GCC
Gleason Clay Company LLC

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Gleason, TN 38229
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May 31, 2024

Ms. Amy Fritz
Tennessee Department of Environment and Conservation
Jackson Environmental Field Office
1625 Hollywood Drive
Jackson, TN 38305

RE: Hydrologic Determination Report for Gleason Clay Company Mine # 10, TN0045527

Dear Ms. Fritz,

Gleason Clay Company has made application to add acreage to Mine #10 in Weakley County Tennessee. As part of the permitting process, TDEC has requested a hydrologic determination of some features of the site. The site was evaluated on April 30, 2024. Based on this evaluation, I determined that all features present meet the criteria of wet weather conveyances. All documentation is attached here.

If you have any questions or need any additional information, please contact me by email at david@oldhickoryclay.com or by phone at 270-247-3042.

Regards,

David Gavin, P.E.
Gleason Clay Company

Property Owners:	Ronald and Janie Yeargin John and Alice Yeargin 3110 Greenfield Hwy 54 Greenfield, TN 38230
Qualified Hydrologic Professional In-Training:	David Gavin QHP IT Old Hickory Clay Company

Overview:

There are three areas identified inside the proposed permit boundary addition for Gleason Clay Company's Mine # 10 (TN0045527) that have been assessed. The area to be permitted is farm land under cultivation for row crops that is divided by a woodland area. The features assessed have moderate alteration of the natural channel morphology. The features are designated here as WWC01, WWC02, and WWC03.

WWC01 begins (Lat 36.20957, Lon -88.71597) on the north east side of an isolated farm pond where water flows through a PCV pipe. From the pipe outlet, any discharge flows in a northeasterly direction to a culvert crossing (Lat 36.21092, Lon -88.71548) under the old Will Young Road. The assessed area is 550' in length. Most of this distance is absent of defined bed and bank, and is dominated by upland vegetation. In the northern section of the assessed area there was standing water in a small depression. The bottom elevation of the culvert crossing under the road is higher than the existing grade of the ground (about 3" off the ground). This acts as a trap for stormwater with any rain event. Any flow through the culvert is directed by a roadside ditch on the north side of the road.

WWC02 begins at a constructed berm with perforated drain pipe (Lat 36.20853, Lon -88.71490) and runs for 1688' through a cultivated field to a point where it transitions into row crops (Lat 36.21096, Lon -88.71075). The majority of this drainageway is a grass lined ditch dominated by upland vegetation. There is a second berm with perforated drain pipe around the midway point.

