Dissolved Metals preserved Y N													
O & G (1L)													
TPH (1L)													
VOA (40 ml 30 ml)													
Cyanide (250 ml)													
Sulfide (500 ml)													
Bacteria (120 ml)													
Wipes / swipe/ smear/ filter													
Radchem Nalgene (125 / 250 / 500 / 1L)													
Radchem Nalgene (1/2 gal. / 1 gal.L)													
Cubitainer (500 ml / 4L)													
Ziploc													
Other													
Other													

SCURF Back (C016-4 15May2012).xls

393866

CHAIN OF CUSTODY RECORD

REIC
Research Environmental & Industrial Consultants, Inc.
MAIN LABORATORY & CORPORATE HEADQUARTERS:
P.O. Box 286 • 225 Industrial Park Rd, Beaver, WV 25813
800-999-0105 • 304-255-2500 • www.reiclabs.com

MID-OHIO VALLEY Service Center
101 17th Street
Ashland, KY 41101
606-393-5027

SHENANDOAH Service Center
1557 Commerce Rd., Ste 201
Verona, VA 24482
540-248-0183

ROANOKE Service Center
3029-C Peters Creek Rd
Roanoke, VA 24019
540-777-1276

MORGANTOWN Service Center
16 Commerce Drive
Westover, WV 26501
304-241-5861

Client: Marshall University CEGAS
Contact Person George Carico
QUOTE # _____ Fax: _____
Address 1 John Marshall Drive City Huntington State WV Zip 25755
Billing Address (if different) _____
City _____ State _____ Zip _____
Site ID & State McGee Unit 2H Project ID Drill Cutting Anal Sampler G. Carico
PO # _____
Phone 304/696-5456
Email: carico@marshall.edu

SAMPLE LOG & ANALYSIS REQUEST

TURNAROUND TIME: [X] NORMAL
RUSH TURNAROUND: [ ] 5 DAY [ ] 3 DAY [ ] 2 DAY [ ] 1 DAY
*Rush work needs prior laboratory approval and will incur additional charges

ANALYSIS & METHOD REQUESTED: * See Attachment (per Jason Clark, RSIC)

SAMPLE ID	No. & Type of Containers	Sampling Date/Time	Matrix	Sample Comp/Grab
McGee Unit 2H	3-16 oz.	1/28/15,	Drill Cuttings	Grab
	3-4 oz.	1:30pm	"	"

ENTER PRESERVATIVE CODE:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA
8 Ascorbic Acid

COMMENTS:
McGee Unit 2H,
Robert Williams Pad
API 47-0170622

All analytical requests are subject to REIC's Standard Terms and Conditions.

Temperature at arrival: 2 °C ICED? Y ✓ N ___

1 Relinquished by (signature) George Carico	1/28/15 Date/Time 12:40 pm	2 Relinquished by (signature)	Date/Time	FAX RESULTS [ ]	EMAIL RESULTS [✓]
Received by (signature)	1/29/15 Date/Time	Received by (signature)	Date/Time	SHIPMENT ___ Hand Delivered ___ Courier ___ UPS ___ FEDEX ___ USPS ___ OTHER	

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

Improving the environment, one client at a time...

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

101 17th Street
Ashland, KY 41101
TEL: 606.393.5027

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Thursday, February 12, 2015

GEORGE CARICO
MARSHALL UNIVERSITY CENTER FOR ENVIRONMENTAL,
1 JOHN MARSHALL DRIVE
HUNTINGTON, WV 25755-2585

TEL: (304) 696-6042
FAX:

RE: DRILL CUTTING ANAL.

Work Order #: 1501U77

Dear GEORGE CARICO:

Kathy Berry

REI Consultants, Inc. - Case Narrative

WO#: 1501U77

Date Reported: 2/12/2015

Client: MARSHALL UNIVERSITY CENTER FOR ENVIRONMENTAL,

Project: DRILL CUTTING ANAL.

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be consider estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1501U77

Date Reported: 2/12/2015

Client:	MARSHALL UNIVERSITY CENTER FOR ENVIRONMENTAL,	**Collection Date:**	1/28/2015 1:30:00 PM
Project:	DRILL CUTTING ANAL.	**Date Received:**	1/30/2015
Lab ID:	1501U77-01A	**Matrix:**	Solid
Client Sample ID:	MCGEE UNIT 2H	**Site ID:**	MCGEE UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS by ICP			**Method: SW6010C (2007)**				**Analyst: JD**	
Aluminum	2,710	3.00	25.0	NA		mg/Kg	2/2/2015 7:21 PM	PA/VA
Antimony	3.99	2.00	5.00	NA	J	mg/Kg	2/2/2015 7:18 PM	PA/VA
Arsenic	26.1	1.00	5.00	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Barium	147	0.200	2.50	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Beryllium	0.463	0.0500	0.250	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Boron	20.4	1.00	2.50	NA		mg/Kg	2/3/2015 11:36 AM	PA/VA
Cadmium	4.43	0.100	0.500	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Chromium	17.0	0.200	2.50	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Copper	95.6	0.200	2.50	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Iron	17,900	5.00	25.0	NA		mg/Kg	2/2/2015 7:21 PM	PA/VA
Lead	29.8	1.00	5.00	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Lithium	3.85	0.100	5.00	NA	J	mg/Kg	2/4/2015 1:46 PM	
Manganese	155	0.200	2.50	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Nickel	79.9	0.200	2.50	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Selenium	9.21	1.00	5.00	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Silver	0.658	0.100	1.25	NA	J	mg/Kg	2/2/2015 7:18 PM	PA/VA
Strontium	6,320	10.0	250	NA		mg/Kg	2/4/2015 3:49 PM	PA/VA
Vanadium	68.7	0.200	2.50	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
Zinc	233	0.500	2.50	NA		mg/Kg	2/2/2015 7:18 PM	PA/VA
MERCURY, Total SW7417B			**Method: SW7471B (2/07)**				**Analyst: CR**	
Mercury	0.106	0.020	0.100	NA		mg/Kg	2/5/2015 12:10 PM	PA/VA
HEXAVALENT CHROMIUM, WATER SOLUBLE			**Method: SW7196A (1992)**				**Analyst: JB**	
Chromium, Hexavalent	1.04	0.100	0.200	NA		mg/kg	2/4/2015 7:45 AM	PA/VA
PERCENT MOISTURE			**Method: SM2540 B-1997**				**Analyst: TS**	
Percent Moisture	29	0.010	0.50	NA		wt%	2/2/2015 2:08 PM	
Oil and Grease			**Method: SW9071B (4/98)**				**Analyst: NC**	
Oil & Grease, Total Recoverable	0.017	0.001	0.070	NA	J	wt%-dry	2/3/2015 11:00 AM	
SEMIVOLATILE ORGANIC COMPOUNDS			**Method: SW8270D (2007)**				**Analyst: JD**	
1,4-Dinitrobenzene	ND	0.168	0.334	NA		mg/Kg	2/3/2015 7:54 PM	
1,4-Napthoquinone	ND	NA	0.334	NA		mg/Kg	2/3/2015 7:54 PM	
4-Nitroquinoline-1-oxide	ND	NA	0.334	NA		mg/Kg	2/3/2015 7:54 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1501U77

