

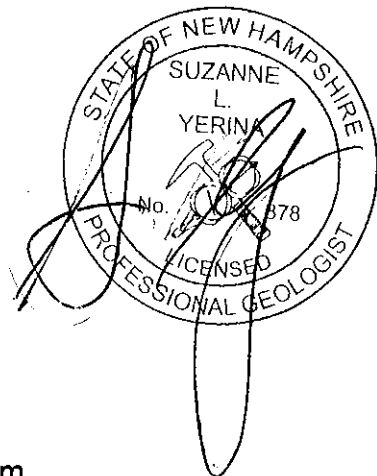
**DES Waste Management Division  
29 Hazen Drive; PO Box 95  
Concord, NH 03302-0095**

**November 2020  
MEMO - DEEP BEDROCK INVESTIGATION  
ESTIMATED COMPLETION SCHEDULE  
COAKLEY LANDFILL SUPERFUND SITE  
North Hampton and Greenland  
New Hampshire**

**NHDES Site #: 198712001  
Project Type: Superfund Site  
Project Number: 0431**

**Prepared For:  
New Hampshire Department of Environmental  
Services  
29 Hazen Drive  
Concord, New Hampshire 03302-0095**

**Prepared By:  
CES, Inc.  
415 Lisbon Street  
Lewiston, Maine 04240  
Phone Number: (207) 795-6009  
Contact Name: Suzanne Yerina  
Contact Email: syerina@ces-maine.com**



**Date of Memo: (November 6, 2020)**

November 6, 2020

Richard Hull  
US Environmental Protection Agency, Region I  
5 Post Office Square, Suite 100  
Boston, Massachusetts 02109-3912

**Re: Deep Bedrock Investigation – Estimated Completion Schedule  
Coakley Landfill Superfund Site – North Hampton and Greenland, New Hampshire**

Dear Mr. Hull:

On behalf of the Coakley Landfill Group (CLG), CES, Inc. (CES) has prepared the following response to the United States Environmental Protection Agency's (USEPA) request for an updated schedule of remaining Deep Bedrock Investigation activities as outlined in the *Deep Bedrock Investigation Work Plan Addendum* (Work Plan Addendum). This request was provided by the USEPA in its October 21, 2020 letter to Mr. Peter Britz of the CLG. The Work Plan Addendum was submitted to the USEPA on July 17, 2020, with conditional approval provided by USEPA on August 4, 2020. Specifically, the investigation tasks that remain include the following, some of which are in the process of being completed, while some are on hold pending access by the New Hampshire Department of Transportation (NHDOT) or require landowner approval.

- ♦ Bedrock Outcrop Mapping: Fall/Winter 2020
- ♦ Residential Water Supply Records Investigation: Fall 2020
- ♦ Pressure Transducer Installation and Monitoring: Fall 2020
- ♦ Deep Bedrock Well Installation at MW-25: Fall 2020
- ♦ Deep Bedrock Well Completion at MW-23, MW-24, MW-25, GZ-109, and GZ-130: Spring 2021
- ♦ Delineation of Westward Extent of Impacts Near MW-21 - Direct Push Investigation: Fall 2020
- ♦ Surface Water Gauging: Fall/Winter 2020
- ♦ Deep Bedrock Pumping Test: Early Spring 2021

**Bedrock Outcrop Mapping**

The proposed bedrock outcrop mapping will be completed in the abandoned quarry located north of the Landfill and along sections of the utility corridor located west and north of the Landfill. Access to the utility corridor via the Breakfast Hill Golf Club (BHGC), located parallel to and adjacent with the utility corridor, will require landowner approval. It is anticipated that the mapping of the quarry will be completed during calendar year 2020, as vegetation will be minimal and access agreements will not be required. Mapping of the utility corridor is proposed for late winter 2020/2021 during a time when the BHGC is not open to the public. The schedule for this effort will coincide with the time of year geologic mapping efforts were completed at the BHGC by CES and USEPA in February 2020.

Mr. Richard Hull | 11.6.2020 | 10424.016 | Page 1

#### Residential Water Supply Records Investigation

The investigation of residential water supply records is ongoing, with currently completed efforts including the correlation of well records provided in Appendix I of the Remedial Investigation (Weston, 1988) with those available from the New Hampshire Department of Environmental Services' (NHDES) OneStop online database. In addition, available information from the Knowles Field Assessment as completed by Geosphere Environmental Management, Inc., on behalf of Aquarion Water Company (Aquarion) in August 2010, has been reviewed, with limited information available for wells located east of the Landfill. Wells evaluated during the Knowles assessment were limited to those within 4,000 feet of the Knowles study area. Several private wells were identified during the assessment but were not addressed, specifically in the report. The water supply records investigation will be completed prior to the end of the 2020 calendar year with available wells considered for use during the Deep Bedrock Investigation Pumping Test (Pumping Test).

