MY0 FINAL MONITORING REPORT

PIERCE TERRACE WETLAND MITIGATION SITE

Gates County, North Carolina
Chowan River Basin
Cataloging Unit 03010203 & 03010204

DMS Project No. 100139
Full Delivery Contract No. 7907-01
DMS RFP No. 16-007907 (issued 5/6/2019)
USACE Action ID No. SAW-2020-00046
DWR Project No. 2020-0034

Data Collection: January 2023–March 2023
Submission: April 2023

Prepared for:

NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF MITIGATION SERVICES
1652 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1652

Mitigation Services
ENVIRONMENTAL QUALITY

Restoration Systems, LLC
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Response to DMS Comments

Pierce Terrace, Project ID #100139, DMS Contract #7907-01
USACE Action ID No. SAW-2020-00046
DWR Project No. 2020-00034
Chowan River Basin 03010203 & 03010204, Gates County
DMS Reviewers: Jeremiah Dow and Jeff Horton

Comments Received (Black Text) & Responses (Blue Text)
Report Comments:

1. Table 1 – Please clarify whether RS wishes to update the project credits to the as-built credit amount, which will require IRT approval through a mitigation plan amendment, or update the credit column with approved mitigation plan credits. Due to the size of the change from mit plan to MY0, changing the non-riparian creation from 5.670 acres to 3.792 acres would also require a mit plan amendment since this is a significant change (in area if not credits). If monitoring is still planned for GW gauge 57, we would recommend restoring the creation area polygon and updating Table 1 accordingly.
   RS is requesting to update project credits to the as-built credit amount. A mitigation plan amendment is included with this response. Since no work was performed in the area of GW gauge 57, we propose to relocate this gauge to Merchant's Millpond State Park to be used as a reference gauge in the location of the reference gauge for the Hofler Mitigation Site. Completed.

2. Section 2 – Recommend adding a brief discussion here of any changes in acreage between mitigation plan and as-built.
   Discussion has been added to Section 2.0 to note changes in acreage between the mitigation plan and as-built.

3. Table C – number of GW gauges and veg plots differ from the amount stated in Sections 4.1 & 4.2, and the CCPV. Please correct.
   Table C has been updated with the correct count of gauges and vegetation plots.

4. CCPV – Please differentiate re-establishment areas with 10% versus 12% hydroperiod success criteria.
   The CCPV has been updated to differentiate between non-riverine wet hardwood forest and non-riverine swamp forest re-establishment areas.

5. We recommend indicating on hydrographs whether it was in a 10% or 12% hydroperiod area, and please indicate that on all future monitoring report graphs as well.
   Hydrographs have been updated to include the appropriate percent hydroperiod success and will be shown on future monitoring reports.

As-Built/Record Drawings:

6. Sheet AB-03 – Similar to the CCPV, recommend differentiating non-riverine wet hardwood forest from non-riverine swamp forest on this map.
   Sheet AB-03 has been updated to differentiate between non-riverine wet hardwood forest and non-riverine swamp forest re-establishment areas.

7. Sheet AB-06 – Recommend a red callout for the wetland creation area around GW gauge 57 indicating that the area was not graded as planned because the fill material was not needed during construction.
   Sheet AB-06 has been updated to remove GW gauge 57 and note that the area is no longer proposed for wetland creation as no borrow material was excavated from this area.

8. Sheet AB-12 – Recommend a callout indicating that log cross vane was not surveyed but was built as proposed.

The log cross vane was surveyed and is shown on Sheet AB-12 but is partially obscured by the rock outlet protection symbology. A call out has been added for the log cross vane.

Digital Files:

9. The wetland assets attribute table lists all three wetland tracts as Non-riverine Swamp Forest; however, the Table A. Success Criteria indicates a 10% hydrology standard for Non-Riverine Wet Hardwood Forest assets and a 12% standard for Swamp Forest wetlands. Please indicate which of the tracts is a Hardwood flat or other NC WAM type associated with the 10% wetland standard.
The wetland assets shapefile and attribute table has been modified to align with the non-riverine wet hardwood forest and non-riverine swamp forest assets.

Boundary Inspection Action Items:

10. Repair all witness and online marking where indicated on the attached KML map.
All witness and online markings noted are scheduled to be repaired and will be documented in the MY1 report.

11. Add improved marking to the western side of the project to stop the farm scalloping and damage to the conservation area. Coordinate with landowner and install any supplemental marking necessary to prevent scallop mowing.
The western boundary will be marked with 4 x 4 treated post with signage this summer and documented in the MY1 report. A phone call discussion with the farmer took place on May 15, 2023 to reiterate that no disturbance is allowed within the conservation easement.

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APPENDICES

1 PROJECT SUMMARY

Restoration Systems, LLC has established the North Carolina Division of Mitigation Services (NCDMS) Pierce Terrace Wetland Mitigation Site (Site). Located in the Chowan River Basin, cataloguing unit **03010203** & **03010204**, the Site is in Targeted Local Watershed (TLW) **03010203040040** of the South Atlantic/Gulf Region (NCDWQ sub-basin number 03-01-01). The Site is not located in a Local Watershed Plan (LWP), Regional Watershed Plan (RWP), or Targeted Resource Area (TRA); however, project activities address priorities associated with the 2009 *Chowan River Basin Restoration Priorities* report.

1.1 Project Background, Components, and Structure

The Site is located approximately 2 miles west of Sunbury, 5 miles northeast of Gatesville, and immediately south and east of Merchant Millpond State Park (MMSP). Mitigation work within the Site included 1) wetland creation totaling 3.792 acres, and 2) wetland reestablishment totaling 108.016 acres. The site is expected to provide 109.280 wetland credits by closeout (Table 1, Page 2). A conservation easement was granted to the State of North Carolina and recorded at the Gates County Register of Deeds on November 17, 2020.

Before construction, the Site was characterized by agriculture row crop production for over 80 years. Typical crop rotation for the last decade has been a winter wheat with cotton, soybeans, and/or corn. Adjacent land management activities include silviculture and agriculture practices. Site design was completed in June 2022. Construction started on July 19, 2022 and ended with final walkthrough on August 29, 2022. The Site was planted March 1-3, 2023. Completed project activities, reporting history, completion dates, and project contacts are summarized in Tables 8–9 (Appendix D).

Table 1. Pierce Terrace Mitigation Site (ID-100139) Project Mitigation Quantities and Credits

Project Segment	Original Mitigation Plan Ft/Ac	As-Built Ft/Ac	Original Mitigation Category	Original Restoration Level	Original Mitigation Ratio (X:1)	Credits		Comments
Wetland								
Non-riparian Re-establishment I	86.706	87.868	NR	REE	1.00000	87.868		
Non-riparian Re-establishment II	19.805	20.148	NR	REE	1.00000	20.148		
Non-riparian Creation	5.670	3.792	NR	C	3.00000	1.264		
					Total:	**109.280**		

Project Credits

	Stream			Riparian	Non-Rip	Coastal
Restoration Level	Warm	Cool	Cold	Wetland	Wetland	Marsh
Restoration				0.000	0.000	0.000
Re-establishment				0.000	108.016	0.000
Rehabilitation				0.000	0.000	0.000
Enhancement				0.000	0.000	0.000
Enhancement I						
Enhancement II						
Creation				0.000	1.264	0.000
Preservation				0.000	0.000	
Totals	**0.000**	**0.000**	**0.000**	**0.000**	**109.280**	**0.000**
Total Wetland Credit	**109.280**					

Wetland Mitigation Category

CM	Coastal Marsh
R	Riparian
NR	Non-Riparian

Restoration Level

P	Preservation
E	Wetland Enhancement - Veg and Hydro
EII	Stream Enhancement II
EI	Stream Enhancement I
C	Wetland Creation
RH	Wetland Rehabilitation - Veg and Hydro
REE	Wetland Re-establishment Veg and Hydro
R	Restoration

