July 27, 2023

Mr. David M. Henderson, P.E.
Roanoke County Engineer
Roanoke County Department of Community Development
5204 Bernard Drive
Roanoke, VA 24018

RE: Dixie Caverns Monofill for Stabilized Soil and Sediment; Post-Closure Inspection;
CHA Project Number 067846.000

Dear David:

This letter provides the documentation of the first semiannual 2023 post-closure care inspection performed on June 26, 2023 by CHA Consulting, Inc. staff for the Dixie Caverns Monofill for Stabilized Soil and Sediment. The inspection was performed by walking and visually inspecting the top and entire perimeter of the monofill to identify any denuded areas, eroded areas, or other items of concern. The components of the leachate collection system were also inspected. No flow was observed in the lines draining from the monofill, so flow measurements were not taken. The surrounding area where a five-cubic-yard pocket of fly ash is buried on-site was also inspected. Enclosed are the inspection log, site plan with comments, and copies of some of the photos taken during the inspection. The following letter summarizes the results of the inspection by describing changes and actions taken by the County since the last inspection, areas that CHA will monitor carefully to ensure that they do not become a concern, and actions that are recommended to be taken by the County for facility maintenance.

Changes/Observations since Last Inspections/Follow-up from Previous Inspections

The following observations were made during the June 2023 inspection:

1. As noted in previous quarterly reports, the monofill was used to store soil on the east side of Cell A, adjacent to the bank as initially noted during the August 9, 2010 quarterly inspection. Vegetative cover continues to improve where stockpiled soil was once stored (Photograph 4 on Photo Log).
2. The shrubs/black locust trees previously located on top of the area where previous soil stockpiles were stored are no longer present (Photograph 4 on Photo Log).
3. The pH of the upper leak detection tank was measured at 7.30 S.U. compared to 6.88 S.U. during the previous inspection. CHA Consulting, Inc. will continue to monitor the pH at the upper leak detection tank during future inspections.
4. Bare patches that were observed at the southeast corner of Cell B during previous inspection were no longer present (Photograph 9 on Photo Log).
5. A small crack that was observed during the previous inspection remains in the terminal end of the corrugated piping that discharges to the creek that bypasses buried fly ash, no threat to integrity due to the location of the crack (Photographs 20-22 on Photo Log).
6. The wire cable to restrict vehicular traffic onto the capped area of the monofil was secure (Photograph 24 on Photo Log).
7. The shrub in the West Drainage Ditch off of the side slope of Cell B has been removed since the previous inspection (Photograph 25 on Photo Log).
8. Benchmark #1 has been replaced (Photograph 28) and is located near the two large boulders by the gravel entrance that leads to capped area.

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Areas for Continued Monitoring during Future Inspections

There were a few denuded areas and other items of concern areas on the capped areas noted above during the June 2023 inspection. The capped areas will continue to be monitoring for any changing conditions during future inspections.

Areas of thin vegetation or small bare spots were noted off of the capped areas and will be continued to be monitored during future inspections. These include the following areas:

1. Bare areas and small patches noted off of the capped areas near the access road surrounding the West Ditch as shown as orange circles on the site map;
2. Patches located at the end of the gravel entrance road adjacent to Cell A; and
3. Bare area noted off of the capped areas south of Cell B where previous staging area was located when the cell was being constructed (shown as a red circle on the site map).

The attached map shows the locations of these areas of thin vegetation that were noted during the June 2023 inspection.

The surrounding area where a five-cubic-yard pocket of fly ash is securely buried underneath 7-feet of clay on the south bank (Photograph 17) of the sediment basin located in the ravine on the northern part of property was assessed during the June 2023 inspection. Additionally, the sediment basin drop inlet (Photograph 19) and associated piping near manhole access (Photograph 20) and at the terminal end of piping were inspected (Photographs 21). There was no evidence of erosion or displacement of soil in this area and all visible conveyance lines diverting the stream around the pocket of fly ash were free of debris and obstructions. As noted during the December 2022 inspection that there may be a small crack in the terminal end of the corrugated piping that discharges to the creek. However, the flow observed during the June 2023 inspection was significant enough that the flow exited the pipe and the extent of the small crack could not be fully determined due to the increased volume and small amount of organic debris that was present where the previous crack was observed (Photograph 21). However, this crack that was observed does not impact the pocket of fly ash and it remains securely entombed in the earthen dam and this area will continue to be monitored during future post-closure inspections.