Date Reported: 2/12/2015

Client:	MARSHALL UNIVERSITY CENTER FOR ENVIRONMENTAL,	**Collection Date:**	1/28/2015 1:30:00 PM
Project:	DRILL CUTTING ANAL.	**Date Received:**	1/30/2015
Lab ID:	1501U77-01A	**Matrix:**	Solid
Client Sample ID:	MCGEE UNIT 2H	**Site ID:**	MCGEE UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Pentachloronitrobenzene	ND	NA	0.334	NA		mg/Kg	2/3/2015 7:54 PM	
Bis(2-ethylhexyl)phthalate	ND	0.168	0.334	NA		mg/Kg	2/3/2015 7:54 PM	PA/VA
Butyl benzyl phthalate	ND	0.168	0.334	NA		mg/Kg	2/3/2015 7:54 PM	
Di-n-butyl phthalate	ND	0.168	0.334	NA		mg/Kg	2/3/2015 7:54 PM	PA/VA
Diethyl phthalate	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:54 PM	PA/VA
Dimethyl phthalate	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:54 PM	PA/VA
2,4-Dinitrotoluene	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:54 PM	PA/VA
2,6-Dinitrotoluene	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:54 PM	PA/VA
Di-n-octyl phthalate	ND	0.168	0.334	NA		mg/Kg	2/3/2015 7:54 PM	PA/VA
Fluoranthene	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:54 PM	PA/VA
Nitrobenzene	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:54 PM	PA/VA
Surr: 2-Fluorophenol	66.9	NA	54.1-110	NA		%REC	2/3/2015 7:54 PM	
Surr: Phenol-d5	74.3	NA	60.1-110	NA		%REC	2/3/2015 7:54 PM	
Surr: 2,4,6-Tribromophenol	55.8	NA	58.8-128	NA	S	%REC	2/3/2015 7:54 PM	
Surr: Nitrobenzene-d5	84.7	NA	68.2-123	NA		%REC	2/3/2015 7:54 PM	
Surr: 2-Fluorobiphenyl	76.0	NA	68.4-116	NA		%REC	2/3/2015 7:54 PM	
Surr: 4-Terphenyl-d14	83.4	NA	52.2-121	NA		%REC	2/3/2015 7:54 PM	
VOLATILE ORGANIC COMPOUNDS-8260			**Method: SW8260B (1996)**				**Analyst: JM**	
Benzene	1,660	50.0	100	NA		µg/Kg	2/9/2015 3:16 PM	PA/VA
Bromodichloromethane	ND	1.90	3.80	NA		µg/Kg	2/5/2015 3:13 PM	PA/VA
Chlorobenzene	ND	1.90	3.80	NA		µg/Kg	2/5/2015 3:13 PM	PA/VA
1,2-Dichlorobenzene	ND	1.90	3.80	NA		µg/Kg	2/5/2015 3:13 PM	PA/VA
1,3-Dichlorobenzene	ND	1.90	3.80	NA		µg/Kg	2/5/2015 3:13 PM	PA/VA
1,4-Dichlorobenzene	ND	1.90	3.80	NA		µg/Kg	2/5/2015 3:13 PM	PA/VA
Surr: 1,2-Dichloroethane-d4	85.1	NA	70-130	NA		%REC	2/9/2015 3:16 PM	
Surr: 4-Bromofluorobenzene	109	NA	70-130	NA		%REC	2/9/2015 3:16 PM	
Surr: Dibromofluoromethane	87.1	NA	70-130	NA		%REC	2/9/2015 3:16 PM	
Surr: Toluene-d8	112	NA	70-130	NA		%REC	2/9/2015 3:16 PM	
ANIONS by IC, WATER SOLUBLE			**Method: SW9056A (2000)**				**Analyst: CF**	
Chloride	57,000	200	2,000	NA		mg/Kg	2/2/2015 4:22 PM	PA/VA
Fluoride	2.20	1.00	4.00	NA	J	mg/Kg	2/2/2015 4:22 PM	
Nitrogen, Nitrate	0.800	0.400	2.00	NA	J	mg/Kg	2/2/2015 4:22 PM	PA/VA
Nitrogen, Nitrite	2.00	1.00	10.0	NA	J	mg/Kg	2/2/2015 4:22 PM	
Sulfate	514	20.0	100	NA		mg/Kg	2/2/2015 4:22 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1501U77

Date Reported: 2/12/2015

Client:	MARSHALL UNIVERSITY CENTER FOR ENVIRONMENTAL,	**Collection Date:**	1/28/2015 1:30:00 PM
Project:	DRILL CUTTING ANAL.	**Date Received:**	1/30/2015
Lab ID:	1501U77-01A	**Matrix:**	Solid
Client Sample ID:	MCGEE UNIT 2H	**Site ID:**	MCGEE UNIT 2H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
AMMONIA NITROGEN			**Method: SM4500-NH3 B-C-1997**				**Analyst: CC**	
Nitrogen, Ammonia	11.2	8.00	10.0	NA		mg/Kg	2/5/2015 2:11 PM	
TOTAL KJELDAHL NITROGEN (TKN)			**Method: EPA 351.2, Rev. 2.0 (1993)**				**Analyst: JH**	
Nitrogen, Kjeldahl, Total	1,170	25.1	126	NA		mg/Kg	2/2/2015 8:08 PM	PA/VA
CYANIDE, FREE			**Method: SM4500-CN I-1997**				**Analyst: JH**	
Cyanide, Free	0.720	0.250	1.00	NA	J	mg/Kg	2/2/2015 1:10 PM	
CONDUCTIVITY			**Method: SM2510 B-1997**				**Analyst: KY**	
Specific Conductivity	173,000	NA	NA	NA		µmhos/cm	2/6/2015 2:43 PM	
ALKALINITY			**Method: SM2320 B-1997**				**Analyst: DSD**	
Alkalinity, Total (As CaCO3)	8,440	20.0	200	NA		mg/Kg	2/2/2015 4:49 PM	
pH			**Method: SW9045D (2002)**				**Analyst: DSD**	
pH	9.02	NA	NA	NA		SU	2/4/2015 3:20 PM	PA/VA

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

Improving the environment, one client at a time...

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

101 17th Street
Ashland, KY 41101
TEL: 606.393.5027

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Monday, March 02, 2015

GEORGE CARICO
MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE
1 JOHN MARSHALL DRIVE
HUNTINGTON, WV 25755-2585

TEL: (304) 696-6042
FAX:

RE: MCGEE UNIT 2H

Work Order #: 1501U76

Dear GEORGE CARICO:

REI Consultants, Inc. received 1 sample(s) on 1/30/2015 for the analyses presented in the following report.

Sincerely,

Kathy Berry

REI Consultants, Inc. - Case Narrative

WO#: 1501U76

Date Reported: 3/2/2015

Client: MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE

Project: MCGEE UNIT 2H

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be consider estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1501U76

Date Reported: 3/2/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	1/28/2015 1:30:00 PM
Project:	MCGEE UNIT 2H	**Date Received:**	1/30/2015
Lab ID:	1501U76-01A	**Matrix:**	Solid
Client Sample ID:	MCGEE UNIT 2H	**Site ID:**	DRILL CUTTING ANAL

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
GROSS ALPHA			**Method: EPA 900.0**				**Analyst: Sub**	
Gross Alpha	see attached	NA	NA	NA				
GROSS BETA			**Method: EPA 900.0**				**Analyst: Sub**	
Gross Beta	see attached	NA	NA	NA				
RADIUM-226			**Method: EPA 903.1**				**Analyst: Sub**	
Radium-226	see attached	NA	NA	NA				
RADIUM-228			**Method: EPA 904.0**				**Analyst: Sub**	
Radium-228	see attached	NA	NA	NA				
STRONTIUM-90			**Method: EPA 905.0**				**Analyst: Sub**	
Strontium-90	see attached	NA	NA	NA				

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

February 27, 2015

Ms. Kathy Berry
REI Consultants, Inc.
225 Industrial Park Drive
PO Box 286
Beaver, WV 25813

RE: Project: 1501U76
Pace Project No.: 30139977

Dear Ms. Berry:
Enclosed are the analytical results for sample(s) received by the laboratory on February 03, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 1501U76
Pace Project No.: 30139977

Pennsylvania Certification IDs
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ACLASS DOD-ELAP Accreditation #: ADE-1544
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California/TNI Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Guam/PADEP Certification
Hawaii/PADEP Certification
Idaho Certification
Illinois/PADEP Certification
Indiana/PADEP Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188
Utah/TNI Certification #: PA014572014-4
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin/PADEP Certification
Wyoming Certification #: 8TMS-Q

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 1501U76
Pace Project No.: 30139977

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30139977001	**1501U76-01A**	Solid	01/28/15 13:30	02/03/15 14:30

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Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 1501U76
Pace Project No.: 30139977

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30139977001	**1501U76-01A**	EPA 900.0	FCC	2
		EPA 901.1	MAH	2
		ASTM D5811-95	LAL	1

Pace Analytical Services, Inc.
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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1501U76
Pace Project No.: 30139977

Date: February 27, 2015

1501U76-01A (Lab ID: 30139977001)

- The matrix on the COC indicates the sample is a liquid, however it is a solid.

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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1501U76
Pace Project No.: 30139977

Method: **EPA 900.0**
Description: 900.0 Gross Alpha/Beta
Client: REI Consultants, Inc.
Date: February 27, 2015

General Information:
1 sample was analyzed for EPA 900.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: RADC/23298

N2: The lab does not hold TNI accreditation for this parameter.

- 1501U76-01A (Lab ID: 30139977001)
  - Gross Alpha
  - Gross Beta
- BLANK (Lab ID: 851090)
  - Gross Alpha
  - Gross Beta

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Greensburg, PA 15601
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PROJECT NARRATIVE

Project: 1501U76
Pace Project No.: 30139977

Method: **EPA 901.1**
Description: 901.1 Gamma Spec INGROWTH
Client: REI Consultants, Inc.
Date: February 27, 2015

General Information:
1 sample was analyzed for EPA 901.1. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 901.1 with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
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Greensburg, PA 15601
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PROJECT NARRATIVE

Project: 1501U76
Pace Project No.: 30139977

Method: **ASTM D5811-95**
Description: ASTM D5811 Sr 89/90 Eichrom
Client: REI Consultants, Inc.
Date: February 27, 2015

General Information:
1 sample was analyzed for ASTM D5811-95. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: RADC/23349

N2: The lab does not hold TNI accreditation for this parameter.