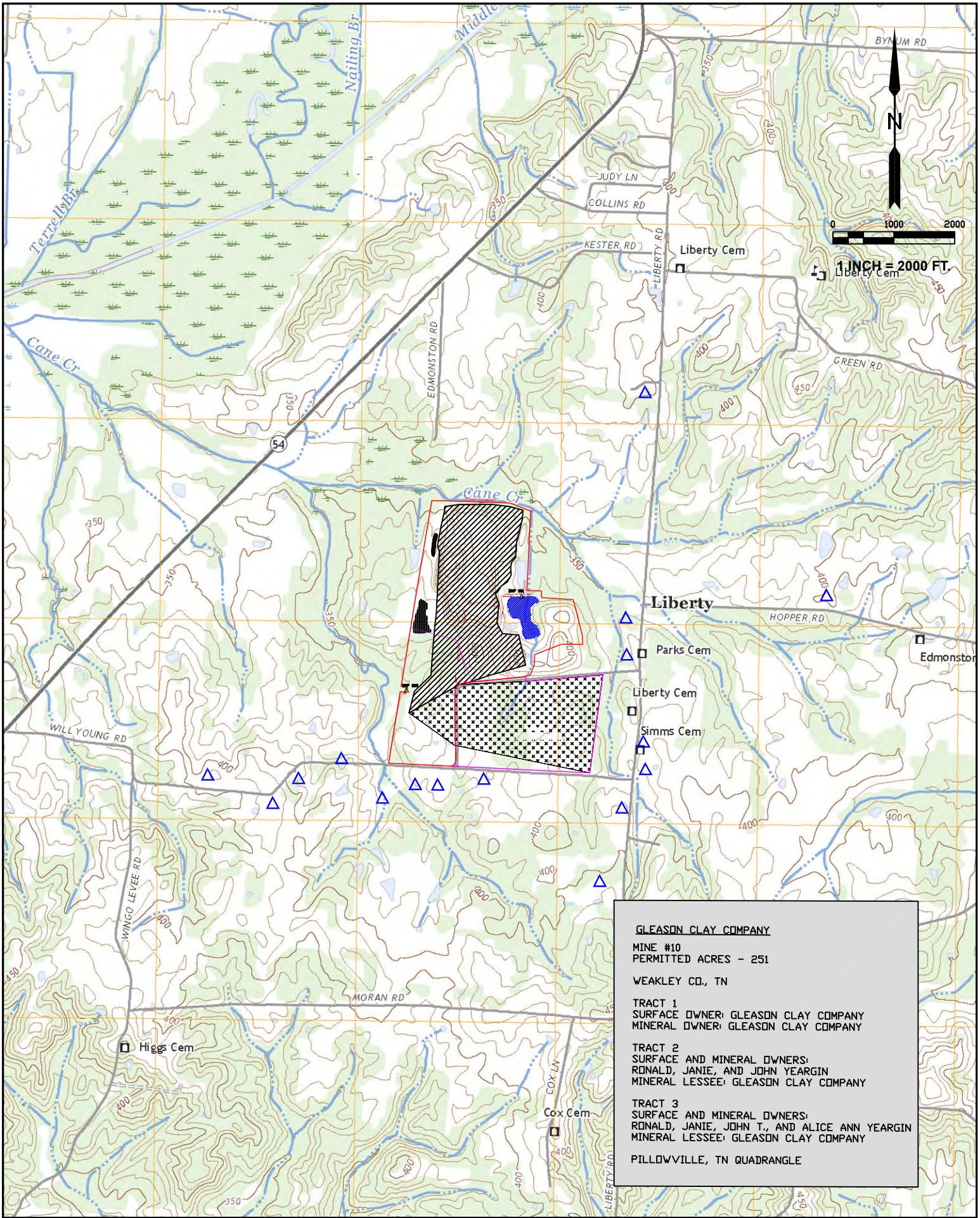
WWC03 begins at a constructed berm with perforated drain pipe (Lat 36.20894, Lon -88.716) and continues for 204' until it reaches the proposed permit boundary line (Lat 36.2091, Lon -88.70099). The eastern half of this feature has been planted with crops.

The assessment was conducted under normal weather conditions.