Table 2. Summary: Goals, Performance, and Results

Goals	Objectives	Success Criteria
(1) HYDROLOGY		
- Minimize downstream flooding to the maximum extent possible.	- Fill and plug agriculture ditches to restore jurisdictional hydrology - Cease row crop production within the easement - Shallow disking (~4") of soils within the entire Site to reduce compaction and increase surface roughness - Plant native woody vegetation - Protect the Site with a perpetual conservation easement	- Row crop production ceased within the easement - Monitoring wells will be successful if the water table is within 12 inches of the soil surface for 10-12% of the growing season - Vegetation plots will be successful if the plant density is 210 stems per acre with an average plant height of 10 feet at 7 years following planting - Conservation Easement recorded
(1) WATER QUALITY		
- Remove direct nutrient and pollutant inputs from the Site	- Reduce agricultural land/inputs - Fill and plug the ditch network to restore ground and surface hydrology within the Site - Plant woody vegetation - Restore jurisdictional wetlands	- Row crop production ceased within the easement - Monitoring wells will be successful if the water table is within 12 inches of the soil surface for 10-12% of the growing season - Vegetation plots will be successful if the plant density is 210 stems per acre with an average plant height of 10 feet at 7 years following planting
(1) HABITAT		
- Improve wildlife habitat within and adjacent to the Site	- Plant woody native vegetation to provide organic matter and shade - Fill and plug ditches to provide groundwater hydrology - Add woody debris material throughout Site for habitat - Protect the Site with perpetual conservation easement - Restore jurisdictional wetlands	- Monitoring wells will be successful if the water table is within 12 inches of the soil surface for 10-12% of the growing season - Vegetation plots will be successful if the plant density is stems per acre with an average plant height of 10 feet at 7 years following planting - Conservation Easement recorded

Table 3. Project Attribute Table			
Project Information			
Project Name	Pierce Terrace Wetland Restoration Site		
Project County	Gates County, North Carolina		
Project Area (acres)	125.74		
Project Coordinates (latitude & latitude)	36.431500°N, 76.649894°W		
Planted Area (acres)	125.74		
Project Watershed Summary Information			
Physiographic Province	Middle Atlantic Coastal Plain		
Project River Basin	Chowan		
USGS HUC for Project (14-digit)	03010203040040		
NCDWR Sub-basin for Project	03-01-01		
Project Drainage Area (acres)	NA		
Percentage of Project Drainage Area that is Impervious	NA		
CGIA Land Use Classification	Cultivated		
Wetland Summary Information			
Parameters	**Wetland 1**	**Wetland 2**	**Wetland 3**
Pre-project (acres)	0	0	0
Post-project (acres)	87.868	20.148	3.792
Wetland Type	Non-riparian		
Mapped Soil Series	Bladen, Craven, Goldsboro, Lenoir, Pantego		
Drainage Class	Poorly drained, Moderately well drained Poorly drained, Somewhat poorly drained, Very poorly drained		
Hydric Soil Status	Hydric, Non-hydric with inclusions, Non-hydric with inclusions, Non-hydric with inclusions, Hydric		
Source of Hydrology	Precipitation, surface water run-on		
Hydrologic Impairment	Ditched and drained		
Native Vegetation Community	Non-riverine Wet Hardwood & Swamp Forest		
% Composition of Exotic Invasive Vegetation	0%		
Restoration Method	Hydrologic, vegetative		
Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States-Section 401	Yes	Yes	PJD package (Mitigation Plan App D)
Waters of the United States-Section 404	Yes	Yes	PJD package (Mitigation Plan App D)
Endangered Species Act	Yes	Yes	CE Document (Mitigation Plan App E)
Historic Preservation Act	No	--	CE Document (Mitigation Plan App E)
Coastal Zone Management Act	No	--	CE Document (Mitigation Plan App E)
FEMA Floodplain Compliance	No	--	CE Document (Mitigation Plan App E)
Essential Fisheries Habitat	No	--	NA

1.2 Success Criteria

Criteria for monitoring and success of stream restoration should relate to project goals and objectives identified from on-site NC WAM data collection. From a mitigation perspective, several of the goals and objectives are assumed to be functionally elevated by restoration activities without direct measurement. Other goals and objectives will be considered successful upon achieving success criteria. The following table summarizes Site success criteria.

Table A. Success Criteria

Wetland Hydrology
• Non-riverine Wet Hardwood Forest – Saturation or inundation within the upper 12 inches of the soil surface for, at a minimum, 10 percent of the growing season, during average climatic conditions based on the *Wilmington District Stream and Wetland Compensatory Mitigation Update* (USACE 2016), Table 1, for a *Typic Albaquult* (Bladen). • Non-riverine Swamp Forest – Saturation or inundation within the upper 12 inches of the soil surface for, at a minimum, 12 percent of the growing season, during average climatic conditions based on the *Wilmington District Stream and Wetland Compensatory Mitigation Update* (USACE 2016), Table 1, for a *Umbric Paleaquult* (Pantego).
Vegetation
• Within planted portions of the Site, a minimum of 320 stems per acre must be present at year 3; a minimum of 260 stems per acre must be present at year 5; and a minimum of 210 stems per acre must be present at year 7. • Trees must average 7 feet in height at year 5, and 10 feet in height at year 7 in each plot[1]. • Planted and volunteer stems are counted, provided they are included in the approved planting list for the Site; natural recruits not on the planting list may be considered by the IRT on a case-by-case basis. • Any single species can only account for 50% of the required stems within any vegetation plot.

[1]Understory/shrub species will be exempt from the vigor performance standard.

2 AS-BUILT CONDITION (BASELINE)

Construction started on July 19, 2022 and ended within a final walkthrough on August 29, 2022. The Site was planted on March 1-3, 2023. As-built and MY0 data collection occurred in March 2023.

During the construction of the Site some adjustments were made to the wetland creation and re-establishment areas due to the amount of fill material required to fill the existing ditch network. A sealed half-size set of record drawings are provided in Appendix E, which includes the post-construction survey and monitoring features. These include redlines for the field adjustments made during construction that differ from the design plans.

As-built adjustments from the approved mitigation plan from review of digital files.

- The conservation easement increased from 125.73 acres to 125.74 acres as the result of using an old GIS shapefile rather than the easement boundary from the map of record.
- The incorrect GIS conservation easement shapefile coupled with an existing ditch alignment paralleling the conservation easement resulted in the wetland re-establishment boundary being proposed not as intended. The intent was for the wetland re-establishment boundary to abut the conservation easement around the Hofler mitigation site. Adjusting the wetland re-establishment boundary results in an overall increase from 106.511 acres to 106.588 acres.

As-built wetland asset adjustments from the approved mitigation plan following construction.

- Less fill material was needed to fill the existing ditch network. So, the wetland creation area decreased from 5.670 acres to 3.792 acres, resulting in a decrease of wetland creation credits from 1.890 WMUs to 1.264 WMUs.
- As a result of the wetland creation area being reduced there was an opportunity to slightly expand the Non-riparian Re-establishment I area where drained hydric soils were observed. The Non-riparian Re-establishment I area increased from 86.783 acres to 87.868 acres.
- The area associated with Non-riparian Re-establishment II increased from 19.805 acres to 20.148 acres as field observations of the soil surface roughening performed during construction will support wetland hydrology between the original wetland re-establishment boundary and conservation easement along Silver Springs Road.
- The total wetland re-establishment area increased from 106.588 acres to 108.016 acres, resulting in an increase of wetland re-establishment credits from 106.588 WMUs to 108.016 WMUs.
- As a result of the reduction of the wetland creation area groundwater gauge 57 is being relocated to a reference wetland in MMSP (location is shown on Figure 2 [Appendix A]).

Additional activities that occurred at the Site included the following.

- The Site was left fallow for a year and a cultivator was used to incorporate herbaceous organic inputs into the soil surface.
- Prior to construction *Typha spp.* (cattails) observed in ditches within the Site were treated by removing the seed heads and spraying the leaves.
- Areas around the Hofler mitigation site where soil was compacted were planted with a tuber seed mix of *Brassica rappa* (turnip) and *Raphanus sativus* (daikon) to improve soil structure and incorporate organic material into the soil.
- Coarse woody debris was randomly placed throughout the Site and consisted of ~1,500 pulpwood logs ~15 feet in length.
- One culvert within the Site used for agricultural activities and seven roadside culverts along Silver Springs were removed.
- All ditches were filled and clay plugs were installed as designed and are shown on the as-built drawings [Appendix E].
- A total of three log cross-vanes were installed, one at each of the three wetland outlets. Below the structures the outfall flow paths were graded to a stable slope and stabilized with Class B stone along with livestake plantings.
- Planting 125.74 acres of the Site with 90,700 stems and 5.67 acres at 2 lbs/acre with a permanent seed mix (planted species are included in Table 5A-B [Appendix B]).

3 PROJECT MONITORING – METHODS

Monitoring will be conducted, in accordance with 2016 NCIRT Guidelines, by Axiom Environmental, Inc. based on the schedule in the following Table B. A summary of monitoring is outlined in Table C on page 7. Annual monitoring reports will be submitted to the NCDMS by Restoration Systems no later than December 1 of each monitoring year data is collected.