- BLANK (Lab ID: 853405)
  - Strontium-90

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1501U76
Pace Project No.: 30139977

Sample: 1501U76-01A **Lab ID: 30139977001** Collected: 01/28/15 13:30 Received: 02/03/15 14:30 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis
Comments: • The matrix on the COC indicates the sample is a liquid, however it is a solid.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	**40.8 ± 11.7 (9.16) C:NA T:NA**	pCi/g	02/07/15 20:49	12587-46-1	N2
Gross Beta	EPA 900.0	**23.2 ± 6.17 (5.63) C:NA T:NA**	pCi/g	02/07/15 20:49	12587-47-2	N2
Radium-226	EPA 901.1	**6.397 ± 0.815 (0.298) C:NA T:NA**	pCi/g	02/26/15 09:48	13982-63-3	
Radium-228	EPA 901.1	**0.458 ± 0.254 (0.739) C:NA T:NA**	pCi/g	02/26/15 09:48	15262-20-1	
Strontium-90	ASTM D5811-95	**0.0610 ± 0.541 (1.25) C:117% T:NA**	pCi/g	02/14/15 10:58	10098-97-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1501U76
Pace Project No.: 30139977

QC Batch: RADC/23298
QC Batch Method: EPA 900.0
Analysis Method: EPA 900.0
Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 30139977001

METHOD BLANK: 851090
Matrix: Solid
Associated Lab Samples: 30139977001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.004 ± 0.0857 (0.218) C:NA T:NA	pCi/g	02/07/15 20:49	N2
Gross Beta	-0.031 ± 0.0984 (0.237) C:NA T:NA	pCi/g	02/07/15 20:49	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1501U76
Pace Project No.: 30139977

QC Batch:	RADC/23384	Analysis Method:	EPA 901.1
QC Batch Method:	EPA 901.1	Analysis Description:	901.1 Gamma Spec Ingrowth

Associated Lab Samples: 30139977001

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1501U76
Pace Project No.: 30139977

QC Batch: RADC/23349
QC Batch Method: ASTM D5811-95
Analysis Method: ASTM D5811-95
Analysis Description: ASTM D5811 Sr 89/90 Eichrom
Associated Lab Samples: 30139977001

METHOD BLANK: 853405
Matrix: Solid
Associated Lab Samples: 30139977001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Strontium-90	0.240 ± 0.561 (1.22) C:100% T:NA	pCi/g	02/16/15 08:12	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1501U76
Pace Project No.: 30139977

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2	The lab does not hold TNI accreditation for this parameter.

REPORT OF LABORATORY ANALYSIS

REIC

Improving the environment, one client at a time...

CHAIN OF CUSTODY RECORD

COC ID: 3278	PAGE: 1	OF: 1

ADDRESS
REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
FAX: (304) 255-2572
Website: www.reiclabs.com

30139977

Please Include Email Address of Report Recipient Whenever Possible!!!

SUB CONTRATOR: **PACE_PA** COMPANY: **PACE ANALYTICAL SERVIC**

ADDRESS: **1638 ROSEYTOWN ROAD**

CITY, STATE, ZIP: **GREENSBURG, PA 15601**

PHONE: **(724) 850-5600** FAX:

ACCOUNT #: **050719EVF1** EMAIL:

SPECIAL INSTRUCTIONS / COMMENTS:

State Code: WV Please use SampleID as purchase order number.
After analysis, the samples do not need to be returned and can be disposed per your standard laboratory practices. Resutls to kberry@reiclabs.com Thank you

ITEM	SAMPLE ID	Client Sample ID	Bottle Type	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	GROSS_ALPHA_SUB (EPA 900.0)	GROSS_BETA_SUB (EPA 900.0)	RADIUM_226_SUB (EPA 903.1)	RADIUM_228_SUB (EPA 904.0)	STRONTIUM_90_SUB (EPA 905.0)
						*	0	0	0	0	0
1	1501U76-01A	MCGEE UNIT 2H	.	Liquid	1/28/2015 1:30:00 PM	1	√	√	√	√	√

ANALYTICAL PARAMETERS

* Preservation Codes:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide/ Sodium Arsenite
6 Sodium Hydroxide
7 Ascorbic Acid
8 Sodium Sulfite/HCL
9 Potassium Dihydrogen Citrate
10 Bromium Chloride

COMMENTS:

D01

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
[illegible]	1/29/15	0845	Cliff McJoy PACE	1/29/15	8:11
Cliff McJoy P.	2/3/15	2:30	Scott Ambler	2-3-15	1430
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TAT: Standard ☑ **RUSH** Next BD ☐ 2nd BD ☐ 3rd BD ☐

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☑ EMAIL ☐ ONLINE

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool ? _____

Comments: _____

Sample Condition Upon Receipt

Pace Analytical

Client Name: REFC

Project # 30139977

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap X Bubble Bags ____ None ____ Other _____

Thermometer Used NA Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.:_____°C Correction Factor: _____°C Final Temp:_____°C

Date and Initials of person examining contents: SRA 2-3-15

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4. waiver on file CMF 2/4/15
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☒No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC: SRA 2-3-15	☒Yes ☐No ☐N/A	12. COC says water but sample is solid
-Includes date/time/ID/Analysis Matrix: S1		
All containers needing preservation have been checked.	☐Yes ☐No ☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☒No	Initial when completed SRA / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Kathy Berry Date/Time: 2/4/15

Comments/ Resolution: sample should be logged as a soil

Project Manager Review: Carena Sevin Date: 2/4/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical

Project Number: 30139977

Client Name: RETC

Item No.	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other
001	SL	2																						

393861

CHAIN OF CUSTODY RECORD

REIC
Research Environmental & Industrial Consultants, Inc.
MAIN LABORATORY & CORPORATE HEADQUARTERS:
P.O. Box 286 • 225 Industrial Park Rd, Beaver, WV 25813
800-999-0105 • 304-255-2500 • www.reiclabs.com

MID-OHIO VALLEY Service Center
101 17th Street
Ashland, KY 41101
606-393-5027

SHENANDOAH Service Center
1557 Commerce Rd., Ste 201
Verona, VA 24482
540-248-0183

ROANOKE Service Center
3029-C Peters Creek Rd
Roanoke, VA 24019
540-777-1276

MORGANTOWN Service Center
16 Commerce Drive
Westover, WV 26501
304-241-5861

Client: Marshall University CEGAS
PO #
Contact Person George Carico
Phone 304/696-5456
QUOTE #
Fax:
Email:
Address 1 John Marshall Drive
City Huntington
State WV Zip 25575
Billing Address (if different)
City
State
Zip
Site ID & State Morton 1H
Project ID Drill Cutting Anal
Sampler G. Carico

SAMPLE LOG & ANALYSIS REQUEST

TURNAROUND TIME
[X] NORMAL
RUSH TURNAROUND
[ ] 5 DAY [ ] 3 DAY [ ] 2 DAY [ ] 1 DAY
*Rush work needs prior laboratory approval and will incur additional charges

ANALYSIS & METHOD REQUESTED

* See Attachment (per Jason Clark)
RADS: Gross Alph + Beta REIC
Radium 226 & 228
Strontium 90

SAMPLE ID	No. & Type of Containers	Sampling Date/Time	Matrix	Sample Comp/Grab
Morton 1H	3-16 oz.	1/28/15, 11:30am	Drill Cuttings	Grab
	3-4 oz.		"	"

ENTER PRESERVATIVE CODE:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA
8 Ascorbic Acid

COMMENTS:
Morton 1H,
Cofor Pad
API 4701706559

All analytical requests are subject to REIC's Standard Terms and Conditions.

Temperature at arrival ° C ICED? Y ✓ N

1 Relinquished by (signature) George Carico	1/29/15 Date/Time 12:40 pm	2 Relinquished by (signature)	Date/Time	FAX RESULTS [ ]	EMAIL RESULTS [ ]
Received by (signature)	1/29/15 Date/Time	Received by (signature)	Date/Time	SHIPMENT ___ Hand Delivered ___ Courier ___ UPS ___ FEDEX ___ USPS ___ OTHER	

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

Improving the environment, one client at a time...

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

101 17th Street
Ashland, KY 41101
TEL: 606.393.5027

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Wednesday, February 18, 2015

GEORGE CARICO
MARSHALL UNIVERSITY CENTER FOR ENVIRONMENTAL,
1 JOHN MARSHALL DRIVE
HUNTINGTON, WV 25755-2585

TEL: (304) 696-6042
FAX:

RE: DRILL CUTTING ANAL.

Work Order #: 1501U73

Dear GEORGE CARICO:

REI Consultants, Inc. received 1 sample(s) on 1/30/2015 for the analyses presented in the following report.

