

Pre-Drilling Water Sampling Submittal Review Checklist

Permit No.: 34-059-24341-0000 Well Name: Red Hill Farms MDS GR 5
Owner: American Energy Utica LLC Pad Name: Red Hill Farms MDS GR
Township/County: Madison / Guernsey
Latitude/Longitude: 40.1275145 / -81.345886
Sampling Company: CESO, Inc. Bridgeville, PA
Laboratory: Pace Analytical Services, Inc.
☒ Yes ☐ No Ohio EPA or NELAP/NELAC Certified Lab
Submittal date(s): 3/28/2014
Via: ☐ eMail ☐ Flash Drive ☐ Paper ☒ CD ☐ Other: _____

Required/Actual Sampling Radius (feet) 1500/2000
☒ Yes ☐ No Any Building Clusters or Potential Residences Identified within Required Sampling Radius
☒ Yes ☐ No ☐ NA All Building Clusters or Potential Residences within Required Sampling Radius Accounted for
Sample Date(s): February 2014
☒ Yes ☐ No Sample Location, Sampling Radius and Oil & Gas Well/Pad Shown on Scaled Aerial Photo/Map
☒ Yes ☐ No Latitude/Longitude or Address of Sample Locations Provided
☒ Yes ☐ No Lab Reports Submitted
☒ Yes ☐ No Chain of Custody Forms Submitted
☒ Yes ☐ No Results Submitted for All Parameters Required in September 20, 2012 BMP

Additional Information Requested: no

Additional Information Received: no

Other Items of Note: _____

DOGRM Reviewer: Rjt Date: 4/8/2014



800 Bursca Drive, Suite 804
Bridgeville, Pennsylvania
15017-1451 (412) 221-2236
www.cesoinc.com

Sent via Certified Mail:
7013 1090 0002 4389 9365

March 14, 2014

Predrill Survey Results
Ohio Department of Natural Resources
Division of Oil & Gas, Permitting Section
2045 Morse Road, Building F-2
Columbus, OH 43229-6693

RE: Submittal of Pre-Drilling Survey Results
Red Hill Farm, AEU, LLC
Londonderry & Madison Townships, Guernsey County, OH
CESO Job #750217

To Whom It May Concern:

CESO, Inc., is submitting predrilling survey results on behalf of America Energy – Utica (AEU) for the properties listed below. This information is submitted to satisfy the requirements of Ohio Senate Bill 315.

Pad Name	Parcel ID	County	Municipality	Owner	Supply Type
Red Hill Farm	220000047000	Guernsey	Madison Twp.	Cooper, David & Mary	1 Well
Red Hill Farm	200000470000	Guernsey	Londonderry Twp.	Kelm, Paul	1 Spring
Red Hill Farm	220000791000	Guernsey	Madison Twp.	Miller, William & Edna	1 Well
Red Hill Farm	220000792000	Guernsey	Madison Twp.	Nisley, Phillip & Ellen	1 Spring
Red Hill Farm	220000226000	Guernsey	Madison Twp.	Raber, Randy	1 Well
Red Hill Farm	200000617000	Guernsey	Londonderry Twp.	Taylor, Gary & Karen	1 Spring

A minimum of three attempts (phone call, home visit, and/or certified letter) were made to contact each parcel owner within the 2,000 foot radius of the Red Hill Farm wellhead. Mailing addresses were obtained from the Guernsey County Auditor's office. A table presenting information regarding parcel owners and their status has been included in this submittal as Attachment A. Additionally, a corresponding map depicting properties sampled, refused, or on public water is included as Attachment B.

Should you have any questions or comments please don't hesitate to contact me at longenecker@cesoinc.com.

Sincerely,
CESO, Inc.

Andrew Longenecker
Environmental Program Manager

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Engineering • Architecture • Survey • Construction Mgt • Environmental



800 Bursca Drive, Suite 804
Bridgeville, Pennsylvania 15017-1451
(412) 221-2236
www.cesoinc.com

Sent via Certified Mail
7013 1090 0002 4389 8641

March 5, 2014

David & Mary Cooper
20411 Cadiz Road
Freeport, OH 43973

RE: Notification of Water Well Sampling Results Performed on Behalf of AEU, LLC

Dear Mr. & Mrs. Cooper:

CESO, Inc., on behalf of American Energy- Utica, LLC (AEU), has collected water samples from the water supply well located at 20411 Cadiz Road, Freeport, Ohio. The well is identified herein as "RHF-RW-Co" and is located within 2,000 feet of the proposed Red Hill Farm wellhead.

The sampling event occurred on February 14, 2014 as part of the pre-drill sampling process, pursuant Chapter 1509 of the Ohio Revised Code (2005) and Ohio Senate Bill 165 (2010), and Ohio Senate Bill 315 (2012), for the above mentioned well pad.

The water quality results of the samples collected are provided in the analytical report attached to this letter. The analyses were performed by Pace Analytical Services, Inc. (Pace) of Indianapolis, Indiana which is Ohio Environmental Protection Agency (OEPA) Voluntary Action Program (VAP) certified.

Please note that this sampling event was not performed to determine the potability of your water. However, to assist you in assessing your water supply, the analytical results for your water source were evaluated against Maximum Contaminant Levels (MCLs) standards and Secondary Maximum Contaminant Levels (SMCLs) established by the United States Environmental Protection Agency (EPA) for public water supplies. These MCLs and SMCLs are not enforced by the EPA, OEPA or Ohio Department of Natural Resources (ODNR) on private residential water supplies.

All chemical analytes sampled in RHF-RW-Co were below MCLs and SMCLs established by the EPA, OEPA, and ODNR.

The Ohio State University (OSU) Extension and the Penn State University (PSU) Cooperative Extension websites offer useful publications regarding the interpretation of analytical results and additional information on private water supplies. The OSU information can be accessed at <http://extension.osu.edu/topics/environment/water-testing-and-treatment> and the PSU information can be found at <http://extension.psu.edu/natural-resources/water/drinking-water>.

CESO, Inc. will be submitting a copy of this notification letter to AEU, LLC and ODNR as part of the well permit package. Should you have any questions or comments, please contact CESO, Inc. at 412.221.2236.

Sincerely,



Environmental Program

**Water Supply Pre-Drill Survey
SITE VISIT FORM**

GENERAL INFORMATION

Operator Name: AELU, LLC
Location of Gas Well:
Municipality: Madison
County: Guernsey
Physical Address: Cadiz Rd
City, State, Zip Code: Freeport, OH 43973

Date Invented: 02/14/14
Invented by: NH/PH

Property of Interest Information:

Municipality: Madison Township County: Guernsey Tax Parcel ID: 220000047000
Person Interviewed: Mary Cooper Owner ☒ Resident ☐ Other ☐
If other, list relationship: _____
Length of time living at residence: 40 years
Send analytical results to: Owner ☒ Other ☐ If other, list: _____
Name: Mary & David Cooper
Mailing Address: 20411 Cadiz Road
City, State, Zip Code: Freeport, OH 43973
Phone: 740-489-5631

WATER SOURCE INFORMATION

Private Water Supply ☒ No Water Supply ☐ Public Water Supply ☐
How many water sources on this property? 1
Number of wells: 1 Number of springs: 0
Number of other (list): _____
Was there ever a well in the basement? No
If yes, explain. _____

Water Supply ID: BHF-RW-Co-01

Is water source located on the property of interest? Yes If no, please explain: _____
Does this source supply any other property? No If yes, please list owner(s): _____
Is this water system ever winterized? If yes, what method is used? No
Number of persons using this water source? 2
Distance from residence (ft): 10' Direction from residence: N
Distance from (proposed) gas well (ft): 1400' Direction from (proposed) gas well: SW

Uses:

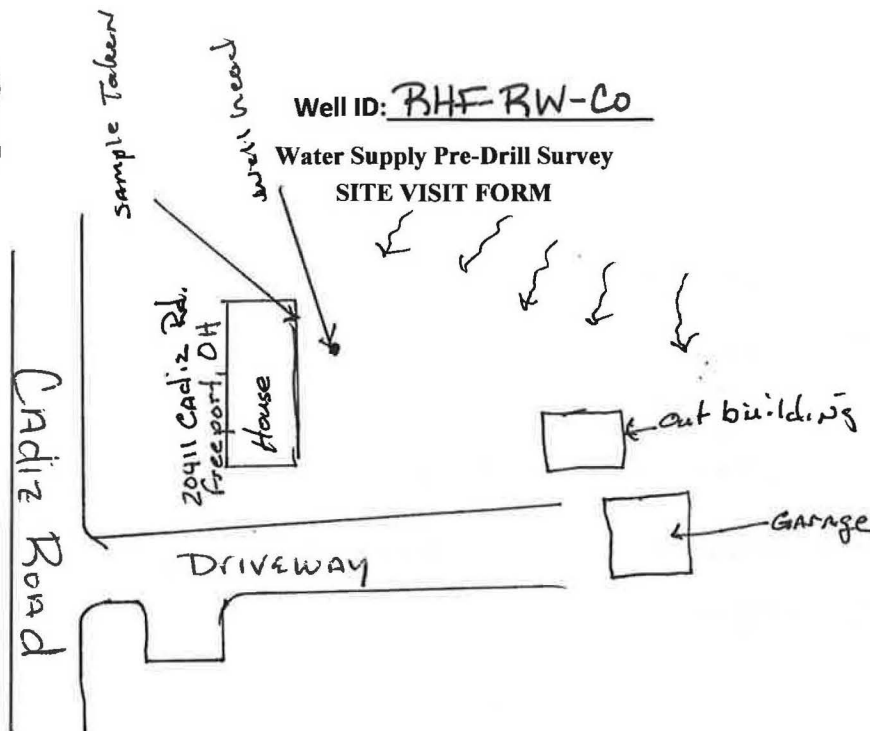
Domestic ☒
Husbandry ☐
Irrigation ☐
Industrial/Commercial ☐
Public, non-community ☐
Abandoned ☐
None ☐

Surrounding Area Information:

Ground sloping toward water source ☐
Water source downgradient of septic ☐
Signs of failing septic, soggy, odor ☐
Close to crops, garden, greenhouse ☐
Close to junkyard, dump, landfill ☐
Close to fuel tanks, storage, garage ☐
Close to livestock, barn, barnyard, etc ☐
Close to salt storage, salted roadway ☐

Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____

PLAN SKETCH



Well ID: BHF-RW-Co

Water Supply Pre-Drill Survey
SITE VISIT FORM

COMMENTS/PHOTO DESCRIPTIONS

Per phone conversation, Ms. Cooper indicates that the well head is buried.

Photo #1 - vented cap on buried well head in the back yard

Photo #2 - sample being collected directly from spigot off of pressure tank

Photo #3 - location of spigot relative to the holding / pressure tank

I hereby acknowledge that I have supplied the correct information to the best of my knowledge.

Signed: Mary K. Cooper

Printed: MARY COOPER

Date: 2-14-14



Photograph 1: Up close view of the spigot used for sampling and the pressure tank located directly beside it in the basement of Mary and David Cooper's residence on parcel # 220000047000, at 20411 Cadiz Road, Freeport, Ohio 43973.



Photograph 2: Southwest view of the vent pipe indicating the location of the buried well head at Mary and David Cooper's property, parcel # 220000047000, at 20411 Cadiz Road, Freeport, Ohio 43973.



Photograph 3: Up close view of CESCO, Inc. collecting a sample directly from the spigot in the basement of Mary and David Cooper's residence on parcel # 220000047000, at 20411 Cadiz Road, Freeport, Ohio 43973.

March 03, 2014

Mr. Andrew Longenecker
Civil Engineers of Southwest Ohio, Inc.
800 Bursca Drive
Suite 804
Bridgeville, PA 15017

RE: Project: Red Hill Farm Pre-Drill 750217
Pace Project No.: 5093430

Dear Mr. Longenecker:

Enclosed are the analytical results for sample(s) received by the laboratory on February 17, 2014. 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,



Regina Bedel
regina.bedel@pacelabs.com
Project Manager

Enclosures

cc: Ms. Natalie Hooton, Civil Engineers of Southwest Ohio,
Inc.
Ms. Carolyn Rummell, Civil Engineers of Southwest Ohio,
Inc.



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas Certification #: E-10247

Kentucky UST Certification #: 0042

Louisiana/NELAP Certification #: 04076

Ohio VAP Certification #: CL-0065

Pennsylvania Certification #: 68-04991

West Virginia Certification #: 330

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 13-012-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-13-4

Utah Certification #: KS000212013-3

Illinois Certification #: 003097

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

Lab ID	Sample ID	Matrix	Date Collected	Date Received
5093430001	RHF-RW-CO-01	Water	02/14/14 10:55	02/17/14 10:52

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SAMPLE ANALYTE COUNT

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
5093430001	RHF-RW-CO-01	RSK 175 Modified	PTH	1	PASI-I
		EPA 200.7	LLB	9	PASI-I
		EPA 200.7	LLB	2	PASI-I
		EPA 8260	ALA	7	PASI-I
		SM 2320B	SLB	1	PASI-I
		SM 2510B	MLS	1	PASI-I
		SM 2540C	MLS	1	PASI-I
		SM 2540D	MLS	1	PASI-I
		SM 4500-H+B	TPD	1	PASI-I
		EPA 9038	TPD	1	PASI-I
		EPA 300.0	OL	1	PASI-K
		SM 4500-CI-E	WDB	1	PASI-I

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ANALYTICAL RESULTS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

Sample: RHF-RW-CO-01		Lab ID: 5093430001		Collected: 02/14/14 10:55		Received: 02/17/14 10:52		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 Headspace		Analytical Method: RSK 175 Modified							
Methane	ND mg/L		0.010	1		02/26/14 16:36	74-82-8	N2	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	0.030 mg/L		0.010	1	02/18/14 19:05	02/19/14 10:03	7440-39-3		
Calcium	88.3 mg/L		1.0	1	02/18/14 19:05	02/19/14 10:03	7440-70-2		
Iron	ND mg/L		0.10	1	02/18/14 19:05	02/19/14 10:03	7439-89-6		
Magnesium	34.1 mg/L		1.0	1	02/18/14 19:05	02/19/14 10:03	7439-95-4		
Manganese	ND mg/L		0.010	1	02/18/14 19:05	02/19/14 10:03	7439-96-5		
Potassium	5.0 mg/L		1.0	1	02/18/14 19:05	02/19/14 10:03	7440-09-7		
Sodium	10.1 mg/L		1.0	1	02/18/14 19:05	02/19/14 10:03	7440-23-5		
Strontium	0.57 mg/L		0.010	1	02/18/14 19:05	02/19/14 10:03	7440-24-6	N2	
Total Hardness by 2340B	361 mg/L		2.0	1	02/18/14 19:05	02/19/14 10:03			
200.7 Metals, Dissolved (LF)		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Dissolved	29.8 ug/L		10.0	1	02/20/14 14:05	02/21/14 10:08	7440-39-3		
Iron, Dissolved	ND ug/L		100	1	02/20/14 14:05	02/21/14 10:08	7439-89-6		
8260 MSV UST		Analytical Method: EPA 8260							
Benzene	ND mg/L		0.0050	1		02/20/14 22:36	71-43-2		
Toluene	ND mg/L		0.0050	1		02/20/14 22:36	108-88-3		
Ethylbenzene	ND mg/L		0.0050	1		02/20/14 22:36	100-41-4		
Xylene (Total)	ND mg/L		0.010	1		02/20/14 22:36	1330-20-7		
Surrogates									
Dibromofluoromethane (S)	111 %.		79-116	1		02/20/14 22:36	1868-53-7		
Toluene-d8 (S)	93 %.		81-110	1		02/20/14 22:36	2037-26-5		
4-Bromofluorobenzene (S)	106 %.		80-114	1		02/20/14 22:36	460-00-4		
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	353 mg/L		2.0	1		02/19/14 10:02			
2510B Specific Conductance		Analytical Method: SM 2510B							
Specific Conductance	701 umhos/cm		1.0	1		02/21/14 10:19		N2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	376 mg/L		10.0	1		02/18/14 14:00			
2540D Total Suspended Solids		Analytical Method: SM 2540D							
Total Suspended Solids	ND mg/L		5.0	1		02/18/14 09:30			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.1 Std. Units		0.10	1		02/17/14 11:46		H3,H6	
9038 Sulfate Water		Analytical Method: EPA 9038							
Sulfate	27.5 mg/L		12.5	2.5		02/18/14 09:54	14808-79-8	N2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

Sample: RHF-RW-CO-01		Lab ID: 5093430001	Collected: 02/14/14 10:55	Received: 02/17/14 10:52	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Bromide	ND	mg/L	1.0	1		02/28/14 20:25	24959-67-9	
4500 Chloride	Analytical Method: SM 4500-Cl-E							
Chloride	3.2	mg/L	1.0	1		02/20/14 10:35	16887-00-6	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch: GCV/17724

Analysis Method: RSK 175 Modified

QC Batch Method: RSK 175 Modified

Analysis Description: RSK 175 HEADSPACE

Associated Lab Samples: 5093430001

METHOD BLANK: 1053216

Matrix: Water

Associated Lab Samples: 5093430001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methane	mg/L	ND	0.010	02/26/14 16:16	N2

LABORATORY CONTROL SAMPLE: 1053217

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methane	mg/L	2	2.2	110	70-130	N2

SAMPLE DUPLICATE: 1053218

Parameter	Units	5093699012 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	mg/L	7690 ug/L	6.7	14	20	N2

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch: MPRP/12875

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 5093430001

METHOD BLANK: 1049786

Matrix: Water

Associated Lab Samples: 5093430001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	ND	0.010	02/19/14 09:47	
Calcium	mg/L	ND	1.0	02/19/14 09:47	
Iron	mg/L	ND	0.10	02/19/14 09:47	
Magnesium	mg/L	ND	1.0	02/19/14 09:47	
Manganese	mg/L	ND	0.010	02/19/14 09:47	
Potassium	mg/L	ND	1.0	02/19/14 09:47	
Sodium	mg/L	ND	1.0	02/19/14 09:47	
Strontium	mg/L	ND	0.010	02/19/14 09:47	N2
Total Hardness by 2340B	mg/L	ND	2.0	02/19/14 09:47	

LABORATORY CONTROL SAMPLE: 1049787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.98	98	85-115	
Calcium	mg/L	10	9.5	95	85-115	
Iron	mg/L	10	9.7	97	85-115	
Magnesium	mg/L	10	9.4	94	85-115	
Manganese	mg/L	1	0.95	95	85-115	
Potassium	mg/L	10	9.8	98	85-115	
Sodium	mg/L	10	9.8	98	85-115	
Strontium	mg/L	1	0.97	97	80-120	N2
Total Hardness by 2340B	mg/L	66.2	62.6	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1049788

1049789

Parameter	Units	5093430001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	0.030	1	1	0.98	0.99	95	96	70-130	0	20	
Calcium	mg/L	88.3	10	10	91.6	92.6	33	43	70-130	1	20	P6
Iron	mg/L	ND	10	10	9.3	9.3	93	93	70-130	0	20	
Magnesium	mg/L	34.1	10	10	41.4	41.6	73	75	70-130	0	20	
Manganese	mg/L	ND	1	1	0.93	0.93	93	93	70-130	0	20	
Potassium	mg/L	5.0	10	10	13.1	13.1	81	80	70-130	0	20	
Sodium	mg/L	10.1	10	10	18.7	18.8	86	87	70-130	1	20	
Strontium	mg/L	0.57	1	1	1.5	1.5	92	92	70-130	0	20	N2
Total Hardness by 2340B	mg/L	361	66.2	66.2	399	402	58	63	70-130	1	20	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch: MPRP/12883

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Dissolved

Associated Lab Samples: 5093430001

METHOD BLANK: 1050597

Matrix: Water

Associated Lab Samples: 5093430001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium, Dissolved	ug/L	ND	10.0	02/21/14 09:21	
Iron, Dissolved	ug/L	ND	100	02/21/14 09:21	

LABORATORY CONTROL SAMPLE: 1050598

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium, Dissolved	ug/L	1000	953	95	85-115	
Iron, Dissolved	ug/L	10000	9760	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1050599 1050600

Parameter	Units	5093315001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium, Dissolved	ug/L	27.2	1000	1000	979	985	95	96	70-130	1	20	
Iron, Dissolved	ug/L	ND	10000	10000	9720	9820	97	98	70-130	1	20	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch:	MSV/61898	Analysis Method:	EPA 8260
QC Batch Method:	EPA 8260	Analysis Description:	8260 MSV UST-WATER
Associated Lab Samples:	5093430001		

METHOD BLANK: 1050335 Matrix: Water

Associated Lab Samples: 5093430001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/L	ND	0.0050	02/20/14 12:38	
Ethylbenzene	mg/L	ND	0.0050	02/20/14 12:38	
Toluene	mg/L	ND	0.0050	02/20/14 12:38	
Xylene (Total)	mg/L	ND	0.010	02/20/14 12:38	
4-Bromofluorobenzene (S)	%	104	80-114	02/20/14 12:38	
Dibromofluoromethane (S)	%	106	79-116	02/20/14 12:38	
Toluene-d8 (S)	%	93	81-110	02/20/14 12:38	

LABORATORY CONTROL SAMPLE: 1050336

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	mg/L	.05	0.051	102	74-122	
Ethylbenzene	mg/L	.05	0.048	96	66-133	
Toluene	mg/L	.05	0.052	104	72-122	
Xylene (Total)	mg/L	.15	0.14	95	70-124	
4-Bromofluorobenzene (S)	%			96	80-114	
Dibromofluoromethane (S)	%			100	79-116	
Toluene-d8 (S)	%			104	81-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1050337 1050338

Parameter	Units	5093464003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	mg/L	6.6 ug/L	.05	.05	0.063	0.061	112	109	62-129	3	20	
Ethylbenzene	mg/L	ND	.05	.05	0.052	0.050	104	100	28-153	5	20	
Toluene	mg/L	ND	.05	.05	0.055	0.052	110	105	50-132	5	20	
Xylene (Total)	mg/L	ND	.15	.15	0.15	0.15	103	98	29-145	5	20	
4-Bromofluorobenzene (S)	%						99	98	80-114			
Dibromofluoromethane (S)	%						99	100	79-116			
Toluene-d8 (S)	%						101	98	81-110			

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch: WET/14687

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 5093430001

METHOD BLANK: 1050023

Matrix: Water

Associated Lab Samples: 5093430001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	ND	2.0	02/19/14 10:02	

LABORATORY CONTROL SAMPLE: 1050024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	50	49.8	100	90-110	

SAMPLE DUPLICATE: 1050025

Parameter	Units	5093437001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	325	334	3	20	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch:	WET/14705	Analysis Method:	SM 2510B
QC Batch Method:	SM 2510B	Analysis Description:	2510B Specific Conductance
Associated Lab Samples:	5093430001		

METHOD BLANK: 1050511 Matrix: Water

Associated Lab Samples: 5093430001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	ND	1.0	02/21/14 10:19	N2

LABORATORY CONTROL SAMPLE: 1050512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1410	1410	100	90-110	N2

SAMPLE DUPLICATE: 1050513

Parameter	Units	5093430001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	701	678	3	20	N2

SAMPLE DUPLICATE: 1050514

Parameter	Units	5093551009 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	504	495	2	20	N2

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch: WET/14677

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 5093430001

METHOD BLANK: 1049486

Matrix: Water

Associated Lab Samples: 5093430001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	02/18/14 14:00	

LABORATORY CONTROL SAMPLE: 1049487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	300	278	93	80-120	

SAMPLE DUPLICATE: 1049488

Parameter	Units	5093430001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	376	390	4	10	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch: WET/14676

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 5093430001

METHOD BLANK: 1049482

Matrix: Water

Associated Lab Samples: 5093430001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	02/18/14 09:29	

LABORATORY CONTROL SAMPLE: 1049483

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	85	85	80-120	

SAMPLE DUPLICATE: 1049484

Parameter	Units	5093233002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	240	224	7	10	

SAMPLE DUPLICATE: 1049485

Parameter	Units	5093430001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch: WET/14671

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 5093430001

SAMPLE DUPLICATE: 1049303

Parameter	Units	5093430001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.2	2	20	H3,H6

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch: WET/14684

Analysis Method: EPA 9038

QC Batch Method: EPA 9038

Analysis Description: 9038 Sulfate Water

Associated Lab Samples: 5093430001

METHOD BLANK: 1049570

Matrix: Water

Associated Lab Samples: 5093430001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	5.0	02/18/14 09:53	N2

LABORATORY CONTROL SAMPLE: 1049571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	18.3	92	90-110	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1049572 1049573

Parameter	Units	5093430001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	27.5	50	50	77.2	80.8	99	107	90-110	5	20	N2

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch: WETA/28393

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 5093430001

METHOD BLANK: 1336979

Matrix: Water

Associated Lab Samples:

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromide	mg/L	ND	1.0	02/28/14 18:44	

LABORATORY CONTROL SAMPLE: 1336980

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromide	mg/L	5	5.3	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1337380 1337381

Parameter	Units	60163163005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Bromide	mg/L	ND	2500	2500	2500	2490	100	100	80-120	0 15	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

QC Batch:	WETA/11757	Analysis Method:	SM 4500-Cl-E
QC Batch Method:	SM 4500-Cl-E	Analysis Description:	4500 Chloride
Associated Lab Samples:	5093430001		

METHOD BLANK: 1050543 Matrix: Water

Associated Lab Samples: 5093430001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	02/20/14 10:25	

LABORATORY CONTROL SAMPLE: 1050544

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1050545 1050546

Parameter	Units	5092224003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.6	20	20	23.2	23.5	98	99	90-110	1	20	

MATRIX SPIKE SAMPLE: 1050547

Parameter	Units	5093551009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	13.8	20	35.0	106	90-110	

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

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.

