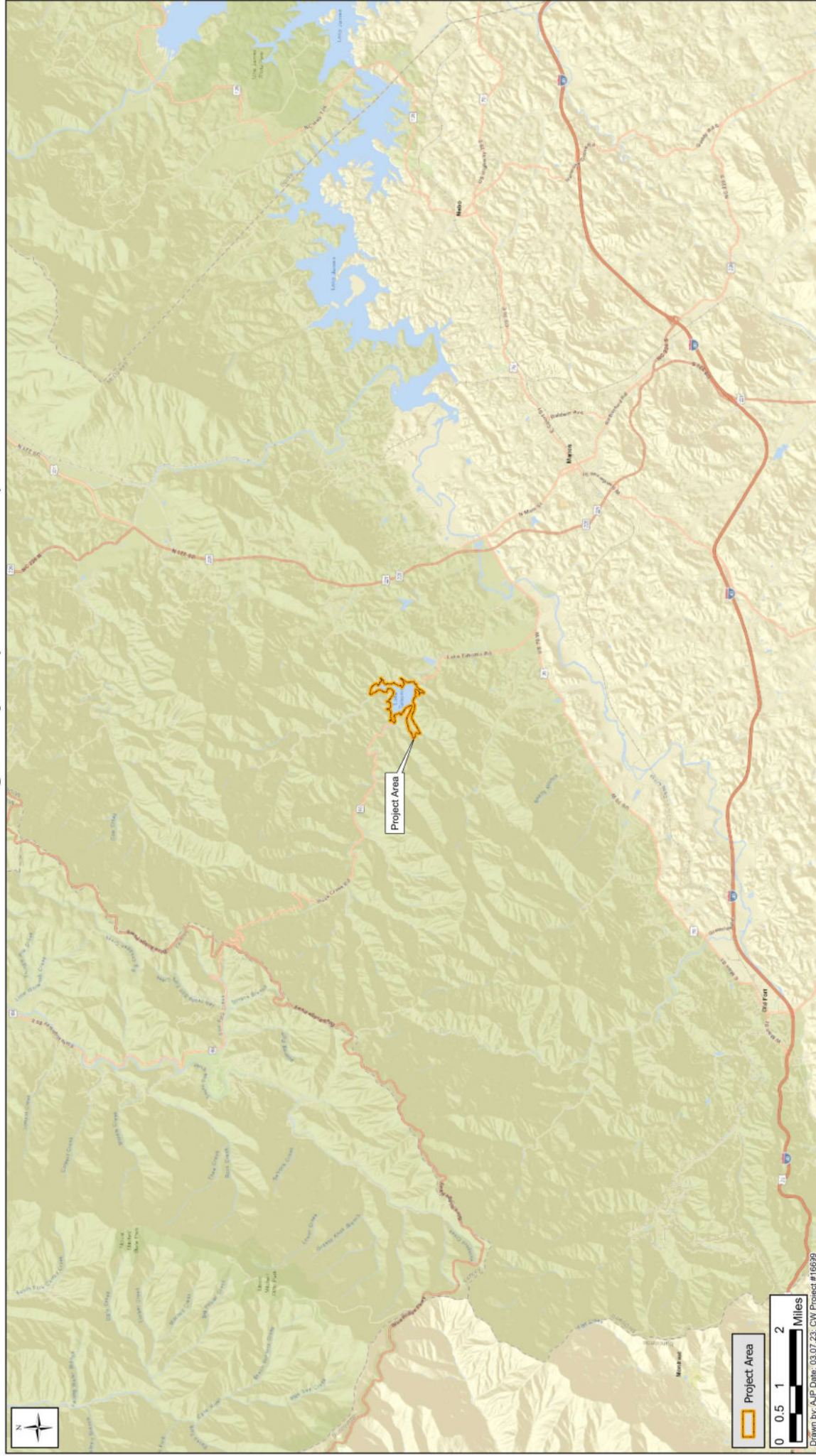


# Lake Tahoma Dredge Project (+/- 212 acres)



Drawn by: AJP Date: 03.07.23: CW Project #16699

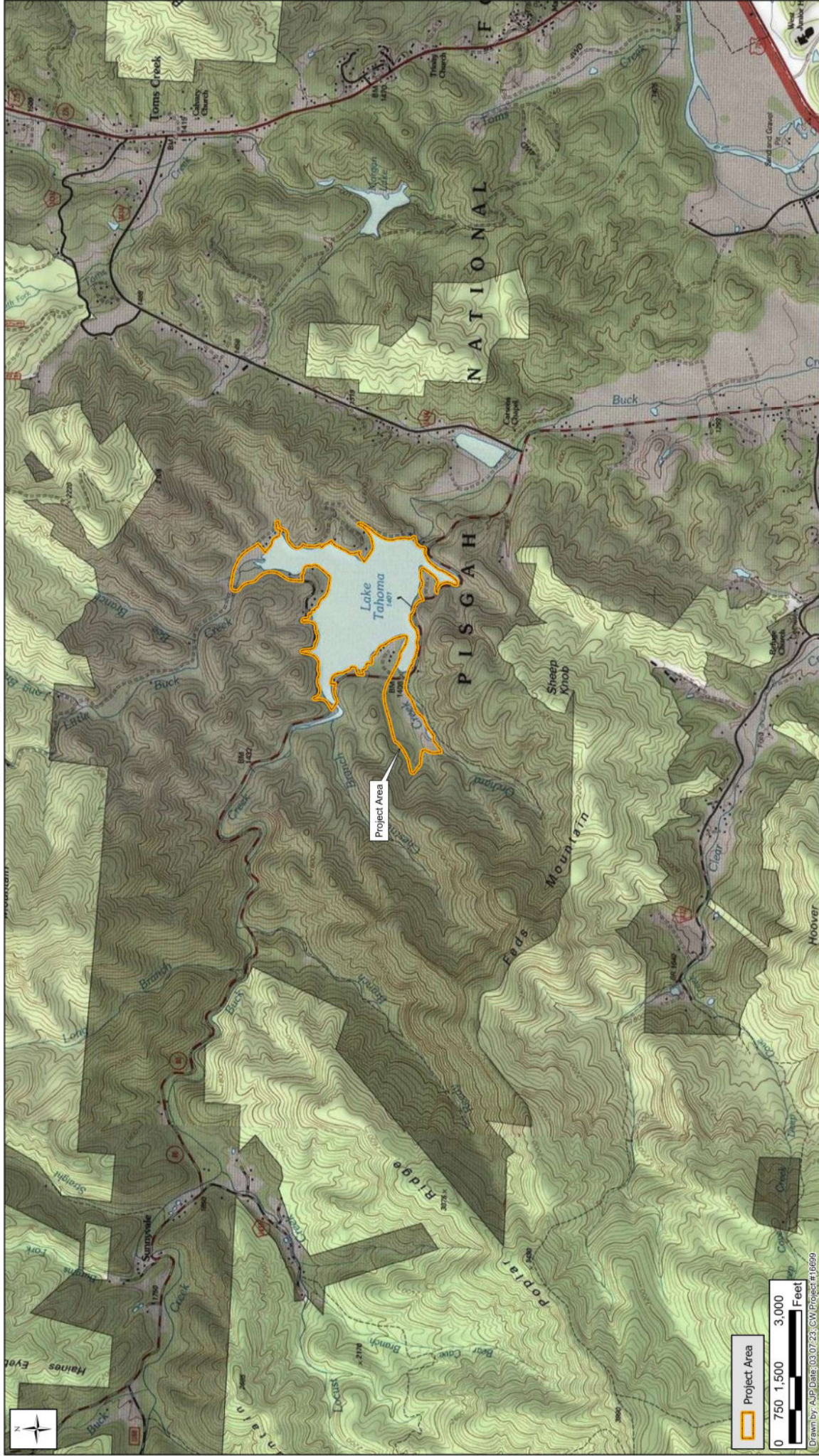
**ClearWater**  
An Environmental Company  
145 7th Ave West, Suite B  
Hendersonville, North Carolina 28792