Sincerely,

Kathy Berry

REI Consultants, Inc. - Case Narrative

WO#: 1501U73

Date Reported: 2/18/2015

Client: MARSHALL UNIVERSITY CENTER FOR ENVIRONMENTAL,

Project: DRILL CUTTING ANAL.

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be consider estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1501U73

Date Reported: 2/18/2015

Client:	MARSHALL UNIVERSITY CENTER FOR ENVIRONMENTAL,	**Collection Date:**	1/28/2015 11:30:00 AM
Project:	DRILL CUTTING ANAL.	**Date Received:**	1/30/2015
Lab ID:	1501U73-01A	**Matrix:**	Solid
Client Sample ID:	MORTON 1H	**Site ID:**	MORTON 1H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS by ICP			**Method: SW6010C (2007)**				**Analyst: JD**	
Aluminum	5,300	3.00	25.0	NA		mg/Kg	2/2/2015 7:14 PM	PA/VA
Antimony	4.21	2.00	5.00	NA	J	mg/Kg	2/2/2015 7:11 PM	PA/VA
Arsenic	36.9	1.00	5.00	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Barium	122	0.200	2.50	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Beryllium	0.674	0.0500	0.250	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Boron	23.4	1.00	2.50	NA		mg/Kg	2/3/2015 11:33 AM	PA/VA
Cadmium	7.18	0.100	0.500	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Chromium	37.2	0.200	2.50	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Copper	170	0.200	2.50	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Iron	21,500	5.00	25.0	NA		mg/Kg	2/2/2015 7:14 PM	PA/VA
Lead	25.4	1.00	5.00	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Lithium	4.66	0.100	5.00	NA	J	mg/Kg	2/4/2015 1:43 PM	
Manganese	121	0.200	2.50	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Nickel	116	0.200	2.50	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Selenium	11.6	1.00	5.00	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Silver	1.36	0.100	1.25	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Strontium	4,640	10.0	250	NA		mg/Kg	2/4/2015 3:46 PM	PA/VA
Vanadium	209	0.200	2.50	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
Zinc	405	0.500	2.50	NA		mg/Kg	2/2/2015 7:11 PM	PA/VA
MERCURY, Total SW7417B			**Method: SW7471B (2/07)**				**Analyst: CR**	
Mercury	0.160	0.020	0.100	NA		mg/Kg	2/5/2015 12:15 PM	PA/VA
HEXAVALENT CHROMIUM, WATER SOLUBLE			**Method: SW7196A (1992)**				**Analyst: JB**	
Chromium, Hexavalent	2.68	0.012	0.040	NA		mg/kg	2/4/2015 7:45 AM	PA/VA
PERCENT MOISTURE			**Method: SM2540 B-1997**				**Analyst: TS**	
Percent Moisture	17	0.010	0.50	NA		wt%	2/2/2015 2:08 PM	
Oil and Grease			**Method: SW9071B (4/98)**				**Analyst: NC**	
Oil & Grease, Total Recoverable	0.039	0.001	0.060	NA	J	wt%-dry	2/3/2015 11:00 AM	
SEMIVOLATILE ORGANIC COMPOUNDS			**Method: SW8270D (2007)**				**Analyst: JD**	
1,4-Dinitrobenzene	ND	0.168	0.334	NA		mg/Kg	2/3/2015 7:32 PM	
1,4-Napthoquinone	ND	NA	0.334	NA		mg/Kg	2/3/2015 7:32 PM	
4-Nitroquinoline-1-oxide	ND	NA	0.334	NA		mg/Kg	2/3/2015 7:32 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1501U73

Date Reported: 2/18/2015

Client:	MARSHALL UNIVERSITY CENTER FOR ENVIRONMENTAL,	**Collection Date:**	1/28/2015 11:30:00 AM
Project:	DRILL CUTTING ANAL.	**Date Received:**	1/30/2015
Lab ID:	1501U73-01A	**Matrix:**	Solid
Client Sample ID:	MORTON 1H	**Site ID:**	MORTON 1H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Pentachloronitrobenzene	ND	NA	0.334	NA		mg/Kg	2/3/2015 7:32 PM	
Bis(2-ethylhexyl)phthalate	ND	0.168	0.334	NA		mg/Kg	2/3/2015 7:32 PM	PA/VA
Butyl benzyl phthalate	ND	0.168	0.334	NA		mg/Kg	2/3/2015 7:32 PM	
Di-n-butyl phthalate	ND	0.168	0.334	NA		mg/Kg	2/3/2015 7:32 PM	PA/VA
Diethyl phthalate	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:32 PM	PA/VA
Dimethyl phthalate	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:32 PM	PA/VA
2,4-Dinitrotoluene	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:32 PM	PA/VA
2,6-Dinitrotoluene	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:32 PM	PA/VA
Di-n-octyl phthalate	ND	0.168	0.334	NA		mg/Kg	2/3/2015 7:32 PM	PA/VA
Fluoranthene	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:32 PM	PA/VA
Nitrobenzene	ND	0.067	0.334	NA		mg/Kg	2/3/2015 7:32 PM	PA/VA
Surr: 2-Fluorophenol	65.7	NA	54.1-110	NA		%REC	2/3/2015 7:32 PM	
Surr: Phenol-d5	72.7	NA	60.1-110	NA		%REC	2/3/2015 7:32 PM	
Surr: 2,4,6-Tribromophenol	41.5	NA	58.8-128	NA	S	%REC	2/3/2015 7:32 PM	
Surr: Nitrobenzene-d5	87.6	NA	68.2-123	NA		%REC	2/3/2015 7:32 PM	
Surr: 2-Fluorobiphenyl	81.9	NA	68.4-116	NA		%REC	2/3/2015 7:32 PM	
Surr: 4-Terphenyl-d14	86.8	NA	52.2-121	NA		%REC	2/3/2015 7:32 PM	
VOLATILE ORGANIC COMPOUNDS-8260			**Method: SW8260B (1996)**				**Analyst: JM**	
Benzene	773	50.0	100	NA		µg/Kg	2/10/2015 3:11 PM	PA/VA
Bromodichloromethane	ND	1.92	3.84	NA		µg/Kg	2/5/2015 1:35 PM	PA/VA
Chlorobenzene	ND	1.92	3.84	NA		µg/Kg	2/5/2015 1:35 PM	PA/VA
1,2-Dichlorobenzene	ND	1.92	3.84	NA		µg/Kg	2/5/2015 1:35 PM	PA/VA
1,3-Dichlorobenzene	ND	1.92	3.84	NA		µg/Kg	2/5/2015 1:35 PM	PA/VA
1,4-Dichlorobenzene	ND	1.92	3.84	NA		µg/Kg	2/5/2015 1:35 PM	PA/VA
Surr: 1,2-Dichloroethane-d4	83.0	NA	70-130	NA		%REC	2/10/2015 3:11 PM	
Surr: 4-Bromofluorobenzene	106	NA	70-130	NA		%REC	2/10/2015 3:11 PM	
Surr: Dibromofluoromethane	83.7	NA	70-130	NA		%REC	2/10/2015 3:11 PM	
Surr: Toluene-d8	110	NA	70-130	NA		%REC	2/10/2015 3:11 PM	
ANIONS by IC, WATER SOLUBLE			**Method: SW9056A (2000)**				**Analyst: CF**	
Chloride	27,000	200	2,000	NA		mg/Kg	2/2/2015 4:03 PM	PA/VA
Fluoride	2.00	1.00	4.00	NA	J	mg/Kg	2/2/2015 4:03 PM	
Nitrogen, Nitrate	0.800	0.400	2.00	NA	J	mg/Kg	2/2/2015 4:03 PM	PA/VA
Nitrogen, Nitrite	1.60	1.00	10.0	NA	J	mg/Kg	2/2/2015 4:03 PM	
Sulfate	374	20.0	100	NA		mg/Kg	2/2/2015 4:03 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1501U73

Date Reported: 2/18/2015

Client:	MARSHALL UNIVERSITY CENTER FOR ENVIRONMENTAL,	**Collection Date:**	1/28/2015 11:30:00 AM
Project:	DRILL CUTTING ANAL.	**Date Received:**	1/30/2015
Lab ID:	1501U73-01A	**Matrix:**	Solid
Client Sample ID:	MORTON 1H	**Site ID:**	MORTON 1H

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
AMMONIA NITROGEN			**Method: SM4500-NH3 B-C-1997**				**Analyst: CC**	
Nitrogen, Ammonia	ND	8.00	10.0	NA		mg/Kg	2/5/2015 2:11 PM	
Notes:								
Elevated PQLs are due to matrix interference.								
TOTAL KJELDAHL NITROGEN (TKN)			**Method: EPA 351.2, Rev. 2.0 (1993)**				**Analyst: JH**	
Nitrogen, Kjeldahl, Total	1,970	101	504	NA		mg/Kg	2/2/2015 9:23 PM	PA/VA
CYANIDE, FREE			**Method: SM4500-CN I-1997**				**Analyst: JH**	
Cyanide, Free	ND	0.250	1.00	NA		mg/Kg	2/2/2015 1:10 PM	
Notes:								
Elevated PQLs are due to matrix interference.								
CONDUCTIVITY			**Method: SM2510 B-1997**				**Analyst: KY**	
Specific Conductivity	84,700	NA	NA	NA		µmhos/cm	2/10/2015 10:35 AM	
Notes:								
Conductivity result was estimated based on measuring a 1:10 dilution.								
ALKALINITY			**Method: SM2320 B-1997**				**Analyst: DSD**	
Alkalinity, Total (As CaCO3)	10,200	100	1,000	NA		mg/Kg	2/2/2015 4:49 PM	
pH			**Method: SW9045D (2002)**				**Analyst: DSD**	
pH	10.7	NA	NA	NA		SU	2/4/2015 3:20 PM	PA/VA

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

Improving the environment, one client at a time...