PRL - Pace Reporting 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.

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

TNI - The NELAC Institute.

LABORATORIES

PASI-I Pace Analytical Services - Indianapolis

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

H3 Sample was received or analysis requested beyond the recognized method holding time.

H6 Analysis initiated outside of the 15 minute EPA recommended holding time.

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

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

REPORT OF LABORATORY ANALYSIS

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METHOD CROSS REFERENCE TABLE

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

Parameter	Matrix	Analytical Method	Preparation Method
8260 MSV UST	Water	SW-846 8260B	SW-846 5030B

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093430

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
5093430001	RHF-RW-CO-01	RSK 175 Modified	GCV/17724		
5093430001	RHF-RW-CO-01	EPA 200.7	MPRP/12875	EPA 200.7	ICP/14614
5093430001	RHF-RW-CO-01	EPA 200.7	MPRP/12883	EPA 200.7	ICP/14635
5093430001	RHF-RW-CO-01	EPA 8260	MSV/61898		
5093430001	RHF-RW-CO-01	SM 2320B	WET/14687		
5093430001	RHF-RW-CO-01	SM 2510B	WET/14705		
5093430001	RHF-RW-CO-01	SM 2540C	WET/14677		
5093430001	RHF-RW-CO-01	SM 2540D	WET/14676		
5093430001	RHF-RW-CO-01	SM 4500-H+B	WET/14671		
5093430001	RHF-RW-CO-01	EPA 9038	WET/14684		
5093430001	RHF-RW-CO-01	EPA 300.0	WETA/28393		
5093430001	RHF-RW-CO-01	SM 4500-CI-E	WETA/11757		

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A

Required Client Information:

Company: **CESO, Inc.**
Address: **800 Bursca Dr., Suite 804**
Bridgeville, PA 15017
Email To: **longenecker@cesoinc.com**
Phone: **412-221-2236**
Requested Due Date/TAT: **Standard**

Section B

Required Project Information:

Report To: **Andrew Longenecker**
Copy To: **hooton@cesoinc.com**
rummell@cesoinc.com
Purchase Order No.:
Project Name: **Red Hill Farm Pre-drill Sampling**
Project Number: **750217**

Section C

Invoice Information:

Attention: **Tina Gunter**
Company Name: **CESO, Inc.**
Address: **8534 Yankee St. #2B Dayton, OH**
Pace Quote Reference: **12062013RJH-1.6**
Pace Project Manager: **Regina Bidel**
Pace Profile #:

Page: **1** of **1**

1741035

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location:

STATE: **OH**

ITEM #	Section D Required Client Information		Matrix Codes MATRIX / CODE		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analysis Test ↓ Y/N ↓											Y	5093430																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
							COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other	BTEX	Methane		Total Metals	Hardness	Sulfate	TDS	TSS	pH, conductivity	Alkalinity	Bromide	Chloride	Dissolved Fe, Ba, Zn			Residual Chlorine (Y/N)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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1	SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
lab filter for dissolved Ba, Fe	Natalie Hooton - CESO	02/14/14	1155	NW Shanahan - Ace	2-14-14	11:55	02 ✓ ✓ ✓

SAMPLER NAME AND SIGNATURE				Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Natalie Hooton							
SIGNATURE of SAMPLER: <i>Natalie Hooton</i>				DATE Signed (MM/DD/YY): 02/14/2014			

ORIGINAL
2/17/14 9/1053

Sample Condition Upon Receipt

Pace Analytical

Client Name: CESD

Project # SD93430

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

Tracking #: 802463902762

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals Intact: ☒ yes ☐ no

Date/Time 5035A kits placed in freezer

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☒ Other ICE

Thermometer Used 1 2 3 4 6 A B C D E

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

Cooler Temperature 02°C
(Corrected, if applicable)

Ice Visible in Sample Containers: ☐ yes ☒ no

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: 2/17/14

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Short Hold Time Analysis (<72hr):	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5. <u>PH rec. out of hold, took to watchmen</u>
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sample Labels match COC: -Includes date/time/ID/Analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
All containers needing acid/base pres. have been checked? exceptions: VOA, coliform, TOC, O&G	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9. (Circle) <u>HNO3</u> H2SO4 NaOH HCl
All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10.
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	11.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Project Manager Review		
Samples Arrived within Hold Time:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
Sufficient Volume:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Correct Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Ali

Date: 2/17/14

Sample Container Count

CLIENT: CESD



COC PAGE 1 of 1

COC ID# 1741035

Project # _____

Sample Line

Item	DG9H	AG1U	WGFU	AG0U	R	4/6	BP2N	BP2U	BP2S	BP3N	BP3U	BP3S	AG3S	AG1H	BP1U	VG9U	pH <2	pH >12	Comments
1	3									1					2	3	✓		
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

Container Codes

DG9H	40mL HCL amber vial	AG0U	100mL unpreserved amber glass	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1 liter unpreserved amber glass	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber glass	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved amber vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	I	Wipe/Swab
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber glass	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber glass	AF	Air Filter	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved clear vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear glass	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFU	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plastic	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag



800 Bursca Drive, Suite 804
Bridgeville, Pennsylvania 15017-1451
(412) 221-2236
www.cesoinc.com

Sent via Certified Mail
7013 1090 0002 4389 9327

March 5, 2014

Paul Kelm
21020 Crossline Lane
Freeport, OH 43973

RE: Notification of Water Well Sampling Results Performed on Behalf of AEU, LLC

Dear Mr. Kelm:

CESO, Inc., on behalf of American Energy- Utica, LLC (AEU), has collected water samples from the water supply spring located at 21020 Crossline Lane, Freeport, Ohio. The spring is identified herein as "RHF-DS-Ke" and is located within 2,000 feet of the proposed Red Hill Farm wellhead.

The sampling event occurred on February 6, 2014 as part of the pre-drill sampling process, pursuant Chapter 1509 of the Ohio Revised Code (2005) and Ohio Senate Bill 165 (2010), and Ohio Senate Bill 315 (2012), for the above mentioned well pad.

The water quality results of the samples collected are provided in the analytical report attached to this letter. The analyses were performed by Pace Analytical Services, Inc. (Pace) of Indianapolis, Indiana which is Ohio Environmental Protection Agency (OEPA) Voluntary Action Program (VAP) certified.

Please note that this sampling event was not performed to determine the potability of your water. However, to assist you in assessing your water supply, the analytical results for your water source were evaluated against Maximum Contaminant Levels (MCLs) standards and Secondary Maximum Contaminant Levels (SMCLs) established by the United States Environmental Protection Agency (EPA) for public water supplies. These MCLs and SMCLs are not enforced by the EPA, OEPA or Ohio Department of Natural Resources (ODNR) on private residential water supplies.

All chemical analytes sampled in RHF-DS-Ta were below MCLs and SMCLs established by the EPA, OEPA, and ODNR.

The Ohio State University (OSU) Extension and the Penn State University (PSU) Cooperative Extension websites offer useful publications regarding the interpretation of analytical results and additional information on private water supplies. The OSU information can be accessed at <http://extension.osu.edu/topics/environment/water-testing-and-treatment> and the PSU information can be found at <http://extension.psu.edu/natural-resources/water/drinking-water>.

CESO, Inc. will be submitting a copy of this notification letter to AEU, LLC and ODNR as part of the well permit package. Should you have any questions or comments, please contact CESO, Inc. at 412.221.2236.

Sincerely,



Environmental Program

CREATION TO COMPLETION

Engineering • Architecture • Survey • Construction Mgt • Environmental

**Water Supply Pre-Drill Survey
SITE VISIT FORM**

GENERAL INFORMATION

Operator Name: AELI, LLC

Location of Gas Well:

Municipality: Madison Township

County: Guernsey

Physical Address: Cadiz Rd

City, State, Zip Code: Freeport, OH 43973

Date Inventoried: 02/06/14

Inventoried by: NH/PH

Property of Interest Information:

Municipality: Madison Township County: Guernsey Tax Parcel ID: 200000470000

Person Interviewed: Paul Kelm Owner ☒ Resident ☐ Other ☐

If other, list relationship: _____

Length of time living at residence: 34 years

Send analytical results to: Owner ☒ Other ☐ If other, list _____

Name: Paul Kelm

Mailing Address: 21020 Crossline Lane

City, State, Zip Code: Freeport, OH 43973

Phone: 740-489-5227

WATER SOURCE INFORMATION

Private Water Supply ☒ No Water Supply ☐ Public Water Supply ☐

How many water sources on this property? 1

Number of wells: 0 Number of springs: 1

Number of other (list): N/A

Was there ever a well in the basement? NO

If yes, explain.

Water Supply ID: RHF-DS-Ke-01

Is water source located on the property of interest? Yes If no, please explain: _____

Does this source supply any other property? NO If yes, please list owner(s): _____

Is this water system ever winterized? If yes, what method is used? NO

Number of persons using this water source? 2

Distance from residence (ft): 1,000 ft. / 100 ft from Tank Direction from residence: E

Distance from (proposed) gas well (ft): ~2000 ft Direction from (proposed) gas well: NE

Uses:

Domestic ☒
Husbandry ☐
Irrigation ☐
Industrial/Commercial ☐
Public, non-community ☐
Abandoned ☐
None ☐

Surrounding Area Information:

Ground sloping toward water source ☒
Water source downgradient of septic ☐
Signs of failing septic, soggy, odor ☐
Close to crops, garden, greenhouse ☐
Close to junkyard, dump, landfill ☐
Close to fuel tanks, storage, garage ☐
Close to livestock, barn, barnyard, etc ☐
Close to salt storage, salted roadway ☐

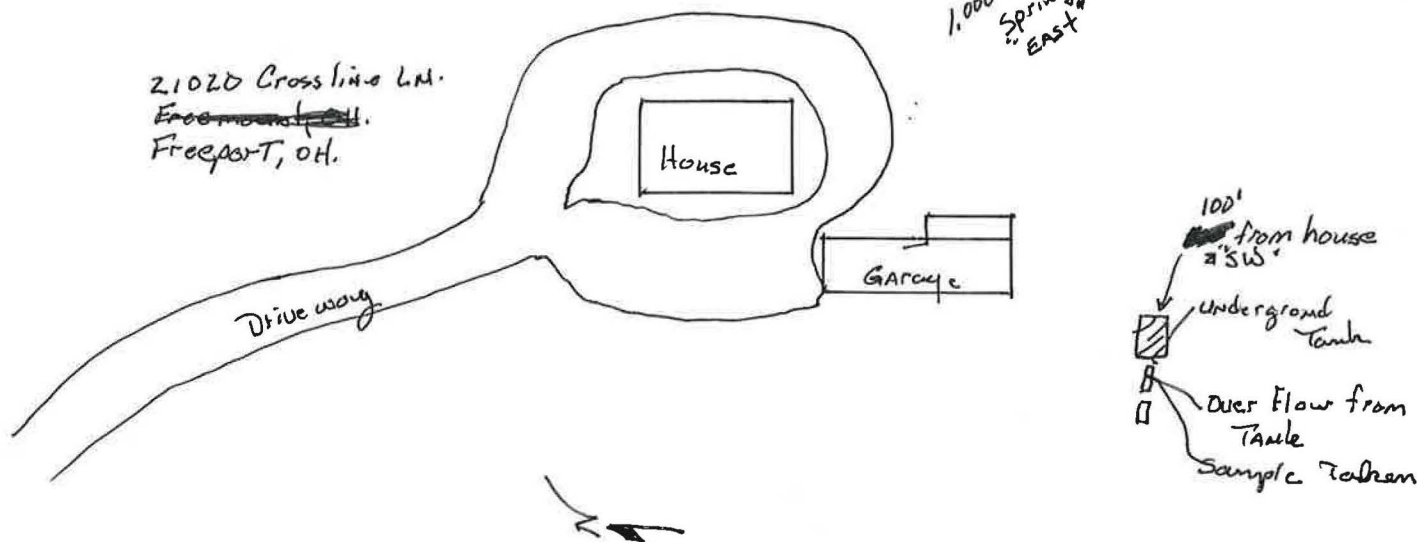
Approximate distance (ft) Gravity fed spring
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____

Well ID: RHF-DS-Ke

Water Supply Pre-Drill Survey
SITE VISIT FORM

Page 2 of 2

PLAN SKETCH



COMMENTS/PHOTO DESCRIPTIONS

Property owner uses a holding Tank - 1,000 Gals and uses a plastic drum as a catch Sediment before the holding Tank.

Photo #1 - location of the spring

Photo #2 - overflow location, downgradient of holding tank

Photo #3 sampling point, overflow pipe

Mr. Kelm's indicates that his property lies in Londonderry Township, not Madison Township as indicated on the front of this form

I hereby acknowledge that I have supplied the correct information to the best of my knowledge.

Signed: Paul Kelm

Printed: PAUL KELM

Date: 2-6-14



Photograph 1: Southeast view of the underground spring that was developed for drinking water on Paul Kelm's property, parcel # 200000470000, at 21020 Crossline Lane, Freeport, Ohio 43973.



Photograph 2: Downward view of the overflow area for the developed spring used as a drinking water source on Paul Kelm's property, parcel # 200000470000, at 21020 Crossline Lane, Freeport, Ohio 43973.



Photograph 3: Up close view of the overflow pipe used as the sampling location for the developed spring on Paul Kelm's property, parcel # 200000470000, at 21020 Crossline Lane, Freeport, Ohio 43973.

February 18, 2014

Mr. Andrew Longenecker
Civil Engineers of Southwest Ohio, Inc.
800 Bursca Drive
Suite 804
Bridgeville, PA 15017

RE: Project: Red Hill FarmsPre-Drill 750217
Pace Project No.: 5093132

Dear Mr. Longenecker:

Enclosed are the analytical results for sample(s) received by the laboratory on February 07, 2014. 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,



Regina Bedel
regina.bedel@pacelabs.com
Project Manager

Enclosures

cc: Ms. Natalie Hooton, Civil Engineers of Southwest Ohio,
Inc.
Ms. Carolyn Rummell, Civil Engineers of Southwest Ohio,
Inc.



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas Certification #: E-10247

Kentucky UST Certification #: 0042

Louisiana/NELAP Certification #: 04076

Ohio VAP Certification #: CL-0065

Pennsylvania Certification #: 68-04991

West Virginia Certification #: 330

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 13-012-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-13-4

Utah Certification #: KS000212013-3

Illinois Certification #: 003097

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

Lab ID	Sample ID	Matrix	Date Collected	Date Received
5093132001	RHF-DS-Ke-01	Water	02/06/14 11:00	02/07/14 10:03

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
5093132001	RHF-DS-Ke-01	RSK 175 Modified	PTH	1	PASI-I
		EPA 200.7	FRW	9	PASI-I
		EPA 200.7	LLB	2	PASI-I
		EPA 8260	GRM	7	PASI-I
		SM 2320B	SLB	1	PASI-I
		SM 2510B	MLS	1	PASI-I
		SM 2540C	MLS	1	PASI-I
		SM 2540D	MLS	1	PASI-I
		SM 4500-H+B	TPD	1	PASI-I
		EPA 9038	ZM	1	PASI-I
		EPA 300.0	OL	1	PASI-K
		SM 4500-CI-E	ILP	1	PASI-I

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ANALYTICAL RESULTS

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

Sample: RHF-DS-Ke-01		Lab ID: 5093132001		Collected: 02/06/14 11:00		Received: 02/07/14 10:03		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 Headspace		Analytical Method: RSK 175 Modified							
Methane	ND mg/L		0.010	1		02/14/14 16:26	74-82-8	N2	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	0.029 mg/L		0.010	1	02/08/14 09:16	02/10/14 09:44	7440-39-3		
Calcium	85.8 mg/L		1.0	1	02/08/14 09:16	02/10/14 09:44	7440-70-2		
Iron	ND mg/L		0.10	1	02/08/14 09:16	02/10/14 09:44	7439-89-6		
Magnesium	17.9 mg/L		1.0	1	02/08/14 09:16	02/10/14 09:44	7439-95-4		
Manganese	ND mg/L		0.010	1	02/08/14 09:16	02/10/14 09:44	7439-96-5		
Potassium	1.2 mg/L		1.0	1	02/08/14 09:16	02/10/14 09:44	7440-09-7		
Sodium	7.1 mg/L		1.0	1	02/08/14 09:16	02/10/14 09:44	7440-23-5		
Strontium	0.31 mg/L		0.010	1	02/08/14 09:16	02/10/14 09:44	7440-24-6	N2	
Total Hardness by 2340B	288 mg/L		2.0	1	02/08/14 09:16	02/10/14 09:44			
200.7 Metals, Dissolved (LF)		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Dissolved	28.6 ug/L		10.0	1	02/10/14 02:00	02/10/14 14:08	7440-39-3		
Iron, Dissolved	ND ug/L		100	1	02/10/14 02:00	02/10/14 14:08	7439-89-6		
8260 MSV UST		Analytical Method: EPA 8260							
Benzene	ND mg/L		0.0050	1		02/11/14 04:42	71-43-2		
Toluene	ND mg/L		0.0050	1		02/11/14 04:42	108-88-3		
Ethylbenzene	ND mg/L		0.0050	1		02/11/14 04:42	100-41-4		
Xylene (Total)	ND mg/L		0.010	1		02/11/14 04:42	1330-20-7		
Surrogates									
Dibromofluoromethane (S)	103 %.		79-116	1		02/11/14 04:42	1868-53-7		
Toluene-d8 (S)	101 %.		81-110	1		02/11/14 04:42	2037-26-5		
4-Bromofluorobenzene (S)	99 %.		80-114	1		02/11/14 04:42	460-00-4		
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	260 mg/L		2.0	1		02/10/14 11:28			
2510B Specific Conductance		Analytical Method: SM 2510B							
Specific Conductance	559 umhos/cm		1.0	1		02/17/14 07:19		N2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	355 mg/L		10.0	1		02/11/14 09:16			
2540D Total Suspended Solids		Analytical Method: SM 2540D							
Total Suspended Solids	ND mg/L		5.0	1		02/11/14 08:56			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.9 Std. Units		0.10	1		02/07/14 10:42		H6	
9038 Sulfate Water		Analytical Method: EPA 9038							
Sulfate	44.9 mg/L		12.5	2.5		02/10/14 08:46	14808-79-8	N2	

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ANALYTICAL RESULTS

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

Sample: RHF-DS-Ke-01		Lab ID: 5093132001	Collected: 02/06/14 11:00	Received: 02/07/14 10:03	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Bromide	ND	mg/L	1.0	1		02/16/14 16:13	24959-67-9	
4500 Chloride	Analytical Method: SM 4500-Cl-E							
Chloride	2.3	mg/L	1.0	1		02/12/14 08:47	16887-00-6	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch:	GCV/17675	Analysis Method:	RSK 175 Modified
QC Batch Method:	RSK 175 Modified	Analysis Description:	RSK 175 HEADSPACE
Associated Lab Samples:	5093132001		

METHOD BLANK: 1047331 Matrix: Water

Associated Lab Samples: 5093132001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methane	mg/L	ND	0.010	02/14/14 15:47	N2

LABORATORY CONTROL SAMPLE: 1047332

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methane	mg/L	2	2.0	103	70-130	N2

SAMPLE DUPLICATE: 1047333

Parameter	Units	5093037005 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	mg/L	ND	ND		20	N2

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch: MPRP/12836

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 5093132001

METHOD BLANK: 1046831

Matrix: Water

Associated Lab Samples: 5093132001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	ND	0.010	02/10/14 09:36	
Calcium	mg/L	ND	1.0	02/10/14 09:36	
Iron	mg/L	ND	0.10	02/10/14 09:36	
Magnesium	mg/L	ND	1.0	02/10/14 09:36	
Manganese	mg/L	ND	0.010	02/10/14 09:36	
Potassium	mg/L	ND	1.0	02/10/14 09:36	
Sodium	mg/L	ND	1.0	02/10/14 09:36	
Strontium	mg/L	ND	0.010	02/10/14 09:36	N2
Total Hardness by 2340B	mg/L	ND	2.0	02/10/14 09:36	