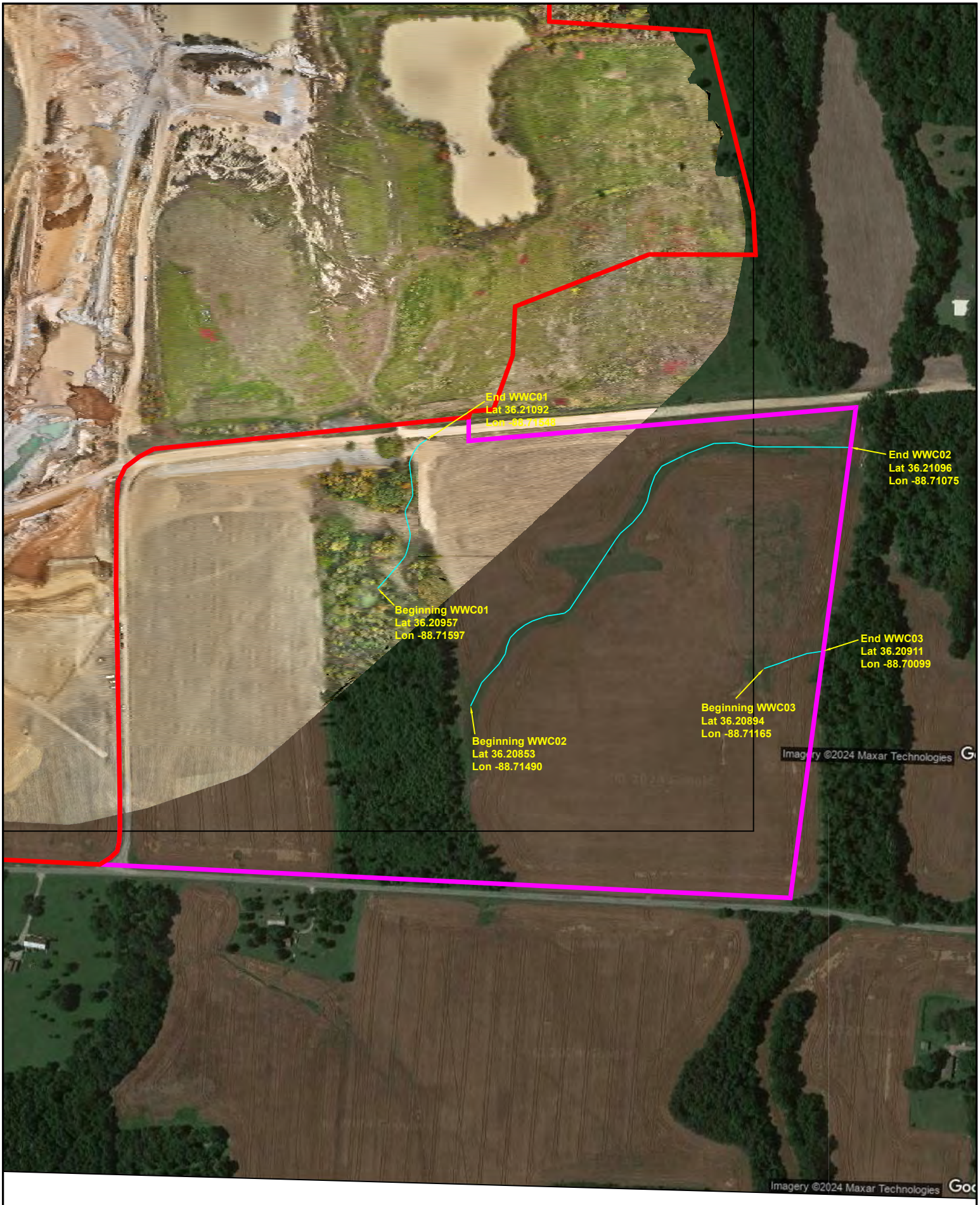
Normal Weather Conditions Calculations Table

			Long-term rainfall records							
	Month	Standard Deviation	Minus One Std. Dev. (DRY)	Normal (Mean inches)	Plus One Std. Dev. (WET)	Actual Rainfall	Condition (elevated, low, average)	Condition value	Month weight value	Product of previous two columns
1st prior month*	Mar	2.76	2.08	4.84	7.60	2.79	average	2	X 3	6
2nd prior month*	Feb	2.40	2.40	4.80	7.20	4.34	average	2	X 2	4
3rd prior month*	Jan	2.37	1.51	3.88	6.25	6.32	elevated	3	X 1	3
									Sum =	13