#### Pressure Transducer Installation and Monitoring

The installation of pressure transducers will be completed during 2020 with remaining wells instrumented during the installation and development of the MW-25 boring as described below. Deep bedrock monitoring wells currently being monitored include MW-6, MW-23, MW-20D2, MW21D2, MW-22D2, and MW-5D, and are representative of the deeper bedrock interval at each bedrock well couplet location.

#### Deep Bedrock Well Installation: MW-25

The installation of MW-25 is ongoing with surface geophysics and well location selection completed as of October 14, 2020. The CLG is currently awaiting an executed Temporary Access Agreement (Agreement) with the NHDOT that will allow for the clearing of access to the location of MW-25. According to correspondence between CES and NHDOT on October 30, 2020, the Attorney General has been made aware of the pending Agreement; however, they have been working remotely pursuant to COVID-19 directives and have not been able to provide immediate feedback on the Agreement. Upon execution of the Agreement, line clearing will commence from the former railroad easement west to the selected MW-25 location.

The proposed MW-25 location was agreed upon by the NHDES, USEPA, and CES at an on-site meeting held on October 14, 2020. The driller has confirmed the week of November 30, 2020 to initiate drilling activities. However, in the event the Agreement is not executed by the NHDOT prior to November 30, 2020, drilling efforts will be postponed until such time the Agreement is in place. An adjustment to the drilling schedule resulting from execution of the Agreement may be subject to changes in driller availability, including any changes to the availability of the line clearing subcontractor. Following installation and development of the boring at MW-25, a borehole geophysical survey will be completed similar to those completed on other open hole deep bedrock borings (e.g., MW-20, MW-21, and MW-22). These results, together with interval packer sampling to be completed following the Pumping Test, will be used to develop well construction recommendations. As included in the provided schedule, several interim deliverables and subsequent Agency reviews are anticipated. These include interval packer sampling and well construction recommendations based on borehole geophysical and interval packer sampling results, respectively.

#### Deep Bedrock Well Completion

Several existing deep bedrock wells (MW-23, MW-24, GZ-109, and GZ-130) were proposed for permanent well construction and are tentatively scheduled for such completion following execution of the Pumping Test. Well construction details are documented in the Work Plan Addendum and were based on the results of borehole geophysical logging and interval packer sampling results. As these wells are identified for water level monitoring prior to and during the pumping test and during recovery following the test, completion as permanent monitoring wells is scheduled after Pumping Test completion.

#### Delineation of Westward Extent of Impacts Near MW-21: Direct Push Investigation

The delineation of impacts in the area located west of MW-21 is currently scheduled for the week of November 30, 2020, concurrent with the installation of the boring at MW-25. Impacts will be evaluated using direct push technology (DPT) and will require notification of the property owner prior to initiating work. Subsequent development, surveying, and sampling of the temporary wells installed during this task will occur within one week of installation. The installation and surveying of proposed surface water gauging locations will occur with the surveying of temporary monitoring wells during a single field effort.

#### Surface Water Gauging

A total of seven surface water gauging locations are proposed for installation during calendar year 2020. The removal of a culvert blockage and dam removal in support of the Surface Water Evaluation Work Plan (CES, 2020) and House Bill 494 (HB 494) surface water treatment remedy occurred on October 20, 2020. This work was completed following the execution of a temporary access agreement between CES and the NHDOT on August 19, 2020, coordination between CES and the United States Department of Agriculture (USDA) for beaver mitigation services, and contractor availability for blockage removal. As a result of this work, water levels in the area east of the easement/north of the Landfill and areas in the wetland complex west of the easement have been lowered. This will facilitate the installation of gauging locations and monitoring of surface water levels. The surface water gauging locations will be installed and surveyed in coordination with the DPT investigation as described above.