Recommended Items for County Action

The following items are recommended for County action:

1. Continue to monitor terminal end of piping that diverts stream around buried fly ash for any undermining of soil underneath piping.

The next semi-annual inspection is scheduled for December 2023 and we will contact you in advance to establish the exact inspection date so that you may participate if desired. We appreciate the opportunity to perform this inspection for you. Please let me know if you have any questions regarding this letter and/or the enclosures.

Sincerely,

Ashley Ruble

Ashley Ruble, CHMM
Project Manager

APR/egl
Enclosures
cc: R. Lawrence Hoffman, Associate Vice President, CHA Consulting, Inc. (w/o enclosures)

DIXIE CAVERNS MONOFILL
FOR DISPOSAL OF STABILIZED SEDIMENT
INSPECTION LOG – CHA CONSULTING, INC.

Date and Time of Inspection: 6/26/23 1330 - 1515
Weather Conditions: Sunny, Mostly Clear
Temperature: 87°F Precipitation: none in past 24 hours Sky: Clear Wind: Strong

	ITEM INSPECTED	YES	NO
1.	**Site Security** Gate, lock and fencing appear to be functioning properly?	X	
2.	**Leachate collection system** a. Does System appear to be functioning properly?	X	
	b. Leak detection tank (receives leachate that penetrates the top liner, but is above the second liner): Does the tank appear to be in good condition? If no, describe observations in Comments section below Depth of fluid in leak detection tank 30.25 inches. Leak detection tank fluid pH 7.3 Temp 20.0°C (Note-Record calibration information on Sample Collection Form and attach)	X	
	Are all the valves (2) in the open position?	X	
	b. Are visible lines clear of debris?	X	
	c. Do all valves appear to be in good condition?	X	
	d. Is manhole A (receives leachate from above the first liner) dry and without any flow?	X	
3.	**Vegetative Cover** Is the vegetation established over the entire monofill area without any significant bare spots? If "NO" describe in Comments section below.	X	
4.	**Erosion/Runoff** a. Has erosion of soil cover been prevented?	X	
	b. Is storm water runoff effectively draining off of the fill and without any observed evidence of ponding or erosion?	X	
	c. Are the drainage structures appear to be effectively draining storm water run-off and run-on?	X	
	d. Does the cover perimeter drainage system appear to be functioning properly?	X	
5.	**Settlement, Subsidence, and Displacement** Does the landfill appear to be settling uniformly without observed depressions?	X	
6.	**Survey Benchmarks** Do Survey Benchmarks #1 and #2 appear to be intact?	X	
7.	**Isolated Pocket of Fly Ash Contaminated Sediment** a. Is there an evidence of erosion or displacement of soil where buried fly ash contaminated sediment is located?		X
	b. Is the sediment basin inlet and discharge piping operating satisfactory?	X	
	c. Is any maintenance activity needed to keep isolated pocket in place?		X

COMMENTS: (Explain any negative responses and any necessary corrective measures.)
See attached comments

NOTE: This inspection log is to be filed in the office of the County Engineer.

Inspector's Name: Rayjani Reis Signature of Inspector: [signature]
Date: 6/26/23
Project Number 067846.000

Revised 11/1/2017

CHA COMPUTATION PAD

		PROJECT	PHASE	ORG
COMPLETED BY:	Raylani Reis	067846		
CHECKED BY:		SHEET #: 1 OF 1		
PROJECT NAME:	Dixie Caverns Inspection	DATE: 6/26/23		
PROJECT LOCATION:		SUBJECT: 1st SA Inspection		

Comments

(1) Benchmark #1 replaced by boulders adjacent to entrance/wire cable. Benchmark # 2 is intact

(2) all signs are intact and upright

(3) shrubs/trees previously observed on area of previous soil stockpile storage are no longer present

(4) Bare patches on SE corner of Cell B no longer present

(5) wire cable used to restrict vechicles is secure

(6) Possible crack as noted in previous inspection at the terminal end of piping that bypasses buried fly ash remains.