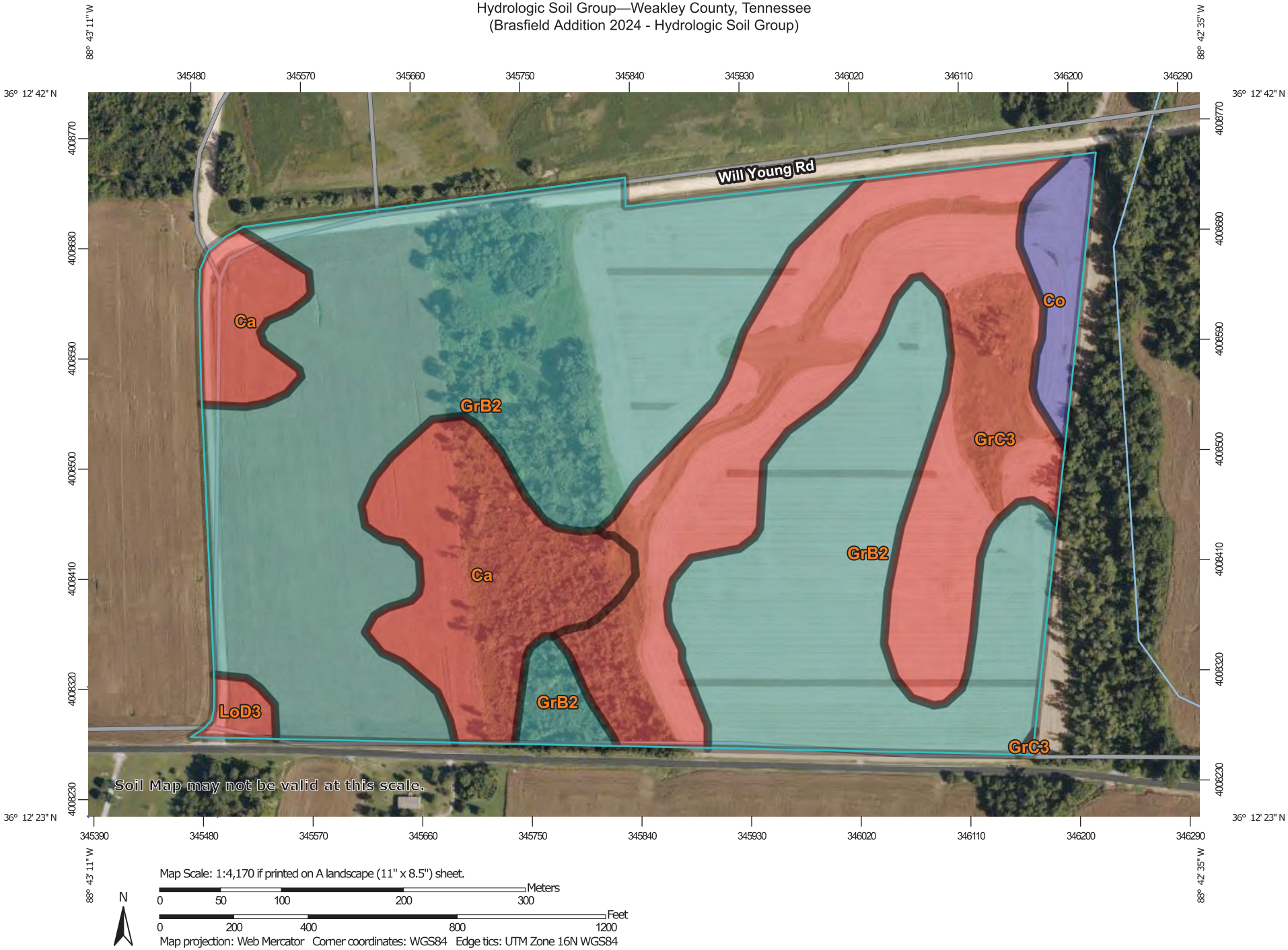
The attached documents include a site general location map, a map of the assessment area with latitude/longitude coordinates for the assessed area, a soil map from the soil web survey (NRCS), the Hydrologic Determination Field Data Sheets, and photographs taken the day the assessment was conducted 4/30/2024.