McDowell County,  
North Carolina

Vicinity Map  
Figure 1



# Lake Tahoma Dredge Project (+/- 212 acres)



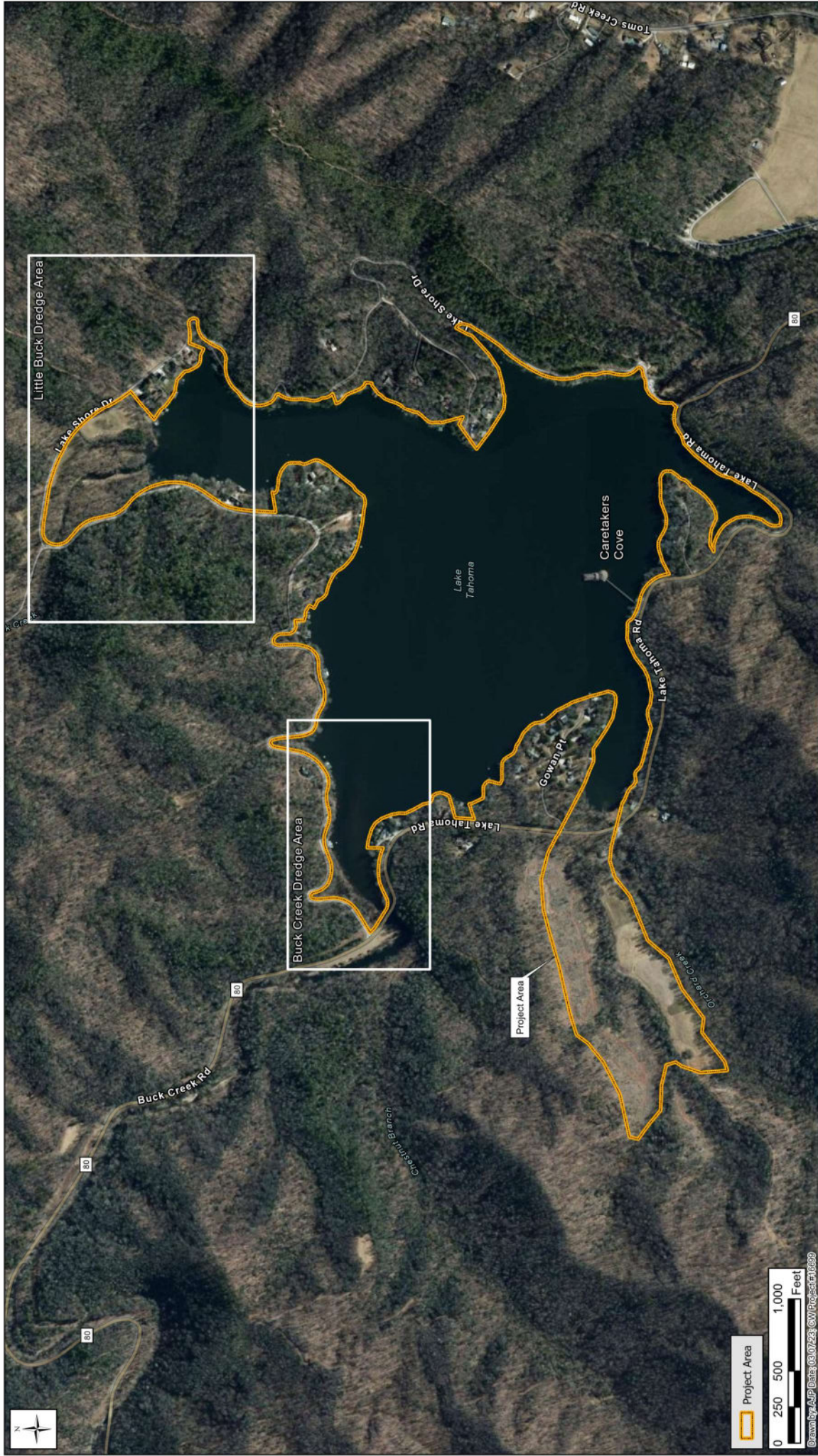
USGS Topographic Map  
1:24L, Marion West Quad  
Figure 2

**ClearWater**  
An Environmental Company  
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Hendersonville, North Carolina 28792

McDowell County,  
North Carolina



# Lake Tahoma Dredge Project (+/- 212 acres)



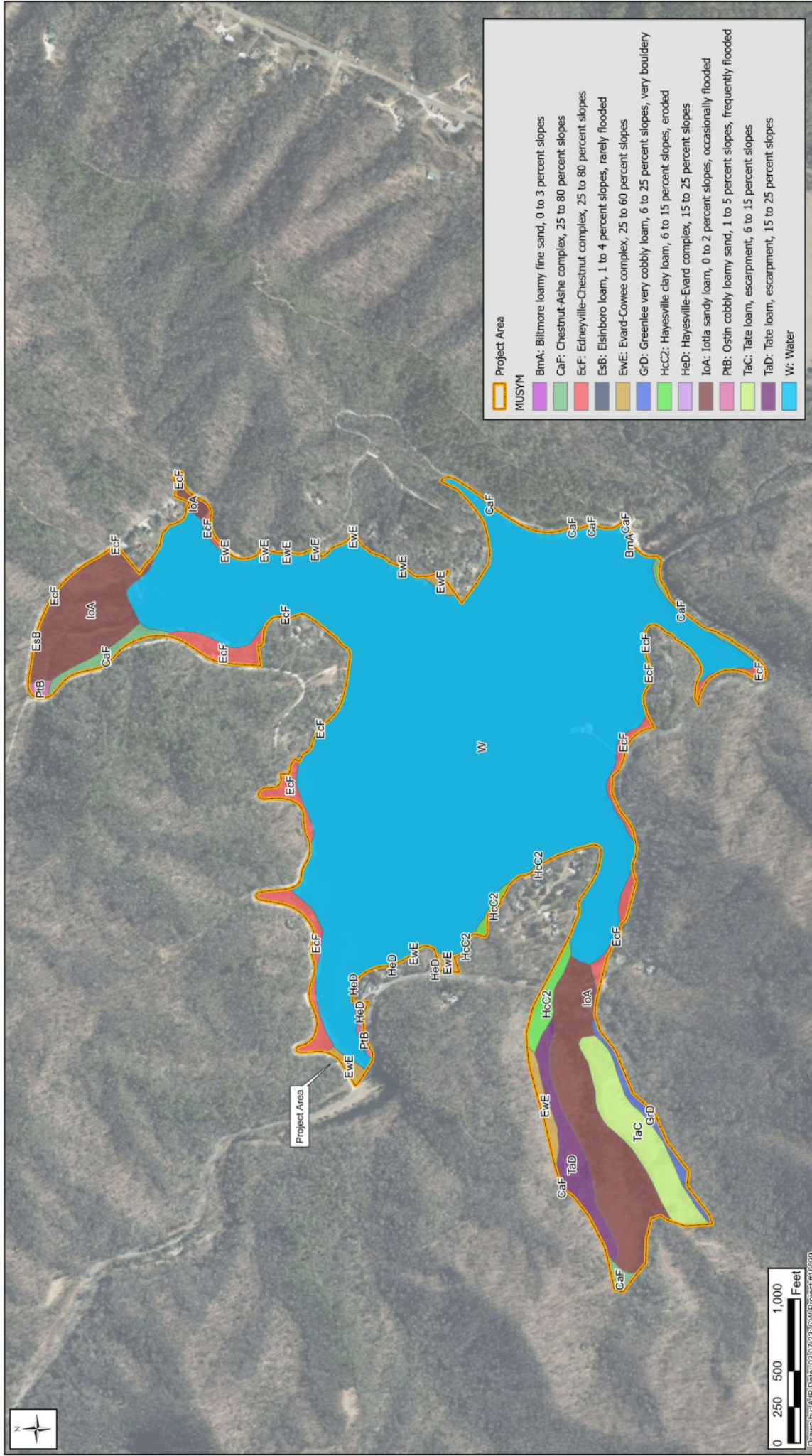
Aerial Imagery Map  
NCCGIA 2019  
Figure 3

**ClearWater**  
An Environmental Company  
145 7th Ave West, Suite B  
Hendersonville, North Carolina 28792

McDowell County,  
North Carolina

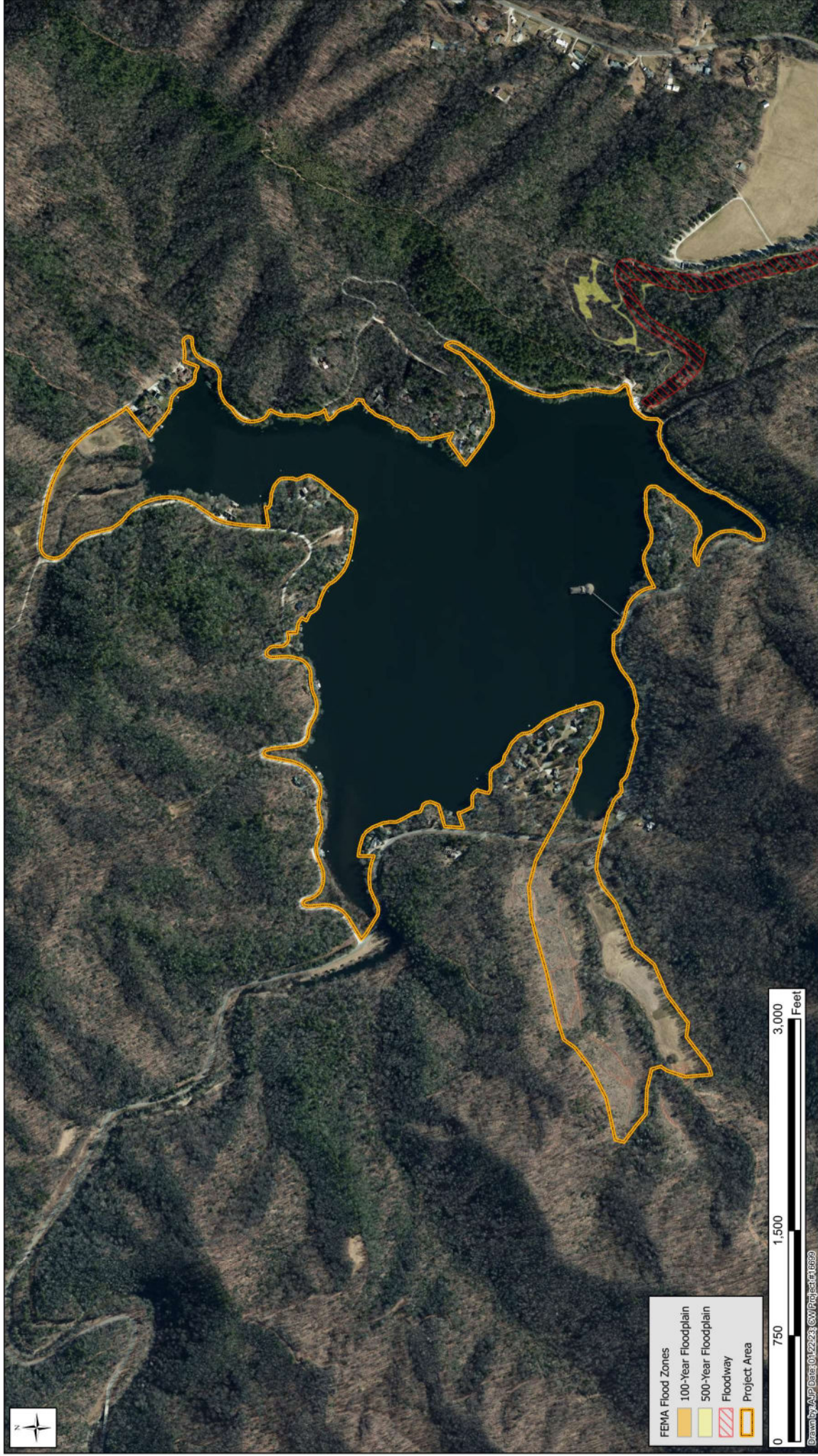


# Lake Tahoma Dredge Project (+/- 212 acres)





# Lake Tahoma Dredge Project (+/- 212 AC)



FEMA Flood Zones  
 100-Year Floodplain  
 500-Year Floodplain  
 Floodway  
 Project Area