#### Deep Bedrock Investigation Pumping Test

The Pumping Test, as detailed in the *Deep Bedrock Investigation Pumping Test Work Plan* (Work Plan) submitted to the USEPA and NHDES on October 21, 2020, is proposed to be completed in late winter/early spring 2021. The schedule for initiating the Pumping Test is based on the installation of the deep bedrock boring at MW-25 prior to initiating pumping test activities as required by the USEPA. In addition, supplemental characterization of existing open bedrock monitoring well BP-4, as recommended by the USEPA in its August 4, 2020 conditional approval of the Work Plan Addendum, will be completed using borehole geophysical methods. Though not required prior to execution of the Pumping Test, the survey will be completed concurrent with borehole geophysics completed at MW-25 as described above.

The included schedule details the Deep Bedrock Investigation since investigation activities began in 2017 with the evaluation of MW-23 (Chinburg Well). As mentioned in the October 21, 2020 letter, it was originally anticipated that the Deep Bedrock Investigation would have been completed within two years of initiation. The attached schedule includes completed investigation activities, provided deliverables and interim updates, conditional approvals and comments received from USEPA, additionally requested investigation activities, and anticipated dates of completion for remaining investigation tasks. Dates of completion for proposed investigation activities are based on those provided by subcontractors, deliverable preparation and review schedules experienced to date during the Deep Bedrock Investigation, and time associated with private access agreement requirements, if needed. The schedule has been conditionally formatted to include completed (green shading) and pending/partially completed (yellow shading) Deep Bedrock Investigation activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "Chris Buckman".

Christopher Buckman, PG  
Senior Project Geologist/Senior Project Manager

CFB/jnc

Enc. Peter L. Britz, City of Portsmouth  
Andrew Hoffman, PE, NHDES

ID	Task Name	Duration	Start	Finish
1	Water Level Transducers - Golf Club Irrigation Well Test	5 days	Wed 4/26/17	Tue 5/2/17
2	Chinburg Well (MW-23) Investigation	183 days	Wed 5/31/17	Fri 2/9/18
3	Borehole Geophysical Surveying	1 day	Wed 5/31/17	Wed 5/31/17
4	Packer Sampling Recommendations Memo: Chinburg Well	18 days	Wed 5/31/17	Fri 6/23/17
5	USEPA Comments - Packer Sampling Recommendations Memo: Chinburg Well	85 days	Fri 6/23/17	Thu 10/19/17
6	Interval Packer Sampling	3 days	Wed 12/6/17	Fri 12/8/17
7	Interval Packer Sampling Results Memorandum	17 days	Thu 1/18/18	Fri 2/9/18
8	Deep Bedrock Investigation Work Plan	106 days	Tue 2/20/18	Tue 7/17/18
9	Draft Work Plan Development and Submittal	24 days	Tue 2/20/18	Fri 3/23/18
10	USEPA Comments on Draft Deep Bedrock Work Plan	28 days	Fri 3/23/18	Tue 5/1/18
11	Revised Work Plan Submittal	23 days	Tue 5/1/18	Thu 5/31/18
12	USEPA Conditional Approval of Deep Bedrock Inv. Work Plan	34 days	Thu 5/31/18	Tue 7/17/18
13	Deep Bedrock Investigation	965 days	Tue 2/20/18	Fri 10/29/21
14	Sampling and Analysis Plan Update	88 days	Mon 3/19/18	Wed 7/18/18
15	Site Specific Health and Safety Plan	14 days	Wed 5/30/18	Mon 6/18/18
16	Initial Well Reconnaissance Survey	11 days	Thu 5/3/18	Thu 5/17/18
17	Well Reconnaissance Memo	10 days	Fri 5/4/18	Thu 5/17/18
18	Surface Geophysics	41 days	Tue 5/1/18	Tue 6/26/18
19	Initial Work Plan - Electrical Resistivity	1 day	Tue 5/1/18	Tue 5/1/18
20	Electrical Resistivity Survey	5 days	Mon 5/7/18	Fri 5/11/18
21	Geophysical Investigation Status Update Memo	4 days	Fri 5/11/18	Wed 5/16/18
22	Seismic Refraction and GPR Data Collection	4 days	Mon 6/4/18	Thu 6/7/18
23	Well Couplet Siting and Surface Geophysics Memo	1 day	Thu 6/7/18	Thu 6/7/18
24	Well Siting	10 days	Wed 6/13/18	Tue 6/26/18
25	Deep Bedrock Drilling	646 days	Tue 6/19/18	Mon 12/7/20
26	Complete Drilling at MW-20	5 days	Tue 6/19/18	Mon 6/25/18
27	Complete Drilling at MW-21	13 days	Tue 6/26/18	Thu 7/12/18
28	Complete Drilling at MW-22	27 days	Mon 7/23/18	Tue 8/28/18
29	Borehole Geophysics	16 days	Wed 7/18/18	Wed 8/8/18
30	Installation of Transducers in New Deep Bedrock Wells	497 days	Fri 1/11/19	Mon 12/7/20