SHEET	BRASFIELD MINE #10 RENEWAL AND MODIFICATION	DRAWING DATE	10/18/22	GCC Gleason Clay Company LLC	PO BOX 111 GLEASON, TN 38229 (731) 648-5596
1	NPDES PERMIT # 0045527	DRAWN BY	DMG		
	WEAKLEY COUNTY, TN	REVISION DATE	11/7/23		
		FILE NAME	BRASFIELD 2023 MODIFICATION		



SHEET				
1	BRASFIELD MINE #10 HDT Assessment Area	DRAWING DATE	5/15/24	GCC Gleason Clay Company LLC
	WEAKLEY COUNTY, TN	DRAWN BY	DMG	PO BOX 111 GLEASON, TN 38229 (731) 648-5596
		SCALE	1" = 400'	
		FILE NAME	BRASFIELD 2024	



Map Scale: 1:4,170 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: Cane Creek	Date/Time: 4/30/24
Assessors/Affiliation: David Gavin / Old Hickory Clay Company	Project ID : WWC01
Site Name/Description: Gleason Clay Company Mine #10 (TN0045527)	
Site Location: Will Young Road west of the intersection with Liberty Road	
HUC (12 digit): 080102030404	Latitude: 36.2094
Previous Rainfall (7-days) : 1.22"	Longitude: -88.7159
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : Cocorahs	
Watershed Size :	County: Weakley
Soil Type(s) / Geology : See Attached Map	Source: NCRS
Surrounding Land Use : Row Crop, Woodlands	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✓	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✓	Stream
6. Presence of fish (except *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✓	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 10.0

Justification / Notes : Defined bed and bank absent through much of reach.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	0.5	1	2	3
2. Sinuous channel	0	0.5	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 1.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 7.0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1.5	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0.5	0
22. Crayfish in stream (exclude in floodplain)	0	1	1.5	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10.0

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 1. Continuous bed and bank absent through much of the area. Very close to WWC call on primary.

19. Hydric soils close to farm pond and low spot close to road. Bottom of culvert crossing is above grade which holds water.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: Cane Creek	Date/Time: 4/30/24
Assessors/Affiliation: David Gavin / Old Hickory Clay Company	Project ID : WWC02
Site Name/Description: Gleason Clay Company Mine #10 (TN0045527)	
Site Location: Will Young Road west of the intersection with Liberty Road	
HUC (12 digit): 080102030404	Latitude: 36.2094
Previous Rainfall (7-days) : 1.22"	Longitude: -88.7159
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : Cocorahs	
Watershed Size :	County: Weakley
Soil Type(s) / Geology : See Attached Map	Source: NCRS
Surrounding Land Use : Row Crop, Woodlands	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✓	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✓	Stream
6. Presence of fish (except *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✓	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 4.0

Justification / Notes : This feature is a grass lined drainage ditch with 2 constructed levees with pipes to control water flow. There was no water observed anywhere in the reach, except in a small pool at the outlet of one of the pipes.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	0.5	1	2	3
2. Sinuous channel	0		1	2	3
3. In-channel structure: riffle-pool sequences	0		1	2	3
4. Sorting of soil textures or other substrate	0	0.5	1	2	3
5. Active/relic floodplain	0		0.5	1	1.5
6. Depositional bars or benches	0		1	2	3
7. Braided channel	0		1	2	3
8. Recent alluvial deposits	0		0.5	1	1.5
9. Natural levees	0		1	2	3
10. Headcuts	0		1	2	3
11. Grade controls	0		0.5	1	1.5
12. Natural valley or drainageway	0		0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0		1	2	3

B. Hydrology (Subtotal = 0.0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 0.5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 4.0

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Drainage ditch dominated by upland grass.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5