LABORATORY CONTROL SAMPLE: 1046832

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.97	97	85-115	
Calcium	mg/L	10	10.1	101	85-115	
Iron	mg/L	10	9.7	97	85-115	
Magnesium	mg/L	10	10.1	101	85-115	
Manganese	mg/L	1	0.97	97	85-115	
Potassium	mg/L	10	9.7	97	85-115	
Sodium	mg/L	10	9.9	99	85-115	
Strontium	mg/L	1	0.99	99	80-120	N2
Total Hardness by 2340B	mg/L	66.2	66.6	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1046833

1046834

Parameter	Units	5093132001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	0.029	1	1	1.0	1.0	98	97	70-130	1	20	
Calcium	mg/L	85.8	10	10	96.5	92.0	108	63	70-130	5	20	P6
Iron	mg/L	ND	10	10	9.5	9.4	95	94	70-130	1	20	
Magnesium	mg/L	17.9	10	10	27.8	26.8	99	89	70-130	4	20	
Manganese	mg/L	ND	1	1	0.96	0.96	96	96	70-130	1	20	
Potassium	mg/L	1.2	10	10	11.1	11.0	99	97	70-130	1	20	
Sodium	mg/L	7.1	10	10	17.1	16.7	101	96	70-130	3	20	
Strontium	mg/L	0.31	1	1	1.3	1.3	100	98	70-130	2	20	N2
Total Hardness by 2340B	mg/L	288	66.2	66.2	356	340	103	79	70-130	4	20	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch: MPRP/12839

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Dissolved

Associated Lab Samples: 5093132001

METHOD BLANK: 1046839

Matrix: Water

Associated Lab Samples: 5093132001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium, Dissolved	ug/L	ND	10.0	02/10/14 13:13	
Iron, Dissolved	ug/L	ND	100	02/10/14 13:13	

LABORATORY CONTROL SAMPLE: 1046840

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium, Dissolved	ug/L	1000	927	93	85-115	
Iron, Dissolved	ug/L	10000	9670	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1046841 1046842

Parameter	Units	5093139001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium, Dissolved	ug/L	0.024 mg/L	1000	1000	966	991	94	97	70-130	3	20	
Iron, Dissolved	ug/L	<0.10 mg/L	10000	10000	9890	10000	99	100	70-130	2	20	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch: MSV/61657

Analysis Method: EPA 8260

QC Batch Method: EPA 8260

Analysis Description: 8260 MSV UST-WATER

Associated Lab Samples: 5093132001

METHOD BLANK: 1047222

Matrix: Water

Associated Lab Samples: 5093132001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/L	ND	0.0050	02/11/14 01:49	
Ethylbenzene	mg/L	ND	0.0050	02/11/14 01:49	
Toluene	mg/L	ND	0.0050	02/11/14 01:49	
Xylene (Total)	mg/L	ND	0.010	02/11/14 01:49	
4-Bromofluorobenzene (S)	%.	101	80-114	02/11/14 01:49	
Dibromofluoromethane (S)	%.	102	79-116	02/11/14 01:49	
Toluene-d8 (S)	%.	102	81-110	02/11/14 01:49	

LABORATORY CONTROL SAMPLE: 1047223

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	mg/L	.05	0.051	103	74-122	
Ethylbenzene	mg/L	.05	0.048	96	66-133	
Toluene	mg/L	.05	0.050	100	72-122	
Xylene (Total)	mg/L	.15	0.14	96	70-124	
4-Bromofluorobenzene (S)	%.			97	80-114	
Dibromofluoromethane (S)	%.			102	79-116	
Toluene-d8 (S)	%.			99	81-110	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch: WET/14595

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 5093132001

METHOD BLANK: 1046938

Matrix: Water

Associated Lab Samples: 5093132001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	ND	2.0	02/10/14 11:28	

LABORATORY CONTROL SAMPLE: 1046939

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	50	48.5	97	90-110	

SAMPLE DUPLICATE: 1046941

Parameter	Units	5093139004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	257	256	0	20	

SAMPLE DUPLICATE: 1046959

Parameter	Units	5093132001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	260	262	1	20	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch: WET/14664

Analysis Method: SM 2510B

QC Batch Method: SM 2510B

Analysis Description: 2510B Specific Conductance

Associated Lab Samples: 5093132001

METHOD BLANK: 1049185

Matrix: Water

Associated Lab Samples: 5093132001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	ND	1.0	02/17/14 07:19	N2

LABORATORY CONTROL SAMPLE: 1049186

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1410	1420	101	90-110	N2

SAMPLE DUPLICATE: 1049187

Parameter	Units	5093132001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	559	557	0	20	N2

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch: WET/14614

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 5093132001

METHOD BLANK: 1047229

Matrix: Water

Associated Lab Samples: 5093132001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	02/11/14 09:15	

LABORATORY CONTROL SAMPLE: 1047230

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	300	318	106	80-120	

SAMPLE DUPLICATE: 1047231

Parameter	Units	5093132001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	355	369	4	10	

SAMPLE DUPLICATE: 1047778

Parameter	Units	5093139006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	371	342	8	10	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch: WET/14613

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 5093132001

METHOD BLANK: 1047226

Matrix: Water

Associated Lab Samples: 5093132001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	02/11/14 08:56	

LABORATORY CONTROL SAMPLE: 1047227

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	100	100	80-120	

SAMPLE DUPLICATE: 1047228

Parameter	Units	5093134001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch: WET/14589

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 5093132001

SAMPLE DUPLICATE: 1046557

Parameter	Units	5093132001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.8	1	20	H6

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch: WET/14597

Analysis Method: EPA 9038

QC Batch Method: EPA 9038

Analysis Description: 9038 Sulfate Water

Associated Lab Samples: 5093132001

METHOD BLANK: 1046980

Matrix: Water

Associated Lab Samples: 5093132001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	5.0	02/10/14 08:30	N2

LABORATORY CONTROL SAMPLE: 1046981

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.9	100	90-110	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1046982 1046983

Parameter	Units	5093139006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	13.9	20	20	41.1	40.0	136	131	90-110	3	20	E,M3, N2

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch: WETA/28200

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 5093132001

METHOD BLANK: 1330769

Matrix: Water

Associated Lab Samples:

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromide	mg/L	ND	1.0	02/16/14 09:48	

LABORATORY CONTROL SAMPLE: 1330770

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromide	mg/L	5	4.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1330771 1330772

Parameter	Units	60162422001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Bromide	mg/L	ND	50	50	48.1	48.7	96	97	80-120	1 15	

MATRIX SPIKE SAMPLE: 1330773

Parameter	Units	60162472001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromide	mg/L	ND	2500	2450	98	80-120	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

QC Batch:	WETA/11718	Analysis Method:	SM 4500-Cl-E
QC Batch Method:	SM 4500-Cl-E	Analysis Description:	4500 Chloride
Associated Lab Samples:	5093132001		

METHOD BLANK: 1047500 Matrix: Water

Associated Lab Samples: 5093132001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	02/12/14 08:37	

LABORATORY CONTROL SAMPLE: 1047501

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.6	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1047502 1047503

Parameter	Units	5093037005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	18.1	20	20	37.3	37.1	96	95	90-110	1	20	

MATRIX SPIKE SAMPLE: 1047504

Parameter	Units	5093139007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	16.0	20	35.5	97	90-110	

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QUALIFIERS

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

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.

PRL - Pace Reporting 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.

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

TNI - The NELAC Institute.

LABORATORIES

PASI-I Pace Analytical Services - Indianapolis

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H6 Analysis initiated outside of the 15 minute EPA recommended holding time.

M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.

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

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

REPORT OF LABORATORY ANALYSIS

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METHOD CROSS REFERENCE TABLE

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

Parameter	Matrix	Analytical Method	Preparation Method
8260 MSV UST	Water	SW-846 8260B	SW-846 5030B

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093132

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
5093132001	RHF-DS-Ke-01	RSK 175 Modified	GCV/17675		
5093132001	RHF-DS-Ke-01	EPA 200.7	MPRP/12836	EPA 200.7	ICP/14516
5093132001	RHF-DS-Ke-01	EPA 200.7	MPRP/12839	EPA 200.7	ICP/14528
5093132001	RHF-DS-Ke-01	EPA 8260	MSV/61657		
5093132001	RHF-DS-Ke-01	SM 2320B	WET/14595		
5093132001	RHF-DS-Ke-01	SM 2510B	WET/14664		
5093132001	RHF-DS-Ke-01	SM 2540C	WET/14614		
5093132001	RHF-DS-Ke-01	SM 2540D	WET/14613		
5093132001	RHF-DS-Ke-01	SM 4500-H+B	WET/14589		
5093132001	RHF-DS-Ke-01	EPA 9038	WET/14597		
5093132001	RHF-DS-Ke-01	EPA 300.0	WETA/28200		
5093132001	RHF-DS-Ke-01	SM 4500-CI-E	WETA/11718		

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

15

Section A

Required Client Information:

Company: **CESD, Inc.**
Address: **800 Bursen Dr., Suite 504**
Bridgeville, PA 15017
Email To: **longenecker@cesoinc.com**
Phone: **412-221-2236** Fax:
Requested Due Date/TAT: **standard**

Section B

Required Project Information:

Report To: **Andrew Longenecker**
Copy To: **hooton@cesoinc.com**
nummell@cesoinc.com
Purchase Order No.: **Red Hill Farms Pre-drill Sampling**
Project Name: **Red Hill Farms Pre-drill Sampling**
Project Number: **750217**

Section C

Invoice Information:

Attention: **Tina Gwenter**
Company Name: **CESD, Inc.**
Address: **8534 Yankee St #2B Dayton, OH**
Pace Quote Reference: **12062013 R.H-1.0**
Pace Project Manager: **Regina Bidel**
Pace Profile #:

Page: 1 of 1

1741027

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location

STATE: **OH**

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analysis Test ↓	Y/N ↓																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							</
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ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		
*Lab filter for dissolved Fe & Ba	<i>[Signature]</i> CESO	02/06/14	1403	<i>[Signature]</i> MMS/Slamback Pace	2-6-14	14103			
				<i>[Signature]</i> MMS/Slamback Pace	2/7/14	1003	0.3	y	y y

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: **Natalie N. Hooton**
SIGNATURE of SAMPLER: *[Signature]*
DATE Signed (MM/DD/YY): **02/06/2014**

ORIGINAL

Sample Condition Upon Receipt

Pace Analytical

Client Name: CESO INC

Project # 5093132

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

Tracking #: ~~8024~~ 6390 2729

Custody Seal on Cooler/Box Present: ☒ Yes ☐ no Seals intact: ☒ Yes ☐ no

Date/Time 5035A kits placed in freezer

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☒ Other 2 blocks

Thermometer Used 1 2 3 4 6 A B C D E

Type of ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 0.3°C
(Corrected, if applicable)

Ice Visible in Sample Containers: ☐ yes ☒ no

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: 2/7/14 sf

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Short Hold Time Analysis (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. <u>pH</u>
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sample Labels match COC: -Includes date/time/ID/Analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
All containers needing acid/base pres. have been checked? exceptions: VOA, coliform, TOC, O&G	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9. (Circle) HNO ₃ H ₂ SO ₄ NaOH HCl
All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10.
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	11.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Project Manager Review		
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Ryan H. Bell

Date: 2/7/14

Sample Container Count

CLIENT: Caso Inc



COC PAGE 1 of 1

COC ID# 1741027

Project # 5093132

Sample Line

Item	DG9H	AG1U	WGFU	AG0U	R	4/6	BP2N	BP2U	BP2S	BP3N	BP3U	BP3S	AG3S	AG1H	VG9H	pH <2	pH >12	Comments
1	3	2								1					3			
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

Container Codes

DG9H	40mL HCL amber vial	AG0U	100mL unpreserved amber glass	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1 liter unpreserved amber glass	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber glass	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved amber vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	I	Wipe/Swab
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber glass	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber glass	AF	Air Filter	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved clear vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear glass	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFU	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plastic	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag



800 Bursca Drive, Suite 804
Bridgeville, Pennsylvania 15017-1451
(412) 221-2236
www.cesoinc.com

Sent via Certified Mail
7013 1090 0002 4389 9334

March 5, 2014

William & Edna Miller
20501 McCoy Road
Freeport, OH 43973

RE: Notification of Water Well Sampling Results Performed on Behalf of AEU, LLC

Dear Mr. & Mrs. Miller:

CESO, Inc., on behalf of American Energy- Utica, LLC (AEU), has collected water samples from the water supply well located at 20410 Cadiz Road, Freeport, Ohio. The well is identified herein as "RHF-RW-Mi" and is located within 2,000 feet of the proposed Red Hill Farm wellhead.

The sampling event occurred on February 6, 2014 as part of the pre-drill sampling process, pursuant Chapter 1509 of the Ohio Revised Code (2005) and Ohio Senate Bill 165 (2010), and Ohio Senate Bill 315 (2012), for the above mentioned well pad.

The water quality results of the samples collected are provided in the analytical report attached to this letter. The analyses were performed by Pace Analytical Services, Inc. (Pace) of Indianapolis, Indiana which is Ohio Environmental Protection Agency (OEPA) Voluntary Action Program (VAP) certified.

Please note that this sampling event was not performed to determine the potability of your water. However, to assist you in assessing your water supply, the analytical results for your water source were evaluated against Maximum Contaminant Levels (MCLs) standards and Secondary Maximum Contaminant Levels (SMCLs) established by the United States Environmental Protection Agency (EPA) for public water supplies. These MCLs and SMCLs are not enforced by the EPA, OEPA or Ohio Department of Natural Resources (ODNR) on private residential water supplies.

The following constituents, listed in the table below, were above the EPA MCLs or SMCLs for public supplies.

Well ID	Sample ID	Parameter	Analytical Results	MCL/SMCLs
Red Hill Farm	RHF-RW-Mi-01	Methane	0.09 mg/L	**3

1- mg/L= milligrams per liter; SU=Standard Units

2- Secondary Maximum Contaminant Levels (SMCLs)

3- Methane does not have an MCL or SMCL standard established by the EPA

The presence of methane and groundwater quality in general (total dissolved solids, sulfate, metals, etc.), may vary from year to year or season to season due to many factors (rainfall, temperature changes, barometric pressure, snow cover, etc.). The ODNR recommends that methane concentrations that are above 7 mg/L in groundwater be regularly monitored to confirm that concentrations are not increasing.

The Ohio State University (OSU) Extension and the Penn State University (PSU) Cooperative Extension websites offer useful publications regarding the interpretation of analytical results and additional information on private water supplies. The OSU information can be accessed at <http://extension.osu.edu/topics/environment/water-testing-and-treatment> and the PSU information can be found at <http://extension.psu.edu/natural-resources/water/drinking-water>.

CESO, Inc. will be submitting a copy of this notification letter to AEU, LLC and ODNR as part of the well permit package. Should you have any questions or comments, please contact CESO, Inc. at 412.221.2236.

Sincerely,



Environmental Program

Well ID: RHF-RW-Mi

Page 1 of 2

**Water Supply Pre-Drill Survey
SITE VISIT FORM**

GENERAL INFORMATION

Operator Name: AELI, LLC
Location of Gas Well:
Municipality: Madison Township
County: Guernsey
Physical Address: Cadiz Rd
City, State, Zip Code: Freeport, OH 43973

Date Inventoried: 02/06/14
Inventoried by: NH/PH

Property of Interest Information:

Municipality: Madison Township County: Guernsey Tax Parcel ID: 220000791000
Person Interviewed: Anita Miller Owner ☐ Resident ☒ Other ☐
If other, list relationship: _____
Length of time living at residence: 8 years
Send analytical results to: Owner ☒ Other ☐ If other, list: _____
Name: William & Edna Miller
Mailing Address: 26501 McCoy Rd
City, State, Zip Code: Freeport, OH 43973
Phone: 740-489-5697

WATER SOURCE INFORMATION

Private Water Supply ☒ No Water Supply ☐ Public Water Supply ☐

How many water sources on this property? 1

Number of wells: 2 Number of springs: 0

Number of other (list): one well is abandoned

Was there ever a well in the basement? NO

If yes, explain.

Water Supply ID: RHF-RW-Mi-01

Is water source located on the property of interest? yes If no, please explain: _____

Does this source supply any other property? NO If yes, please list owner(s): _____

Is this water system ever winterized? If yes, what method is used? NO

Number of persons using this water source? 5

Distance from residence (ft): residents were unsure Direction from residence: SW

Distance from (proposed) gas well (ft): 1250 Direction from (proposed) gas well: SW

Uses:

Domestic ☒
Husbandry ☐
Irrigation ☐
Industrial/Commercial ☐
Public, non-community ☐
Abandoned ☐
None ☐

Surrounding Area Information:

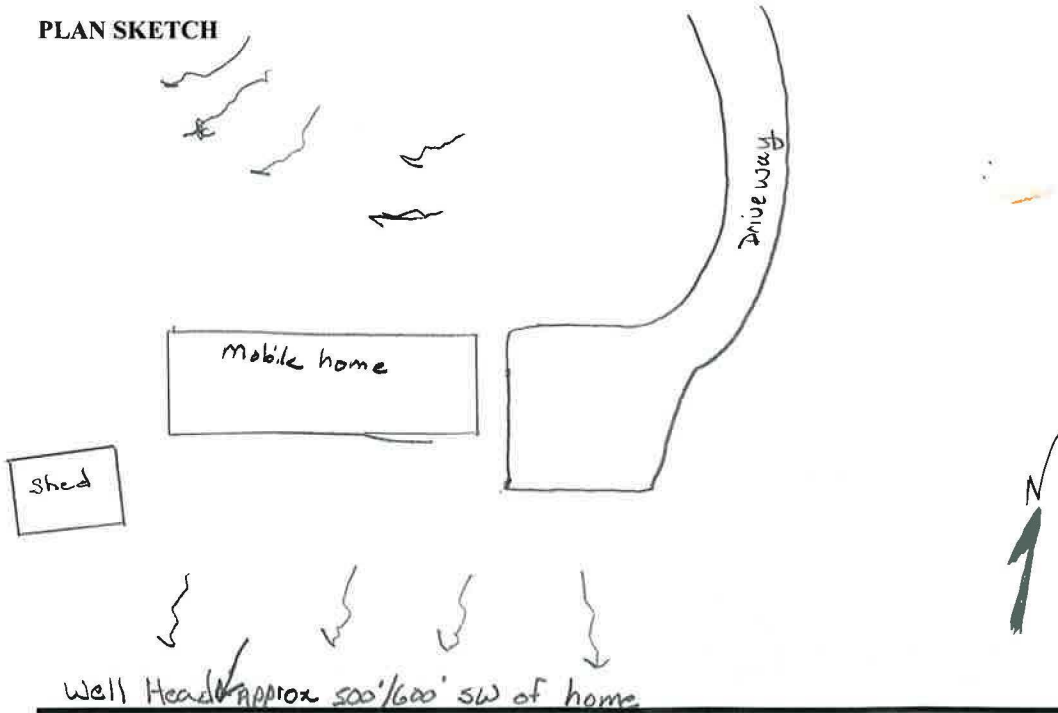
Ground sloping toward water source ☐
Water source downgradient of septic ☐
Signs of failing septic, soggy, odor ☐
Close to crops, garden, greenhouse ☐
Close to junkyard, dump, landfill ☐
Close to fuel tanks, storage, garage ☐
Close to livestock, barn, barnyard, etc ☐
Close to salt storage, salted roadway ☐

Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____

Water Supply Pre-Drill Survey

SITE VISIT FORM

PLAN SKETCH



COMMENTS/PHOTO DESCRIPTIONS

The residence not such of location of well head on property.
 Property owner can be contacted if additional well information is needed, but he could not be reached at the time of visit
 Sampled from bathroom faucet which is believed to be the closest to the well head
 Photo #1 - YSI set-up at sink
 Photo #2 - aerator removed from spigot for sampling

I hereby acknowledge that I have supplied the correct information to the best of my knowledge.

Signed: Anita Miller

Printed: Anita Miller

Date: 02/06/14



Photograph 1: Up close view of the kitchen faucet with the aerator removed that was used for sampling the spring water for William and Edna Miller's property, parcel # 220000791000, at 20410 Cadiz Road, Freeport, Ohio 43973.



Photograph 2: Up close view of the YSI water quality meter set-up at the sampling location for the spring water at William and Edna Miller's property, parcel # 220000791000, at 20410 Cadiz Road, Freeport, Ohio 43973.

February 20, 2014

Mr. Andrew Longenecker
Civil Engineers of Southwest Ohio, Inc.
800 Bursca Drive
Suite 804
Bridgeville, PA 15017

RE: Project: Red Hill FarmsPre-Drill 750217
Pace Project No.: 5093134

Dear Mr. Longenecker:

Enclosed are the analytical results for sample(s) received by the laboratory on February 07, 2014. 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,



Regina Bedel
regina.bedel@pacelabs.com
Project Manager

Enclosures

cc: Ms. Natalie Hooton, Civil Engineers of Southwest Ohio,
Inc.
Ms. Carolyn Rummell, Civil Engineers of Southwest Ohio,
Inc.