Table B. Monitoring Schedule

Resource	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Wetlands	x	x	x	x	x	x	x
Vegetation	x	x	x		x		x
Visual Assessment	x	x	x	x	x	x	x
Report Submittal	x	x	x	x	x	x	x

3.1 Monitoring

The monitoring parameters are summarized in the following table.

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Table C. Monitoring Summary

Hydrology Parameters				
Parameter	**Method**	**Schedule/Frequency**	**Number/Extent**	**Data Collected/Reported**
Wetland Re-establishment and Creation	Groundwater gauges	Years 1–7 throughout the year with the growing season defined as March 26–November 12	60 gauges spread throughout restored wetlands, 2 gauges spread throughout created wetlands, and 1 gauge in a reference wetland	Groundwater/rain data for each monitoring period will be collected and reported for the growing season[1] (March 26–November 12).
	Soil profile descriptions	As-built and Years 3, 5, 7	63[3] profile descriptions, one at each groundwater gauge	Soil profile descriptions completed to assess the development of hydric soil morphologic features
Vegetation Parameters				
Parameter	**Method**	**Schedule/Frequency**	**Number/Extent**	**Data Collected/Reported**
Vegetation establishment and vigor	Permanent vegetation plots 0.0247 acre (100 square meters) in size; *CVS-EEP Protocol for Recording Vegetation, Version 4.2* (Lee et al. 2008)	As-built, Years 1, 2, 3, 5, and 7	61 plots spread across the Site	Species, height, planted vs. volunteer, stems/acre
	Annual random vegetation plots, 0.0247 acre (100 square meters) in size		20 random transects spread across the Site	Species and height
Visual Parameters				
Parameter	**Method**	**Schedule/Frequency**	**Number/Extent**	**Data Collected/Reported**
Encroachment, stabilized outfalls	Visual	Years 1–7	20 fixed photo points and Site boundary walking	Documented conditions in yearly monitoring report narrative, current condition figures, and reporting tables

[1]The growing season will begin on March 26 and end on November 12 (231 days), which is the WETS growing season based on the most recent (1992–2022) 30-year historical temperature data from the WETS weather station closest to Site (Murfreesboro, NC).

[2]During Vegetation monitoring years, three of the random transections will be located in the non-credit generation upland buffers with the remaining 17 random transects to be located in credit generating wetland assets.

[3]The profile for the original location of gauge 57 in the wetland creation area is included in the appendix, a profile for the reference gauge will be included in the MY1 report.

4 MONITORING YEAR 0 – DATA ASSESSMENT

Annual monitoring and site visits were conducted in February and March 2023 to assess the condition of the project. Wetland and vegetation criteria for the Site follow the approved success criteria presented in the Mitigation Plan and summarized in Section 1.2; monitoring methods are detailed in Section 3.1.

4.1 Hydrology Assessment

62 groundwater monitoring gauges were installed throughout the Site's wetlands and one groundwater monitoring gauge in a reference wetland at Merchants Millpond State Park. Hydrologic data will be collected and reported during MY1 (2023). Soil profiles collected at each groundwater gauge location along with pre-construction groundwater gauge data are in Appendix C.

4.2 Vegetative Assessment

The MY0 vegetative survey was completed on March 6–7, 2023. Vegetation monitoring resulted in a sitewide stem density average of 631 planted stems per acre, above the interim requirement of 320 stems per acre required at MY3. All 61 fixed vegetation plots and 20 random transects met the interim success criteria. Please refer to Appendix A for Vegetation Plot Photographs and the Vegetation Condition Assessment Table, and Appendix B for Vegetation Plot Data. No vegetation areas of concern were identified during MY0.

4.3 Monitoring Year 0 Summary

Overall, the Site looks good, is performing as intended, and is on track to meet success criteria. All vegetation plots are on track to exceed the MY3 interim requirement of 320 planted stems per acre.

5 REFERENCES

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation. Version 4.2. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, North Carolina.

North Carolina Division of Mitigation Services (NCDMS). 2014. Stream and Wetland Mitigation Monitoring Guidelines. North Carolina Department of Environmental Quality, Raleigh, North Carolina.

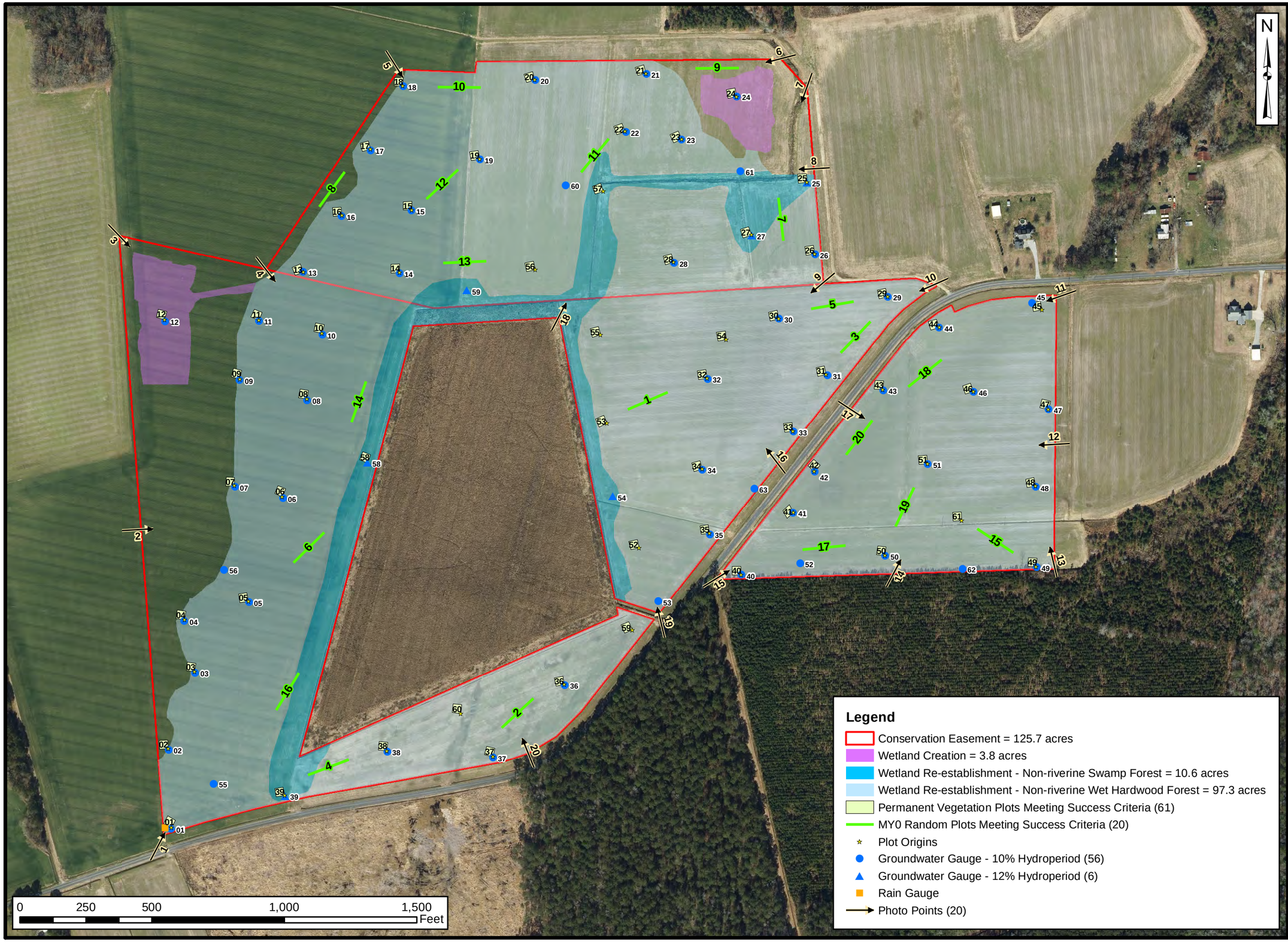
North Carolina Ecosystem Enhancement Program (NCEEP 2007). Lower Catawba River Basin Restoration Priorities 2007 (online). Available: https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Catawba_River_Basin/RBRP_2007%20Lower%20CAT_032013%20Final.pdf. North Carolina Department of Environment and Natural Resources, Raleigh (December 18, 2018).

North Carolina Stream Functional Assessment Team. (NC SFAT 2015). N.C. Stream Assessment Method (NC SAM) User Manual. Version 2.1.