Named Waterbody: Cane Creek		Date/Time: 4/30/24
Assessors/Affiliation: David Gavin / Old Hickory Clay Company		Project ID :
Site Name/Description: Gleason Clay Company Mine #10 (TN0045527)		WWC03
Site Location: Will Young Road west of the intersection with Liberty Road		
HUC (12 digit): 080102030404	Latitude: 36.2094	
Previous Rainfall (7-days) : 1.22"	Longitude: -88.7159	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip. data : Cocorahs		
Watershed Size :	County: Weakley	
Soil Type(s) / Geology : See Attached Map	Source: NCRS	
Surrounding Land Use : Row Crop, Woodlands		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✓	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✓	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✓	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✓	Stream
6. Presence of fish (except *Gambusia*)	✓	Stream
7. Presence of naturally occurring ground water table connection	✓	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✓	Stream
9. Evidence watercourse has been used as a supply of drinking water	✓	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Wet Weather Conveyance

Secondary Indicator Score (if applicable) = 8.5

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	1.5	2	3
2. Sinuous channel	0	0.5	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3

B. Hydrology (Subtotal = 0.0)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 4.0)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2.5	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1.5	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Picture 1

Date of Photo: 04/30/24. Photo looking southwest to the beginning of WWC01 (36.20975, -88.71603).

Picture 2

Date of Photo: 04/30/24. Photo looking north near the beginning of WWC01 (36.20981, -88.71600).

Picture 3

Date of Photo: 04/30/24. Photo of WWC01 looking north inside the wood line seen in picture 2 (36.20986, -88.71592).

Picture 4

Date of Photo: 04/30/24. Photo of WWC01 looking north. North of picture 3 (36.21006, -88.71572).

Picture 5

Date of Photo: 04/30/24. Photo of WWC01 along tree line looking west (36.21051, -88.71556).

Picture 6

Date of Photo: 04/30/24. Photo of WWC01 looking southwest in the direction of photo 5 (36.21086, -88.71555).

Picture 7

Date of Photo: 04/30/24. Photo of WWC01 looking northeast to culvert crossing under old Will Young Road (36.21081, -88.71564).

Picture 8

Date of Photo: 04/30/24. Beginning of WWC02 looking west at perforated pipe drain on west side of constructed levee (36.21081, -88.71564).

Picture 9

Date of Photo: 04/30/24. WWC02 looking west at perforated pipe drain outlet through levee (36.21081, -88.71564).

Picture 10

Date of Photo: 04/30/24. WWC02 looking southwest (36.20961, -88.71369).

Picture 11

Date of Photo: 04/30/24. WWC02 from the same location as picture 10, looking northeast at second levee (36.20961, -88.71369).

Picture 12

Date of Photo: 04/30/24. WWC02 from the top of the levee looking southwest towards location of picture 11 (36.20987, -88.71346).

Picture 13

Date of Photo: 04/30/24. WWC02 from the top of the levee looking northeast. Taken in same location as picture 12 (36.20987, -88.71346).

Picture 14

Date of Photo: 04/30/24. WWC02 looking east (36.21090, -88.71242).

Picture 15

Date of Photo: 04/30/24. WWC02 looking west (36.21093, -88.71124).

Picture 16

Date of Photo: 04/30/24. WWC02 looking east to the end of this WWC. Same location as picture 15 (36.21093, -88.71124).

Picture 17

Date of Photo: 04/30/24. Beginning of WWC03 looking west at perforated pipe drain on west side of constructed levee (36.20895, -88.71173).

Picture 18

Date of Photo: 04/30/24. WWC03 looking east from top of levee. Taken in the same location as picture 17 (36.20895, -88.71173).

Picture 19

Date of Photo: 04/30/24. WWC03 looking west toward picture 18 location to drain pipe outlet through levee (36.20897, -88.71156).

Picture 20

Date of Photo: 04/30/24. WWC03 looking east. Picture taken in same location as picture 19 (36.20897, -88.71156).

Picture 21

Date of Photo: 04/30/24. WWC03 looking west.
(36.20910, -88.71124).

Picture 22

Date of Photo: 04/30/24. WWC03 looking east. Same location as picture 21.
(36.20910, -88.71124).