0 750 1,500 3,000 Feet  
 Drawn by: A.P. Date: 01/22/21 (GW Project 1629)

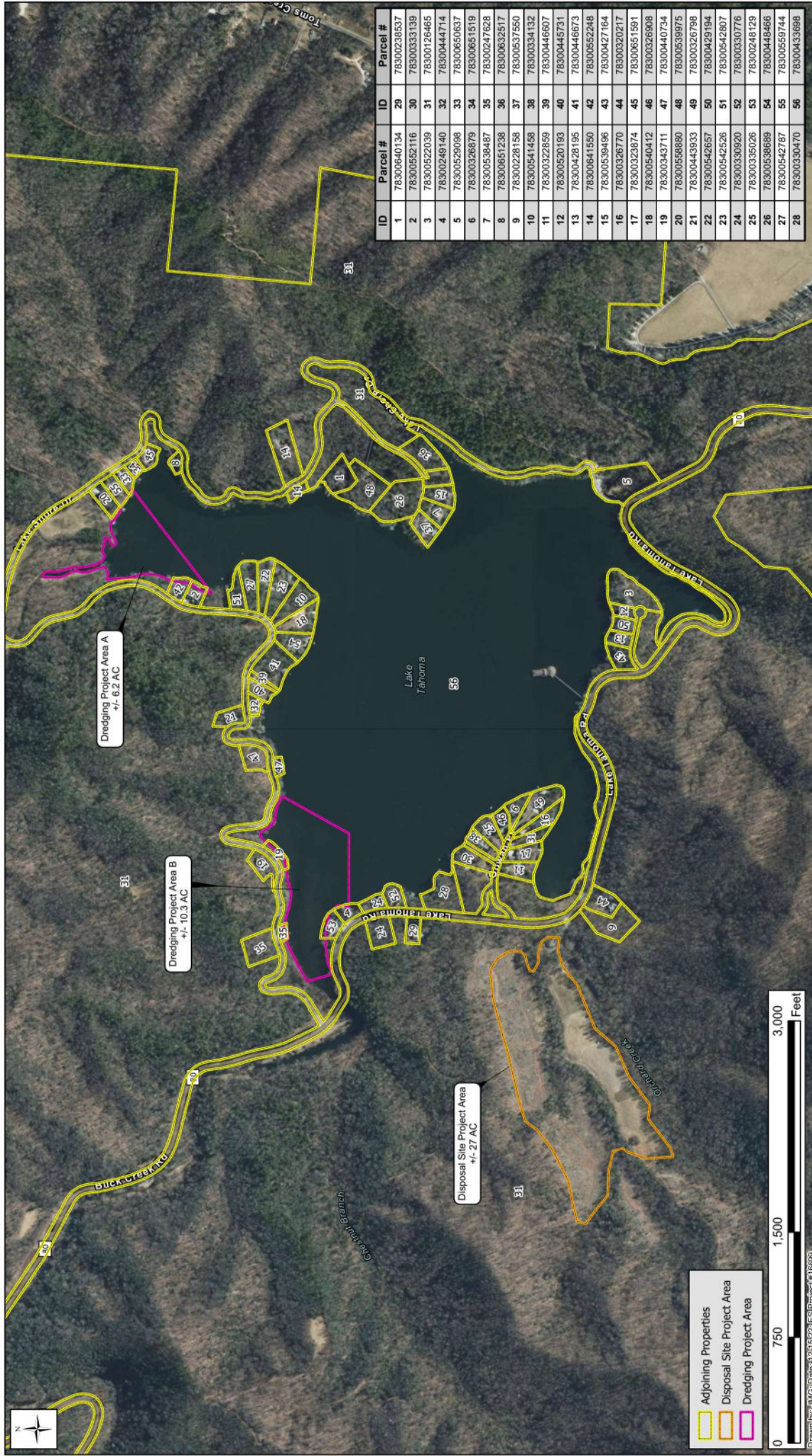
McDowell County,  
 North Carolina

**ClearWater**  
 An Environmental Science Company  
 145 7th Ave West, Suite B  
 Hendersonville, North Carolina 28792

FEMA Flood Zone Map  
 FIRM Panel: 3710078300J  
 (eff. 10/02/2008)  
 Figure 5



# Lake Tahoma Dredge Project (+/- 212 AC)





**Attachment A**  
**Engineering Designs**



This topographic map illustrates the Lake Tahoe region, including surrounding towns and infrastructure. Key features include:

- Towns:** East Marion, Marion, and Rutledge are labeled in the upper right.
- Roads:** Major roads shown include US 221 N, US 70 W, and US 89. Local roads include Tom's Creek Rd, Clear Creek Rd, N Main St, and State St.
- Water Bodies:** Lake Tahoe is shown in blue in the lower left. The Catawba River is depicted as a winding black line flowing through the center.
- Geographic Features:** The map shows a mountainous terrain with numerous contour lines. A red triangle marks the Orchard Meadows Upland Containment Site, with a line pointing to its label.
- Scale and Orientation:** A scale bar in the bottom right corner indicates distances of 0, 3000, and 6000 feet. A north arrow is also present.

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828.337.5716

SCALE:	NTS
DRAWN BY:	JFG
PROJECT NO:	GE-2/10
DATE:	02/10

PROF. ENG. FIRM  
NO. C-4451

20 GLENN WILLOW DR, #11  
ARDEN, NC 28704  
www.garner-eng.com  
828.337.5716

DATE:	02/10/2023
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PROF. ENG. FIRM  
NO. C-4451