North Carolina Wetland Functional Assessment Team. (NC WFAT 2010). N.C. Wetland Assessment Method (NC WAM) User Manual. Version 4.1.

Appendix A: Visual Assessment Data

Figure 1. Current Conditions Plan View
Figure 2. Reference Gauge Location
Table 4. Visual Vegetation Condition Assessment Table
Vegetation Plot Photographs
Photo Log



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

PIERCE TERRACE WETLAND MITIGATION SITE

Gates County, NC

Title:

CURRENT CONDITIONS PLAN VIEW

Drawn by: BEF

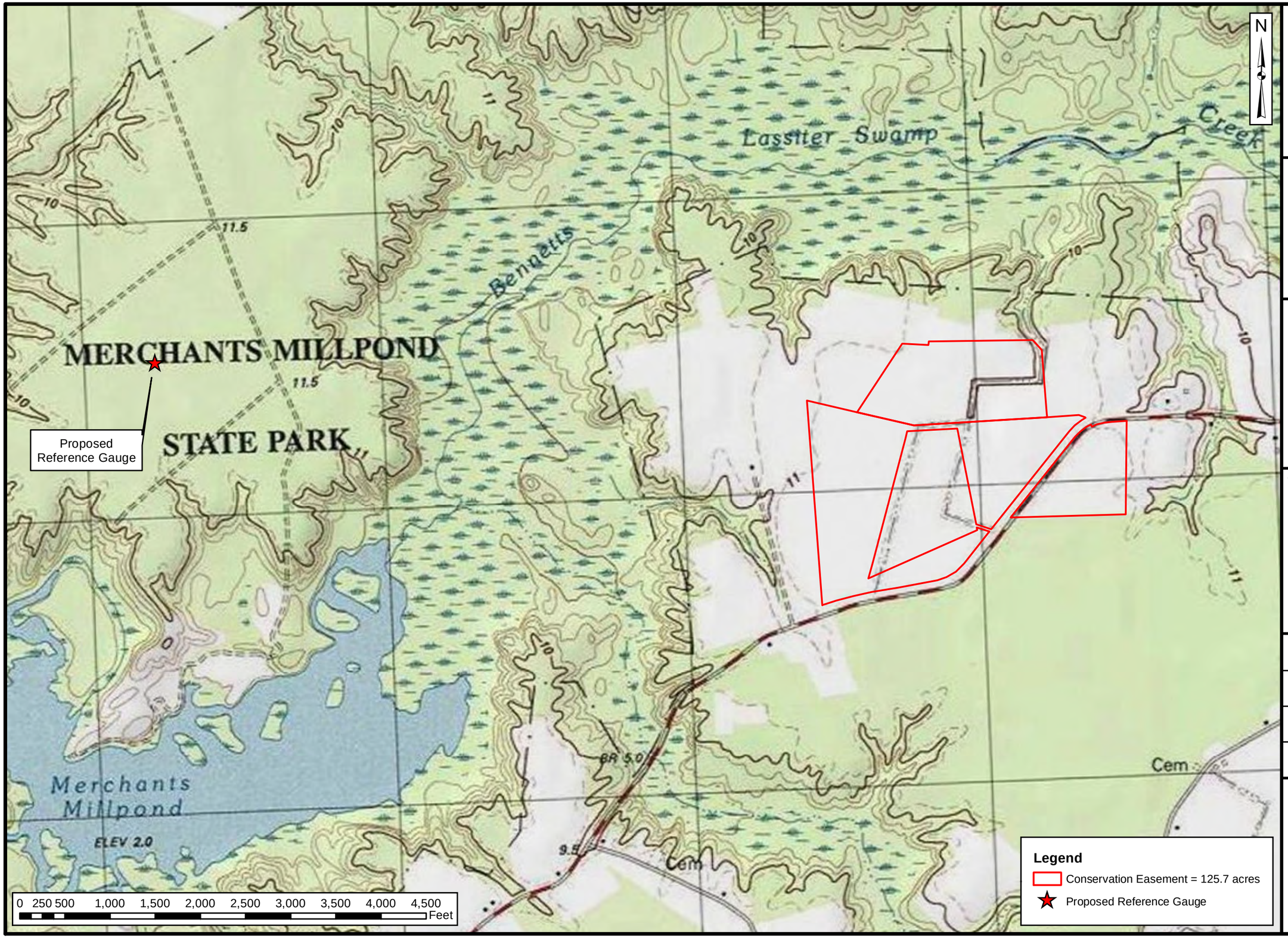
Date: JUNE 2023

Scale: 1:4000

Project No.: 22-037

FIGURE

1



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

PIERCE TERRACE WETLAND MITIGATION SITE

Gates County, NC

Title:

PROPOSED REFERENCE GAUGE LOCATION

Drawn by: BEF

Date: JUNE 2023

Scale: 1:12,000

Project No.: 22-037

FIGURE

2

Table 4. Visual Vegetation Assessment

Planted acreage **125.7**

Vegetation Category	Definitions	Mapping Threshold	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material.	0.10 acres	0.00	0.0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on current MY stem count criteria.	0.10acres	0.00	0.0%
	Total		0.00	0.0%
Areas of Poor Growth Rates	Planted areas where average height is not meeting current MY Performance Standard.	0.10 acres	0.00	0.0%
	Cumulative Total		0.00	0.0%

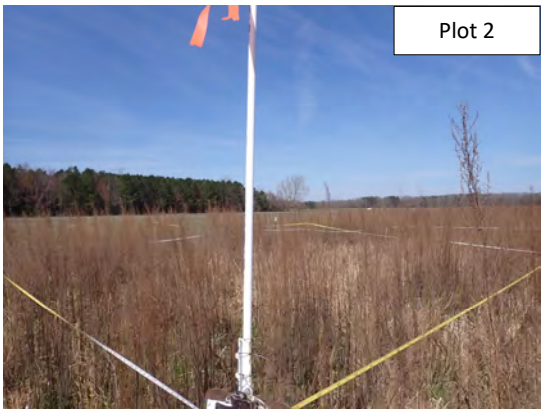
Easement Acreage **125.7**

Vegetation Category	Definitions	Mapping Threshold	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern	Invasives may occur outside of planted areas and within the easement and will therefore be calculated against the total easement acreage. Include species with the potential to directly outcompete native, young, woody stems in the short-term or community structure for existing communities. Species included in summation above should be identified in report summary.	0.10 acres	0.00	0.0%
Easement Encroachment Areas	Encroachment may be point, line, or polygon. Encroachment to be mapped consists of any violation of restrictions specified in the conservation easement. Common encroachments are mowing, cattle access, vehicular access. Encroachment has no threshold value as will need to be addressed regardless of impact area.	none	0	

Pierce Terrace Site
MY0 (2023) Vegetation Monitoring Photographs (taken March 6-7, 2023)

Plot 1

Plot 2



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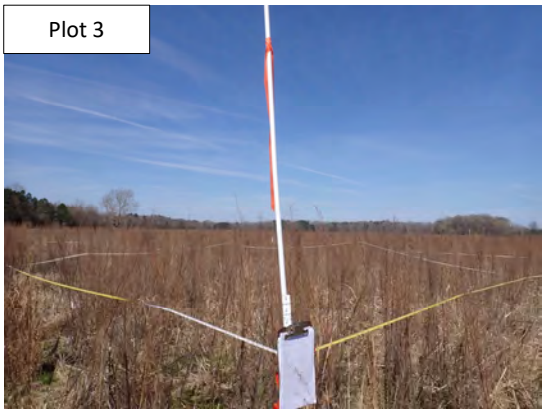

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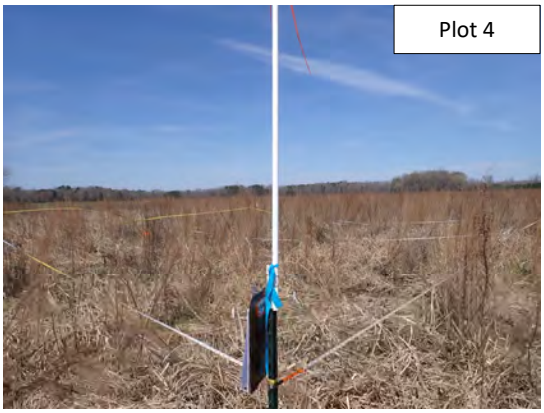
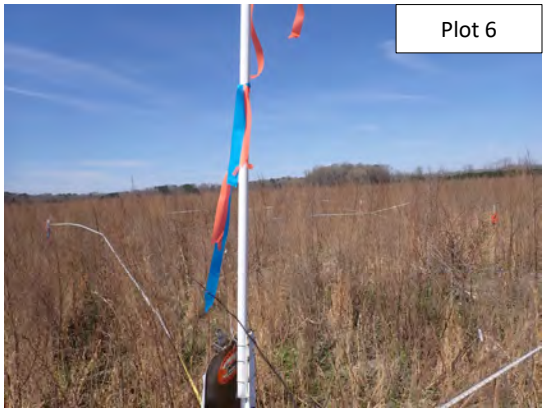