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

CERTIFICATIONS

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas Certification #: E-10247

Kentucky UST Certification #: 0042

Louisiana/NELAP Certification #: 04076

Ohio VAP Certification #: CL-0065

Pennsylvania Certification #: 68-04991

West Virginia Certification #: 330

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 13-012-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-13-4

Utah Certification #: KS000212013-3

Illinois Certification #: 003097

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

Lab ID	Sample ID	Matrix	Date Collected	Date Received
5093134001	RHF-RW-Mi-01	Water	02/06/14 13:35	02/07/14 10:04

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SAMPLE ANALYTE COUNT

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
5093134001	RHF-RW-Mi-01	RSK 175 Modified	PTH	1	PASI-I
		EPA 200.7	FRW	9	PASI-I
		EPA 200.7	LLB	2	PASI-I
		EPA 8260	GRM	7	PASI-I
		SM 2320B	SLB	1	PASI-I
		SM 2510B	MLS	1	PASI-I
		SM 2540C	MLS	1	PASI-I
		SM 2540D	MLS	1	PASI-I
		SM 4500-H+B	TPD	1	PASI-I
		EPA 9038	ZM	1	PASI-I
		EPA 300.0	OL	1	PASI-K
		SM 4500-CI-E	ILP	1	PASI-I

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ANALYTICAL RESULTS

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

Sample: RHF-RW-Mi-01		Lab ID: 5093134001	Collected: 02/06/14 13:35	Received: 02/07/14 10:04	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace		Analytical Method: RSK 175 Modified						
Methane	0.090 mg/L		0.010	1		02/14/14 16:06	74-82-8	N2
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium	0.088 mg/L		0.010	1	02/08/14 09:16	02/10/14 09:54	7440-39-3	
Calcium	19.8 mg/L		1.0	1	02/08/14 09:16	02/10/14 09:54	7440-70-2	
Iron	ND mg/L		0.10	1	02/08/14 09:16	02/10/14 09:54	7439-89-6	
Magnesium	5.4 mg/L		1.0	1	02/08/14 09:16	02/10/14 09:54	7439-95-4	
Manganese	0.026 mg/L		0.010	1	02/08/14 09:16	02/10/14 09:54	7439-96-5	
Potassium	2.1 mg/L		1.0	1	02/08/14 09:16	02/10/14 09:54	7440-09-7	
Sodium	100 mg/L		1.0	1	02/08/14 09:16	02/10/14 09:54	7440-23-5	
Strontium	0.62 mg/L		0.010	1	02/08/14 09:16	02/10/14 09:54	7440-24-6	N2
Total Hardness by 2340B	72.0 mg/L		2.0	1	02/08/14 09:16	02/10/14 09:54		
200.7 Metals, Dissolved (LF)		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Dissolved	84.6 ug/L		10.0	1	02/10/14 02:00	02/10/14 14:11	7440-39-3	
Iron, Dissolved	ND ug/L		100	1	02/10/14 02:00	02/10/14 14:11	7439-89-6	
8260 MSV UST		Analytical Method: EPA 8260						
Benzene	ND mg/L		0.0050	1		02/11/14 05:17	71-43-2	
Toluene	ND mg/L		0.0050	1		02/11/14 05:17	108-88-3	
Ethylbenzene	ND mg/L		0.0050	1		02/11/14 05:17	100-41-4	
Xylene (Total)	ND mg/L		0.010	1		02/11/14 05:17	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	107 %.		79-116	1		02/11/14 05:17	1868-53-7	
Toluene-d8 (S)	100 %.		81-110	1		02/11/14 05:17	2037-26-5	
4-Bromofluorobenzene (S)	100 %.		80-114	1		02/11/14 05:17	460-00-4	
2320B Alkalinity		Analytical Method: SM 2320B						
Alkalinity, Total as CaCO3	241 mg/L		2.0	1		02/10/14 11:28		
2510B Specific Conductance		Analytical Method: SM 2510B						
Specific Conductance	576 umhos/cm		1.0	1		02/17/14 07:19		N2
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	353 mg/L		10.0	1		02/11/14 09:17		
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	ND mg/L		5.0	1		02/11/14 08:56		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.9 Std. Units		0.10	1		02/07/14 10:46		H6
9038 Sulfate Water		Analytical Method: EPA 9038						
Sulfate	31.0 mg/L		12.5	2.5		02/10/14 08:46	14808-79-8	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

Sample: RHF-RW-Mi-01		Lab ID: 5093134001		Collected: 02/06/14 13:35		Received: 02/07/14 10:04		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Bromide		ND	mg/L	1.0	1		02/17/14 19:00	24959-67-9	
4500 Chloride		Analytical Method: SM 4500-Cl-E							
Chloride		18.6	mg/L	1.0	1		02/12/14 08:48	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: GCV/17675

Analysis Method: RSK 175 Modified

QC Batch Method: RSK 175 Modified

Analysis Description: RSK 175 HEADSPACE

Associated Lab Samples: 5093134001

METHOD BLANK: 1047331

Matrix: Water

Associated Lab Samples: 5093134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methane	mg/L	ND	0.010	02/14/14 15:47	N2

LABORATORY CONTROL SAMPLE: 1047332

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methane	mg/L	2	2.0	103	70-130	N2

SAMPLE DUPLICATE: 1047333

Parameter	Units	5093037005 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	mg/L	ND	ND		20	N2

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: MPRP/12836

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 5093134001

METHOD BLANK: 1046831

Matrix: Water

Associated Lab Samples: 5093134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	ND	0.010	02/10/14 09:36	
Calcium	mg/L	ND	1.0	02/10/14 09:36	
Iron	mg/L	ND	0.10	02/10/14 09:36	
Magnesium	mg/L	ND	1.0	02/10/14 09:36	
Manganese	mg/L	ND	0.010	02/10/14 09:36	
Potassium	mg/L	ND	1.0	02/10/14 09:36	
Sodium	mg/L	ND	1.0	02/10/14 09:36	
Strontium	mg/L	ND	0.010	02/10/14 09:36	N2
Total Hardness by 2340B	mg/L	ND	2.0	02/10/14 09:36	

LABORATORY CONTROL SAMPLE: 1046832

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.97	97	85-115	
Calcium	mg/L	10	10.1	101	85-115	
Iron	mg/L	10	9.7	97	85-115	
Magnesium	mg/L	10	10.1	101	85-115	
Manganese	mg/L	1	0.97	97	85-115	
Potassium	mg/L	10	9.7	97	85-115	
Sodium	mg/L	10	9.9	99	85-115	
Strontium	mg/L	1	0.99	99	80-120	N2
Total Hardness by 2340B	mg/L	66.2	66.6	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1046833

1046834

Parameter	Units	5093132001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	0.029	1	1	1.0	1.0	98	97	70-130	1	20	
Calcium	mg/L	85.8	10	10	96.5	92.0	108	63	70-130	5	20	P6
Iron	mg/L	ND	10	10	9.5	9.4	95	94	70-130	1	20	
Magnesium	mg/L	17.9	10	10	27.8	26.8	99	89	70-130	4	20	
Manganese	mg/L	ND	1	1	0.96	0.96	96	96	70-130	1	20	
Potassium	mg/L	1.2	10	10	11.1	11.0	99	97	70-130	1	20	
Sodium	mg/L	7.1	10	10	17.1	16.7	101	96	70-130	3	20	
Strontium	mg/L	0.31	1	1	1.3	1.3	100	98	70-130	2	20	N2
Total Hardness by 2340B	mg/L	288	66.2	66.2	356	340	103	79	70-130	4	20	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: MPRP/12839

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Dissolved

Associated Lab Samples: 5093134001

METHOD BLANK: 1046839

Matrix: Water

Associated Lab Samples: 5093134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium, Dissolved	ug/L	ND	10.0	02/10/14 13:13	
Iron, Dissolved	ug/L	ND	100	02/10/14 13:13	

LABORATORY CONTROL SAMPLE: 1046840

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium, Dissolved	ug/L	1000	927	93	85-115	
Iron, Dissolved	ug/L	10000	9670	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1046841 1046842

Parameter	Units	5093139001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium, Dissolved	ug/L	0.024 mg/L	1000	1000	966	991	94	97	70-130	3	20	
Iron, Dissolved	ug/L	<0.10 mg/L	10000	10000	9890	10000	99	100	70-130	2	20	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: MSV/61657

Analysis Method: EPA 8260

QC Batch Method: EPA 8260

Analysis Description: 8260 MSV UST-WATER

Associated Lab Samples: 5093134001

METHOD BLANK: 1047222

Matrix: Water

Associated Lab Samples: 5093134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/L	ND	0.0050	02/11/14 01:49	
Ethylbenzene	mg/L	ND	0.0050	02/11/14 01:49	
Toluene	mg/L	ND	0.0050	02/11/14 01:49	
Xylene (Total)	mg/L	ND	0.010	02/11/14 01:49	
4-Bromofluorobenzene (S)	%	101	80-114	02/11/14 01:49	
Dibromofluoromethane (S)	%	102	79-116	02/11/14 01:49	
Toluene-d8 (S)	%	102	81-110	02/11/14 01:49	

LABORATORY CONTROL SAMPLE: 1047223

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	mg/L	.05	0.051	103	74-122	
Ethylbenzene	mg/L	.05	0.048	96	66-133	
Toluene	mg/L	.05	0.050	100	72-122	
Xylene (Total)	mg/L	.15	0.14	96	70-124	
4-Bromofluorobenzene (S)	%			97	80-114	
Dibromofluoromethane (S)	%			102	79-116	
Toluene-d8 (S)	%			99	81-110	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: WET/14595

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 5093134001

METHOD BLANK: 1046938

Matrix: Water

Associated Lab Samples: 5093134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	ND	2.0	02/10/14 11:28	

LABORATORY CONTROL SAMPLE: 1046939

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	50	48.5	97	90-110	

SAMPLE DUPLICATE: 1046941

Parameter	Units	5093139004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	257	256	0	20	

SAMPLE DUPLICATE: 1046959

Parameter	Units	5093132001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	260	262	1	20	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: WET/14664

Analysis Method: SM 2510B

QC Batch Method: SM 2510B

Analysis Description: 2510B Specific Conductance

Associated Lab Samples: 5093134001

METHOD BLANK: 1049185

Matrix: Water

Associated Lab Samples: 5093134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	ND	1.0	02/17/14 07:19	N2

LABORATORY CONTROL SAMPLE: 1049186

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1410	1420	101	90-110	N2

SAMPLE DUPLICATE: 1049187

Parameter	Units	5093132001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	559	557	0	20	N2

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: WET/14614

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 5093134001

METHOD BLANK: 1047229

Matrix: Water

Associated Lab Samples: 5093134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	02/11/14 09:15	

LABORATORY CONTROL SAMPLE: 1047230

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	300	318	106	80-120	

SAMPLE DUPLICATE: 1047231

Parameter	Units	5093132001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	355	369	4	10	

SAMPLE DUPLICATE: 1047778

Parameter	Units	5093139006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	371	342	8	10	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: WET/14613

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 5093134001

METHOD BLANK: 1047226

Matrix: Water

Associated Lab Samples: 5093134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	02/11/14 08:56	

LABORATORY CONTROL SAMPLE: 1047227

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	100	100	80-120	

SAMPLE DUPLICATE: 1047228

Parameter	Units	5093134001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: WET/14589

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 5093134001

SAMPLE DUPLICATE: 1046557

Parameter	Units	5093132001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.8	1	20	H6

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: WET/14597

Analysis Method: EPA 9038

QC Batch Method: EPA 9038

Analysis Description: 9038 Sulfate Water

Associated Lab Samples: 5093134001

METHOD BLANK: 1046980

Matrix: Water

Associated Lab Samples: 5093134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	5.0	02/10/14 08:30	N2

LABORATORY CONTROL SAMPLE: 1046981

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.9	100	90-110	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1046982 1046983

Parameter	Units	5093139006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	13.9	20	20	41.1	40.0	136	131	90-110	3	20	E,M3, N2

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch: WETA/28212

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 5093134001

METHOD BLANK: 1330856

Matrix: Water

Associated Lab Samples:

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromide	mg/L	ND	1.0	02/17/14 12:35	

LABORATORY CONTROL SAMPLE: 1330857

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromide	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1330858 1330859

Parameter	Units	60162622001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Bromide	mg/L		50	50	53.6	50.3	107	101	80-120	6	15	

MATRIX SPIKE SAMPLE: 1330860

Parameter	Units	60162841001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromide	mg/L		10	10	100	80-120	

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QUALITY CONTROL DATA

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

QC Batch:	WETA/11718	Analysis Method:	SM 4500-Cl-E
QC Batch Method:	SM 4500-Cl-E	Analysis Description:	4500 Chloride
Associated Lab Samples:	5093134001		

METHOD BLANK: 1047500 Matrix: Water

Associated Lab Samples: 5093134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	02/12/14 08:37	

LABORATORY CONTROL SAMPLE: 1047501

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.6	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1047502 1047503

Parameter	Units	5093037005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	18.1	20	20	37.3	37.1	96	95	90-110	1	20	

MATRIX SPIKE SAMPLE: 1047504

Parameter	Units	5093139007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	16.0	20	35.5	97	90-110	

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

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.

PRL - Pace Reporting 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.

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

TNI - The NELAC Institute.

LABORATORIES

PASI-I Pace Analytical Services - Indianapolis

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H6 Analysis initiated outside of the 15 minute EPA recommended holding time.

M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.

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

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

REPORT OF LABORATORY ANALYSIS

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METHOD CROSS REFERENCE TABLE

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

Parameter	Matrix	Analytical Method	Preparation Method
8260 MSV UST	Water	SW-846 8260B	SW-846 5030B

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Red Hill FarmsPre-Drill 750217

Pace Project No.: 5093134

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
5093134001	RHF-RW-Mi-01	RSK 175 Modified	GCV/17675		
5093134001	RHF-RW-Mi-01	EPA 200.7	MPRP/12836	EPA 200.7	ICP/14516
5093134001	RHF-RW-Mi-01	EPA 200.7	MPRP/12839	EPA 200.7	ICP/14528
5093134001	RHF-RW-Mi-01	EPA 8260	MSV/61657		
5093134001	RHF-RW-Mi-01	SM 2320B	WET/14595		
5093134001	RHF-RW-Mi-01	SM 2510B	WET/14664		
5093134001	RHF-RW-Mi-01	SM 2540C	WET/14614		
5093134001	RHF-RW-Mi-01	SM 2540D	WET/14613		
5093134001	RHF-RW-Mi-01	SM 4500-H+B	WET/14589		
5093134001	RHF-RW-Mi-01	EPA 9038	WET/14597		
5093134001	RHF-RW-Mi-01	EPA 300.0	WETA/28212		
5093134001	RHF-RW-Mi-01	SM 4500-CI-E	WETA/11718		

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A

Required Client Information:

Company: **CESO, Inc**
Address: **600 Bursca Dr. Suite 804**
Bridgeville, PA 15017
Email To: **longenecker@cesoinc.com**
Phone: **412-221-2236** Fax:
Requested Due Date/TAT: **Standard**

Section B

Required Project Information:

Report To: **Andrew Longenecker**
Copy To: **hooton@cesoinc.com**
rummell@cesoinc.com
Purchase Order No.:
Project Name: **Red Hill Farms Pre-Drill Sampling**
Project Number: **750217**

Section C

Invoice Information:

Attention: **Tina Gwenter**
Company Name: **CESO, Inc**
Address: **8534 Yankee St. #2B Dayton, OH**
Pace Quote Reference: **12062013RSH-1.0**
Pace Project Manager: **Regina Bidel**
Pace Profile #:

Page: **1** of **1**

1741028

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location

STATE: **OH**

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	Matrix Codes (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analysis Test ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓	Y/N ↓
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ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		
*lab filter for dissolved Fe & Ba	<i>[Signature]</i> CESO	02/06/14	1403	Muskaubaugh/PACE	2-6-14	14:03			
				Shumata/PACE	2/7/14	1004	0.3	y	y y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: **Natalie N Hooton**

SIGNATURE of SAMPLER: *[Signature]*

DATE Signed (MM/DD/YY): **02/06/2014**

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

ORIGINAL

Sample Condition Upon Receipt

Pace Analytical

Client Name: CEISO INC

Project # 5093134

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

Tracking #: 8024 63902729

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals Intact: ☒ yes ☐ no

Date/Time 5035A kits placed in freezer

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☒ Other Ziplock

Thermometer Used 1 2 3 4 6 A B C D E

Type of Ice: Wet Blue None

☐ Samples on ice, cooling process has begun

Cooler Temperature 0.3°C

Ice Visible in Sample Containers: ☐ yes ☒ no

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: 2/7/14 SP

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Short Hold Time Analysis (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. <u>PH</u>
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
-Includes date/time/ID/Analysis		
All containers needing acid/base pres. have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
exceptions: VOA, coliform, TOC, O&G		
All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10.
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	11.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Project Manager Review <u>2/7/14</u>		
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.

Client Notification/ Resolution:

Field Data Required?

Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review:

Regina H. Buhl

Date:

2/7/14

Sample Container Count

CLIENT: CESO Inc



COC PAGE 1 of 1
COC ID# 1741028

Project # 5093134

Sample Line

Item	DG9H	AG1U	WGFU	AG0U	R	4/6	BP2N	BP2U	BP2S	BP3N	BP3U	BP3S	AG3S	AG1H	VG9H	pH <2	pH >12	Comments
1	3	2								1					3			
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

Container Codes

DG9H	40mL HCL amber vial	AG0U	100mL unpreserved amber glass	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1 liter unpreserved amber glass	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber glass	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved amber vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	I	Wipe/Swab
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber glass	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber glass	AF	Air Filter	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved clear vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear glass	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFU	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plastic	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag



800 Bursca Drive, Suite 804
Bridgeville, Pennsylvania 15017-1451
(412) 221-2236
www.cesoinc.com

Sent via Certified Mail
7013 1090 0002 4389 9358

March 12, 2014

Phillip & Ellen Nisley
20424 Cadiz Road
Freeport, OH 43973

RE: Notification of Water Well Sampling Results Performed on Behalf of AEU, LLC

Dear Mr. & Mrs. Nisley:

CESO, Inc., on behalf of American Energy- Utica, LLC (AEU), has collected water samples from the water supply spring located at 20424 Cadiz Road, Freeport, Ohio. The spring is identified herein as "RHF-DS-Ni" and is located within 2,000 feet of the proposed Red Hill Farm wellhead.

The sampling event occurred on February 18, 2014 as part of the pre-drill sampling process, pursuant Chapter 1509 of the Ohio Revised Code (2005) and Ohio Senate Bill 165 (2010), and Ohio Senate Bill 315 (2012), for the above mentioned well pad.

The water quality results of the samples collected are provided in the analytical report attached to this letter. The analyses were performed by Pace Analytical Services, Inc. (Pace) of Indianapolis, Indiana which is Ohio Environmental Protection Agency (OEPA) Voluntary Action Program (VAP) certified.

Please note that this sampling event was not performed to determine the potability of your water. However, to assist you in assessing your water supply, the analytical results for your water source were evaluated against Maximum Contaminant Levels (MCLs) standards and Secondary Maximum Contaminant Levels (SMCLs) established by the United States Environmental Protection Agency (EPA) for public water supplies. These MCLs and SMCLs are not enforced by the EPA, OEPA or Ohio Department of Natural Resources (ODNR) on private residential water supplies.

The following constituents, listed in the table below, were above the EPA MCLs or SMCLs for public supplies.

Well ID	Sample ID	Parameter	Analytical Results	MCL/SMCLs
Red Hill Farm	RHF-RW-Pe-01	Total Dissolved Solids	970 mg/L	500 mg/L ²
Red Hill Farm	RHF-RW-Pe-01	Chloride	300 mg/L	250 mg/L ²

1- mg/L= milligrams per liter

2- Secondary Maximum Contaminant Levels (SMCLs)

The Ohio State University (OSU) Extension and the Penn State University (PSU) Cooperative Extension websites offer useful publications regarding the interpretation of analytical results and additional information on private water supplies. The OSU information can be accessed at <http://extension.osu.edu/topics/environment/water-testing-and-treatment> and the PSU information can be found at <http://extension.psu.edu/natural-resources/water/drinking-water>.

CESO, Inc. will be submitting a copy of this notification letter to AEU, LLC and ODNR as part of the well permit package. Should you have any questions or comments, please contact CESO, Inc. at 412.221.2236.

Sincerely,



Environmental Program

**Water Supply Pre-Drill Survey
SITE VISIT FORM**

GENERAL INFORMATION

Operator Name: A&U, LLC
Location of Gas Well:
Municipality: Madison Township
County: Guernsey
Physical Address: Cadiz Rd
City, State, Zip Code: Freeport, OH 43973

Date Inventoried: 02/18/2014
Inventoried by: NH/GB

Property of Interest Information:

Municipality: Madison Township County: Guernsey Tax Parcel ID: 220000792000
Person Interviewed: Phillip Nisley Owner ☒ Resident ☐ Other ☐
If other, list relationship _____
Length of time living at residence: 7 years
Send analytical results to: Owner ☐ Other ☐ If other, list _____
Name: Phillip & Ellen Nisley
Mailing Address: 20424 Cadiz Rd
City, State, Zip Code: Freeport, OH 43973
Phone: 740-489-9185

WATER SOURCE INFORMATION

Private Water Supply ☒ No Water Supply ☐ Public Water Supply ☐
How many water sources on this property? 1
Number of wells: 1 abandoned Number of springs: 1
Number of other (list): N/A
Was there ever a well in the basement? No
If yes, explain.

Water Supply ID: RHF-DS-NI-01

Is water source located on the property of interest? YES If no, please explain: _____
Does this source supply any other property? NO If yes, please list owner(s): _____
Is this water system ever winterized? If yes, what method is used? No
Number of persons using this water source? 2
Distance from residence (ft): 150 Direction from residence: SE
Distance from (proposed) gas well (ft): 1250 Direction from (proposed) gas well: SW

Uses:

Domestic ☒
Husbandry ☐
Irrigation ☐
Industrial/Commercial ☐
Public, non-community ☐
Abandoned ☐
None ☐

Surrounding Area Information:

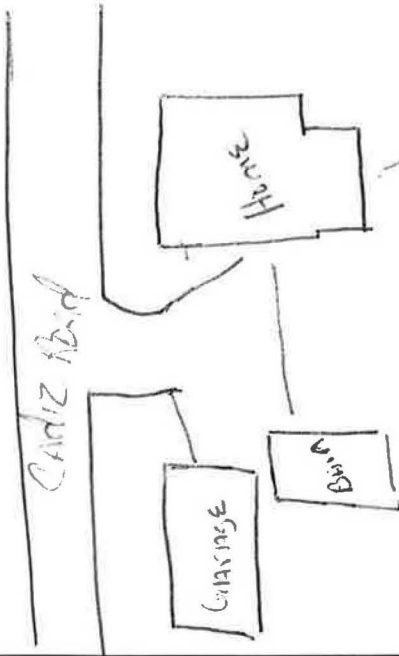
Ground sloping toward water source ☒
Water source downgradient of septic ☐
Signs of failing septic, soggy, odor ☐
Close to crops, garden, greenhouse ☐
Close to junkyard, dump, landfill ☐
Close to fuel tanks, storage, garage ☐
Close to livestock, barn, barnyard, etc ☐
Close to salt storage, salted roadway ☐

Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____

Water Supply Pre-Drill Survey

SITE VISIT FORM

PLAN SKETCH



COMMENTS/PHOTO DESCRIPTIONS

- Photo #1 - spring holding tank with concrete lid removed,
 Photo #2 - inflow pipe into holding tank; sampling location
 Photo #3 - view of the Nisley's residence from the spring holding/settling tank

I hereby acknowledge that I have supplied the correct information to the best of my knowledge.

Signed: Phil Nisley

Printed: Phil Nisley

Date: 2-15-14



Photograph 1: Up close view of the opening to the holding tank to collect spring water for domestic uses on the Phillip and Ellen Nisely property, parcel # 220000792000, at 20424 Cadiz Road, Freeport, Ohio 43973.



Photograph 2: Northwest view of the Nisley residence from the opening to the holding tank parcel # 220000792000, at 20424 Cadiz Road, Freeport, Ohio 43973.



Photograph 3: Up close view of the inflow pipe inside of the holding tank used as the sampling point for the spring water on Phillip and Ellen Nisely property, parcel # 220000792000, at 20424 Cadiz Road, Freeport, Ohio 43973.

March 07, 2014

Mr. Andrew Longenecker
Civil Engineers of Southwest Ohio, Inc.
800 Bursca Drive
Suite 804
Bridgeville, PA 15017

RE: Project: Red Hill Farm Pre-Drill 750217
Pace Project No.: 5093573

Dear Mr. Longenecker:

Enclosed are the analytical results for sample(s) received by the laboratory on February 19, 2014. 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,



Regina Bedel
regina.bedel@pacelabs.com
Project Manager

Enclosures

cc: Ms. Natalie Hooton, Civil Engineers of Southwest Ohio,
Inc.
Ms. Carolyn Rummell, Civil Engineers of Southwest Ohio,
Inc.