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1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Monday, March 02, 2015

GEORGE CARICO
MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE
1 JOHN MARSHALL DRIVE
HUNTINGTON, WV 25755-2585

TEL: (304) 696-6042
FAX:

RE: DRILL CUTTING ANAL.

Work Order #: 1501U75

Dear GEORGE CARICO:

REI Consultants, Inc. received 1 sample(s) on 1/30/2015 for the analyses presented in the following report.

Sincerely,

Kathy Berry

REI Consultants, Inc. - Case Narrative

WO#: 1501U75

Date Reported: 3/2/2015

Client: MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE

Project: DRILL CUTTING ANAL.

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be consider estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1501U75

Date Reported: 3/2/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	1/28/2015 11:30:00 AM
Project:	DRILL CUTTING ANAL.	**Date Received:**	1/30/2015
Lab ID:	1501U75-01A	**Matrix:**	Solid
Client Sample ID:	MORTON 1H	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
GROSS ALPHA			**Method: EPA 900.0**				**Analyst: Sub**	
Gross Alpha	see attached	NA	NA	NA				
GROSS BETA			**Method: EPA 900.0**				**Analyst: Sub**	
Gross Beta	see attached	NA	NA	NA				
RADIUM-226			**Method: EPA 903.1**				**Analyst: Sub**	
Radium-226	see attached	NA	NA	NA				
RADIUM-228			**Method: EPA 904.0**				**Analyst: Sub**	
Radium-228	see attached	NA	NA	NA				
STRONTIUM-90			**Method: EPA 905.0**				**Analyst: Sub**	
Strontium-90	see attached	NA	NA	NA				

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

February 27, 2015

Ms. Kathy Berry
REI Consultants, Inc.
225 Industrial Park Drive
PO Box 286
Beaver, WV 25813

RE: Project: 1501U75
Pace Project No.: 30139976

Dear Ms. Berry:
Enclosed are the analytical results for sample(s) received by the laboratory on February 03, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 1501U75
Pace Project No.: 30139976

Pennsylvania Certification IDs
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ACLASS DOD-ELAP Accreditation #: ADE-1544
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California/TNI Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Guam/PADEP Certification
Hawaii/PADEP Certification
Idaho Certification
Illinois/PADEP Certification
Indiana/PADEP Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188
Utah/TNI Certification #: PA014572014-4
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin/PADEP Certification
Wyoming Certification #: 8TMS-Q

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 1501U75
Pace Project No.: 30139976

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30139976001	**1501U75-01A**	Solid	01/28/15 11:30	02/03/15 14:30

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 1501U75
Pace Project No.: 30139976

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30139976001	**1501U75-01A**	EPA 900.0	FCC	2
		EPA 901.1	MAH	2
		ASTM D5811-95	LAL	1

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1501U75
Pace Project No.: 30139976

Method: **EPA 900.0**
Description: 900.0 Gross Alpha/Beta
Client: REI Consultants, Inc.
Date: February 27, 2015

General Information:
1 sample was analyzed for EPA 900.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: RADC/23298

N2: The lab does not hold TNI accreditation for this parameter.

- 1501U75-01A (Lab ID: 30139976001)
  - Gross Alpha
  - Gross Beta
- BLANK (Lab ID: 851090)
  - Gross Alpha
  - Gross Beta

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1501U75
Pace Project No.: 30139976

Method: **EPA 901.1**
Description: 901.1 Gamma Spec INGROWTH
Client: REI Consultants, Inc.
Date: February 27, 2015

General Information:
1 sample was analyzed for EPA 901.1. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 901.1 with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1501U75
Pace Project No.: 30139976

Method: **ASTM D5811-95**
Description: ASTM D5811 Sr 89/90 Eichrom
Client: REI Consultants, Inc.
Date: February 27, 2015

General Information:
1 sample was analyzed for ASTM D5811-95. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: RADC/23349

N2: The lab does not hold TNI accreditation for this parameter.

- BLANK (Lab ID: 853405)
  - Strontium-90

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1501U75
Pace Project No.: 30139976

Sample: 1501U75-01A **Lab ID: 30139976001** Collected: 01/28/15 11:30 Received: 02/03/15 14:30 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	**30.4 ± 9.49 (8.90) C:NA T:NA**	pCi/g	02/07/15 20:49	12587-46-1	N2
Gross Beta	EPA 900.0	**31.2 ± 7.10 (4.78) C:NA T:NA**	pCi/g	02/07/15 20:49	12587-47-2	N2
Radium-226	EPA 901.1	**8.189 ± 1.195 (0.281) C:NA T:NA**	pCi/g	02/26/15 12:44	13982-63-3	
Radium-228	EPA 901.1	**0.794 ± 0.469 (0.746) C:NA T:NA**	pCi/g	02/26/15 12:44	15262-20-1	
Strontium-90	ASTM D5811-95	**0.0740 ± 0.565 (1.30) C:114% T:NA**	pCi/g	02/14/15 10:58	10098-97-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1501U75
Pace Project No.: 30139976

QC Batch:	RADC/23312	Analysis Method:	EPA 901.1
QC Batch Method:	EPA 901.1	Analysis Description:	901.1 Gamma Spec Ingrowth

Associated Lab Samples: 30139976001

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1501U75
Pace Project No.: 30139976

QC Batch: RADC/23298
QC Batch Method: EPA 900.0
Analysis Method: EPA 900.0
Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 30139976001

METHOD BLANK: 851090
Matrix: Solid
Associated Lab Samples: 30139976001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.004 ± 0.0857 (0.218) C:NA T:NA	pCi/g	02/07/15 20:49	N2
Gross Beta	-0.031 ± 0.0984 (0.237) C:NA T:NA	pCi/g	02/07/15 20:49	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1501U75
Pace Project No.: 30139976

QC Batch: RADC/23349
QC Batch Method: ASTM D5811-95
Analysis Method: ASTM D5811-95
Analysis Description: ASTM D5811 Sr 89/90 Eichrom
Associated Lab Samples: 30139976001

METHOD BLANK: 853405
Matrix: Solid
Associated Lab Samples: 30139976001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Strontium-90	0.240 ± 0.561 (1.22) C:100% T:NA	pCi/g	02/16/15 08:12	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1501U75
Pace Project No.: 30139976

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2	The lab does not hold TNI accreditation for this parameter.

REPORT OF LABORATORY ANALYSIS

REIC

Improving the environment, one client at a time...

CHAIN OF CUSTODY RECORD

COC ID: 3279	PAGE: 1	OF: 1

ADDRESS
REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
FAX: (304) 255-2572
Website: www.reiclabs.com

30139976

Please Include Email Address of Report Recipient Whenever Possible!!!