Plot 5

Plot 6



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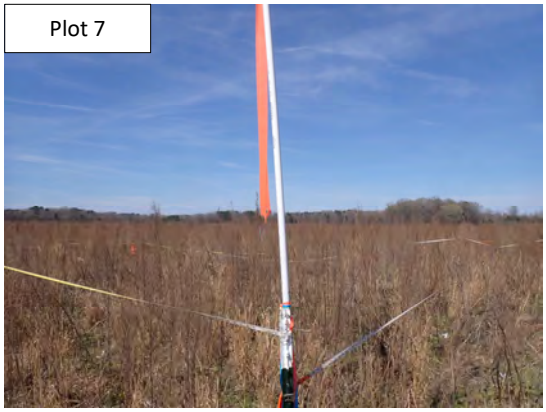
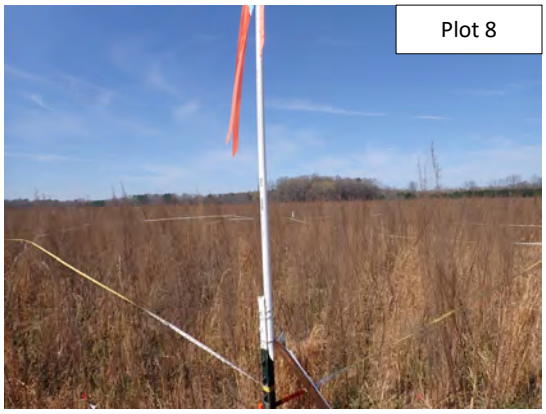
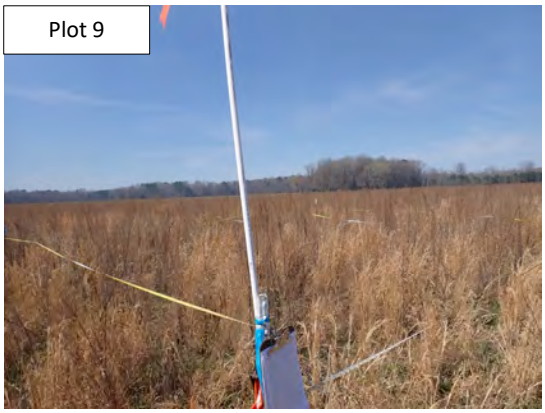


Plot 8



Pierce Terrace Site
MY0 (2023) Vegetation Monitoring Photographs (taken March 6-7, 2023)

Plot 9



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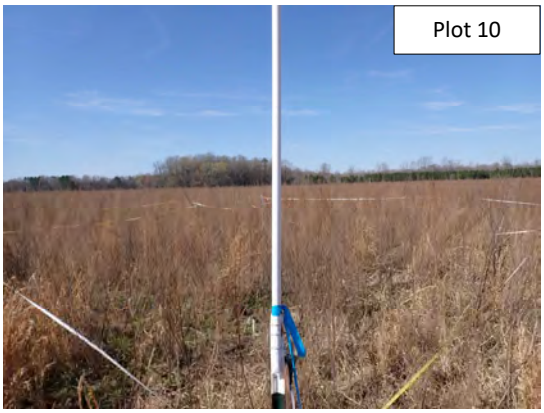

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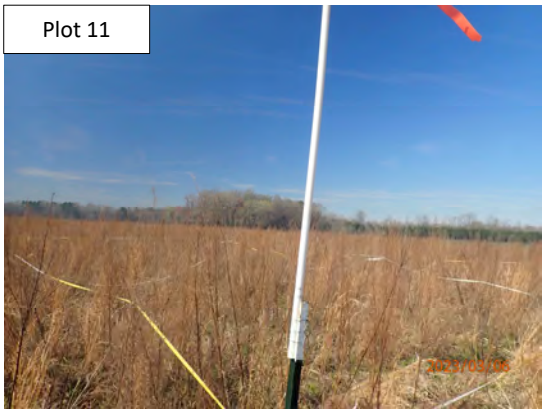

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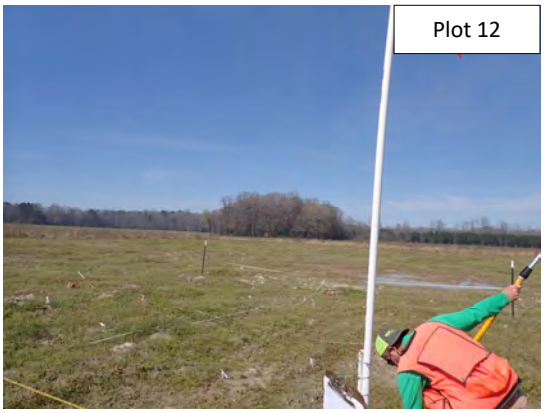

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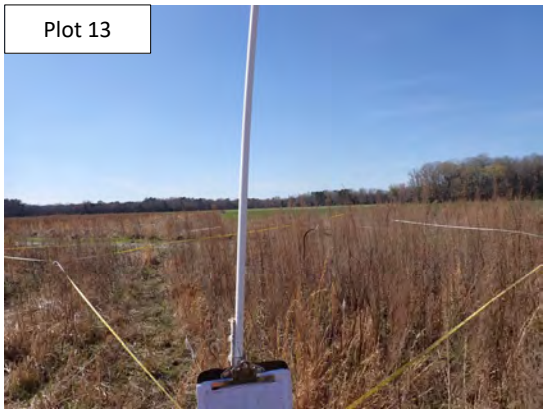

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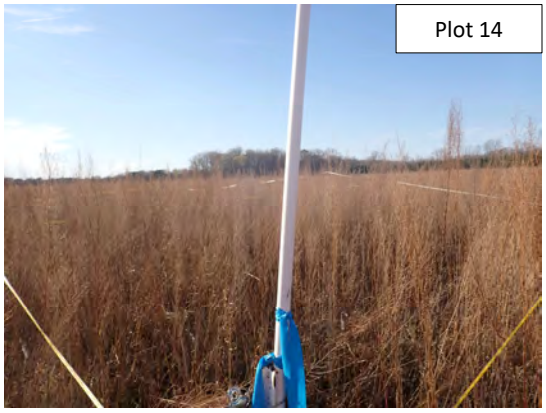

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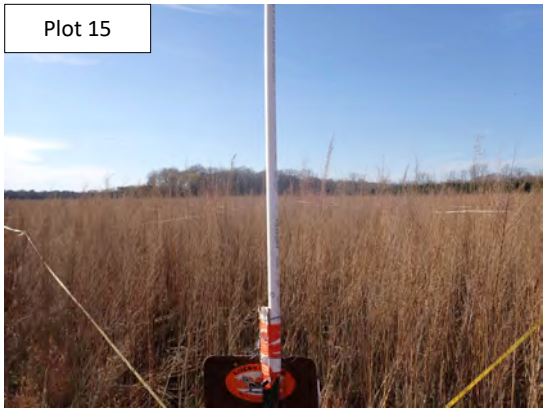

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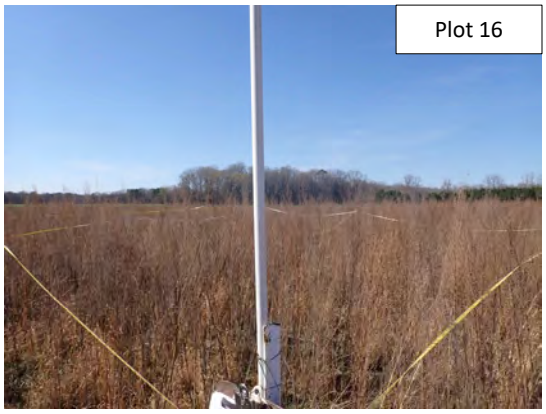