NTS

JFG

GE-226

DATE: 02/10/2023

PROF. ENG. FIRM

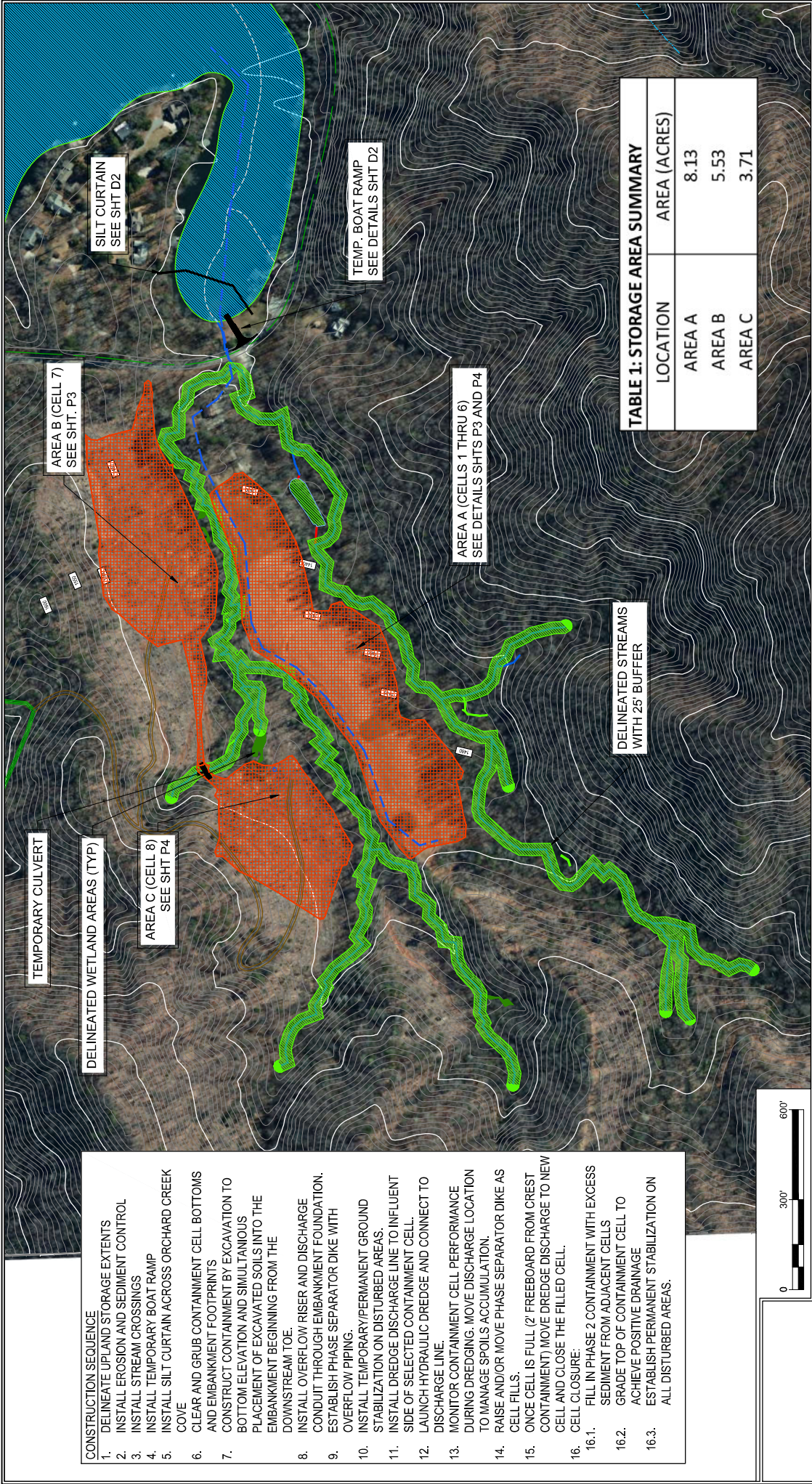
NO. C-4451

DWG

LAKE TAHOMA DREDGED SPOILS MANAGEMENT  
HWY 80  
MARION, NC

5





- CONSTRUCTION SEQUENCE
1. DELINEATE UPLAND STORAGE EXTENTS
  2. INSTALL EROSION AND SEDIMENT CONTROL
  3. INSTALL STREAM CROSSINGS
  4. INSTALL TEMPORARY BOAT RAMP
  5. INSTALL SILT CURTAIN ACROSS ORCHARD CREEK COVE
  6. CLEAR AND GRUB CONTAINMENT CELL BOTTOMS AND EMBANKMENT FOOTPRINTS
  7. CONSTRUCT CONTAINMENT BY EXCAVATION TO BOTTOM ELEVATION AND SIMULTANEOUS PLACEMENT OF EXCAVATED SOILS INTO THE EMBANKMENT BEGINNING FROM THE DOWNSTREAM TOE.
  8. INSTALL OVERFLOW RISER AND DISCHARGE CONDUIT THROUGH EMBANKMENT FOUNDATION.
  9. ESTABLISH PHASE SEPARATOR DIKE WITH OVERFLOW PIPING.
  10. INSTALL TEMPORARY/PERMANENT GROUND STABILIZATION ON DISTURBED AREAS.
  11. INSTALL DREDGE DISCHARGE LINE TO INFLUENT SIDE OF SELECTED CONTAINMENT CELL.
  12. LAUNCH HYDRAULIC DREDGE AND CONNECT TO DISCHARGE LINE.
  13. MONITOR CONTAINMENT CELL PERFORMANCE DURING DREDGING. MOVE DISCHARGE LOCATION TO MANAGE SPOILS ACCUMULATION.
  14. RAISE AND/OR MOVE PHASE SEPARATOR DIKE AS CELL FILLS.
  15. ONCE CELL IS FULL (2' FREEBOARD FROM CREST CONTAINMENT) MOVE DREDGE DISCHARGE TO NEW CELL AND CLOSE THE FILLED CELL.
  16. CELL CLOSURE:
    - 16.1. FILL IN PHASE 2 CONTAINMENT WITH EXCESS SEDIMENT FROM ADJACENT CELLS
    - 16.2. GRADE TOP OF CONTAINMENT CELL TO ACHIEVE POSITIVE DRAINAGE
    - 16.3. ESTABLISH PERMANENT STABILIZATION ON ALL DISTURBED AREAS.

TABLE 1: STORAGE AREA SUMMARY		
LOCATION	AREA (ACRES)	
AREA A	8.13	
AREA B	5.53	
AREA C	3.71	



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DATE:	02/10/2023
PROF. ENG. FIRM NO. C-4451	

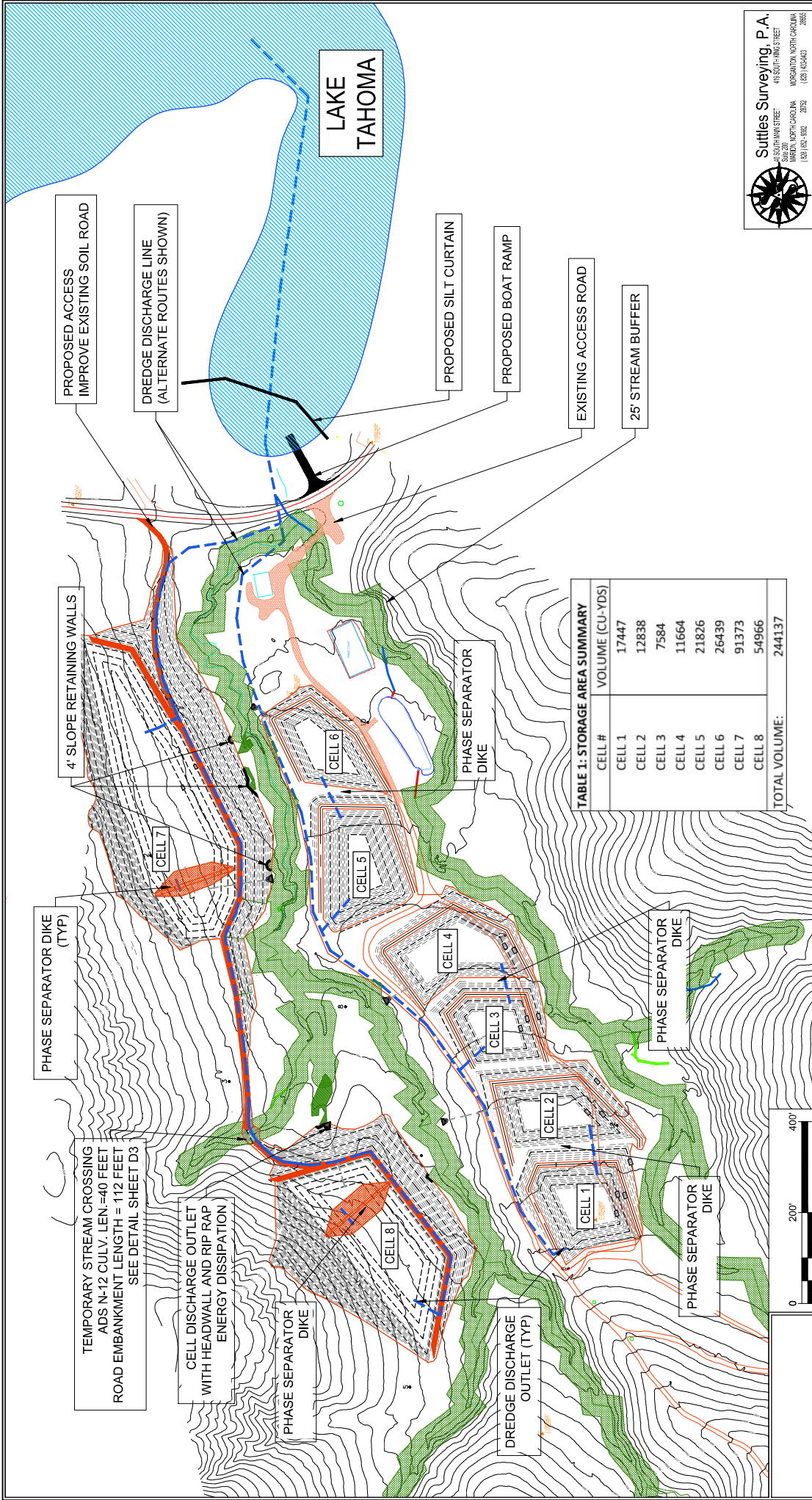
SITE MAP

LAKE TAHOMA DREDGED SPOILS MANAGEMENT  
HWY 80  
MARION, NC

DWG

P1





**Suttles Surveying, P.A.**  
415 SOUTH MAIN STREET  
SUITE 200  
WILKES-BARRE, PA 18201  
(610) 840-1800  
FAX (610) 840-1801  
WWW.SUTTLESURVEYING.COM

TABLE 1: STORAGE AREA SUMMARY	
CELL #	VOLUME (CU-YDS)
CELL 1	17447
CELL 2	12838
CELL 3	7584
CELL 4	11664
CELL 5	21826
CELL 6	26439
CELL 7	91373
CELL 8	54966
TOTAL VOLUME:	244137