SUB CONTRATOR: **PACE_PA** COMPANY: **PACE ANALYTICAL SERVIC**

ADDRESS: **1638 ROSEYTOWN ROAD**

CITY, STATE, ZIP: **GREENSBURG, PA 15601**

PHONE: **(724) 850-5600** FAX:

ACCOUNT #: **050719EVF1** EMAIL:

SPECIAL INSTRUCTIONS / COMMENTS:

State Code: WV Please use SampleID as purchase order number.
After analysis, the samples do not need to be returned and can be disposed per your standard laboratory practices. Results to kberry@reiclabs.com Thank you

ITEM	SAMPLE ID	Client Sample ID	Bottle Type	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	ANALYTICAL PARAMETERS: GROSS_ALPHA_SUB (EPA 900.0)	GROSS_BETA_SUB (EPA 900.0)	RADIUM_226_SUB (EPA 903.1)	RADIUM_228_SUB (EPA 904.0)	STRONTIUM_90_SUB (EPA 905.0)
						*	0	0	0	0	0
1	1501U75-01A	MORTON 1H	.	Solid	1/28/2015 11:30:00 AM	1	√	√	√	√	√

001

* Preservation Codes:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide/ Sodium Arsenite
6 Sodium Hydroxide
7 Ascorbic Acid
8 Sodium Sulfite/HCL
9 Potassium Dihydrogen Citrate
10 Bromium Chloride

COMMENTS:

Relinquished By:	Date: 2/2/15	Time: 10:00	Received By: MSC	Date: 2/2/15	Time: 10:00
Relinquished By:	Date: 2/5/15	Time: 0845	Received By: Cliff Mt Joy Pace	Date: 2/5/15	Time: 8:11
Relinquished By: Cliff Mt Joy P.	Date: 2/3/15	Time: 2:30P	Received By: Scott Cunliffe / Pace	Date: 2-3-15	Time: 1430

TAT: Standard ☑ **RUSH** Next BD ☐ 2nd BD ☐ 3rd BD ☐

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☑ EMAIL ☐ ONLINE

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool ? _____

Comments: _____

Sample Condition Upon Receipt

Pace Analytical

Client Name: REFC

Project # 30139976

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap X Bubble Bags ____ None ____ Other _____

Thermometer Used NA Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Date and Initials of person examining contents: SRA 2-13-15

Temp should be above freezing to 6°C

				Comments:
Chain of Custody Present:	☒Yes	☐No	☐N/A	1.
Chain of Custody Filled Out:	☒Yes	☐No	☐N/A	2.
Chain of Custody Relinquished:	☒Yes	☐No	☐N/A	3.
Sampler Name & Signature on COC:	☐Yes	☒No	☐N/A	4. Waiver on file OK 2/4/15
Samples Arrived within Hold Time:	☒Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes	☒No	☐N/A	6.
Rush Turn Around Time Requested:	☐Yes	☒No	☐N/A	7.
Sufficient Volume:	☒Yes	☐No	☐N/A	8.
Correct Containers Used:	☒Yes	☐No	☐N/A	9.
-Pace Containers Used:	☐Yes	☒No	☐N/A	
Containers Intact:	☒Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☒N/A	11.
Sample Labels match COC:	☒Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL				
All containers needing preservation have been checked.	☐Yes	☐No	☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes	☐No	☒N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes	☒No		Initial when completed SRA Lot # of added preservative
Samples checked for dechlorination:	☐Yes	☐No	☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☒N/A	15.
Trip Blank Present:	☐Yes	☒No	☐N/A	16.
Trip Blank Custody Seals Present	☐Yes	☐No	☒N/A	
Pace Trip Blank Lot # (if purchased): _____				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Connie Serna **Date:** 2/4/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical

page 2

Project Number: 30139976

Client Name: REFE

Item No.	01												
Matrix Code	SL												
Glass Jar (120 / 250 / 500 / 1L)	2												
Soil Kit (2 SB, 1M, soil jar)													
Chemistry (250 / 500 / 1L)													
Organics (1L)													
Nutrient (250 / 500)													
Phenolics (250 ml)													
TOC (40 ml / 250 ml)													
TOX (250 ml)													
Total Metals													
Dissolved Metals preserved Y N													
O & G (1L)													
TPH (1L)													
VOA (40 ml 30 ml)													
Cyanide (250 ml)													
Sulfide (500 ml)													
Bacteria (120 ml)													
Wipes / swipe/ smear/ filter													
Radchem Nalgene (125 / 250 / 500 / 1L)													
Radchem Nalgene (1/2 gal. / 1 gal.L)													
Cubitainer (500 ml / 4L)													
Ziploc													
Other													
Other													
Other													

SCURF Back (C016-4 15May2012).xls

393862

CHAIN OF CUSTODY RECORD

REIC
Research Environmental & Industrial Consultants, Inc.
MAIN LABORATORY & CORPORATE HEADQUARTERS:
P.O. Box 286 • 225 Industrial Park Rd, Beaver, WV 25813
800-999-0105 • 304-255-2500 • www.reiclabs.com

MID-OHIO VALLEY Service Center
101 17th Street
Ashland, KY 41101
606-393-5027

SHENANDOAH Service Center
1557 Commerce Rd., Ste 201
Verona, VA 24482
540-248-0183

ROANOKE Service Center
3029-C Peters Creek Rd
Roanoke, VA 24019
540-777-1276

MORGANTOWN Service Center
16 Commerce Drive
Westover, WV 26501
304-241-5861

Client: Marshall University CEGAS
Contact Person George Carico
QUOTE # ____ Fax: ____
Address 1 John Marshall Drive City Huntington State WV Zip 25755
Billing Address (if different) ____
City ____ State ____ Zip ____
Site ID & State Wentz IH Project ID Drill Cutting Anal. Sampler G. Carico
PO # ____
Phone 304/696-5456
Email: carico@marshall.edu

SAMPLE LOG & ANALYSIS REQUEST

TURNAROUND TIME: [X] NORMAL
RUSH TURNAROUND: [ ] 5 DAY [ ] 3 DAY [ ] 2 DAY [ ] 1 DAY
*Rush work needs prior laboratory approval and will incur additional charges

ANALYSIS & METHOD REQUESTED: * See Attachment (per Jason Clark, REIC)

SAMPLE ID	No. & Type of Containers	Sampling Date/Time	Matrix	Sample Comp/Grab
Wentz IH	3-16 oz.	1/28/15,	Drill Cuttings	Grab
	3-4 oz.	16:30 am.	"	"

ENTER PRESERVATIVE CODE:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA
8 Ascorbic Acid

COMMENTS: Wentz IH, Rock Run Pad API 47-017-06476

All analytical requests are subject to REIC's Standard Terms and Conditions.

Temperature at arrival: 3 °C ICED? Y ✓ N ____

1			2		
Relinquished by (signature) George Carico	1/29/15. Date/Time 12:40 pm		Relinquished by (signature)	Date/Time	
Received by (signature)	1/29/15 Date/Time 1240		Received by (signature)	Date/Time	

FAX RESULTS [ ] EMAIL RESULTS [✓]
SHIPMENT ___ Hand Delivered ___ Courier ___ UPS ___ FEDEX ___ USPS ___ OTHER

COC-NCR-061312

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

Improving the environment, one client at a time...

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

101 17th Street
Ashland, KY 41101
TEL: 606.393.5027

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Wednesday, February 18, 2015

GEORGE CARICO
MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE
1 JOHN MARSHALL DRIVE
HUNTINGTON, WV 25755-2585

TEL: (304) 696-6042
FAX:

RE: WENTZ 1H

Work Order #: 1501U70

Dear GEORGE CARICO:

REI Consultants, Inc. received 1 sample(s) on 1/30/2015 for the analyses presented in the following report.

Sincerely,

Kathy Berry

REI Consultants, Inc. - Case Narrative

WO#: 1501U70

Date Reported: 2/18/2015

Client: MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE

Project: WENTZ 1H

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be consider estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1501U70

Date Reported: 2/18/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	1/28/2015 10:30:00 AM
Project:	WENTZ 1H	**Date Received:**	1/30/2015
Lab ID:	1501U70-01A	**Matrix:**	Solid
Client Sample ID:	WENTZ	**Site ID:**	DRILL CUTTING ANAL

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS by ICP			**Method: SW6010C (2007)**				**Analyst: JD**	
Aluminum	4,170	3.00	25.0	NA		mg/Kg	2/2/2015 6:54 PM	PA/VA
Antimony	4.29	2.00	5.00	NA	J	mg/Kg	2/2/2015 6:51 PM	PA/VA
Arsenic	42.8	1.00	5.00	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Barium	125	0.200	2.50	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Beryllium	0.739	0.0500	0.250	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Boron	26.3	1.00	2.50	NA		mg/Kg	2/3/2015 11:29 AM	PA/VA
Cadmium	2.57	0.100	0.500	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Chromium	21.9	0.200	2.50	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Copper	177	0.200	2.50	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Iron	22,100	50.0	250	NA		mg/Kg	2/2/2015 6:58 PM	PA/VA
Lead	28.3	1.00	5.00	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Lithium	4.69	0.100	5.00	NA	J	mg/Kg	2/4/2015 1:40 PM	
Manganese	132	0.200	2.50	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Nickel	98.0	0.200	2.50	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Selenium	13.5	1.00	5.00	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Silver	0.789	0.100	1.25	NA	J	mg/Kg	2/2/2015 6:51 PM	PA/VA
Strontium	5,560	10.0	250	NA		mg/Kg	2/4/2015 3:43 PM	PA/VA
Vanadium	155	0.200	2.50	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
Zinc	138	0.500	2.50	NA		mg/Kg	2/2/2015 6:51 PM	PA/VA
MERCURY, Total SW7417B			**Method: SW7471B (2/07)**				**Analyst: CR**	
Mercury	0.140	0.020	0.100	NA		mg/Kg	2/5/2015 12:13 PM	PA/VA
HEXAVALENT CHROMIUM, WATER SOLUBLE			**Method: SW7196A (1992)**				**Analyst: JB**	
Chromium, Hexavalent	1.96	0.100	0.200	NA		mg/kg	2/4/2015 7:45 AM	PA/VA
PERCENT MOISTURE			**Method: SM2540 B-1997**				**Analyst: TS**	
Percent Moisture	18	0.010	0.50	NA		wt%	2/2/2015 2:08 PM	
Oil and Grease			**Method: SW9071B (4/98)**				**Analyst: NC**	
Oil & Grease, Total Recoverable	0.032	0.001	0.061	NA	J	wt%-dry	2/3/2015 11:00 AM	
SEMIVOLATILE ORGANIC COMPOUNDS			**Method: SW8270D (2007)**				**Analyst: JD**	
1,4-Dinitrobenzene	ND	0.066	0.332	NA		mg/Kg	2/3/2015 7:10 PM	
1,4-Napthoquinone	ND	NA	0.332	NA		mg/Kg	2/3/2015 7:10 PM	
4-Nitroquinoline-1-oxide	ND	NA	0.332	NA		mg/Kg	2/3/2015 7:10 PM	