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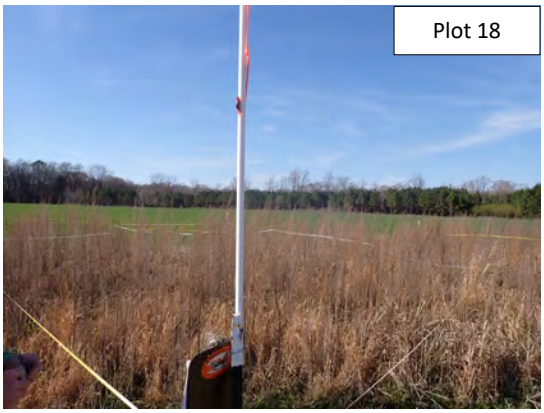
Plot 17

Plot 18



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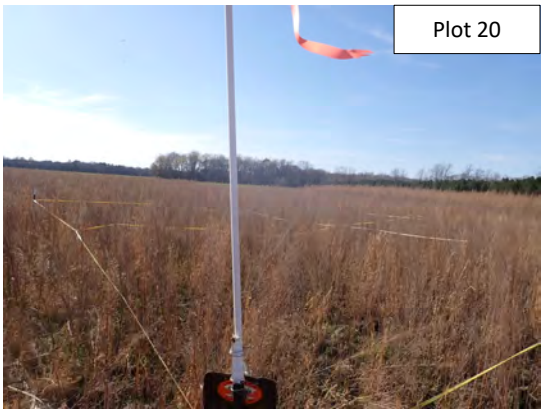

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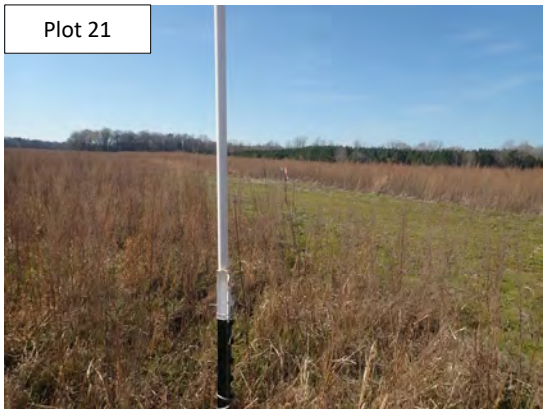

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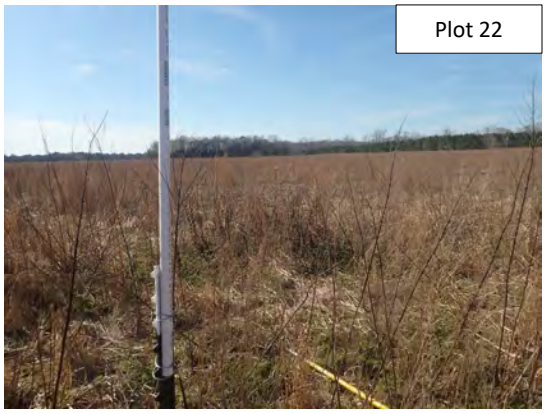

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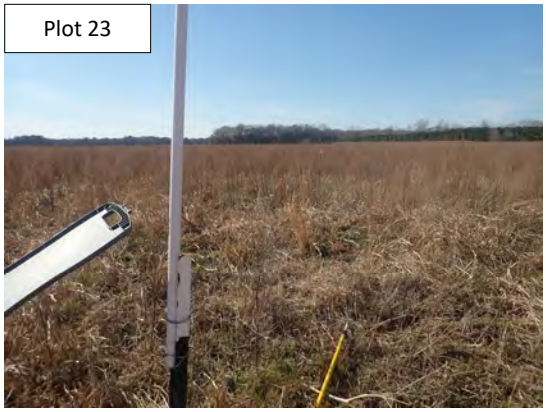

Plot 24

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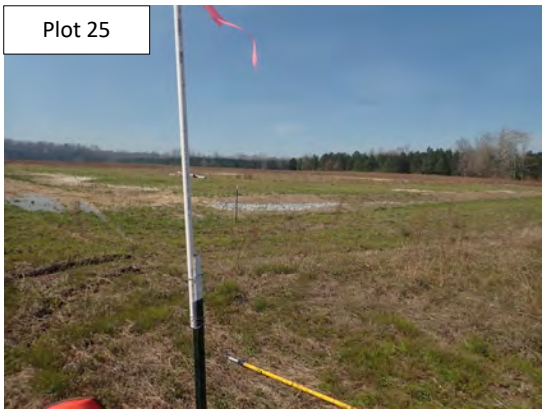
Plot 25



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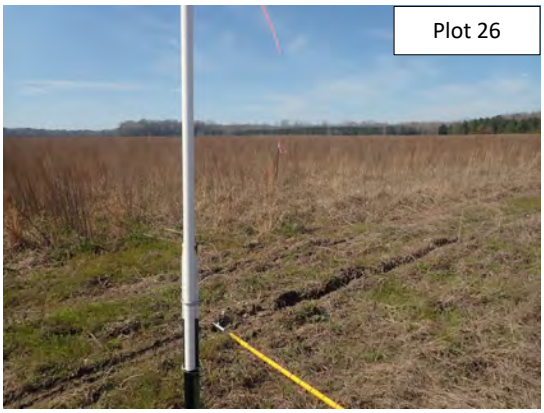

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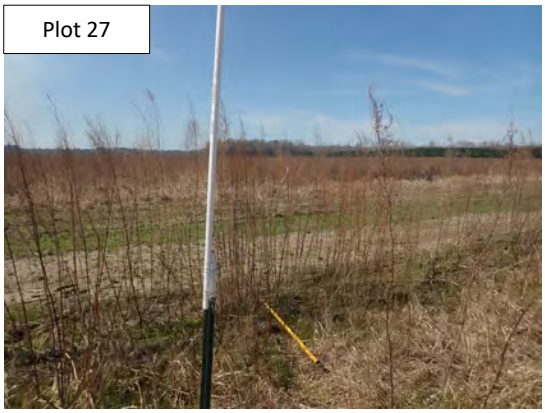

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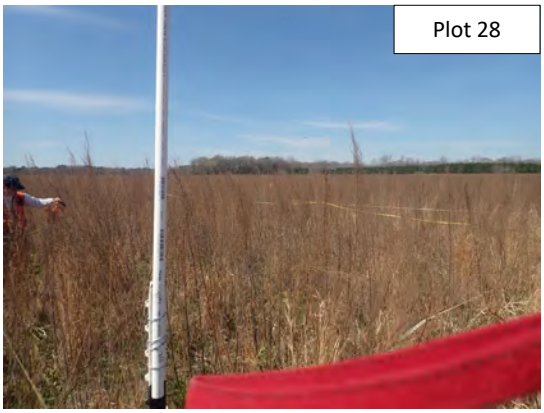

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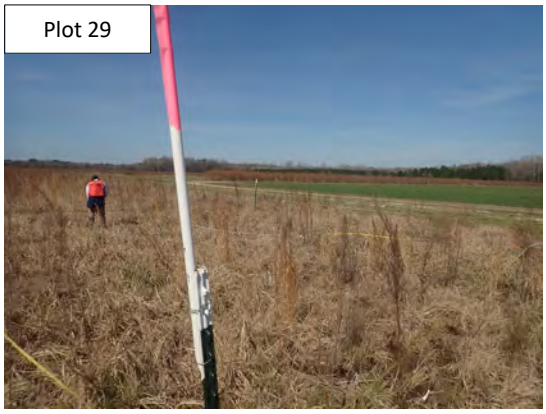

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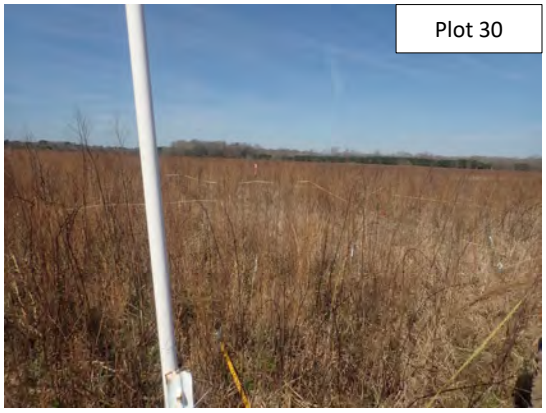

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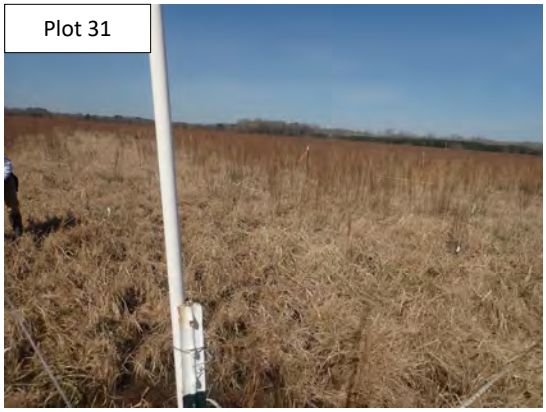