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas Certification #: E-10247

Kentucky UST Certification #: 0042

Louisiana/NELAP Certification #: 04076

Ohio VAP Certification #: CL-0065

Pennsylvania Certification #: 68-04991

West Virginia Certification #: 330

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 13-012-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-13-4

Utah Certification #: KS000212013-3

Illinois Certification #: 003097

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

Lab ID	Sample ID	Matrix	Date Collected	Date Received
5093573001	RHF-DS-Ni-01	Water	02/18/14 09:50	02/19/14 09:40

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SAMPLE ANALYTE COUNT

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
5093573001	RHF-DS-Ni-01	RSK 175 Modified	PTH	1	PASI-I
		EPA 200.7	LLB	9	PASI-I
		EPA 200.7	FRW	2	PASI-I
		EPA 8260	JLZ	7	PASI-I
		SM 2320B	SLB	1	PASI-I
		SM 2510B	MLS	1	PASI-I
		SM 2540C	MLS	1	PASI-I
		SM 2540D	MLS	1	PASI-I
		SM 4500-H+B	TPD	1	PASI-I
		EPA 9038	ZM	1	PASI-I
		EPA 300.0	OL	1	PASI-K
		SM 4500-CI-E	ILP	1	PASI-I

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ANALYTICAL RESULTS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

Sample: RHF-DS-Ni-01		Lab ID: 5093573001		Collected: 02/18/14 09:50		Received: 02/19/14 09:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
RSK 175 Headspace		Analytical Method: RSK 175 Modified							
Methane	ND	mg/L	0.010	1		02/25/14 16:47	74-82-8	N2	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	0.057	mg/L	0.010	1	02/21/14 14:30	02/24/14 14:09	7440-39-3		
Calcium	172	mg/L	1.0	1	02/21/14 14:30	02/24/14 14:09	7440-70-2		
Iron	ND	mg/L	0.10	1	02/21/14 14:30	02/24/14 14:09	7439-89-6		
Magnesium	52.1	mg/L	1.0	1	02/21/14 14:30	02/24/14 14:09	7439-95-4		
Manganese	ND	mg/L	0.010	1	02/21/14 14:30	02/24/14 14:09	7439-96-5		
Potassium	5.8	mg/L	1.0	1	02/21/14 14:30	02/24/14 14:09	7440-09-7		
Sodium	85.4	mg/L	1.0	1	02/21/14 14:30	02/24/14 14:09	7440-23-5		
Strontium	2.0	mg/L	0.010	1	02/21/14 14:30	02/24/14 14:09	7440-24-6	N2	
Total Hardness by 2340B	645	mg/L	2.0	1	02/21/14 14:30	02/24/14 14:09			
200.7 Metals, Dissolved (LF)		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Dissolved	59.6	ug/L	10.0	1	02/24/14 07:21	02/24/14 13:32	7440-39-3		
Iron, Dissolved	ND	ug/L	100	1	02/24/14 07:21	02/24/14 13:32	7439-89-6		
8260 MSV UST		Analytical Method: EPA 8260							
Benzene	ND	mg/L	0.0050	1		02/21/14 14:50	71-43-2		
Toluene	ND	mg/L	0.0050	1		02/21/14 14:50	108-88-3		
Ethylbenzene	ND	mg/L	0.0050	1		02/21/14 14:50	100-41-4		
Xylene (Total)	ND	mg/L	0.010	1		02/21/14 14:50	1330-20-7		
Surrogates									
Dibromofluoromethane (S)	98	%	79-116	1		02/21/14 14:50	1868-53-7		
Toluene-d8 (S)	93	%	81-110	1		02/21/14 14:50	2037-26-5		
4-Bromofluorobenzene (S)	98	%	80-114	1		02/21/14 14:50	460-00-4		
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	298	mg/L	2.0	1		02/21/14 09:50			
2510B Specific Conductance		Analytical Method: SM 2510B							
Specific Conductance	1700	umhos/cm	1.0	1		02/27/14 10:09		N2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	970	mg/L	10.0	1		02/21/14 14:01			
2540D Total Suspended Solids		Analytical Method: SM 2540D							
Total Suspended Solids	ND	mg/L	5.0	1		02/24/14 09:44			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.3	Std. Units	0.10	1		02/20/14 11:31		H3,H6	
9038 Sulfate Water		Analytical Method: EPA 9038							
Sulfate	162	mg/L	50.0	10		02/21/14 09:54	14808-79-8	N2	

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ANALYTICAL RESULTS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

Sample: RHF-DS-Ni-01		Lab ID: 5093573001		Collected: 02/18/14 09:50		Received: 02/19/14 09:40		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Bromide		ND	mg/L	1.0	1		03/05/14 16:42	24959-67-9	
4500 Chloride		Analytical Method: SM 4500-Cl-E							
Chloride		300	mg/L	5.0	5		02/28/14 12:26	16887-00-6	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch: GCV/17718

Analysis Method: RSK 175 Modified

QC Batch Method: RSK 175 Modified

Analysis Description: RSK 175 HEADSPACE

Associated Lab Samples: 5093573001

METHOD BLANK: 1052600

Matrix: Water

Associated Lab Samples: 5093573001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methane	mg/L	ND	0.010	02/25/14 15:49	N2

LABORATORY CONTROL SAMPLE: 1052601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methane	mg/L	2	2.3	117	70-130	N2

SAMPLE DUPLICATE: 1052602

Parameter	Units	5093656001 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	mg/L	3240 ug/L	3.6	12	20	N2

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch: MPRP/12890

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 5093573001

METHOD BLANK: 1051432

Matrix: Water

Associated Lab Samples: 5093573001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	ND	0.010	02/24/14 15:23	
Calcium	mg/L	ND	1.0	02/24/14 15:23	
Iron	mg/L	ND	0.10	02/24/14 15:23	
Magnesium	mg/L	ND	1.0	02/24/14 15:23	
Manganese	mg/L	ND	0.010	02/24/14 15:23	
Potassium	mg/L	ND	1.0	02/24/14 15:23	
Sodium	mg/L	ND	1.0	02/24/14 15:23	
Strontium	mg/L	ND	0.010	02/24/14 15:23	N2
Total Hardness by 2340B	mg/L	ND	2.0	02/24/14 15:23	

LABORATORY CONTROL SAMPLE: 1051433

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.94	94	85-115	
Calcium	mg/L	10	9.3	93	85-115	
Iron	mg/L	10	9.5	95	85-115	
Magnesium	mg/L	10	9.4	94	85-115	
Manganese	mg/L	1	0.92	92	85-115	
Potassium	mg/L	10	9.1	91	85-115	
Sodium	mg/L	10	9.0	90	85-115	
Strontium	mg/L	1	0.96	96	80-120	N2
Total Hardness by 2340B	mg/L	66.2	62.1	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1051434

1051435

Parameter	Units	5093564002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	0.13	1	1	1.1	1.1	101	100	70-130	1	20	
Calcium	mg/L	89.0	10	10	102	100	125	115	70-130	1	20	
Iron	mg/L	6.3	10	10	16.5	16.2	102	99	70-130	2	20	
Magnesium	mg/L	33.5	10	10	43.7	43.0	103	95	70-130	2	20	
Manganese	mg/L	0.36	1	1	1.4	1.3	100	98	70-130	2	20	
Potassium	mg/L	56.5	10	10	66.6	65.8	101	93	70-130	1	20	
Sodium	mg/L	479	10	10	486	481	76	21	70-130	1	20	E,P6
Strontium	mg/L	1.4	1	1	2.5	2.5	107	104	70-130	1	20	N2
Total Hardness by 2340B	mg/L	360	66.2	66.2	433	428	111	102	70-130	1	20	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch:	MPRP/12885	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Dissolved
Associated Lab Samples:	5093573001		

METHOD BLANK: 1050766 Matrix: Water

Associated Lab Samples: 5093573001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium, Dissolved	ug/L	ND	10.0	02/24/14 13:14	
Iron, Dissolved	ug/L	ND	100	02/24/14 13:14	

LABORATORY CONTROL SAMPLE: 1050767

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium, Dissolved	ug/L	1000	973	97	85-115	
Iron, Dissolved	ug/L	10000	9590	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1050768 1050769

Parameter	Units	5093574001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium, Dissolved	ug/L	99.2	1000	1000	1040	1060	94	96	70-130	2	20	
Iron, Dissolved	ug/L	ND	10000	10000	9060	9290	90	93	70-130	3	20	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch: MSV/61935

Analysis Method: EPA 8260

QC Batch Method: EPA 8260

Analysis Description: 8260 MSV UST-WATER

Associated Lab Samples: 5093573001

METHOD BLANK: 1051025

Matrix: Water

Associated Lab Samples: 5093573001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/L	ND	0.0050	02/21/14 13:09	
Ethylbenzene	mg/L	ND	0.0050	02/21/14 13:09	
Toluene	mg/L	ND	0.0050	02/21/14 13:09	
Xylene (Total)	mg/L	ND	0.010	02/21/14 13:09	
4-Bromofluorobenzene (S)	%	101	80-114	02/21/14 13:09	
Dibromofluoromethane (S)	%	98	79-116	02/21/14 13:09	
Toluene-d8 (S)	%	94	81-110	02/21/14 13:09	

LABORATORY CONTROL SAMPLE: 1051026

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	mg/L	.05	0.057	115	74-122	
Ethylbenzene	mg/L	.05	0.056	111	66-133	
Toluene	mg/L	.05	0.052	105	72-122	
Xylene (Total)	mg/L	.15	0.16	107	70-124	
4-Bromofluorobenzene (S)	%			103	80-114	
Dibromofluoromethane (S)	%			99	79-116	
Toluene-d8 (S)	%			95	81-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1051027 1051028

Parameter	Units	5093569015 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Benzene	mg/L	ND	.05	.05	0.040	0.043	81	86	62-129	7	20
Ethylbenzene	mg/L	ND	.05	.05	0.021	0.020	42	40	28-153	4	20
Toluene	mg/L	ND	.05	.05	0.028	0.028	55	57	50-132	3	20
Xylene (Total)	mg/L	ND	.15	.15	0.062	0.061	42	41	29-145	2	20
4-Bromofluorobenzene (S)	%						104	107	80-114		
Dibromofluoromethane (S)	%						96	98	79-116		
Toluene-d8 (S)	%						93	93	81-110		

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch: WET/14723

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 5093573001

METHOD BLANK: 1051083

Matrix: Water

Associated Lab Samples: 5093573001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	ND	2.0	02/21/14 09:50	

LABORATORY CONTROL SAMPLE: 1051084

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	50	48.2	96	90-110	

SAMPLE DUPLICATE: 1051085

Parameter	Units	5093551001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	245	242	2	20	

SAMPLE DUPLICATE: 1051086

Parameter	Units	5093585001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	426	436	2	20	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch:	WET/14775	Analysis Method:	SM 2510B
QC Batch Method:	SM 2510B	Analysis Description:	2510B Specific Conductance
Associated Lab Samples:	5093573001		

METHOD BLANK: 1052934 Matrix: Water

Associated Lab Samples: 5093573001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	ND	1.0	02/27/14 10:09	N2

LABORATORY CONTROL SAMPLE: 1052935

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1410	1400	100	90-110	N2

SAMPLE DUPLICATE: 1052936

Parameter	Units	5093573001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	1700	1700	0	20	N2

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch:	WET/14735	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
Associated Lab Samples:	5093573001		

METHOD BLANK: 1051330 Matrix: Water

Associated Lab Samples: 5093573001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	02/21/14 14:01	

LABORATORY CONTROL SAMPLE: 1051331

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	300	299	100	80-120	

SAMPLE DUPLICATE: 1051332

Parameter	Units	5093573001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	970	959	1	10	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch: WET/14744

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 5093573001

METHOD BLANK: 1051960

Matrix: Water

Associated Lab Samples: 5093573001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	02/24/14 09:44	

LABORATORY CONTROL SAMPLE: 1051961

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	90	90	80-120	

SAMPLE DUPLICATE: 1051962

Parameter	Units	5093573001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

SAMPLE DUPLICATE: 1051963

Parameter	Units	5093683003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	217	212	2	10	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch: WET/14707

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 5093573001

SAMPLE DUPLICATE: 1050538

Parameter	Units	5093551001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.7	8.7	0	20	H6

SAMPLE DUPLICATE: 1050737

Parameter	Units	5093580001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	1	20	H6

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch: WET/14726

Analysis Method: EPA 9038

QC Batch Method: EPA 9038

Analysis Description: 9038 Sulfate Water

Associated Lab Samples: 5093573001

METHOD BLANK: 1051167

Matrix: Water

Associated Lab Samples: 5093573001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	5.0	02/21/14 09:00	N2

LABORATORY CONTROL SAMPLE: 1051168

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	20.7	104	90-110	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1051169 1051170

Parameter	Units	5093551002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	4120	5000	5000	9090	9230	99	102	90-110	1	20	N2

MATRIX SPIKE SAMPLE: 1051171

Parameter	Units	5093551003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	1140	2000	3030	95	90-110	N2

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch: WETA/28420

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 5093573001

METHOD BLANK: 1339070

Matrix: Water

Associated Lab Samples:

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromide	mg/L	ND	1.0	03/05/14 12:05	

LABORATORY CONTROL SAMPLE: 1339071

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromide	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1337981 1337982

Parameter	Units	60163186003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Bromide	mg/L	ND	100	100	98.5	96.4	99	96	80-120	2	15	

MATRIX SPIKE SAMPLE: 1337983

Parameter	Units	60163399002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromide	mg/L	3.0	5	7.5	89	80-120	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

QC Batch:	WETA/11811	Analysis Method:	SM 4500-Cl-E
QC Batch Method:	SM 4500-Cl-E	Analysis Description:	4500 Chloride
Associated Lab Samples:	5093573001		

METHOD BLANK: 1054419 Matrix: Water

Associated Lab Samples: 5093573001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	02/28/14 11:43	

LABORATORY CONTROL SAMPLE: 1054420

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.6	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1054421 1054422

Parameter	Units	5092615003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.5	20	20	21.7	22.2	101	103	90-110	2	20	

MATRIX SPIKE SAMPLE: 1054423

Parameter	Units	5093641004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	15.1	20	35.5	102	90-110	

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QUALIFIERS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

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.

PRL - Pace Reporting 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.

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

TNI - The NELAC Institute.

LABORATORIES

PASI-I Pace Analytical Services - Indianapolis

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H3 Sample was received or analysis requested beyond the recognized method holding time.

H6 Analysis initiated outside of the 15 minute EPA recommended holding time.

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

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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METHOD CROSS REFERENCE TABLE

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

Parameter	Matrix	Analytical Method	Preparation Method
8260 MSV UST	Water	SW-846 8260B	SW-846 5030B

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093573

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
5093573001	RHF-DS-Ni-01	RSK 175 Modified	GCV/17718		
5093573001	RHF-DS-Ni-01	EPA 200.7	MPRP/12890	EPA 200.7	ICP/14647
5093573001	RHF-DS-Ni-01	EPA 200.7	MPRP/12885	EPA 200.7	ICP/14651
5093573001	RHF-DS-Ni-01	EPA 8260	MSV/61935		
5093573001	RHF-DS-Ni-01	SM 2320B	WET/14723		
5093573001	RHF-DS-Ni-01	SM 2510B	WET/14775		
5093573001	RHF-DS-Ni-01	SM 2540C	WET/14735		
5093573001	RHF-DS-Ni-01	SM 2540D	WET/14744		
5093573001	RHF-DS-Ni-01	SM 4500-H+B	WET/14707		
5093573001	RHF-DS-Ni-01	EPA 9038	WET/14726		
5093573001	RHF-DS-Ni-01	EPA 300.0	WETA/28420		
5093573001	RHF-DS-Ni-01	SM 4500-CI-E	WETA/11811		

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A

Required Client Information:

Company: **CESO, Inc.**
Address: **500 Bursa Dr., Suite 504**
Bridgeville, PA 15017
Email To: **longenecker@cesoinc.com**
Phone: **412-221-2236** Fax:
Requested Due Date/TAT: **Standard**

Section B

Required Project Information:

Report To: **A. Longenecker**
Copy To: **hooton@cesoinc.com**
rummell@cesoinc.com
Purchase Order No.:
Project Name: **Red Hill Farm Re-drill Sampling**
Project Number: **750217**

Section C

Invoice Information:

Attention: **T. Gunter**
Company Name: **CESO**
Address: **2534 Yankee St. #28 Dayton, OH**
Pace Quote Reference: **12062DI3R JH-1.0**
Pace Project Manager: **Regina Bidel**
Pace Profile #:

Page: **1** of **1**

1718025

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location

STATE: **OH**

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	Matrix Code (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analysis Test ↓	Y/N ↓	Y	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.										
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other	BTX	Methane						Total Metals	Hardness	Sulfate	TDS	TSS	pH conductivity	Alkalinity	Bromide	Chloride	Dissolved Fe, Ba
					DATE	TIME	DATE	TIME																											
1	RHF-DS-NI-DI	DW	G				02/18	0950		9		XX						XX	XX	XX	XX	XX	XX	XX	XX	XX				5093573	001				
2																																			
3																																			
4																																			
5																																			
6																																			
7																																			
8																																			
9																																			
10																																			
11																																			
12																																			

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		
lab filter for dissolved Ba, Fe	Natalie Longenecker CESO	02/18/14	10:40	MW Landmark Data	2-18-14	10:40			
	Aluma R. Muchoney	2/19/14	12:15	Aluma R. Muchoney	2/19/14	09:40	Y	Y	Y
	Aluma R. Muchoney	2/19/14	12:15	Aluma R. Muchoney	2/19/14	09:40	Y	Y	Y

Page 2 of 2

ORIGINAL

SAMPLER NAME AND SIGNATURE: **Natalie Longenecker**

PRINT Name of SAMPLER: **Natalie Longenecker**

SIGNATURE of SAMPLER: **Natalie Longenecker**

DATE Signed (MM/DD/YY): **02/18/14**

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Sample Condition Upon Receipt

Pace Analytical

Client Name: CEISO, INC

Project # 5093573

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

Tracking #: 5348 26810424

Custody Seal on Cooler/Box Present: ☒ Yes ☐ no Seals intact: ☒ Yes ☐ no

Date/Time 5035A kits placed in freezer

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☒ Other Ice

Thermometer Used 2346 ABCDE

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

Cooler Temperature 0.8c
(Corrected, if applicable)

Ice Visible in Sample Containers: ☐ yes ☒ no

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: 2/20/14 Kelly

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Short Hold Time Analysis (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. <u>Ph took to letchem</u>
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
-Includes date/time/ID/Analysis		
All containers needing acid/base pres. have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9. (Circle) <u>HNO3</u> H2SO4 NaOH HCl
exceptions: VOA, coliform, TOC, O&G		
All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10.
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	11.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Project Manager Review		
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Roger N Bell

Date: 2/20/14

CLIENT: C&S, Inc

Sample Container Count



COC PAGE 1 of 1
COC ID# 1718025

Project # 5093573

Sample Line VEAH

Item	DG9H	AG1U	WGFU	AG0U	R	4/6	BP2N	BP2U	BP2S	BP3N	BP3U	BP3S	AG3S	AG1H	BP1U	pH <2	pH >12	Comments
1	3	3								1	1				2			
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

Container Codes

DG9H	40mL HCL amber vial	AG0U	100mL unpreserved amber gl	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1 liter unpreserved amber gla	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved amber vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	I	Wipe/Swab
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber g	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber g	AF	Air Filter	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved clear vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear gl	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFU	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plasti	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag



800 Bursca Drive, Suite 804
Bridgeville, Pennsylvania 15017-1451
(412) 221-2236
www.cesoinc.com

Sent via Certified Mail
7013 1090 0002 4389 9341

March 12, 2014

Randy Raber
71963 Lodge Road
Freeport, OH 43973

RE: Notification of Water Well Sampling Results Performed on Behalf of AEU, LLC

Dear Mr. Raber:

CESO, Inc., on behalf of American Energy- Utica, LLC (AEU), has collected water samples from the water supply well located at 20633 Halfpenny Lane, Freeport, Ohio. The well is identified herein as "RHF-RW-Pe" and is located within 2,000 feet of the proposed Red Hill Farm wellhead.

The sampling event occurred on February 19, 2014 as part of the pre-drill sampling process, pursuant Chapter 1509 of the Ohio Revised Code (2005) and Ohio Senate Bill 165 (2010), and Ohio Senate Bill 315 (2012), for the above mentioned well pad.

The water quality results of the samples collected are provided in the analytical report attached to this letter. The analyses were performed by Pace Analytical Services, Inc. (Pace) of Indianapolis, Indiana which is Ohio Environmental Protection Agency (OEPA) Voluntary Action Program (VAP) certified.

Please note that this sampling event was not performed to determine the potability of your water. However, to assist you in assessing your water supply, the analytical results for your water source were evaluated against Maximum Contaminant Levels (MCLs) standards and Secondary Maximum Contaminant Levels (SMCLs) established by the United States Environmental Protection Agency (EPA) for public water supplies. These MCLs and SMCLs are not enforced by the EPA, OEPA or Ohio Department of Natural Resources (ODNR) on private residential water supplies.

The following constituents, listed in the table below, were above the EPA MCLs or SMCLs for public supplies.

Well ID	Sample ID	Parameter	Analytical Results	MCL/SMCLs
Red Hill Farm	RHF-RW-Pe-01	Iron	9.3 mg/L	0.3 mg/L ²
Red Hill Farm	RHF-RW-Pe-01	Manganese	0.40 mg/L	0.05 mg/L ²
Red Hill Farm	RHF-RW-Pe-01	Total Dissolved Solids	536 mg/L	500 mg/L ²

1- mg/L= milligrams per liter

2- Secondary Maximum Contaminant Levels (SMCLs)

Iron and Manganese are considered secondary contaminants by EPA and have been assigned a SMCL set by the non-enforceable National Secondary Drinking Water Regulations. Secondary contaminants may cause cosmetic effects (discoloration) or aesthetic effects (undesired taste, odor, or color), but are not considered to present a risk to human health at the SMCLs.

The Ohio State University (OSU) Extension and the Penn State University (PSU) Cooperative Extension websites offer useful publications regarding the interpretation of analytical results and additional information on private water supplies. The OSU information can be accessed at <http://extension.osu.edu/topics/environment/water-testing-and-treatment> and the PSU information can be found at <http://extension.psu.edu/natural-resources/water/drinking-water>.

CESO, Inc. will be submitting a copy of this notification letter to AEU, LLC and ODNR as part of the well permit package. Should you have any questions or comments, please contact CESO, Inc. at 412.221.2236.