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SCALE: NTS

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DATE: 02/10/2023

PROF. ENG. FIRM  
NO. C-4451

SITE PLAN

LAKE TAHOMA DREDGED SPOILS MANAGEMENT

HWY 80  
MARION, NC

DWG

P2



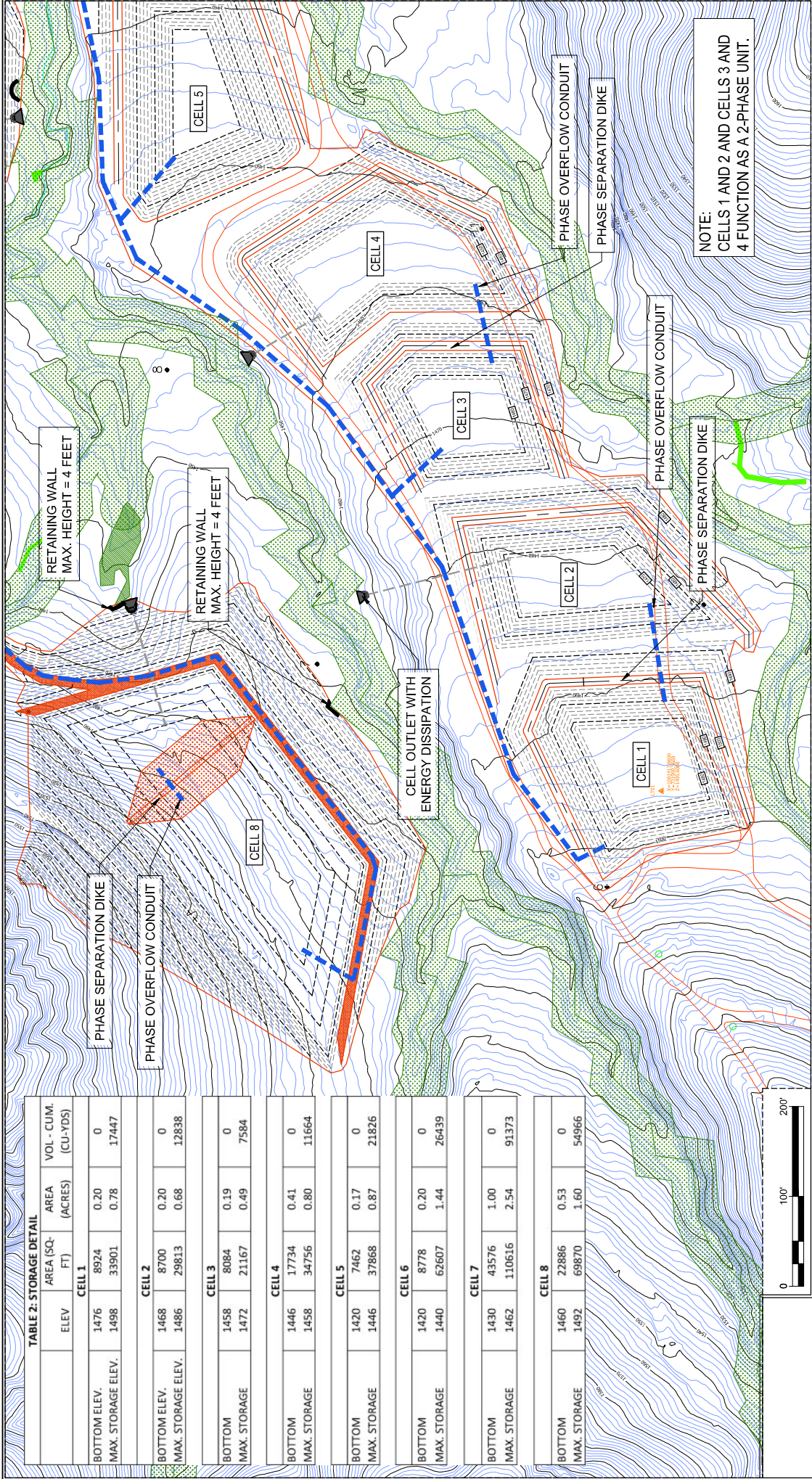


TABLE 2: STORAGE DETAIL

	ELEV	AREA (SQ. FT)	AREA (ACRES)	VOL - CUM. (CU-YDS)
CELL 1				
BOTTOM ELEV.	1476	8924	0.20	0
MAX. STORAGE ELEV.	1498	33901	0.78	17447
CELL 2				
BOTTOM ELEV.	1468	8700	0.20	0
MAX. STORAGE ELEV.	1486	29813	0.68	12838
CELL 3				
BOTTOM	1458	8084	0.19	0
MAX. STORAGE	1472	21167	0.49	7584
CELL 4				
BOTTOM	1446	17734	0.41	0
MAX. STORAGE	1458	34756	0.80	11664
CELL 5				
BOTTOM	1420	7462	0.17	0
MAX. STORAGE	1446	37868	0.87	21826
CELL 6				
BOTTOM	1420	8778	0.20	0
MAX. STORAGE	1440	62607	1.44	26439
CELL 7				
BOTTOM	1430	43576	1.00	0
MAX. STORAGE	1462	110616	2.54	91373
CELL 8				
BOTTOM	1460	22886	0.53	0
MAX. STORAGE	1492	69870	1.60	54966

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DATE:	02/10/2023
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CELL LAYOUT - 1-4, 8

LAKE TAHOMA DREDGED SPOILS MANAGEMENT  
HWY 80  
MARION, NC

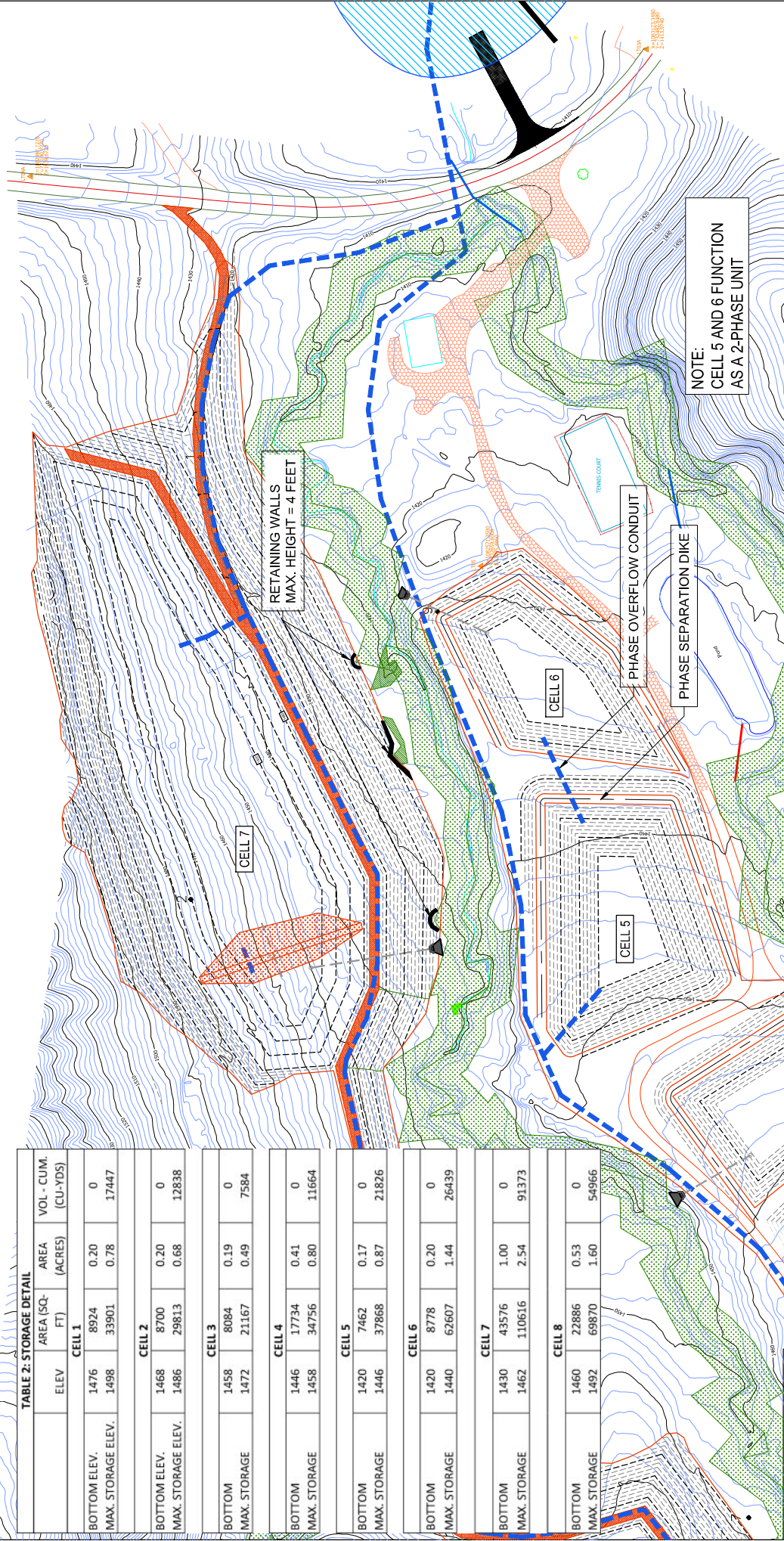
DWG

P3



TABLE 2: STORAGE DETAIL

ELEV		AREA (SQ- FT)	AREA (ACRES)	VOL - CUM. (CU-YDS)
CELL 1				
BOTTOM ELEV.	1476	8924	0.20	0
MAX. STORAGE ELEV.	1498	33901	0.78	17447
CELL 2				
BOTTOM ELEV.	1468	8700	0.20	0
MAX. STORAGE ELEV.	1486	29813	0.68	12838
CELL 3				
BOTTOM	1458	8084	0.19	0
MAX. STORAGE	1472	21167	0.49	7584
CELL 4				
BOTTOM	1446	17734	0.41	0
MAX. STORAGE	1458	34756	0.80	11664
CELL 5				
BOTTOM	1420	7462	0.17	0
MAX. STORAGE	1446	37868	0.87	21826
CELL 6				
BOTTOM	1420	8778	0.20	0
MAX. STORAGE	1440	62607	1.44	26439
CELL 7				
BOTTOM	1430	43576	1.00	0
MAX. STORAGE	1462	110616	2.54	91373
CELL 8				
BOTTOM	1460	22886	0.53	0
MAX. STORAGE	1492	69870	1.60	54966