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Project:	WENTZ 1H	**Date Received:**	1/30/2015
Lab ID:	1501U70-01A	**Matrix:**	Solid
Client Sample ID:	WENTZ	**Site ID:**	DRILL CUTTING ANAL

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Pentachloronitrobenzene	ND	NA	0.332	NA		mg/Kg	2/3/2015 7:10 PM	
Bis(2-ethylhexyl)phthalate	ND	0.166	0.332	NA		mg/Kg	2/3/2015 7:10 PM	PA/VA
Butyl benzyl phthalate	ND	0.166	0.332	NA		mg/Kg	2/3/2015 7:10 PM	
Di-n-butyl phthalate	ND	0.166	0.332	NA		mg/Kg	2/3/2015 7:10 PM	PA/VA
Diethyl phthalate	ND	0.066	0.332	NA		mg/Kg	2/3/2015 7:10 PM	PA/VA
Dimethyl phthalate	ND	0.066	0.332	NA		mg/Kg	2/3/2015 7:10 PM	PA/VA
2,4-Dinitrotoluene	ND	0.066	0.332	NA		mg/Kg	2/3/2015 7:10 PM	PA/VA
2,6-Dinitrotoluene	ND	0.066	0.332	NA		mg/Kg	2/3/2015 7:10 PM	PA/VA
Di-n-octyl phthalate	ND	0.166	0.332	NA		mg/Kg	2/3/2015 7:10 PM	PA/VA
Fluoranthene	0.240	0.066	0.332	NA	J	mg/Kg	2/3/2015 7:10 PM	PA/VA
Nitrobenzene	ND	0.066	0.332	NA		mg/Kg	2/3/2015 7:10 PM	PA/VA
Surr: 2-Fluorophenol	56.1	NA	54.1-110	NA		%REC	2/3/2015 7:10 PM	
Surr: Phenol-d5	61.8	NA	60.1-110	NA		%REC	2/3/2015 7:10 PM	
Surr: 2,4,6-Tribromophenol	28.8	NA	58.8-128	NA	S	%REC	2/3/2015 7:10 PM	
Surr: Nitrobenzene-d5	73.1	NA	68.2-123	NA		%REC	2/3/2015 7:10 PM	
Surr: 2-Fluorobiphenyl	69.9	NA	68.4-116	NA		%REC	2/3/2015 7:10 PM	
Surr: 4-Terphenyl-d14	74.0	NA	52.2-121	NA		%REC	2/3/2015 7:10 PM	
VOLATILE ORGANIC COMPOUNDS-8260			**Method: SW8260B (1996)**				**Analyst: JM**	
Benzene	2,010	50.0	100	NA		µg/Kg	2/10/2015 2:17 PM	PA/VA
Bromodichloromethane	ND	1.82	3.64	NA		µg/Kg	2/5/2015 1:02 PM	PA/VA
Chlorobenzene	ND	1.82	3.64	NA		µg/Kg	2/5/2015 1:02 PM	PA/VA
1,2-Dichlorobenzene	ND	1.82	3.64	NA		µg/Kg	2/5/2015 1:02 PM	PA/VA
1,3-Dichlorobenzene	ND	1.82	3.64	NA		µg/Kg	2/5/2015 1:02 PM	PA/VA
1,4-Dichlorobenzene	ND	1.82	3.64	NA		µg/Kg	2/5/2015 1:02 PM	PA/VA
Surr: 1,2-Dichloroethane-d4	80.3	NA	70-130	NA		%REC	2/10/2015 2:17 PM	
Surr: 4-Bromofluorobenzene	109	NA	70-130	NA		%REC	2/10/2015 2:17 PM	
Surr: Dibromofluoromethane	89.5	NA	70-130	NA		%REC	2/10/2015 2:17 PM	
Surr: Toluene-d8	103	NA	70-130	NA		%REC	2/10/2015 2:17 PM	
ANIONS by IC, WATER SOLUBLE			**Method: SW9056A (2000)**				**Analyst: CF**	
Chloride	35,400	200	2,000	NA		mg/Kg	2/2/2015 3:40 PM	PA/VA
Fluoride	2.20	1.00	4.00	NA	J	mg/Kg	2/2/2015 3:40 PM	
Nitrogen, Nitrate	1.20	0.400	2.00	NA	J	mg/Kg	2/2/2015 3:40 PM	PA/VA
Nitrogen, Nitrite	ND	1.00	10.0	NA		mg/Kg	2/2/2015 3:40 PM	
Sulfate	510	20.0	100	NA		mg/Kg	2/2/2015 3:40 PM	

REI Consultants, Inc. - Analytical Report

WO#: 1501U70

Date Reported: 2/18/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	1/28/2015 10:30:00 AM
Project:	WENTZ 1H	**Date Received:**	1/30/2015
Lab ID:	1501U70-01A	**Matrix:**	Solid
Client Sample ID:	WENTZ	**Site ID:**	DRILL CUTTING ANAL

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
AMMONIA NITROGEN			**Method: SM4500-NH3 B-C-1997**				**Analyst: CC**	
Nitrogen, Ammonia	11.2	8.00	10.0	NA		mg/Kg	2/5/2015 2:11 PM	
TOTAL KJELDAHL NITROGEN (TKN)			**Method: EPA 351.2, Rev. 2.0 (1993)**				**Analyst: JH**	
Nitrogen, Kjeldahl, Total	1,910	100	502	NA		mg/Kg	2/2/2015 9:18 PM	PA/VA
CYANIDE, FREE			**Method: SM4500-CN I-1997**				**Analyst: JH**	
Cyanide, Free	ND	0.250	1.00	NA		mg/Kg	2/2/2015 1:10 PM	

Notes:

Elevated PQLs are due to matrix interference.

CONDUCTIVITY			**Method: SM2510 B-1997**				**Analyst: KY**	
Specific Conductivity	118,000	NA	NA	NA		µmhos/cm	2/10/2015 10:35 AM	

Notes:

Conductivity result was estimated based on measuring a 1:10 dilution.

ALKALINITY			**Method: SM2320 B-1997**				**Analyst: DSD**	
Alkalinity, Total (As CaCO3)	6,630	20.0	200	NA		mg/Kg	2/2/2015 4:49 PM	
pH			**Method: SW9045D (2002)**				**Analyst: DSD**	
pH	10.5	NA	NA	NA		SU	2/4/2015 3:20 PM	PA/VA

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

Improving the environment, one client at a time...

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

101 17th Street
Ashland, KY 41101
TEL: 606.393.5027

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Monday, March 02, 2015

GEORGE CARICO
MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE
1 JOHN MARSHALL DRIVE
HUNTINGTON, WV 25755-2585

TEL: (304) 696-6042
FAX:

RE: WENTZ 1H

Work Order #: 1501U74

Dear GEORGE CARICO:

REI Consultants, Inc. received 1 sample(s) on 1/30/2015 for the analyses presented in the following report.