Sincerely,



Environmental Program

**Water Supply Pre-Drill Survey
SITE VISIT FORM**

GENERAL INFORMATION

Operator Name: AEL, LLC
Location of Gas Well:
Municipality: Madison Township
County: Guernsey
Physical Address: Cadiz Rd 0
City, State, Zip Code: Freeport, OH

Gas Well Permit #: N/A
Date Invenoried: 02/19/14
Invenoried by: GB/NH

Property of Interest Information:

Municipality: Madison Township County: Guernsey Tax Parcel ID: 220000226000
Person Interviewed: Brandy Barber Owner ☒ Resident ☐ Other ☐
If other, list relationship Trustee
Length of time living at residence: Since 1987
Send analytical results to: Owner ☐ Other ☒
Name: Brandy Barber 02/19/14
Mailing Address: 71963 Lodge Road
City, State, Zip Code: Freeport, OH 43973
Phone: 740-260-3399

WATER SOURCE INFORMATION

Private Water Supply ☒ No Water Supply ☐ Public Water Supply ☐
How many water sources on this property? 1
Number of wells: 1 Number of springs: 0
Number of other (list): Pond (1)
Was there ever a well in the basement? NO
If yes, explain.

Water Supply ID: RHF-RW-Pe-01

Is water source located on the property of interest? YES If no, please explain: _____
Does this source supply any other property? NO If yes, please list owner(s): _____
Is this water system ever winterized? If yes, what method is used? No - well not currently used
Number of persons using this water source? ~500 cattle
Distance from ^{cattle barn} residence (ft): 150 Direction from residence: S
Distance from (proposed) gas well (ft): 800 Direction from (proposed) gas well: NW

Uses:

Domestic ☐
Husbandry ☒
Irrigation ☐
Industrial/Commercial ☐
Public, non-community ☐
Abandoned ☐
None ☐

Surrounding Area Information:

Ground sloping toward water source ☒
Water source downgradient of septic ☐
Signs of failing septic, soggy, odor ☐
Close to crops, garden, greenhouse ☐
Close to junkyard, dump, landfill ☐
Close to fuel tanks, storage, garage ☐
Close to livestock, barn, barnyard, etc ☒
Close to salt storage, salted roadway ☐

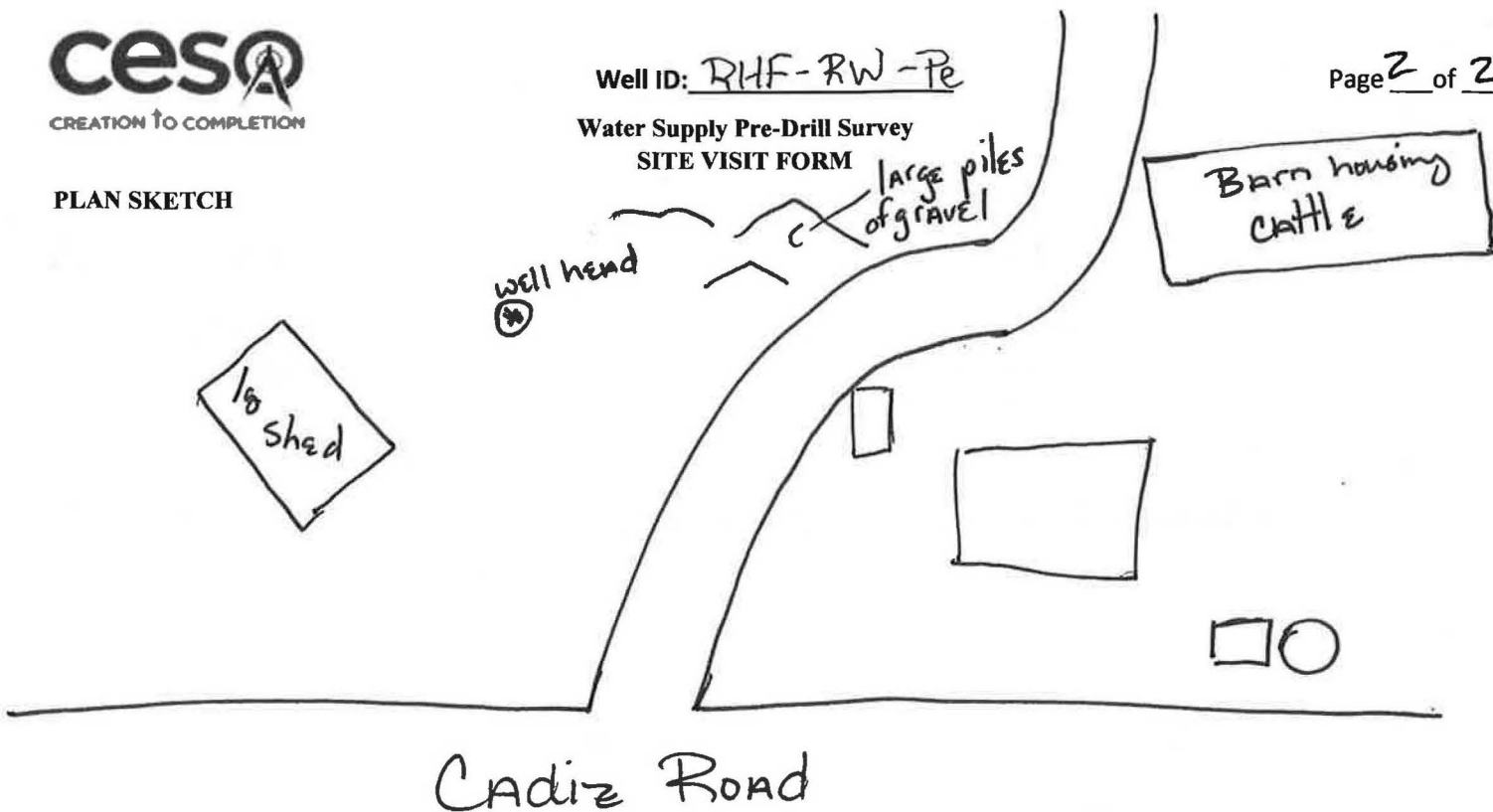
Approximate distance (ft) 5
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) ~150
Approximate distance (ft) _____

PLAN SKETCH

Well ID: RHF-RW-7e

Page 2 of 2

Water Supply Pre-Drill Survey
SITE VISIT FORM



COMMENTS/PHOTO DESCRIPTIONS

- checked location of second well on Lodge Road & determined that it was out of the 2000 foot radius
- checked location of the large pond identified by Mr. Baber on the property & determined water/pond was outside the 2,000 Foot Radius

While purging - the well ran dry on three occasions. On each occasion, the pump was dropped to a greater depth & the flow rate reduced to attempt to get a steady flow & allow for recharge. Final attempt, pump was set ~4 feet above the measured depth. Well was allowed to recharge for 20 minutes prior to re-start. Sediment was apparent on the pump & the line.

I hereby acknowledge that I have supplied the correct information to the best of my knowledge.

Signed:

Handy Baber

Printed:

Handy Baber

Date:

2-19-14



Photograph 1: Southern view of the capped well head on parcel # 220000226000, at 20633 Halfpenny Lane, Freeport, Ohio 43973.



Photograph 2: Up close view of a Bascom-Turner Gas Explorer used to measure gases in the headspace immediately after the well cap is removed. The well is used to supply approximately 500 head of cattle on parcel # 220000226000, at 20633 Halfpenny Lane, Freeport, Ohio 43973.



Photograph 3: Northeastern view from the well head towards the barn housing over 450 head of cattle on parcel # 220000226000, at 20633 Halfpenny Lane, Freeport, Ohio 43973.

March 10, 2014

Mr. Andrew Longenecker
Civil Engineers of Southwest Ohio, Inc.
800 Bursca Drive
Suite 804
Bridgeville, PA 15017

RE: Project: Red Hill Farm Pre-Drill 750217
Pace Project No.: 5093580

Dear Mr. Longenecker:

Enclosed are the analytical results for sample(s) received by the laboratory on February 20, 2014. 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,



Regina Bedel
regina.bedel@pacelabs.com
Project Manager

Enclosures

cc: Ms. Natalie Hooton, Civil Engineers of Southwest Ohio,
Inc.
Ms. Carolyn Rummell, Civil Engineers of Southwest Ohio,
Inc.



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas Certification #: E-10247

Kentucky UST Certification #: 0042

Louisiana/NELAP Certification #: 04076

Ohio VAP Certification #: CL-0065

Pennsylvania Certification #: 68-04991

West Virginia Certification #: 330

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 13-012-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-13-4

Utah Certification #: KS000212013-3

Illinois Certification #: 003097

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

Lab ID	Sample ID	Matrix	Date Collected	Date Received
5093580001	RHF-RW-Pe-01	Water	02/19/14 12:55	02/20/14 09:48

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
5093580001	RHF-RW-Pe-01	RSK 175 Modified	PTH	1	PASI-I
		EPA 200.7	LLB	9	PASI-I
		EPA 200.7	FRW	2	PASI-I
		EPA 8260	JLZ	7	PASI-I
		SM 2320B	SLB	1	PASI-I
		SM 2510B	MLS	1	PASI-I
		SM 2540C	MLS	1	PASI-I
		SM 2540D	MLS	1	PASI-I
		SM 4500-H+B	TPD	1	PASI-I
		EPA 9038	ZM	1	PASI-I
		EPA 300.0	OL	1	PASI-K
		SM 4500-CI-E	ILP	1	PASI-I

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

Sample: RHF-RW-Pe-01		Lab ID: 5093580001	Collected: 02/19/14 12:55	Received: 02/20/14 09:48	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace		Analytical Method: RSK 175 Modified						
Methane	ND	mg/L	0.010	1		02/26/14 16:55	74-82-8	N2
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium	0.11	mg/L	0.010	1	02/21/14 14:30	02/24/14 14:14	7440-39-3	
Calcium	5.4	mg/L	1.0	1	02/21/14 14:30	02/24/14 14:14	7440-70-2	
Iron	9.3	mg/L	0.10	1	02/21/14 14:30	02/24/14 14:14	7439-89-6	
Magnesium	1.9	mg/L	1.0	1	02/21/14 14:30	02/24/14 14:14	7439-95-4	
Manganese	0.40	mg/L	0.010	1	02/21/14 14:30	02/24/14 14:14	7439-96-5	
Potassium	2.2	mg/L	1.0	1	02/21/14 14:30	02/24/14 14:14	7440-09-7	
Sodium	184	mg/L	1.0	1	02/21/14 14:30	02/24/14 14:14	7440-23-5	
Strontium	0.18	mg/L	0.010	1	02/21/14 14:30	02/24/14 14:14	7440-24-6	N2
Total Hardness by 2340B	21.2	mg/L	2.0	1	02/21/14 14:30	02/24/14 14:14		
200.7 Metals, Dissolved (LF)		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Dissolved	63.0	ug/L	10.0	1	02/24/14 07:21	02/24/14 13:38	7440-39-3	
Iron, Dissolved	127	ug/L	100	1	02/24/14 07:21	02/24/14 13:38	7439-89-6	
8260 MSV UST		Analytical Method: EPA 8260						
Benzene	ND	mg/L	0.0050	1		02/21/14 15:23	71-43-2	
Toluene	ND	mg/L	0.0050	1		02/21/14 15:23	108-88-3	
Ethylbenzene	ND	mg/L	0.0050	1		02/21/14 15:23	100-41-4	
Xylene (Total)	ND	mg/L	0.010	1		02/21/14 15:23	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	101	%	79-116	1		02/21/14 15:23	1868-53-7	
Toluene-d8 (S)	93	%	81-110	1		02/21/14 15:23	2037-26-5	
4-Bromofluorobenzene (S)	101	%	80-114	1		02/21/14 15:23	460-00-4	
2320B Alkalinity		Analytical Method: SM 2320B						
Alkalinity, Total as CaCO3	381	mg/L	2.0	1		02/21/14 09:50		
2510B Specific Conductance		Analytical Method: SM 2510B						
Specific Conductance	864	umhos/cm	1.0	1		02/27/14 10:09		N2
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	536	mg/L	10.0	1		02/21/14 14:02		
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	76	mg/L	5.0	1		02/24/14 09:44		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.8	Std. Units	0.10	1		02/20/14 11:33		H6
9038 Sulfate Water		Analytical Method: EPA 9038						
Sulfate	67.3	mg/L	25.0	5		02/21/14 09:56	14808-79-8	N2

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ANALYTICAL RESULTS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

Sample: RHF-RW-Pe-01		Lab ID: 5093580001		Collected: 02/19/14 12:55		Received: 02/20/14 09:48		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Bromide		ND	mg/L	1.0	1		03/07/14 23:39	24959-67-9	
4500 Chloride		Analytical Method: SM 4500-Cl-E							
Chloride		5.8	mg/L	1.0	1		02/28/14 11:54	16887-00-6	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch: GCV/17724

Analysis Method: RSK 175 Modified

QC Batch Method: RSK 175 Modified

Analysis Description: RSK 175 HEADSPACE

Associated Lab Samples: 5093580001

METHOD BLANK: 1053216

Matrix: Water

Associated Lab Samples: 5093580001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methane	mg/L	ND	0.010	02/26/14 16:16	N2

LABORATORY CONTROL SAMPLE: 1053217

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methane	mg/L	2	2.2	110	70-130	N2

SAMPLE DUPLICATE: 1053218

Parameter	Units	5093699012 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	mg/L	7690 ug/L	6.7	14	20	N2

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch: MPRP/12890

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 5093580001

METHOD BLANK: 1051432

Matrix: Water

Associated Lab Samples: 5093580001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	ND	0.010	02/24/14 15:23	
Calcium	mg/L	ND	1.0	02/24/14 15:23	
Iron	mg/L	ND	0.10	02/24/14 15:23	
Magnesium	mg/L	ND	1.0	02/24/14 15:23	
Manganese	mg/L	ND	0.010	02/24/14 15:23	
Potassium	mg/L	ND	1.0	02/24/14 15:23	
Sodium	mg/L	ND	1.0	02/24/14 15:23	
Strontium	mg/L	ND	0.010	02/24/14 15:23	N2
Total Hardness by 2340B	mg/L	ND	2.0	02/24/14 15:23	

LABORATORY CONTROL SAMPLE: 1051433

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.94	94	85-115	
Calcium	mg/L	10	9.3	93	85-115	
Iron	mg/L	10	9.5	95	85-115	
Magnesium	mg/L	10	9.4	94	85-115	
Manganese	mg/L	1	0.92	92	85-115	
Potassium	mg/L	10	9.1	91	85-115	
Sodium	mg/L	10	9.0	90	85-115	
Strontium	mg/L	1	0.96	96	80-120	N2
Total Hardness by 2340B	mg/L	66.2	62.1	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1051434

1051435

Parameter	Units	5093564002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	0.13	1	1	1.1	1.1	101	100	70-130	1	20	
Calcium	mg/L	89.0	10	10	102	100	125	115	70-130	1	20	
Iron	mg/L	6.3	10	10	16.5	16.2	102	99	70-130	2	20	
Magnesium	mg/L	33.5	10	10	43.7	43.0	103	95	70-130	2	20	
Manganese	mg/L	0.36	1	1	1.4	1.3	100	98	70-130	2	20	
Potassium	mg/L	56.5	10	10	66.6	65.8	101	93	70-130	1	20	
Sodium	mg/L	479	10	10	486	481	76	21	70-130	1	20	E,P6
Strontium	mg/L	1.4	1	1	2.5	2.5	107	104	70-130	1	20	N2
Total Hardness by 2340B	mg/L	360	66.2	66.2	433	428	111	102	70-130	1	20	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch: MPRP/12885

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Dissolved

Associated Lab Samples: 5093580001

METHOD BLANK: 1050766

Matrix: Water

Associated Lab Samples: 5093580001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium, Dissolved	ug/L	ND	10.0	02/24/14 13:14	
Iron, Dissolved	ug/L	ND	100	02/24/14 13:14	

LABORATORY CONTROL SAMPLE: 1050767

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium, Dissolved	ug/L	1000	973	97	85-115	
Iron, Dissolved	ug/L	10000	9590	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1050768 1050769

Parameter	Units	5093574001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium, Dissolved	ug/L	99.2	1000	1000	1040	1060	94	96	70-130	2	20	
Iron, Dissolved	ug/L	ND	10000	10000	9060	9290	90	93	70-130	3	20	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch: MSV/61935

Analysis Method: EPA 8260

QC Batch Method: EPA 8260

Analysis Description: 8260 MSV UST-WATER

Associated Lab Samples: 5093580001

METHOD BLANK: 1051025

Matrix: Water

Associated Lab Samples: 5093580001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/L	ND	0.0050	02/21/14 13:09	
Ethylbenzene	mg/L	ND	0.0050	02/21/14 13:09	
Toluene	mg/L	ND	0.0050	02/21/14 13:09	
Xylene (Total)	mg/L	ND	0.010	02/21/14 13:09	
4-Bromofluorobenzene (S)	%	101	80-114	02/21/14 13:09	
Dibromofluoromethane (S)	%	98	79-116	02/21/14 13:09	
Toluene-d8 (S)	%	94	81-110	02/21/14 13:09	

LABORATORY CONTROL SAMPLE: 1051026

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	mg/L	.05	0.057	115	74-122	
Ethylbenzene	mg/L	.05	0.056	111	66-133	
Toluene	mg/L	.05	0.052	105	72-122	
Xylene (Total)	mg/L	.15	0.16	107	70-124	
4-Bromofluorobenzene (S)	%			103	80-114	
Dibromofluoromethane (S)	%			99	79-116	
Toluene-d8 (S)	%			95	81-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1051027 1051028

Parameter	Units	5093569015 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	mg/L	ND	.05	.05	0.040	0.043	81	86	62-129	7	20	
Ethylbenzene	mg/L	ND	.05	.05	0.021	0.020	42	40	28-153	4	20	
Toluene	mg/L	ND	.05	.05	0.028	0.028	55	57	50-132	3	20	
Xylene (Total)	mg/L	ND	.15	.15	0.062	0.061	42	41	29-145	2	20	
4-Bromofluorobenzene (S)	%						104	107	80-114			
Dibromofluoromethane (S)	%						96	98	79-116			
Toluene-d8 (S)	%						93	93	81-110			

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch: WET/14723

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 5093580001

METHOD BLANK: 1051083

Matrix: Water

Associated Lab Samples: 5093580001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	ND	2.0	02/21/14 09:50	

LABORATORY CONTROL SAMPLE: 1051084

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	50	48.2	96	90-110	

SAMPLE DUPLICATE: 1051085

Parameter	Units	5093551001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	245	242	2	20	

SAMPLE DUPLICATE: 1051086

Parameter	Units	5093585001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	426	436	2	20	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch: WET/14775

Analysis Method: SM 2510B

QC Batch Method: SM 2510B

Analysis Description: 2510B Specific Conductance

Associated Lab Samples: 5093580001

METHOD BLANK: 1052934

Matrix: Water

Associated Lab Samples: 5093580001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	ND	1.0	02/27/14 10:09	N2

LABORATORY CONTROL SAMPLE: 1052935

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1410	1400	100	90-110	N2

SAMPLE DUPLICATE: 1052936

Parameter	Units	5093573001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	1700	1700	0	20	N2

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch:	WET/14735	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
Associated Lab Samples:	5093580001		

METHOD BLANK: 1051330 Matrix: Water

Associated Lab Samples: 5093580001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	02/21/14 14:01	

LABORATORY CONTROL SAMPLE: 1051331

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	300	299	100	80-120	

SAMPLE DUPLICATE: 1051332

Parameter	Units	5093573001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	970	959	1	10	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch: WET/14744

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 5093580001

METHOD BLANK: 1051960

Matrix: Water

Associated Lab Samples: 5093580001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	02/24/14 09:44	

LABORATORY CONTROL SAMPLE: 1051961

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	90	90	80-120	

SAMPLE DUPLICATE: 1051962

Parameter	Units	5093573001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

SAMPLE DUPLICATE: 1051963

Parameter	Units	5093683003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	217	212	2	10	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch: WET/14707

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 5093580001

SAMPLE DUPLICATE: 1050538

Parameter	Units	5093551001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.7	8.7	0	20	H6

SAMPLE DUPLICATE: 1050737

Parameter	Units	5093580001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	1	20	H6

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch: WET/14726

Analysis Method: EPA 9038

QC Batch Method: EPA 9038

Analysis Description: 9038 Sulfate Water

Associated Lab Samples: 5093580001

METHOD BLANK: 1051167

Matrix: Water

Associated Lab Samples: 5093580001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	5.0	02/21/14 09:00	N2

LABORATORY CONTROL SAMPLE: 1051168

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	20.7	104	90-110	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1051169 1051170

Parameter	Units	5093551002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	4120	5000	5000	9090	9230	99	102	90-110	1	20	N2

MATRIX SPIKE SAMPLE: 1051171

Parameter	Units	5093551003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	1140	2000	3030	95	90-110	N2

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

QC Batch:	WETA/11811	Analysis Method:	SM 4500-Cl-E
QC Batch Method:	SM 4500-Cl-E	Analysis Description:	4500 Chloride
Associated Lab Samples:	5093580001		

METHOD BLANK: 1054419 Matrix: Water

Associated Lab Samples: 5093580001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	02/28/14 11:43	

LABORATORY CONTROL SAMPLE: 1054420

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.6	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1054421 1054422

Parameter	Units	5092615003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.5	20	20	21.7	22.2	101	103	90-110	2	20	

MATRIX SPIKE SAMPLE: 1054423

Parameter	Units	5093641004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	15.1	20	35.5	102	90-110	

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QUALIFIERS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

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.

PRL - Pace Reporting 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.

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

TNI - The NELAC Institute.

LABORATORIES

PASI-I Pace Analytical Services - Indianapolis

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H6 Analysis initiated outside of the 15 minute EPA recommended holding time.

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

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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METHOD CROSS REFERENCE TABLE

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

Parameter	Matrix	Analytical Method	Preparation Method
8260 MSV UST	Water	SW-846 8260B	SW-846 5030B

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093580

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
5093580001	RHF-RW-Pe-01	RSK 175 Modified	GCV/17724		
5093580001	RHF-RW-Pe-01	EPA 200.7	MPRP/12890	EPA 200.7	ICP/14647
5093580001	RHF-RW-Pe-01	EPA 200.7	MPRP/12885	EPA 200.7	ICP/14651
5093580001	RHF-RW-Pe-01	EPA 8260	MSV/61935		
5093580001	RHF-RW-Pe-01	SM 2320B	WET/14723		
5093580001	RHF-RW-Pe-01	SM 2510B	WET/14775		
5093580001	RHF-RW-Pe-01	SM 2540C	WET/14735		
5093580001	RHF-RW-Pe-01	SM 2540D	WET/14744		
5093580001	RHF-RW-Pe-01	SM 4500-H+B	WET/14707		
5093580001	RHF-RW-Pe-01	EPA 9038	WET/14726		
5093580001	RHF-RW-Pe-01	EPA 300.0	WETA/28457		
5093580001	RHF-RW-Pe-01	SM 4500-CI-E	WETA/11811		

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Sample Condition Upon Receipt

Pace Analytical

Client Name: Ceso

Project # 5093580

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

Tracking #: 8024 6390 2773

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals Intact: ☒ yes ☐ no

Date/Time 5035A kits placed in freezer

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☒ Other Zyphloc

Thermometer Used 12346 ABCDE Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 0.4°C Ice Visible in Sample Containers: ☐ yes ☒ no

Temp should be above freezing to 6°C Comments: Date and Initials of person examining contents: 2/20/14 sg

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Short Hold Time Analysis (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. <u>pH</u>
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
-Includes date/time/ID/Analysis		
All containers needing acid/base pres. have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9. (Circle) HNO3 H2SO4 NaOH HCl
exceptions: VOA, coliform, TOC, O&G		
All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10.
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	11.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Project Manager Review		
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.