NOTE:  
CELL 5 AND 6 FUNCTION  
AS A 2-PHASE UNIT

RETAINING WALLS  
MAX. HEIGHT = 4 FEET

PHASE OVERFLOW CONDUIT

PHASE SEPARATION DIKE

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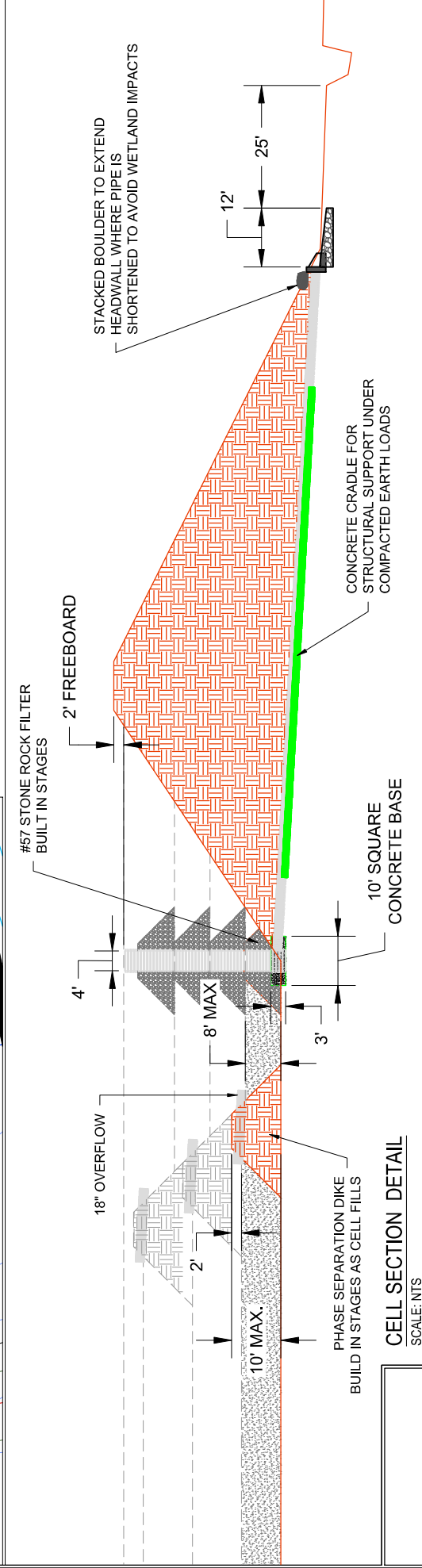
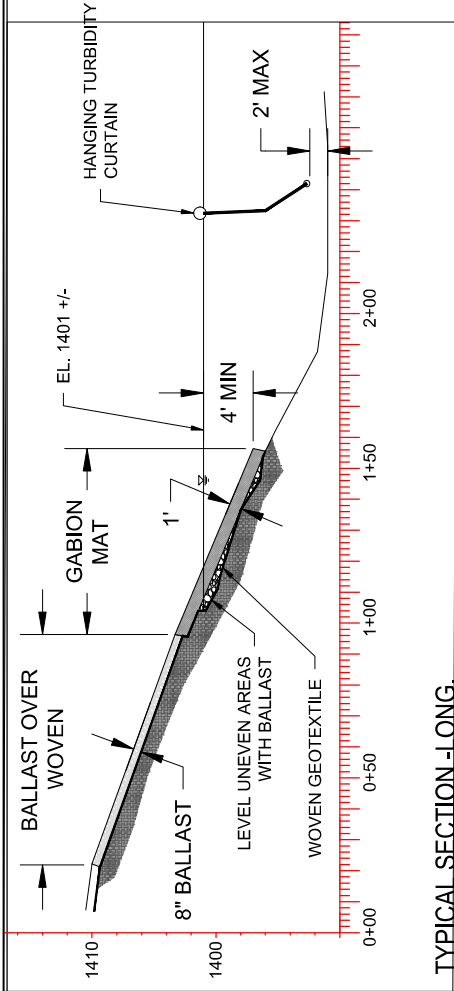
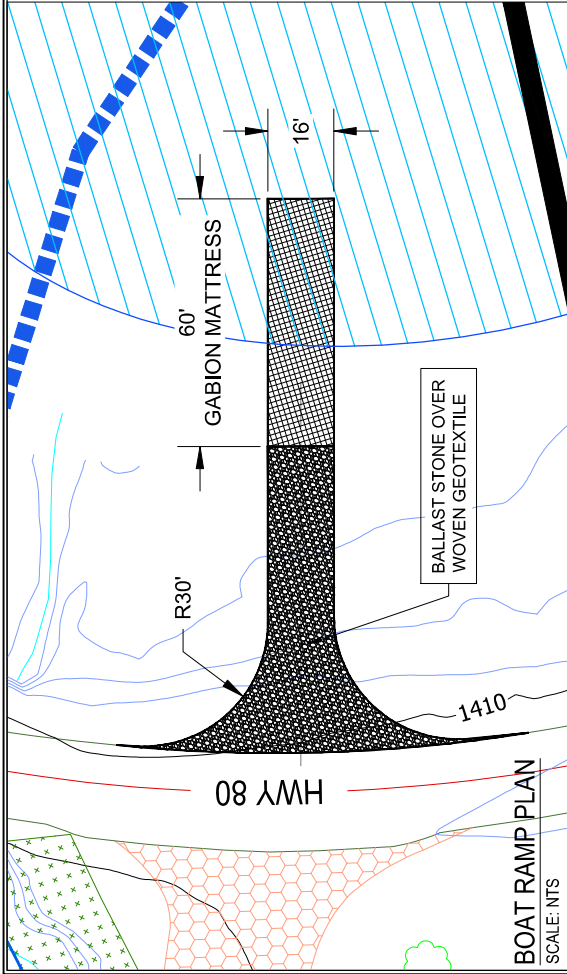
CELL LAYOUT - 5-7

LAKE TAHOMA DREDGED SPOILS MANAGEMENT  
HWY 80  
MARION, NC

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P4





<b>GARNER</b> ENGINEERING	SCALE: NTS	NTS
DRAWN BY: JFG		
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DATE: 02/10/2023		
20 GLENN WILLOW DR, #11 ARDEN, NC 28704 www.garner-eng.com 828.337.5716	PROF. ENG. FIRM NO. C-4451	

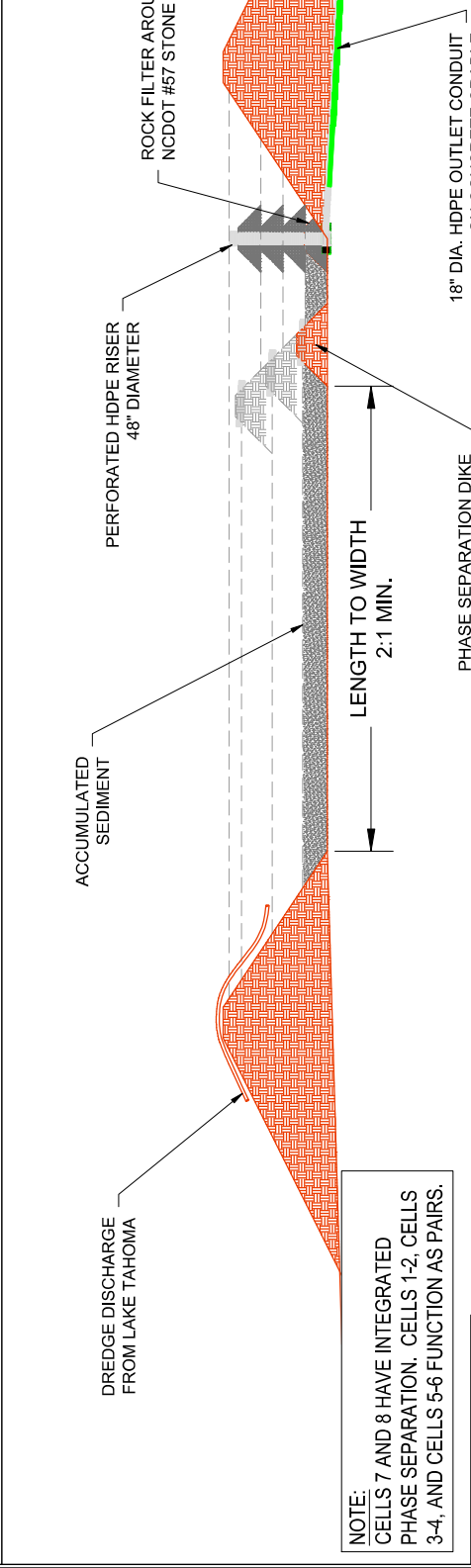
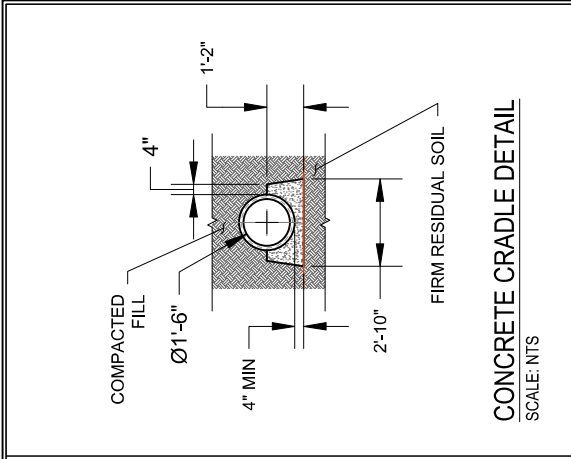
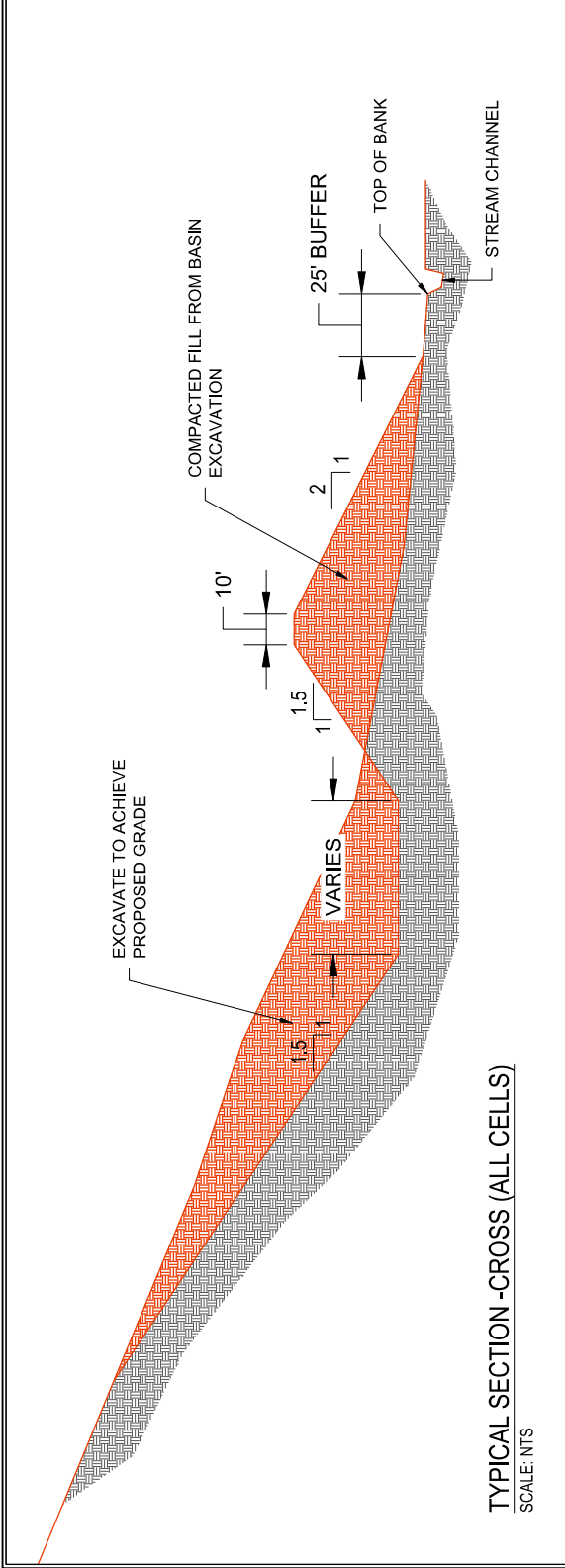
## BASIN DETAILS

LAKE TAHOA DREDGED SPOILS MANAGEMENT  
HWY 80  
MARION, NC

DWG

D2





NOTE:  
CELLS 7 AND 8 HAVE INTEGRATED  
PHASE SEPARATION. CELLS 1-2, CELLS  
3-4, AND CELLS 5-6 FUNCTION AS PAIRS.