(7) Shrub in west drainage ditch on slide slope of Cell B is no longer present

Sample Collection Log

Client	Roanoke County	**Project Number**	67846
Source	Dixie Cavern's	**Project**	Semi-annual
Outfall	Leak Detection Tank	**Weather Condition**	Sunny, Clear 85°F

Field Analyses

Initials RR	**Grab**
Date	6/26/23
Time Collected	1340
Time Measured	1341
pH (SM 4500 – H^+ B-2011)	7.30
Duplicate pH*	NR
Temperature (SM 2550 B-2011)	20.0°C

*Duplicate samples are required at a minimum frequency of 5% (once every 20 samples). If a duplicate sample is required, record the results of the duplicate measurement in the Duplicate pH box in the Field Analysis section; if a duplicate sample is not required at this time put NR in the box. The duplicate sample (when required) is for QA/QC purposes only.

Date of last Temperature Calibration: 8/15/22

pH Calibration (SM 4500 – H^+ B-2011)

Date	**Time**	**4.01, 7.00, 10.01, Calibration Values, SU**			**7.00 Reading, SU@°C**	**Initials**
		Buffer Temperature °C				
6/26/23	1320	4.01	7.00	10.01	7.02@27.9°C	RR
		28.1	27.7	25.8		

Additional Notes: _____

Technician Signature: _____

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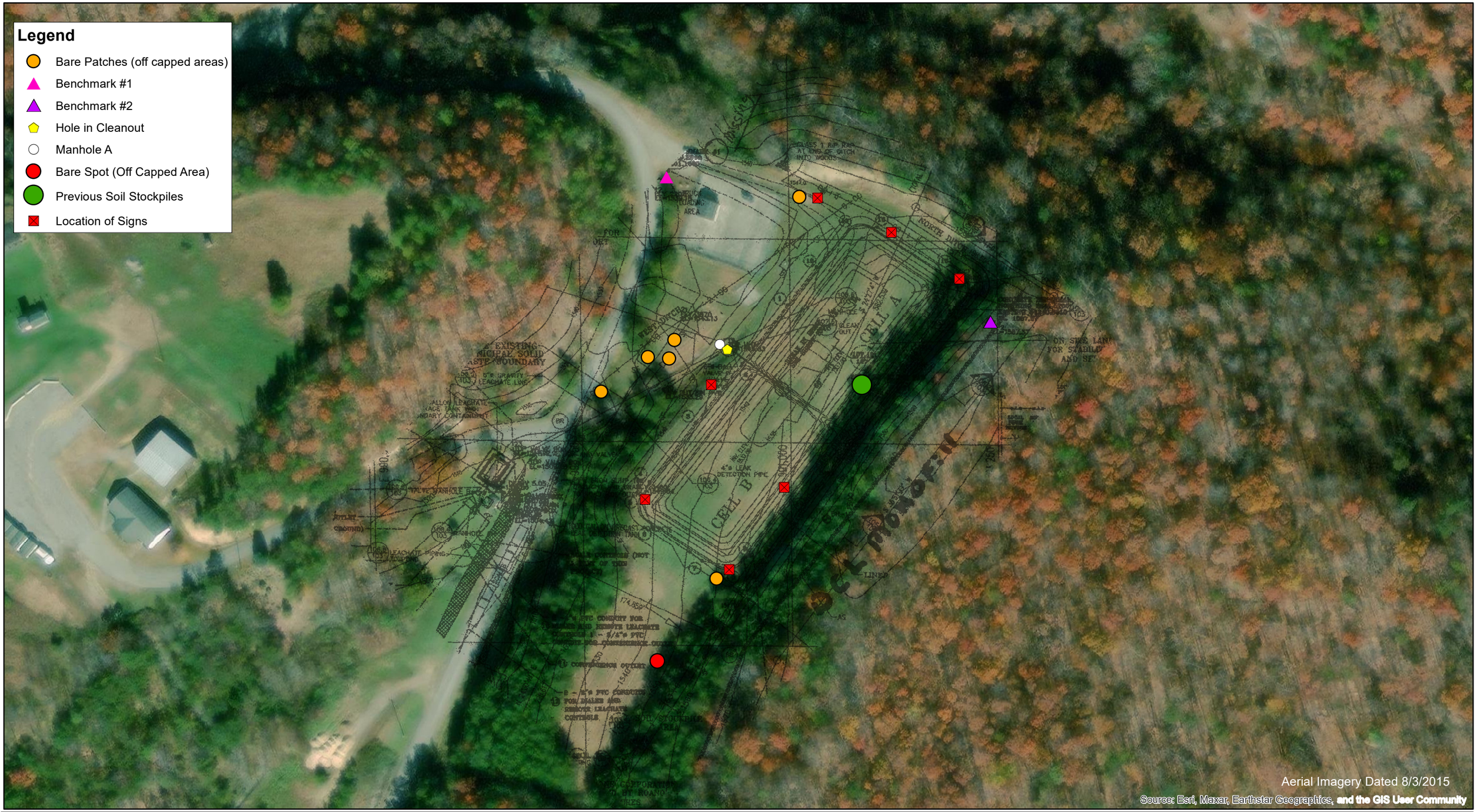