Plot 32

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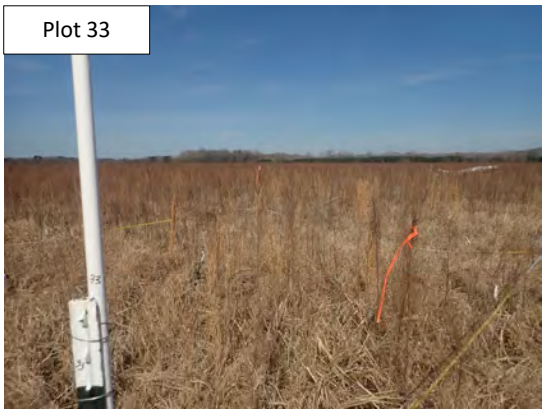
Plot 33



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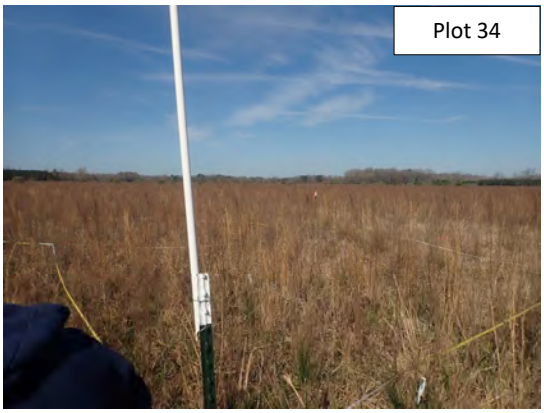

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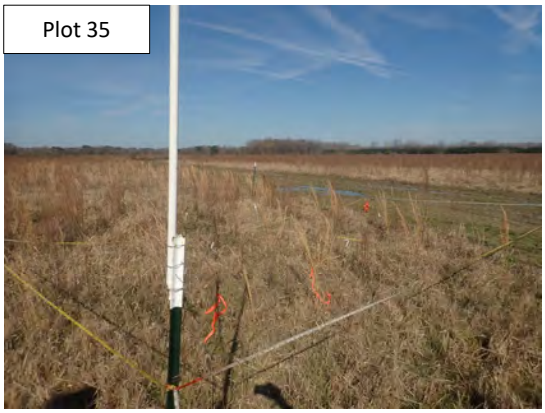

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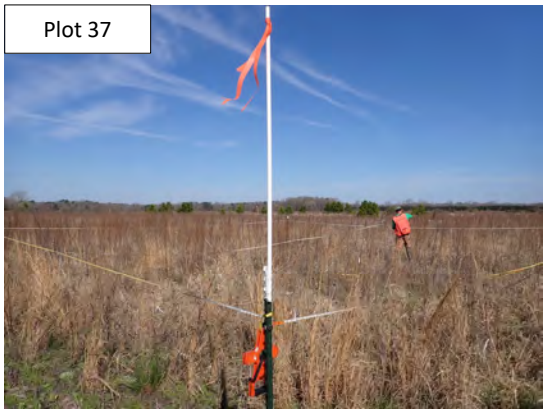
Plot 37



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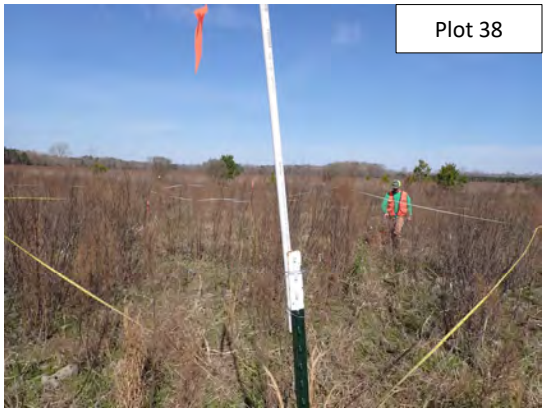

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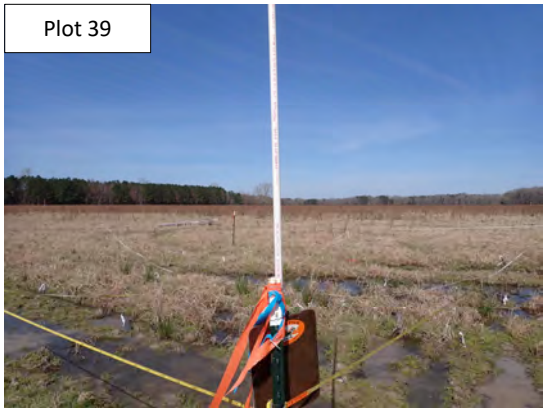

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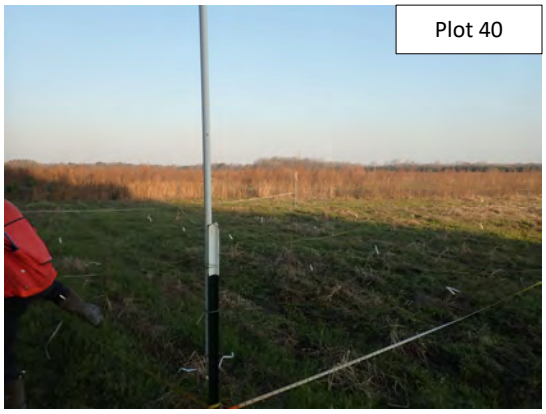

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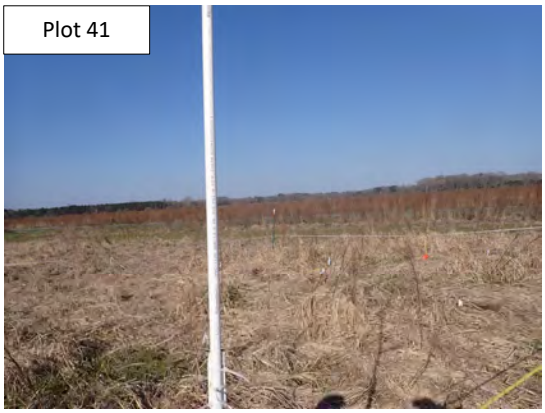
Plot 41



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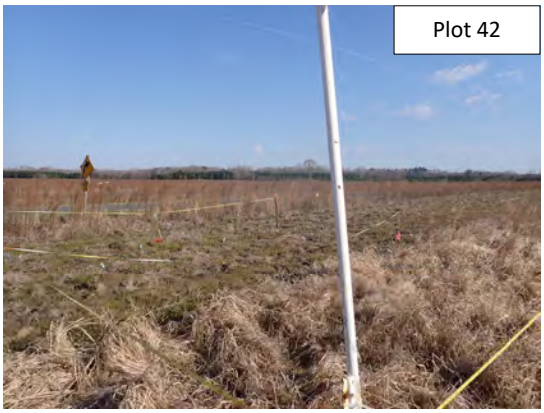

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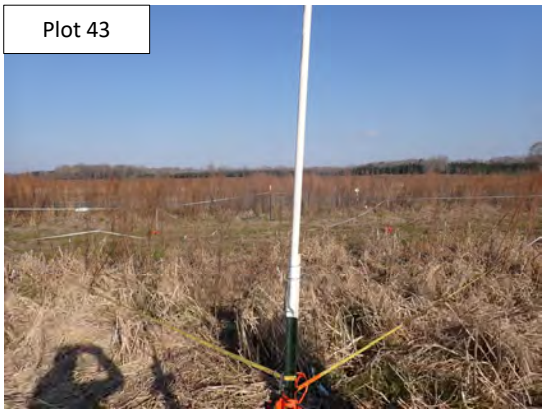

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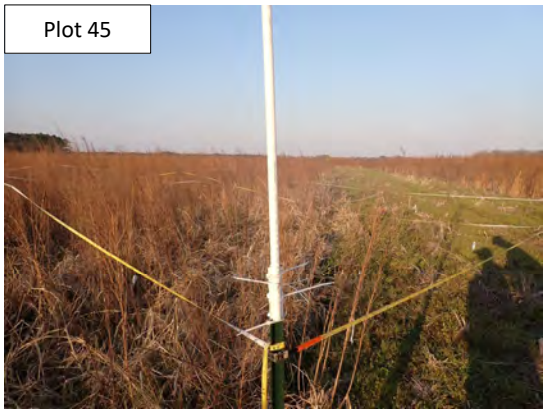