**TYPICAL LONG. SECTION CELLS 7 AND 8**

SCALE: NTS

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SCALE: NTS  
DRAWN BY: JFG  
PROJECT NO: GE-226  
DATE: 02/10/2023

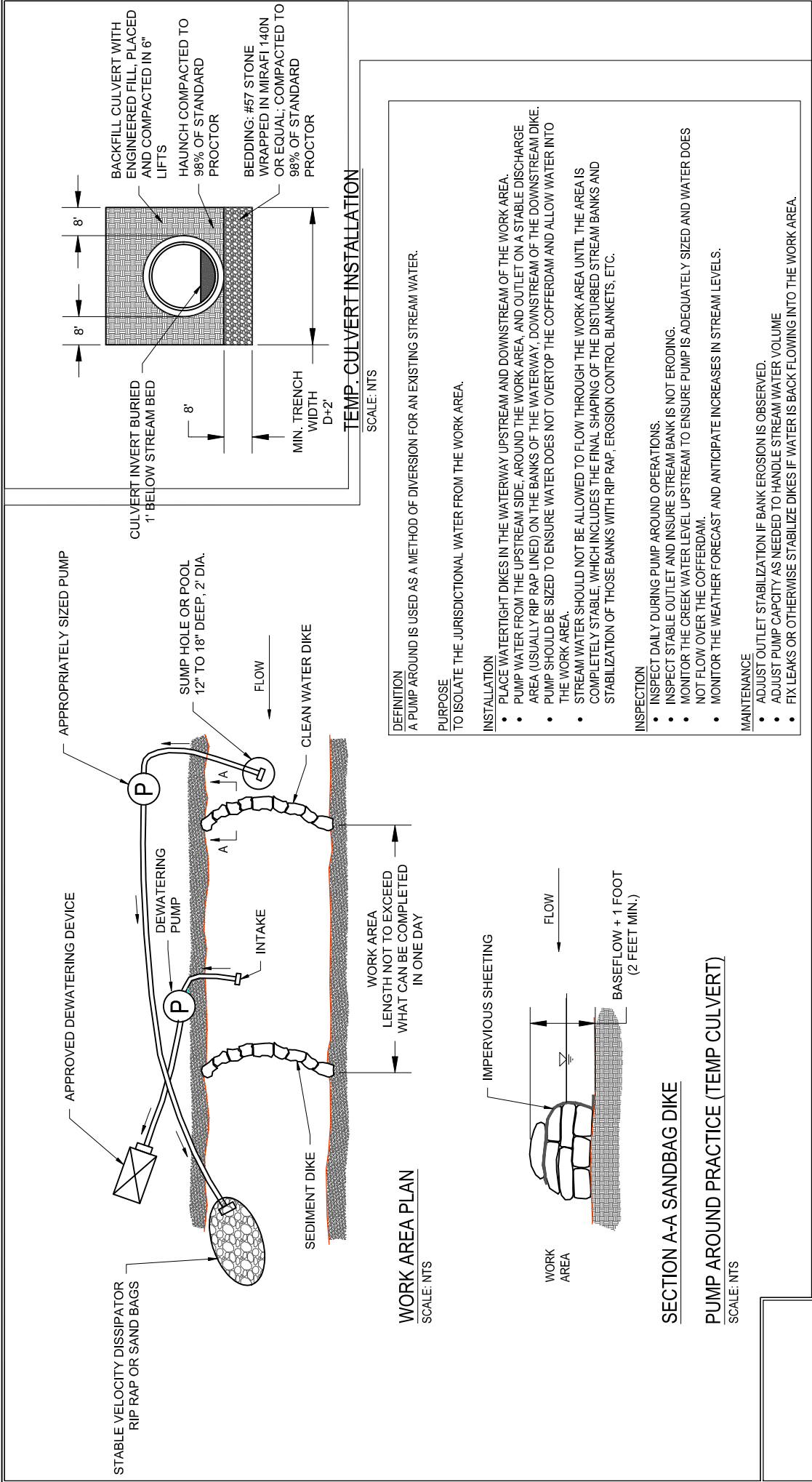
## BASIN DETAILS

LAKE TAHOMA DREDGED SPOILS MANAGEMENT  
HWY 80  
MARION, NC

DWG

D1





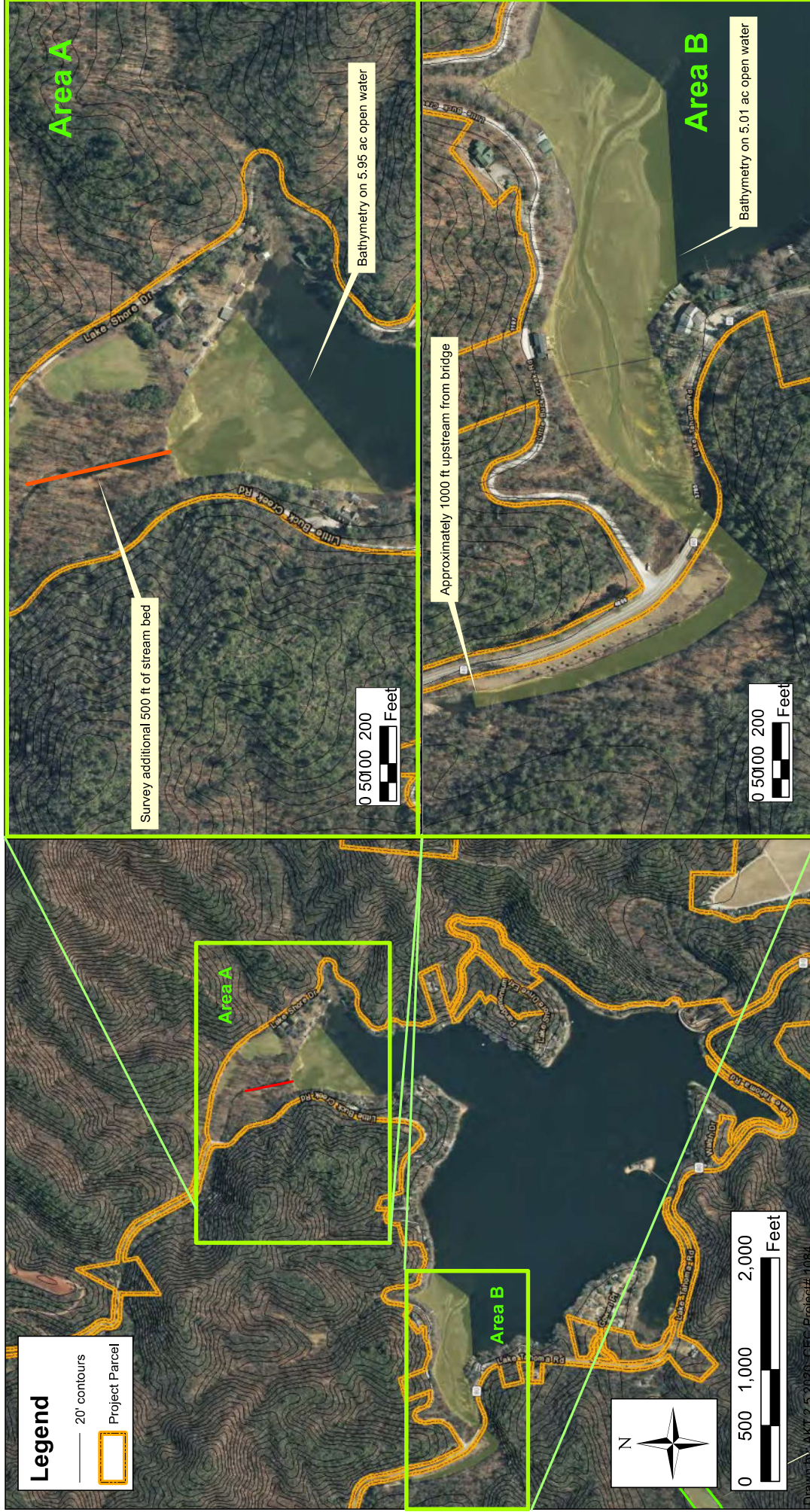
DWG				D3			
CONSTRUCTION DETAILS				LAKE TAHOMA DREDGED SPOILS MANAGEMENT			
				HWY 80			
				MARION, NC			
SCALE: NTS		NTS		DRAWN BY: JFG		PROJECT NO: GE-226	
20 GLENN WILLOW DR, #11		20 GLENN WILLOW DR, #11		DATE: 02/10/2023		PROF. ENG. FIRM	
ARDEN, NC 28704		ARDEN, NC 28704		www.garner-eng.com		NO. C-4451	
828.337.5716		828.337.5716					