N

0 55 110 220 330 440 Feet

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POST-CLOSURE INSPECTION

Dixie Caverns Monofill

Date: June 26, 2023

Performed By: Raylani Reis

SHEET 1

Photograph 1. Cell A and B – Looking Southwest from Ridge.

Photograph 2. Cell A (Looking North)

Photograph 3. Cell A (Looking South).

Photograph 4. Cell A – Area of Former Soil Stockpile.

Photograph 5. Cell A – Southwest Corner of Cell B (Looking North).

Photograph 6. Cell B (Looking South).

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SITE PHOTOGRAPHS

Dixie Caverns Monofill
Post-Closure Inspection
June 26, 2023

PROJECT NO.
067846.000

Photograph 7. Cell B (Looking North).

Photograph 8. Cell B – East Ditch (Looking South).

Photograph 9. Southeast corner of Cell B (Looking North).

Photograph 10. Patches near entrance to capped area at northwest corner of Cell A.

Photograph 11. Cell A Side Slope (Looking South).

Photograph 12. Cell B Side Slope (Looking South).

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Photograph 13. Rocks above Sediment Basin (Looking Southeast).

Photograph 14. Sediment Basin and Drop Inlet in Ravine above Culverted Stream (Looking West).

Photograph 15. Sediment Basin in Ravine above Culverted stream (Looking West).

Photograph 16. Area Downstream of Sediment Basin (Looking East).

Photograph 17. Location of Pocket of Fly Ash-contaminated Sediment (Looking West).

Photograph 18. Side Slope Above Area Downstream of Sediment Basin (Looking West).

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SITE PHOTOGRAPHS
Dixie Caverns Monofill
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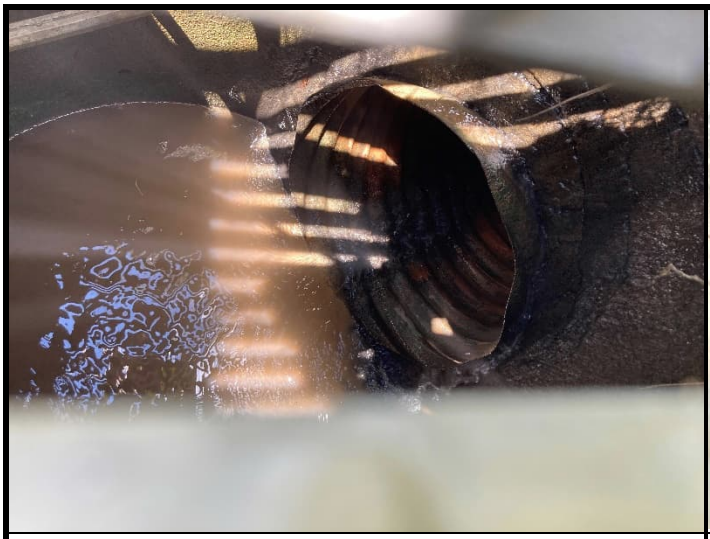

Photograph 19. Drop Inlet Diverting Stream Around Buried Fly Ash.

Photograph 20. Conveyance Lines Diverting Stream around Buried Fly Ash.

Photograph 21. Terminal End of Piping Diverting Stream Around Buried Fly Ash – Possible Crack at end of Plastic Corrugated Piping (Looking South).

Photograph 22. Drainage from Piping Divertingg Stream Around Buried Fly Ash (Looking South)

Photograph 23. Northeast Corner of Cell A (Looking East).

Photograph 24. Secured Wire Cable Preventing Access to Capped Area.

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Photograph 25. West Drainage Ditch Looking West

Photograph 26. Leak Detection Tank.

Photograph 27. Small patches near West Drainage Ditch (Looking Northeast).

Photograph 28. Benchmark #1

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