Sincerely,

Kathy Berry

REI Consultants, Inc. - Case Narrative

WO#: 1501U74

Date Reported: 3/2/2015

Client: MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE

Project: WENTZ 1H

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be consider estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1501U74

Date Reported: 3/2/2015

Client:	MARSHALL UNIVERSITY CENTER. FOR ENV. SCIENCE	**Collection Date:**	1/28/2015 10:30:00 AM
Project:	WENTZ 1H	**Date Received:**	1/30/2015
Lab ID:	1501U74-01A	**Matrix:**	Solid
Client Sample ID:	WENTZ 1H	**Site ID:**	DRILL CUTTING ANAL

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
GROSS ALPHA			**Method: EPA 900.0**				**Analyst: Sub**	
Gross Alpha	see attached	NA	NA	NA				
GROSS BETA			**Method: EPA 900.0**				**Analyst: Sub**	
Gross Beta	see attached	NA	NA	NA				
RADIUM-226			**Method: EPA 903.1**				**Analyst: Sub**	
Radium-226	see attached	NA	NA	NA				
RADIUM-228			**Method: EPA 904.0**				**Analyst: Sub**	
Radium-228	see attached	NA	NA	NA				
STRONTIUM-90			**Method: EPA 905.0**				**Analyst: Sub**	
Strontium-90	see attached	NA	NA	NA				

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

February 27, 2015

Ms. Kathy Berry
REI Consultants, Inc.
225 Industrial Park Drive
PO Box 286
Beaver, WV 25813

RE: Project: 1501U74
Pace Project No.: 30139981

Dear Ms. Berry:
Enclosed are the analytical results for sample(s) received by the laboratory on February 03, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 1501U74
Pace Project No.: 30139981

Pennsylvania Certification IDs
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ACLASS DOD-ELAP Accreditation #: ADE-1544
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California/TNI Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Guam/PADEP Certification
Hawaii/PADEP Certification
Idaho Certification
Illinois/PADEP Certification
Indiana/PADEP Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188
Utah/TNI Certification #: PA014572014-4
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin/PADEP Certification
Wyoming Certification #: 8TMS-Q

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 1501U74
Pace Project No.: 30139981

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30139981001	**1501U74-01A**	Solid	01/28/15 10:30	02/03/15 14:30

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Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 1501U74
Pace Project No.: 30139981

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30139981001	**1501U74-01A**	EPA 900.0	FCC	2
		EPA 901.1	MAH	2
		ASTM D5811-95	LAL	1

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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1501U74
Pace Project No.: 30139981

Method: **EPA 900.0**
Description: 900.0 Gross Alpha/Beta
Client: REI Consultants, Inc.
Date: February 27, 2015

General Information:
1 sample was analyzed for EPA 900.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: RADC/23298

N2: The lab does not hold TNI accreditation for this parameter.

- 1501U74-01A (Lab ID: 30139981001)
  - Gross Alpha
  - Gross Beta
- BLANK (Lab ID: 851090)
  - Gross Alpha
  - Gross Beta

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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1501U74
Pace Project No.: 30139981

Method: **EPA 901.1**
Description: 901.1 Gamma Spec INGROWTH
Client: REI Consultants, Inc.
Date: February 27, 2015

General Information:
1 sample was analyzed for EPA 901.1. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 901.1 with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1501U74
Pace Project No.: 30139981

Method: **ASTM D5811-95**
Description: ASTM D5811 Sr 89/90 Eichrom
Client: REI Consultants, Inc.
Date: February 27, 2015

General Information:
1 sample was analyzed for ASTM D5811-95. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: RADC/23280

N2: The lab does not hold TNI accreditation for this parameter.

- BLANK (Lab ID: 850775)
  - Strontium-90

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1501U74
Pace Project No.: 30139981

Sample: 1501U74-01A **Lab ID: 30139981001** Collected: 01/28/15 10:30 Received: 02/03/15 14:30 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	**26.3 ± 8.93 (9.28) C:NA T:NA**	pCi/g	02/07/15 20:49	12587-46-1	N2
Gross Beta	EPA 900.0	**34.8 ± 7.78 (4.58) C:NA T:NA**	pCi/g	02/07/15 20:49	12587-47-2	N2
Radium-226	EPA 901.1	**4.442 ± 0.708 (0.213) C:NA T:NA**	pCi/g	02/26/15 13:01	13982-63-3	
Radium-228	EPA 901.1	**1.230 ± 0.329 (0.289) C:NA T:NA**	pCi/g	02/26/15 13:01	15262-20-1	
Strontium-90	ASTM D5811-95	**0.151 ± 0.152 (0.321) C:62% T:NA**	pCi/g	02/09/15 07:18	10098-97-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1501U74
Pace Project No.: 30139981

QC Batch: RADC/23280
QC Batch Method: ASTM D5811-95
Analysis Method: ASTM D5811-95
Analysis Description: ASTM D5811 Sr 89/90 Eichrom
Associated Lab Samples: 30139981001

METHOD BLANK: 850775
Matrix: Solid
Associated Lab Samples: 30139981001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Strontium-90	-0.0355 ± 0.0831 (0.220) C:97% T:NA	pCi/g	02/09/15 07:18	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1501U74
Pace Project No.: 30139981

QC Batch:	RADC/23312	Analysis Method:	EPA 901.1
QC Batch Method:	EPA 901.1	Analysis Description:	901.1 Gamma Spec Ingrowth

Associated Lab Samples: 30139981001

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1501U74
Pace Project No.: 30139981

QC Batch: RADC/23298
QC Batch Method: EPA 900.0
Analysis Method: EPA 900.0
Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 30139981001

METHOD BLANK: 851090
Matrix: Solid
Associated Lab Samples: 30139981001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.004 ± 0.0857 (0.218) C:NA T:NA	pCi/g	02/07/15 20:49	N2
Gross Beta	-0.031 ± 0.0984 (0.237) C:NA T:NA	pCi/g	02/07/15 20:49	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1501U74
Pace Project No.: 30139981

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2 The lab does not hold TNI accreditation for this parameter.

REPORT OF LABORATORY ANALYSIS

REIC

improving the environment, one client at a time...

CHAIN OF CUSTODY RECORD

COC ID: 3277	PAGE: 1	OF: 1

ADDRESS
REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
FAX: (304) 255-2572
Website: www.reiclabs.com

30139981

Please Include Email Address of Report Recipient Whenever Possible!!!

SUB CONTRATOR: **PACE_PA** COMPANY: **PACE ANALYTICAL SERVIC**

ADDRESS: **1638 ROSEYTOWN ROAD**

CITY, STATE, ZIP: **GREENSBURG, PA 15601**

PHONE: **(724) 850-5600** FAX:

ACCOUNT #: **050719EVF1** EMAIL:

SPECIAL INSTRUCTIONS / COMMENTS:

State Code: WV Please use SampleID as purchase order number.
After analysis, the samples do not need to be returned and can be disposed per your standard laboratory practices. Results to kberry@reiclabs.com Thank you

ITEM	SAMPLE ID	Client Sample ID	Bottle Type	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	GROSS_ALPHA_SUB (EPA 900.0)	GROSS_BETA_SUB (EPA 900.0)	RADIUM_226_SUB (EPA 903.1)	RADIUM_228_SUB (EPA 904.0)	STRONTIUM_90_SUB (EPA 905.0)
						*	0	0	0	0	0
1	1501U74-01A	WENTZ 1H	.	Solid	1/28/2015 10:30:00 AM	2	√	√	√	√	√

ANALYTICAL PARAMETERS

* Preservation Codes:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide/ Sodium Arsenite
6 Sodium Hydroxide
7 Ascorbic Acid
8 Sodium Sulfite/HCL
9 Potassium Dihydrogen Citrate
10 Bromium Chloride

COMMENTS: 901

Relinquished By:	Date: 2/2/15	Time: 16:00	Received By: MSC	Date: 2/2/15	Time: 16:00
Relinquished By:	Date: 2/3/15	Time: 0841	Received By: Cliff Mitchell Pace	Date: 2/3/15	Time: 8:41
Relinquished By: Cliff Mitchell	Date: 2/3/15	Time: 2:30 P	Received By: Scott Annick Pace	Date: 2-3-15	Time: 1430

TAT: Standard ☑ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☑ EMAIL ☐ ONLINE

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool ? _____

Comments: _____

Sample Condition Upon Receipt

Pace Analytical

Client Name: REIC Project # 30134981

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap X Bubble Bags ____ None ____ Other _____

Thermometer Used NA Type of Ice: Wet Blue (None) ☐ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.:_____°C Correction Factor: _____°C Final Temp:_____°C

Date and Initials of person examining contents: SRA 2-3-15

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4. waiver on file OF 2/4/15
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☒No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SW		
All containers needing preservation have been checked.	☐Yes ☐No ☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☒No	Initial when completed SRA Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Dawn Sears Date: 2/4/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Project Number: 361399B1

Client Name: REFE

Item No.	1												
Matrix Code	SL												
Glass Jar (120 / 250 / 500 / 1L)	N												
Soil Kit (2 SB, 1M, soil jar)													
Chemistry (250 / 500 / 1L)													
Organics (1L)													
Nutrient (250 / 500)													
Phenolics (250 ml)													
TOC (40 ml / 250 ml)													
TOX (250 ml)													
Total Metals													
Dissolved Metals preserved Y N													
O & G (1L)													
TPH (1L)													
VOA (40 ml 30 ml)													
Cyanide (250 ml)													
Sulfide (500 ml)													
Bacteria (120 ml)													
Wipes / swipe/ smear/ filter													
Radchem Nalgene (125 / 250 / 500 / 1L)													
Radchem Nalgene (1/2 gal. / 1 gal.L)													
Cubitainer (500 ml / 4L)													
Ziploc													
Other													
Other													
Other													

SCURF Back (C016-4 15May2012).xls