**Attachment B**  
**Bathymetric Study**



# Lake Tahoma Inc. Parcel (+/- 2750 AC)



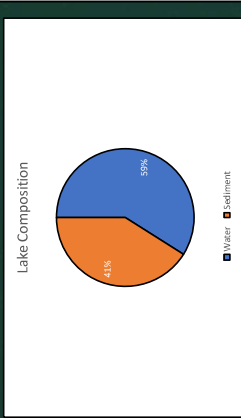
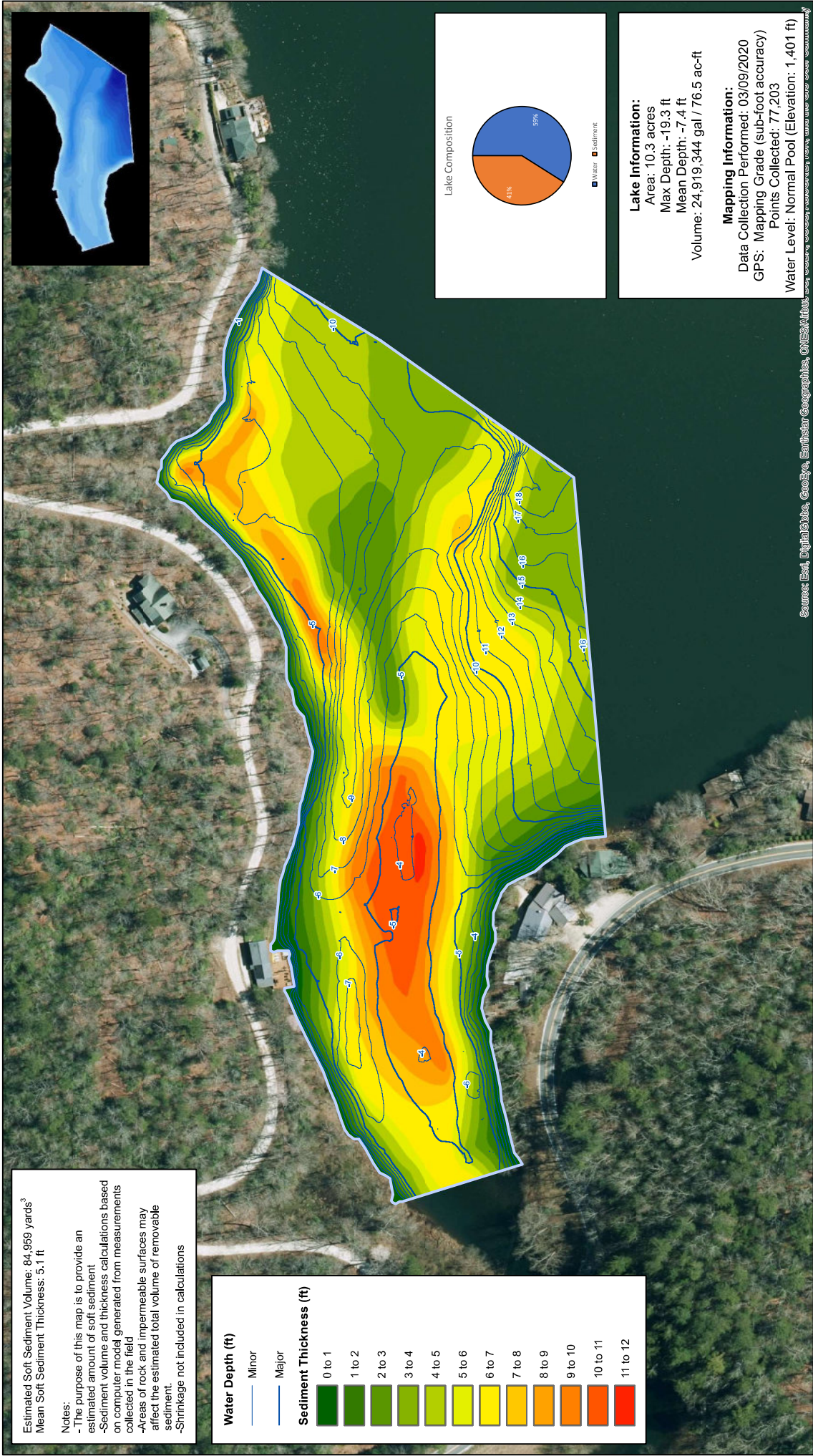
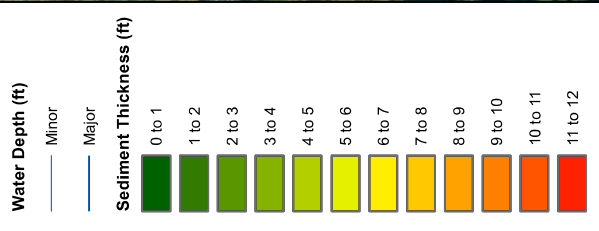
<p>Lake Tahoma Inc Parcel 2014 Lake Drawdown Survey Scope</p>	<p><b>ClearWater</b> 32 Clayton Street Asheville, North Carolina 28801</p>	<p>McDowell County, North Carolina</p>
---	--	--



Estimated Soft Sediment Volume: 84,959 yards<sup>3</sup>  
Mean Soft Sediment Thickness: 5.1 ft

Notes:

- The purpose of this map is to provide an estimated amount of soft sediment
- Sediment volume and thickness calculations based on computer model generated from measurements collected in the field
- Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.
- Shrinkage not included in calculations

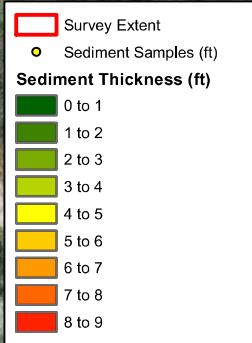


**Lake Information:**  
Area: 10.3 acres  
Max Depth: -19.3 ft  
Mean Depth: -7.4 ft  
Volume: 24,919,344 gal / 76.5 ac-ft

**Mapping Information:**  
Data Collection Performed: 03/09/2020  
GPS: Mapping Grade (sub-foot accuracy)  
Points Collected: 77,203  
Water Level: Normal Pool (Elevation: 1,401 ft)

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus, USDA, AeroGRID, IGN, SIA, USGS Earth Resource

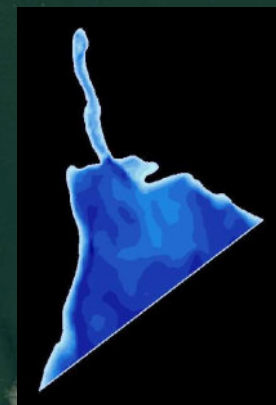
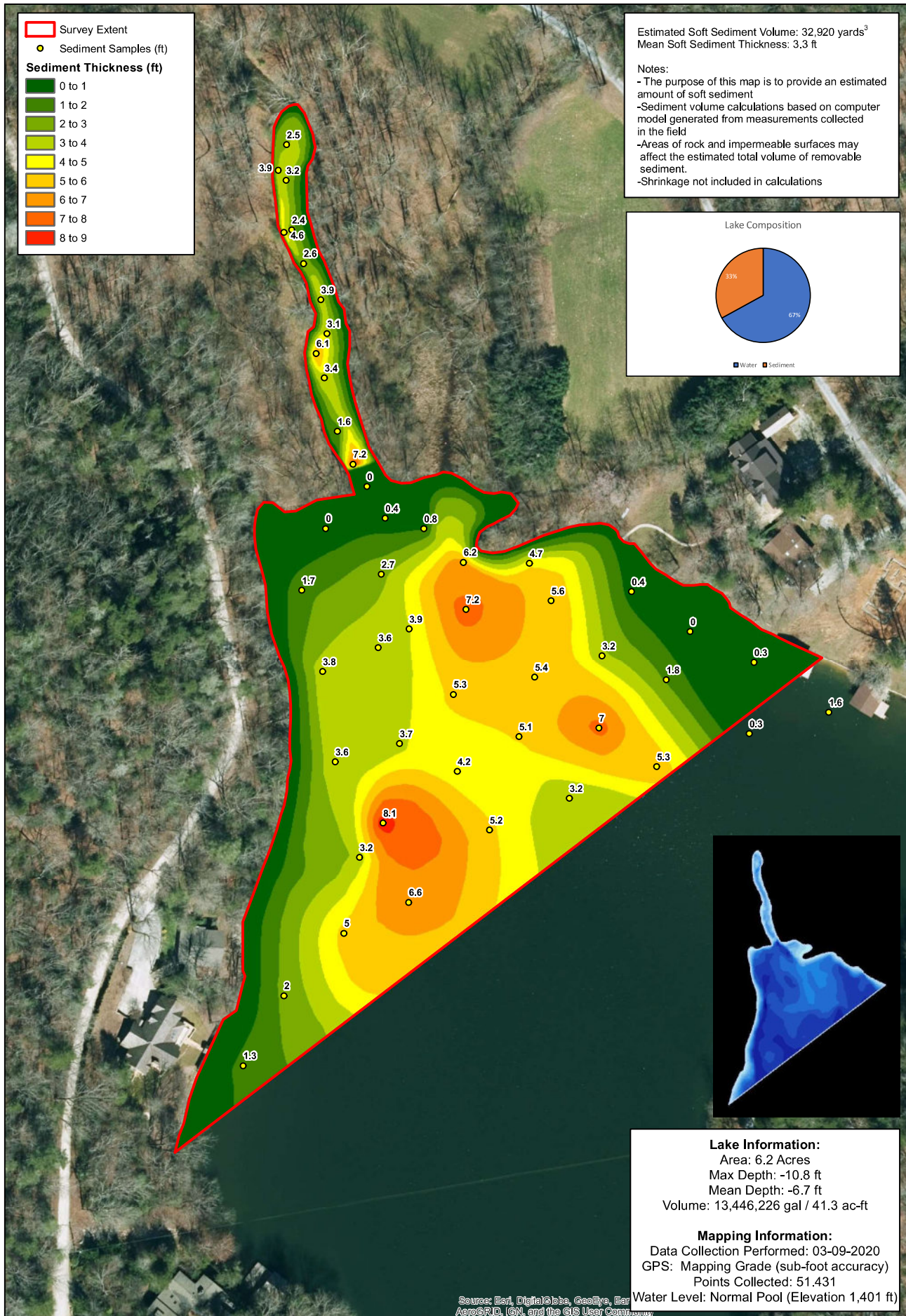
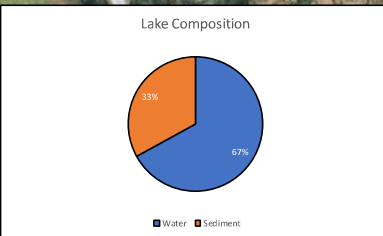




Estimated Soft Sediment Volume: 32,920 yards<sup>3</sup>  
 Mean Soft Sediment Thickness: 3.3 ft

**Notes:**

- The purpose of this map is to provide an estimated amount of soft sediment
- Sediment volume calculations based on computer model generated from measurements collected in the field
- Areas of rock and impermeable surfaces may affect the estimated total volume of removable sediment.
- Shrinkage not included in calculations



**Lake Information:**  
 Area: 6.2 Acres  
 Max Depth: -10.8 ft  
 Mean Depth: -6.7 ft  
 Volume: 13,446,226 gal / 41.3 ac-ft

**Mapping Information:**  
 Data Collection Performed: 03-09-2020  
 GPS: Mapping Grade (sub-foot accuracy)  
 Points Collected: 51.431  
 Water Level: Normal Pool (Elevation 1,401 ft)

Source: Esri, DigitalGlobe, GeoEye, Earthstar, GeoEye, IGN, and the GIS User Community