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

Person Contacted: Nabele H Date/Time: 2/20/14 1041

Comments/ Resolution: Concerned about pH of VOA vials. I noted to lab to run within 7 day hold.

Project Manager Review: Rizque N. Ball

Date: 2/20/14

Sample Container Count

CLIENT: Ceso



COC PAGE 1 of 1
COC ID# 1741034

Project # 5093580

Sample Line

Item	DG9H	AG1U	WGFU	AG0U	R	4/6	BP2N	BP2U	BP2S	BP3N	BP3U	BP3S	AG3S	AG1H	BP1U	VG9H	pH <2	pH >12	Comments
1	3									1					2	3			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

Container Codes

DG9H	40mL HCL amber vial	AG0U	100mL unpreserved amber glass	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1liter unpreserved amber glass	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber glass	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved amber vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	I	Wipe/Swab
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber glass	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber glass	AF	Air Filter	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved clear vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear glass	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFU	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plastic	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag



800 Bursca Drive, Suite 804
Bridgeville, Pennsylvania 15017-1451
(412) 221-2236
www.cesoinc.com

Sent via Certified Mail
7013 1090 0002 4389 8658

March 5, 2014

Karen Taylor
Po Box 265
Howard, OH 43028

RE: Notification of Water Well Sampling Results Performed on Behalf of AEU, LLC

Dear Mrs. Taylor:

CESO, Inc., on behalf of American Energy- Utica, LLC (AEU), has collected water samples from the water supply spring located at 20530 Crossline Lane, Freeport, Ohio. The spring is identified herein as "RHF-DS-Ta" and is located within 2,000 feet of the proposed Red Hill Farm wellhead.

The sampling event occurred on February 11, 2014 as part of the pre-drill sampling process, pursuant Chapter 1509 of the Ohio Revised Code (2005) and Ohio Senate Bill 165 (2010), and Ohio Senate Bill 315 (2012), for the above mentioned well pad.

The water quality results of the samples collected are provided in the analytical report attached to this letter. The analyses were performed by Pace Analytical Services, Inc. (Pace) of Indianapolis, Indiana which is Ohio Environmental Protection Agency (OEPA) Voluntary Action Program (VAP) certified.

Please note that this sampling event was not performed to determine the potability of your water. However, to assist you in assessing your water supply, the analytical results for your water source were evaluated against Maximum Contaminant Levels (MCLs) standards and Secondary Maximum Contaminant Levels (SMCLs) established by the United States Environmental Protection Agency (EPA) for public water supplies. These MCLs and SMCLs are not enforced by the EPA, OEPA or Ohio Department of Natural Resources (ODNR) on private residential water supplies.

All chemical analytes sampled in RHF-DS-Ta were below MCLs and SMCLs established by the EPA, OEPA, and ODNR.

The Ohio State University (OSU) Extension and the Penn State University (PSU) Cooperative Extension websites offer useful publications regarding the interpretation of analytical results and additional information on private water supplies. The OSU information can be accessed at <http://extension.osu.edu/topics/environment/water-testing-and-treatment> and the PSU information can be found at <http://extension.psu.edu/natural-resources/water/drinking-water>.

CESO, Inc. will be submitting a copy of this notification letter to AEU, LLC and ODNR as part of the well permit package. Should you have any questions or comments, please contact CESO, Inc. at 412.221.2236.

Sincerely,



Environmental Program

CREATION TO COMPLETION

Engineering • Architecture • Survey • Construction Mgt • Environmental

Water Supply Pre-Drill Survey
SITE VISIT FORM

GENERAL INFORMATION

Operator Name: AEL, LLC
Location of Gas Well:
Municipality: Madison Township
County: Guernsey
Physical Address: Cadiz Road
City, State, Zip Code: Freeport, OH 43973

Date Inventoried: 02/11/2014-Site Visit
Inventoried by: Phone Interview 02/10
NH

Property of Interest Information:

Municipality: Londonderry Township County: Guernsey Tax Parcel ID: 200000617000
Person Interviewed: Karen Taylor (phone) Owner ☒ Resident ☐ Other ☐
If other, list relationship _____
Length of time living at residence: _____
Send analytical results to: Owner ☒ Other ☐ If other, list _____
Name: Karen Taylor
Mailing Address: P.O. Box 245
City, State, Zip Code: Howard, OH 43028
Phone: 740-599-7008

WATER SOURCE INFORMATION

Private Water Supply ☒ No Water Supply ☐ Public Water Supply ☐
How many water sources on this property? 1
Number of wells: 0 Number of springs: 1
Number of other (list): _____
Was there ever a well in the basement? NO
If yes, explain. _____

Water Supply ID: BHF-DS-Ta-01

Is water source located on the property of interest? Yes If no, please explain: _____
Does this source supply any other property? NO If yes, please list owner(s): _____
Is this water system ever winterized? If yes, what method is used? NO
Number of persons using this water source? Unknown
Distance from residence (ft): _____ Direction from residence: South
Distance from (proposed) gas well (ft): 1700 Direction from (proposed) gas well: South East

Uses:
Domestic ☒
Husbandry ☐
Irrigation ☐
Industrial/Commercial ☐
Public, non-community ☐
Abandoned ☐
None ☐

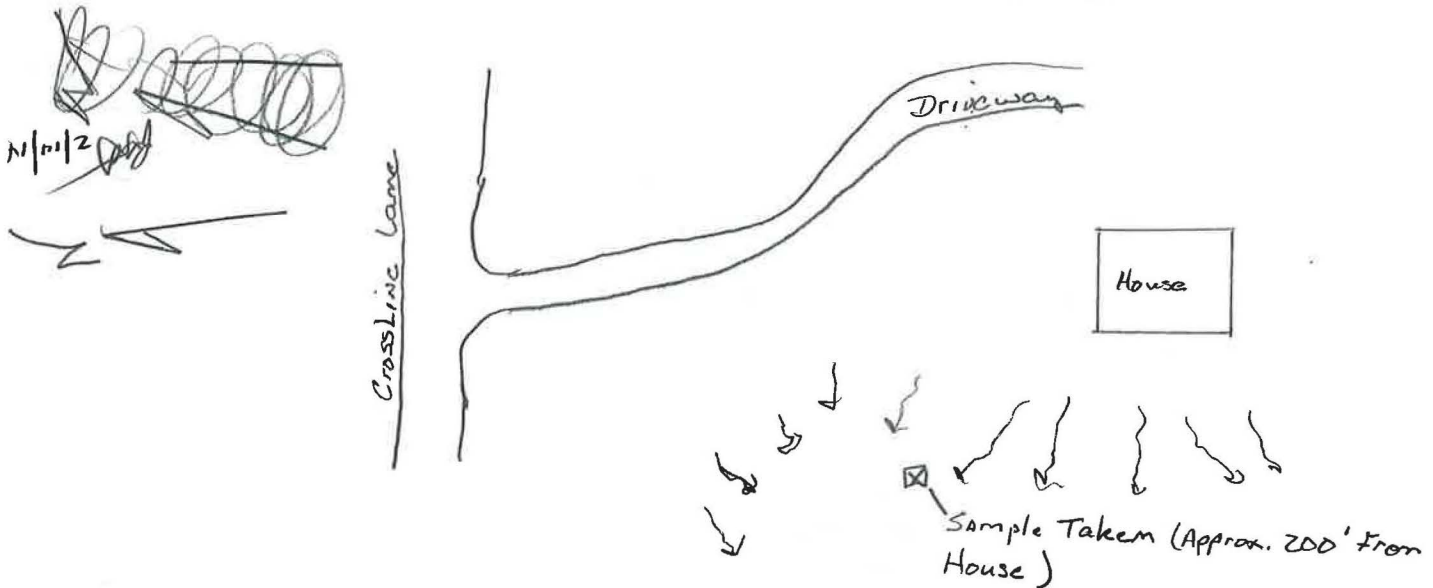
Surrounding Area Information:

Ground sloping toward water source ☒
Water source downgradient of septic ☐
Signs of failing septic, soggy, odor ☐
Close to crops, garden, greenhouse ☐
Close to junkyard, dump, landfill ☐
Close to fuel tanks, storage, garage ☐
Close to livestock, barn, barnyard, etc ☐
Close to salt storage, salted roadway ☐

Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____
Approximate distance (ft) _____

Water Supply Pre-Drill Survey
SITE VISIT FORM

PLAN SKETCH



COMMENTS/PHOTO DESCRIPTIONS

Phone interview conducted on 02/07/2014 - owner does not live on the Londonderry township parcel (200000617000) and is unable to meet CESO on the property. However, Ms. Taylor would like the spring water on this property sampled & has given CESO permission to access her property in her absence. Developed spring reportedly collects in stainless steel drum.

- No water was observed flowing into either holding tank although the above ground spring had some flow
- Large metal tank covered w/ fiberglass insulation & wooden boards
- Sampled from small overflow hole on the side of the large holding tank until water dropped below hole. Large poly bottles were sampled via dipping

Photo #1 - metal holding tank covered

Photo #2 - view from spring to house

Photo #3 - view of metal lid covering a small holding/settling tank

Photo #4 View of small tank with water (no flow was observed)

Photo #5 - small hole in large metal holding tank for overflow control used as sampling location

Photo #6 - view of insulation used to cover metal, aboveground holding tank

I hereby acknowledge that I have supplied the correct information to the best of my knowledge.

Signed: N/A Printed: Karen Taylor Date: _____



Photograph 1: Northern view of the covered large stainless steel basin used for holding water which is pumped to the cabin for drinking water on Karen L. and Gary N. Taylor's property, parcel # 200000617000, at 20530 Crossline Lane, Freeport, Ohio 43973.



Photograph 2: Southeastern view from the spring of the cabin that relies on the spring for a drinking water supply on Karen L. and Gary N. Taylor's property, parcel # 200000617000, at 20530 Crossline Lane, Freeport, Ohio 43973.



Photograph 3: Up close view of the metal lid covering a small below ground settling/holding container up gradient from the large stainless steel basin used as a holding tank for spring water on Karen L. and Gary N. Taylor's property, parcel # 200000617000, at 20530 Crossline Lane, Freeport, Ohio 43973.



Photograph 4: Up close view of the overflow hole in the side of the large stainless steel holding tank used as the sampling location for the spring water on Karen L. and Gary N. Taylor's property, parcel # 200000617000, at 20530 Crossline Lane, Freeport, Ohio 43973.



Photograph 5: Up close view of the insulation used to cover the large aboveground stainless steel basin used as a holding tank on Karen L. and Gary N. Taylor's property, parcel # 200000617000, at 20530 Crossline Lane, Freeport, Ohio 43973.

February 25, 2014

Mr. Andrew Longenecker
Civil Engineers of Southwest Ohio, Inc.
800 Bursca Drive
Suite 804
Bridgeville, PA 15017

RE: Project: Red Hill Farm Pre-Drill 750217
Pace Project No.: 5093252

Dear Mr. Longenecker:

Enclosed are the analytical results for sample(s) received by the laboratory on February 12, 2014. 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,



Regina Bedel
regina.bedel@pacelabs.com
Project Manager

Enclosures

cc: Ms. Natalie Hooton, Civil Engineers of Southwest Ohio,
Inc.
Ms. Carolyn Rummell, Civil Engineers of Southwest Ohio,
Inc.



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas Certification #: E-10247

Kentucky UST Certification #: 0042

Louisiana/NELAP Certification #: 04076

Ohio VAP Certification #: CL-0065

Pennsylvania Certification #: 68-04991

West Virginia Certification #: 330

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 13-012-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-13-4

Utah Certification #: KS000212013-3

Illinois Certification #: 003097

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SAMPLE SUMMARY

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

Lab ID	Sample ID	Matrix	Date Collected	Date Received
5093252001	RHF-DS-Ta-01	Water	02/11/14 12:20	02/12/14 10:11

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SAMPLE ANALYTE COUNT

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
5093252001	RHF-DS-Ta-01	RSK 175 Modified	PTH	1	PASI-I
		EPA 200.7	FRW	9	PASI-I
		EPA 200.7	LLB	2	PASI-I
		EPA 8260	JLZ	7	PASI-I
		SM 2320B	SLB	1	PASI-I
		SM 2510B	MLS	1	PASI-I
		SM 2540C	MLS	1	PASI-I
		SM 2540D	MLS	1	PASI-I
		SM 4500-H+B	ZM	1	PASI-I
		EPA 9038	TPD	1	PASI-I
		EPA 300.0	OL	1	PASI-K
		SM 4500-CI-E	WDB	1	PASI-I

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ANALYTICAL RESULTS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

Sample: RHF-DS-Ta-01		Lab ID: 5093252001	Collected: 02/11/14 12:20	Received: 02/12/14 10:11	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace		Analytical Method: RSK 175 Modified						
Methane	ND mg/L		0.010	1		02/14/14 19:57	74-82-8	N2
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium	0.043 mg/L		0.010	1	02/12/14 13:44	02/13/14 09:07	7440-39-3	
Calcium	26.3 mg/L		1.0	1	02/12/14 13:44	02/13/14 09:07	7440-70-2	
Iron	0.14 mg/L		0.10	1	02/12/14 13:44	02/13/14 09:07	7439-89-6	
Magnesium	4.5 mg/L		1.0	1	02/12/14 13:44	02/13/14 09:07	7439-95-4	
Manganese	ND mg/L		0.010	1	02/12/14 13:44	02/13/14 09:07	7439-96-5	
Potassium	1.6 mg/L		1.0	1	02/12/14 13:44	02/13/14 09:07	7440-09-7	
Sodium	2.7 mg/L		1.0	1	02/12/14 13:44	02/13/14 09:07	7440-23-5	
Strontium	0.080 mg/L		0.010	1	02/12/14 13:44	02/13/14 09:07	7440-24-6	N2
Total Hardness by 2340B	84.1 mg/L		2.0	1	02/12/14 13:44	02/13/14 09:07		
200.7 Metals, Dissolved (LF)		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Dissolved	43.1 ug/L		10.0	1	02/20/14 14:05	02/21/14 09:54	7440-39-3	
Iron, Dissolved	ND ug/L		100	1	02/20/14 14:05	02/21/14 09:54	7439-89-6	
8260 MSV UST		Analytical Method: EPA 8260						
Benzene	ND mg/L		0.0050	1		02/13/14 16:09	71-43-2	
Toluene	ND mg/L		0.0050	1		02/13/14 16:09	108-88-3	
Ethylbenzene	ND mg/L		0.0050	1		02/13/14 16:09	100-41-4	
Xylene (Total)	ND mg/L		0.010	1		02/13/14 16:09	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	99 %		79-116	1		02/13/14 16:09	1868-53-7	
Toluene-d8 (S)	93 %		81-110	1		02/13/14 16:09	2037-26-5	
4-Bromofluorobenzene (S)	102 %		80-114	1		02/13/14 16:09	460-00-4	
2320B Alkalinity		Analytical Method: SM 2320B						
Alkalinity, Total as CaCO3	75.0 mg/L		2.0	1		02/17/14 10:30		
2510B Specific Conductance		Analytical Method: SM 2510B						
Specific Conductance	189 umhos/cm		1.0	1		02/17/14 07:19		N2
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	105 mg/L		10.0	1		02/17/14 13:28		
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	ND mg/L		5.0	1		02/18/14 09:30		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2 Std. Units		0.10	1		02/12/14 10:39		H6
9038 Sulfate Water		Analytical Method: EPA 9038						
Sulfate	21.5 mg/L		12.5	2.5		02/17/14 09:21	14808-79-8	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

Sample: RHF-DS-Ta-01		Lab ID: 5093252001		Collected: 02/11/14 12:20		Received: 02/12/14 10:11		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Bromide		ND	mg/L	1.0	1		02/23/14 23:05	24959-67-9	
4500 Chloride		Analytical Method: SM 4500-Cl-E							
Chloride		ND	mg/L	1.0	1		02/20/14 10:29	16887-00-6	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: GCV/17675

Analysis Method: RSK 175 Modified

QC Batch Method: RSK 175 Modified

Analysis Description: RSK 175 HEADSPACE

Associated Lab Samples: 5093252001

METHOD BLANK: 1047331

Matrix: Water

Associated Lab Samples: 5093252001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methane	mg/L	ND	0.010	02/14/14 15:47	N2

LABORATORY CONTROL SAMPLE: 1047332

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methane	mg/L	2	2.0	103	70-130	N2

SAMPLE DUPLICATE: 1047333

Parameter	Units	5093037005 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	mg/L	ND	ND		20	N2

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: MPRP/12847

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 5093252001

METHOD BLANK: 1047753

Matrix: Water

Associated Lab Samples: 5093252001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	ND	0.010	02/13/14 08:39	
Calcium	mg/L	ND	1.0	02/13/14 08:39	
Iron	mg/L	ND	0.10	02/13/14 08:39	
Magnesium	mg/L	ND	1.0	02/13/14 08:39	
Manganese	mg/L	ND	0.010	02/13/14 08:39	
Potassium	mg/L	ND	1.0	02/13/14 08:39	
Sodium	mg/L	ND	1.0	02/13/14 08:39	
Strontium	mg/L	ND	0.010	02/13/14 08:39	N2
Total Hardness by 2340B	mg/L	ND	2.0	02/13/14 08:39	

LABORATORY CONTROL SAMPLE: 1047754

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.98	98	85-115	
Calcium	mg/L	10	9.9	99	85-115	
Iron	mg/L	10	9.8	98	85-115	
Magnesium	mg/L	10	9.7	97	85-115	
Manganese	mg/L	1	0.99	99	85-115	
Potassium	mg/L	10	9.7	97	85-115	
Sodium	mg/L	10	9.7	97	85-115	
Strontium	mg/L	1	0.98	98	80-120	N2
Total Hardness by 2340B	mg/L	66.2	64.6	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1047755

1047756

Parameter	Units	5093230002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	0.10	1	1	1.2	1.1	105	103	70-130	2	20	
Calcium	mg/L	91.6	10	10	103	98.7	115	70	70-130	4	20	
Iron	mg/L	3.6	10	10	13.9	13.4	103	98	70-130	3	20	
Magnesium	mg/L	32.6	10	10	43.3	41.4	106	87	70-130	4	20	
Manganese	mg/L	0.24	1	1	1.3	1.2	105	101	70-130	3	20	
Potassium	mg/L	44.9	10	10	55.9	53.9	110	90	70-130	4	20	
Sodium	mg/L	316	10	10	328	314	114	-28	70-130	4	20	E,P6
Strontium	mg/L	1.1	1	1	2.2	2.2	107	101	70-130	3	20	N2
Total Hardness by 2340B	mg/L	363	66.2	66.2	436	417	109	81	70-130	4	20	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: MPRP/12883

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Dissolved

Associated Lab Samples: 5093252001

METHOD BLANK: 1050597

Matrix: Water

Associated Lab Samples: 5093252001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium, Dissolved	ug/L	ND	10.0	02/21/14 09:21	
Iron, Dissolved	ug/L	ND	100	02/21/14 09:21	

LABORATORY CONTROL SAMPLE: 1050598

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium, Dissolved	ug/L	1000	953	95	85-115	
Iron, Dissolved	ug/L	10000	9760	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1050599 1050600

Parameter	Units	5093315001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium, Dissolved	ug/L	27.2	1000	1000	979	985	95	96	70-130	1	20	
Iron, Dissolved	ug/L	ND	10000	10000	9720	9820	97	98	70-130	1	20	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: MSV/61755

Analysis Method: EPA 8260

QC Batch Method: EPA 8260

Analysis Description: 8260 MSV UST-WATER

Associated Lab Samples: 5093252001

METHOD BLANK: 1048328

Matrix: Water

Associated Lab Samples: 5093252001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/L	ND	0.0050	02/13/14 12:42	
Ethylbenzene	mg/L	ND	0.0050	02/13/14 12:42	
Toluene	mg/L	ND	0.0050	02/13/14 12:42	
Xylene (Total)	mg/L	ND	0.010	02/13/14 12:42	
4-Bromofluorobenzene (S)	%	101	80-114	02/13/14 12:42	
Dibromofluoromethane (S)	%	99	79-116	02/13/14 12:42	
Toluene-d8 (S)	%	94	81-110	02/13/14 12:42	

LABORATORY CONTROL SAMPLE: 1048329

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	mg/L	.05	0.055	110	74-122	
Ethylbenzene	mg/L	.05	0.051	103	66-133	
Toluene	mg/L	.05	0.049	97	72-122	
Xylene (Total)	mg/L	.15	0.15	100	70-124	
4-Bromofluorobenzene (S)	%			103	80-114	
Dibromofluoromethane (S)	%			100	79-116	
Toluene-d8 (S)	%			94	81-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1048330 1048331

Parameter	Units	5093300001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	mg/L	ND	.05	.05	0.056	0.054	111	109	62-129	2	20	
Ethylbenzene	mg/L	ND	.05	.05	0.049	0.046	97	92	28-153	5	20	
Toluene	mg/L	ND	.05	.05	0.048	0.046	96	93	50-132	3	20	
Xylene (Total)	mg/L	ND	.15	.15	0.14	0.13	92	88	29-145	4	20	
4-Bromofluorobenzene (S)	%						106	108	80-114			
Dibromofluoromethane (S)	%						102	103	79-116			
Toluene-d8 (S)	%						95	94	81-110			

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: WET/14665

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 5093252001

METHOD BLANK: 1049197

Matrix: Water

Associated Lab Samples: 5093252001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	ND	2.0	02/17/14 10:30	

LABORATORY CONTROL SAMPLE: 1049198

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	50	49.8	100	90-110	

SAMPLE DUPLICATE: 1049199

Parameter	Units	5093315001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	36.0	36.4	1	20	

SAMPLE DUPLICATE: 1049200

Parameter	Units	5093364014 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	616	612	1	20	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: WET/14664

Analysis Method: SM 2510B

QC Batch Method: SM 2510B

Analysis Description: 2510B Specific Conductance

Associated Lab Samples: 5093252001

METHOD BLANK: 1049185

Matrix: Water

Associated Lab Samples: 5093252001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	ND	1.0	02/17/14 07:19	N2

LABORATORY CONTROL SAMPLE: 1049186

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1410	1420	101	90-110	N2

SAMPLE DUPLICATE: 1049187

Parameter	Units	5093132001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	559	557	0	20	N2

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: WET/14663

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 5093252001

METHOD BLANK: 1049182

Matrix: Water

Associated Lab Samples: 5093252001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	02/17/14 13:28	

LABORATORY CONTROL SAMPLE: 1049183

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	300	279	93	80-120	

SAMPLE DUPLICATE: 1049184

Parameter	Units	5093252001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	105	110	5	10	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: WET/14676

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 5093252001

METHOD BLANK: 1049482

Matrix: Water

Associated Lab Samples: 5093252001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	5.0	02/18/14 09:29	

LABORATORY CONTROL SAMPLE: 1049483

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	85	85	80-120	

SAMPLE DUPLICATE: 1049484

Parameter	Units	5093233002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	240	224	7	10	

SAMPLE DUPLICATE: 1049485

Parameter	Units	5093430001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: WET/14639

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 5093252001

SAMPLE DUPLICATE: 1047890

Parameter	Units	5093252001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	1	20	H6

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: WET/14669

Analysis Method: EPA 9038

QC Batch Method: EPA 9038

Analysis Description: 9038 Sulfate Water

Associated Lab Samples: 5093252001

METHOD BLANK: 1049248

Matrix: Water

Associated Lab Samples: 5093252001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	5.0	02/17/14 09:08	N2

LABORATORY CONTROL SAMPLE: 1049249

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	18.6	93	90-110	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1049250 1049251

Parameter	Units	5093252001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	21.5	50	50	71.9	71.0	101	99	90-110	1	20	N2

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: WETA/28306

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 5093252001

METHOD BLANK: 1334139

Matrix: Water

Associated Lab Samples:

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromide	mg/L	ND	1.0	02/23/14 17:57	

LABORATORY CONTROL SAMPLE: 1334140

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromide	mg/L	5	5.1	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1334141 1334142

Parameter	Units	60163227001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Bromide	mg/L	ND	1000	1000	1000	1010	100	101	80-120	1	15	

MATRIX SPIKE SAMPLE: 1334143

Parameter	Units	60163149004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromide	mg/L	ND	5	5.3	91	80-120	

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QUALITY CONTROL DATA

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

QC Batch: WETA/11757

Analysis Method: SM 4500-Cl-E

QC Batch Method: SM 4500-Cl-E

Analysis Description: 4500 Chloride

Associated Lab Samples: 5093252001

METHOD BLANK: 1050543

Matrix: Water

Associated Lab Samples: 5093252001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	02/20/14 10:25	

LABORATORY CONTROL SAMPLE: 1050544

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1050545 1050546

Parameter	Units	5092224003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.6	20	20	23.2	23.5	98	99	90-110	1	20	

MATRIX SPIKE SAMPLE: 1050547

Parameter	Units	5093551009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	13.8	20	35.0	106	90-110	

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QUALIFIERS

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

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.