Project: Coakley\_Deep Bedrock  
Date: Fri 11/6/20

Task

Split

Milestone

Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Progress

Manual Progress

Page 1

ID	Task Name	Duration	Start	Finish
31	Interval Packer Sampling Recommendation Memo	82 days	Fri 8/10/18	Fri 11/30/18
32	Draft Interval Packer Sampling Memo	12 days	Fri 8/10/18	Mon 8/27/18
33	USEPA Comments - Interval Packer Sampling Memo	17 days	Mon 8/27/18	Tue 9/18/18
34	Interval Packer Sampling	7 days	Tue 10/9/18	Wed 10/17/18
35	Overburden Well Couplet Development and Sampling	10 days	Mon 11/19/18	Fri 11/30/18
36	Well Construction Recommendations	195 days	Wed 11/14/18	Tue 8/13/19
37	Draft Well Construction Recommendation Memo	10 days	Wed 11/14/18	Tue 11/27/18
38	NHDES Comments to Draft Well Construction Memo	29 days	Tue 11/27/18	Fri 1/4/19
39	Final Well Construction Recommendation Memo	22 days	Fri 1/4/19	Mon 2/4/19
40	CLG/USEPA/NHDES Meeting - Portsmouth, NH	1 day	Wed 2/27/19	Wed 2/27/19
41	USEPA Comments	21 days	Wed 2/27/19	Wed 3/27/19
42	USEPA Email Correspondence - P. Britz	1 day	Tue 5/28/19	Tue 5/28/19
43	Final Well Installation Recommendations Memo to USEPA	1 day	Wed 7/24/19	Wed 7/24/19
44	Final Well Installation Recommendations Memo - USEPA Comments	15 days	Wed 7/24/19	Tue 8/13/19
45	Deep Bedrock Reconnaissance Well Investigation	231 days	Tue 12/11/18	Tue 10/29/19
46	Reconnaissance Well Redevelopment	31 days	Tue 12/11/18	Tue 1/22/19
47	Reconnaissance Well Borehole Geophysics	46 days	Mon 12/17/18	Mon 2/18/19
48	Reconnaissance Well Packer Sampling Recommedation Memo	31 days	Mon 2/18/19	Mon 4/1/19
49	Reconnaissane Wel Packer Sampling Memo - USEPA Comments	30 days	Mon 4/1/19	Fri 5/10/19
50	Reconnaissane Well Packer Sampling	19 days	Tue 6/4/19	Fri 6/28/19
51	Packer Sampling Recommendations Memo: GZ-110/GZ-130	6 days	Tue 6/11/19	Tue 6/18/19
52	USEPA Comments - Packer Sampling Recommendations Memo: GZ-110/GZ-130	3 days	Tue 6/18/19	Thu 6/20/19
53	Revised Packer Sampling Memo: GZ-110/GZ-130	19 days	Thu 6/20/19	Tue 7/16/19
54	Deep Bedrock Reconnaissance Well Interval Packer Sampling Results Memo	29 days	Thu 8/1/19	Tue 9/10/19
55	USEPA Comments - Deep Bedrock Reconnaissance Well Interval Packer Sampling Results Memo	36 days	Tue 9/10/19	Tue 10/29/19
56	Golf Course and GMZ Bedrock Outcrop Field Mapping	2 days	Tue 2/5/19	Wed 2/6/19
57	Quarterly Groundwater Gauging	173 days	Thu 11/15/18	Mon 7/15/19
58	4th Quarter 2018	1 day	Thu 11/15/18	Thu 11/15/18
59	1st Quarter 2019	1 day	Fri 1/11/19	Fri 1/11/19

Project: Coakley\_Deep Bedrock  
Date: Fri 11/6/20

Task

Split

Milestone

Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Progress

Manual Progress

Page 2



ID	Task Name	Duration	Start	Finish	2018												2019												2020												2021																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
					M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
60	2nd Quarter 2019	1 day	Mon 5/6/19	Mon 5/6/19																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

Project: Coakley\_Deep Bedrock  
Date: Fri 11/6/20

Task

Split

Milestone

Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Progress

Manual Progress