PRL - Pace Reporting 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.

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

TNI - The NELAC Institute.

LABORATORIES

PASI-I Pace Analytical Services - Indianapolis

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H6 Analysis initiated outside of the 15 minute EPA recommended holding time.

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

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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METHOD CROSS REFERENCE TABLE

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

Parameter	Matrix	Analytical Method	Preparation Method
8260 MSV UST	Water	SW-846 8260B	SW-846 5030B

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Red Hill Farm Pre-Drill 750217

Pace Project No.: 5093252

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
5093252001	RHF-DS-Ta-01	RSK 175 Modified	GCV/17675		
5093252001	RHF-DS-Ta-01	EPA 200.7	MPRP/12847	EPA 200.7	ICP/14563
5093252001	RHF-DS-Ta-01	EPA 200.7	MPRP/12883	EPA 200.7	ICP/14635
5093252001	RHF-DS-Ta-01	EPA 8260	MSV/61755		
5093252001	RHF-DS-Ta-01	SM 2320B	WET/14665		
5093252001	RHF-DS-Ta-01	SM 2510B	WET/14664		
5093252001	RHF-DS-Ta-01	SM 2540C	WET/14663		
5093252001	RHF-DS-Ta-01	SM 2540D	WET/14676		
5093252001	RHF-DS-Ta-01	SM 4500-H+B	WET/14639		
5093252001	RHF-DS-Ta-01	EPA 9038	WET/14669		
5093252001	RHF-DS-Ta-01	EPA 300.0	WETA/28306		
5093252001	RHF-DS-Ta-01	SM 4500-CI-E	WETA/11757		

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Sample Condition Upon Receipt



Client Name: CESO

Project # 5093252

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

Tracking #: 8024 6390 2730

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals Intact: ☒ yes ☐ no

Date/Time 5035A kits placed in freezer

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☒ Other Ziplock

Thermometer Used 1 2 3 4 6 A B C D E Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 0.2°C Ice Visible in Sample Containers: ☐ yes ☒ no

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: 2/12/14 sj

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6. <u>ptt</u>
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
-Includes date/time/ID/Analysis		
All containers needing acid/base pres. have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9. (Circle) HNO3 H2SO4 NaOH HCl
exceptions: VOA, coliform, TOC, O&G		
All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10.
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	11.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Project Manager Review		
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Rogee H. Biedl

Date: 2/12/14

Sample Container Count

CLIENT: CESO



COC PAGE 1 of 1
COC ID# 1718024

Project # 5093252

Sample Line

Item	DG9H	AG1U	WGFU	AG0U	R	4/6	BP2N	BP2U	BP2S	BP3N	BP3U	BP3S	AG3S	AG1H	BP1U	VG9H	pH <2	pH >12	Comments
1	3									1					2	3			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

Container Codes

DG9H	40mL HCL amber vial	AG0U	100mL unpreserved amber glass	BP1N	1 liter HNO3 plastic	DG9P	40mL TSP amber vial
AG1U	1 liter unpreserved amber glass	AG1H	1 liter HCL amber glass	BP1S	1 liter H2SO4 plastic	DG9S	40mL H2SO4 amber vial
WGFU	4oz clear soil jar	AG1S	1 liter H2SO4 amber glass	BP1U	1 liter unpreserved plastic	DG9T	40mL Na Thio amber vial
R	terra core kit	AG1T	1 liter Na Thiosulfate amber glass	BP1Z	1 liter NaOH, Zn, Ac	DG9U	40mL unpreserved amber vial
BP2N	500mL HNO3 plastic	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	I	Wipe/Swab
BP2U	500mL unpreserved plastic	AG2S	500mL H2SO4 amber glass	BP2O	500mL NaOH plastic	JGFU	4oz unpreserved amber wide
BP2S	500mL H2SO4 plastic	AG2U	500mL unpreserved amber glass	BP2Z	500mL NaOH, Zn Ac	U	Summa Can
BP3N	250mL HNO3 plastic	AG3U	250mL unpreserved amber glass	AF	Air Filter	VG9H	40mL HCL clear vial
BP3U	250mL unpreserved plastic	BG1H	1 liter HCL clear glass	BP3C	250mL NaOH plastic	VG9T	40mL Na Thio. clear vial
BP3S	250mL H2SO4 plastic	BG1S	1 liter H2SO4 clear glass	BP3Z	250mL NaOH, Zn Ac plastic	VG9U	40mL unpreserved clear vial
AG3S	250mL H2SO4 glass amber	BG1T	1 liter Na Thiosulfate clear glass	C	Air Cassettes	VSG	Headspace septa vial & HCL
AG1S	1 liter H2SO4 amber glass	BG1U	1 liter unpreserved glass	DG9B	40mL Na Bisulfate amber vial	WGFU	4oz wide jar w/hexane wipe
BP1U	1 liter unpreserved plastic	BP1A	1 liter NaOH, Asc Acid plastic	DG9M	40mL MeOH clear vial	ZPLC	Ziploc Bag



**RED HILL FARM WELL PAD
PRE-DRILLING SURVEY RESULTS**

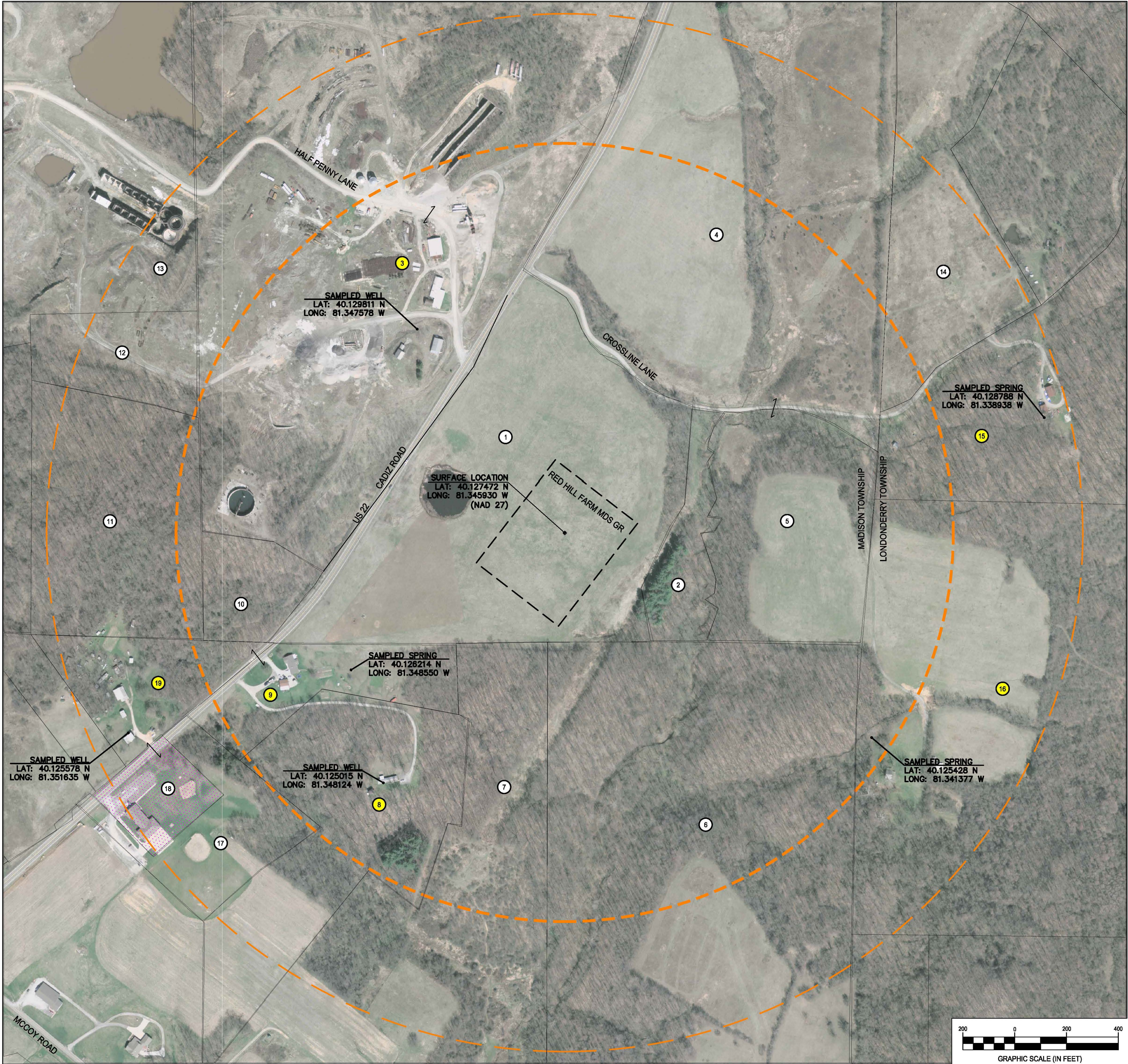
ATTACHMENT A – PARCEL OWNER TABLE

RED HILL FARM (Madison Township, Guernsey County, OH) WELL PAD- PARCELS WITHIN 2000 FOOT RADIUS									
ID	Parcel ID	Township	Status	Coordinates	CONTACT INFORMATION				
					Parcel Owner	Mailing Address	Local Address	Phone Number	Notes
1	220000225000	Madison	No Water Source	N/A	Thomas Perkowski & Joan Bond Randy Raber	71963 Lodge Road, Freeport, OH 43973	Cadiz Road	740.260.3399	1/31 CR spoke with Joan Bond, owner stated property belong to Kimble Limestone. 2/6 techs assessing property in field. NH: 2/11/14 @ 1421 - no structures observed on property. CR: 2/13/14 @ 0845 - spoke with Randy Raber; there is no water source
2	220000225001	Madison	No Water Source	N/A	David & Mary Cooper	20411 Cadiz Road, Freeport, OH 43973	Crossline Road	740.489.5631	2/4 CR spoke with Mary Cooper; there is no water source
3	220000226000	Madison	Sampled	40.129811 -81.347578 (1 Well)	Thomas Perkowski & Joan Bond Randy Raber	71963 Lodge Road, Freeport, OH 43973	20633 Halfpenny Lane	740.260.3399	1/31 CR spoke with Joan Bond, owner stated property belong to Kimble Limestone. 2/6 techs assessing property in field. NH: 2/11/14 @ 1355 spoke with Nathan Raber; 450 cattle on parcel but water supply is essentially rainwater collected in lrg cistern. N. Raber stated there is a well on property that is currently not hooked to electricity. Owner stated well is not used and was not necessary to sample. CR: 2/13/14 @ 0845 spoke with Randy Raber; owner indicated well on property. Well pump has no power, owner willing to pull pump for sampling.
4	220000362000	Madison	Outside 2000'	N/A	Sally Jo Yarnell (Son; Bryan Dennis)	3819 Holmes Road, Cambridge, OH 43725	Cadiz Road	740.439.5665 740.510.0883 (B. Dennis)	2/6 techs assessing property in field. 2/11 NH did not observe any structures on property. Son, Bryan Dennis lives on property. Techs assessing well location on 3/4/14; source believed to be outside 2000'. 3/4 NH met with Bryan Dennis; there is 1 well & 1 spring on property; both sources are outside 2000'.
5	220000329000	Madison	No Water Source	N/A	Gary & Karen Taylor	Box 265, Howard, OH 43028	Crossline Road	740.599.7008	1/31 CR spoke with Deborah Ritchie (owner's daughter); there is a undeveloped spring but no source(s) to sample. 2/7 CR spoke with Karen Taylor; confirmed there is no water source.
6	220000305000	Madison	Outside 2000'	N/A	Richard Lee Sheppard Jr	3506 Ridgestone Drive, Mansfield, OH 44903	20855 McCoy Road	419.706.5808	2/6 techs assessing property in field. NH: 2/11/14 @ 1427 no structure evident on parcel; however terrain made it difficult to see entire parcel. CR: 2/13/14 @ 1007 spoke with Richard Sheppard; there is a well located near a trailer home along McCoy Rd. The well is outside 2000'. There is a creek in the northern portion of parcel; owner was informed the creek would not be sampled.
7	220000791002	Madison	Outside 2000'	N/A	Hirsh Family Holdings, LLC	4381 Biltmore Court, New Albany, OH 43054	20615 McCoy Road	614.562.5586	2/6 techs assessing property in field. 2/11 NH did not observe any structures on property. 2/21 CR spoke with Suzie Hirsh, souce is outside 2000'.
8	220000791000	Madison	Sampled	40.125015 -81.348124 (1 Well)	William & Edna Miller	20501 McCoy Road, Freeport, OH 43973	20410 Cadiz Road	740.489.5697	2/4 CR spoke with William Miller; there is a trailer on the property with 1 well
9	220000792000	Madison	Sampled	40.126214 -81.348550 (1 Spring)	Phillip & Ellen Nisley	20424 Cadiz Road, Freeport, OH 43973	20424 Cadiz Road	740.489.9185	2/3 CR spoke with Larry Nisley; owners are out of town until 2/7. CR: 2/13 left voicemail. CR: 1/14 @ 0857 spoke with Phillip Nisley; there is one spring and an abandoned well on property.
10	220000226001	Madison	No Water Source	N/A	David & Mary Cooper	20411 Cadiz Road, Freeport, OH 43973	Cadiz Road	740.489.5631	2/4 CR spoke with Mary Cooper; there is no water source
11	220000048000	Madison	No Water Source	N/A	David & Mary Cooper	20411 Cadiz Road, Freeport, OH 43973	Cadiz Road	740.489.5631	2/4 CR spoke with Mary Cooper; there is no water source
12	220000048001	Madison	No Water Source	N/A	Thomas Perkowski & Joan Bond Randy Raber	71963 Lodge Road, Freeport, OH 43973	Lodge Road	740.260.3399	1/31 CR spoke with Joan Bond, owner stated property belong to Kimble Limestone. 2/6 techs assessing property in field. CR: 1/13/14 @ 0845 spoke with Randy Raber; there is no water source.
13	220000228000	Madison	Outside 2000'	N/A	Thomas Perkowski & Joan Bond Randy Raber	71963 Lodge Road, Freeport, OH 43973	71379 Lodge Road	740.260.3399	1/31 CR spoke with Joan Bond, owner stated property belong to Kimble Limestone. 2/6 techs assessing property in field. CR: 2/13/14 @ 0845 spoke with Randy Raber; owner indicated well on property. Well currently not being use, but owner stated it could be used in future. No pump in well. 2/19 per assessment by NH/GB the well is outside 2000'.
14	200001421000	Londonderry	No Water Source	N/A	Thomas Perkowski & Joan Bond Randy Raber	71963 Lodge Road, Freeport, OH 43973	Crossline Road	740.260.3399	1/31 CR spoke with Joan Bond, owner stated property belong to Kimble Limestone. 2/6 techs assessing property in field. NH: 2/11/14 @ 1416 no structures observed on the property. CR: 2/13/14 @ 0845 spoke with Randy Raber; there is no water source.
15	200000470000	Londonderry	Sampled	40.128788 -81.338938 (1 Spring)	Paul Kelm	21020 Crossline Road, Freeport, OH 43973	21020 Crossline Road	740.489.5227	2/3 CR spoke with Paul Kelm; there is 1 spring
16	200000617000	Londonderry	Sampled	40.125428 -81.341377 (1 Spring)	Gary & Karen Taylor	Box 265, Howard, OH 43028	20530 Crossline Road	740.599.7008	1/31 CR spoke with Deborah Ritchie (owner's daughter); there is a undeveloped spring but no source(s) to sample. 2/7 CR spoke with Karen Taylor; owner stated there is a spring that has a stainless steel drum that collects spring water. Accessibility maybe an issue; will have techs assess on 2/11. Sample was collected on 2/11
17	220000791001	Madison	No Water Source	N/A	Heritage Christian Fellowship Antrim Mennonite Church	20360 Cadiz Road, Freeport, OH 43973	Cadiz Road	740.489.5161	2/4 CR spoke with William Miller (spoke on behalf of church); there is no water source. 2/7 CR spoke with Titus Lapp; informed property was now owned by Antrim Mennonite Church. Sold to church by William Miller. Confirmed there is no water source.
18	220000131000	Madison	No Water Source	N/A	Heritage Christian Fellowship Antrim Mennonite Church	20501 McCoy Road, Freeport, OH 43973	20360 Cadiz Road	740.489.5161	2/4 CR spoke with William Miller (spoke on behalf of church); church is on public water; there is a well but it is no longer used. 2/7 CR spoke with Titus Lapp; informed property was now owned by Antrim Mennonite Church. Sold to church by William Miller. Confirmed well is no longer used and property on public water.
19	220000047000	Madison	Sampled	40.125578 -81.351635 (1 Well)	David & Mary Cooper	20411 Cadiz Road, Freeport, OH 43973	20411 Cadiz Road	740.489.5631	2/4 CR spoke with Mary Cooper; there is 1 well



**RED HILL FARM WELL PAD
PRE-DRILLING SURVEY RESULTS**

ATTACHM9NT B – WATER SOURCE IDENTIFICATION/LOCATION MAP



OHIO REGISTERED WATER WELL LOGS*

WELL LOG #	ORIGINAL OWNER	LATITUDE	LONGITUDE	ADDRESS
N/A	N/A	N/A	N/A	N/A

* INFORMATION PER ODNR WATER WELL LOG ONLINE DATABASE (www.dnr.state.oh.us/water/maptechs/welllogs/appNEWERINMapSearch.shtml)

PROPERTY DATA

#	PROPERTY ID	OWNER	SOURCE ON PROPERTY	LAT (NAD 83/86)	LONG (NAD 83/86)
1	220000225000	PERKOWSKI THOMAS & BOND JOAN	NONE	---	---
2	220000225001	COOPER DAVID & MARY	NONE	---	---
3	220000226000	RABER RANDY	1 WELL (SAMPLED)	40.129811	-81.347578
4	220000362000	YARNELL SALLY JO	OUTSIDE OF TESTING RADIUS	---	---
5	220000329000	TAYLOR KAREN L & GARY N TRUSTEE	NONE	---	---
6	220000305000	SHEPPARD RICHARD LEE JR	OUTSIDE OF TESTING RADIUS	---	---
7	220000791002	HIRSH FAMILY HOLDINGS LLC	OUTSIDE OF TESTING RADIUS	---	---
8	220000791000	MILLER WILLIAM A & EDNA	1 WELL (SAMPLED)	40.125015	-81.348124
9	220000792000	NISLEY PHILLIP E & ELLEN I	1 SPRING (SAMPLED)	40.126214	-81.348550
10	220000226001	COOPER DAVID & MARY	NONE	---	---
11	220000048000	COOPER DAVID WILLIAM & MARY K	NONE	---	---
12	220000048001	PERKOWSKI THOMAS & JOAN BOND ET AL TRUSTEES	NONE	---	---
13	220000228000	PERKOWSKI THOMAS & BOND JOAN	OUTSIDE OF TESTING RADIUS	---	---
14	200001421000	PERKOWSKI THOMAS & BOND JOAN	NONE	---	---
15	200000470000	KELM PAUL	1 SPRING (SAMPLED)	40.128788	-81.338938
16	200000617000	TAYLOR KAREN L & GARY N TRUSTEE	1 SPRING (SAMPLED)	40.125428	-81.341377
17	220000791001	HERITAGE CHRISTIAN FELLOWSHIP	NONE	---	---
18	220000131000	HERITAGE CHRISTIAN FELLOWSHIP	NONE (PUBLIC WATER)	---	---
19	220000047000	COOPER DAVID WILLIAM & MARY K	1 WELL (SAMPLED)	40.125578	-81.351635

NOTE: PROPERTY LINES ARE SHOWN FOR REFERENCE ONLY AND ARE NOT BASED ON SURVEY DATA.

LEGEND

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REQUIRED TESTING RADIUS (1,500')

BUFFER ZONE (500')

PROPERTY LINE

ROADWAY

STREAM

TESTING REFUSED BY OWNER

PUBLIC WATER SUPPLY

Issue: EXHIBIT

DATE: 03.14.14

JOB NO.: 750217

DESIGN: NJD

DRAWN: NJD

CHECKED: CR

SHEET NO. 1

REVISED NO. DATE DESCRIPTION

AMERICAN ENERGY UTICA

WATER SAMPLING MAP

RED HILL FARM MDS GR

MADISON TOWNSHIP GUERNSEY COUNTY, OHIO

CREATION TO COMPLETION

WWW.CESOINC.COM

Engineering • Architecture • Survey • Construction Mgt • Environmental

ISSUE: EXHIBIT

DATE: 03.14.14

JOB NO.: 750217

DESIGN: NJD

DRAWN: NJD

CHECKED: CR

SHEET NO. 1