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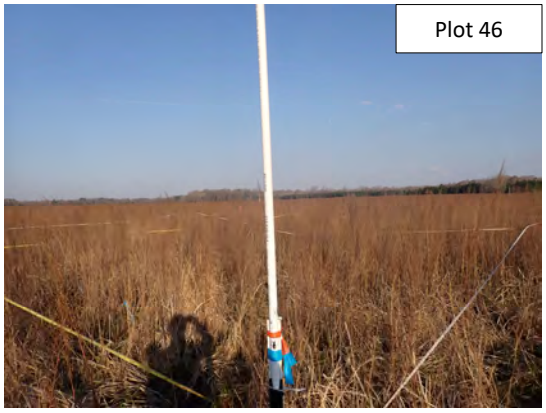

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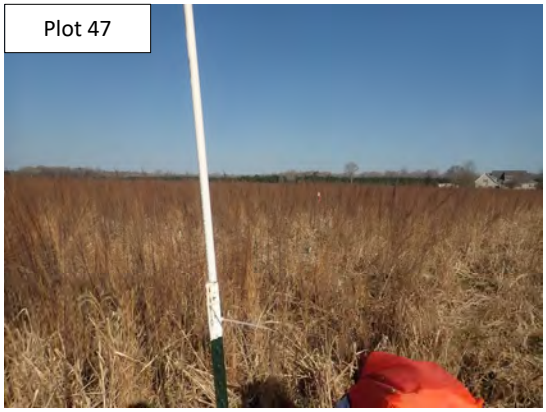

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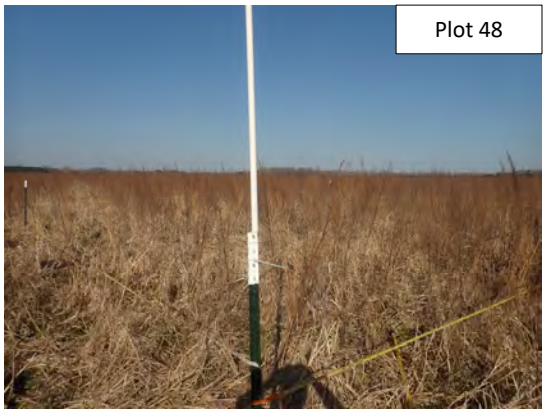

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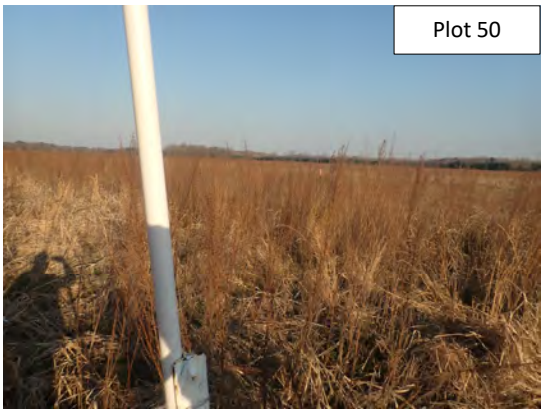
Plot 49

Plot 50



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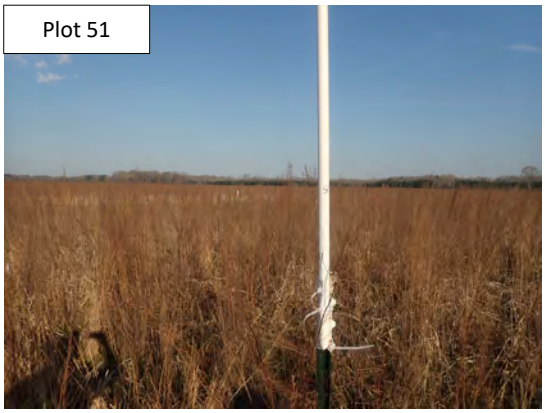

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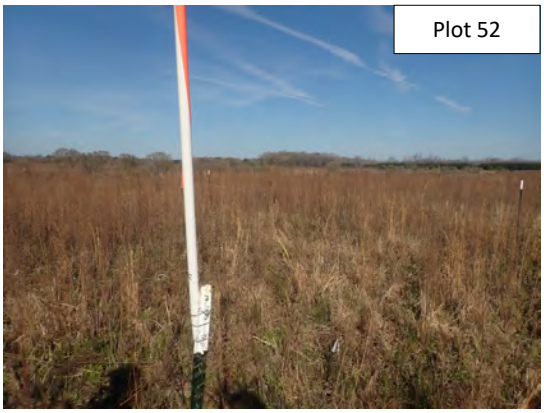
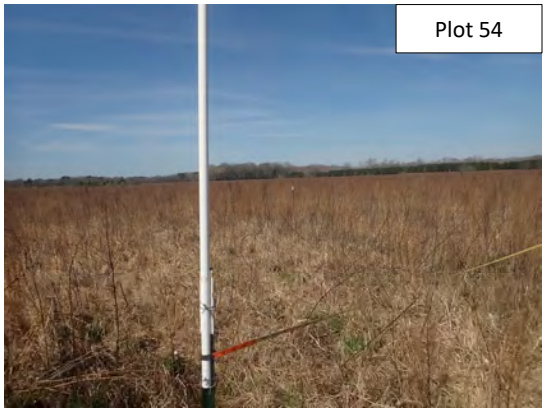


Plot 53

Plot 54



Plot 55

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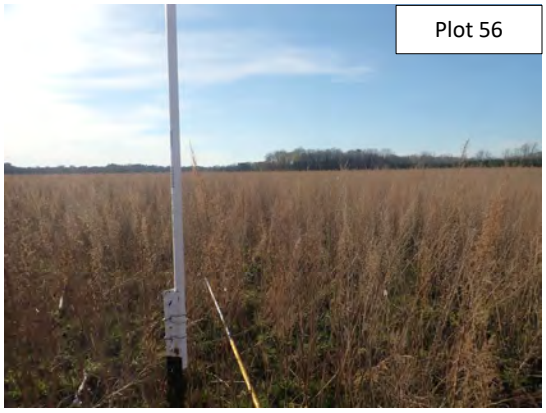

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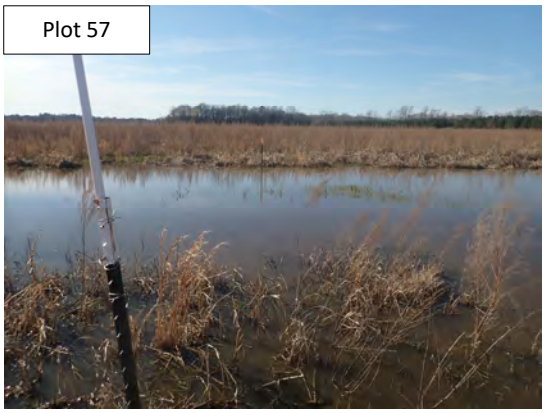
Plot 57



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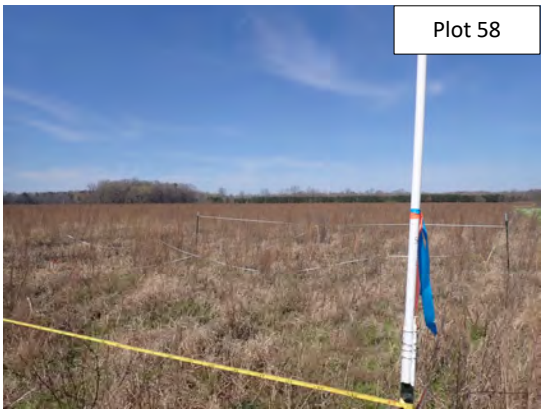

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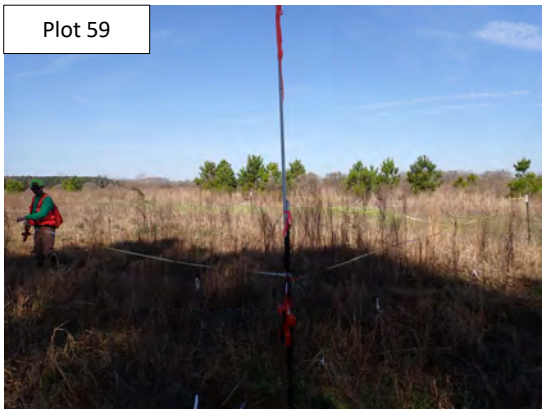

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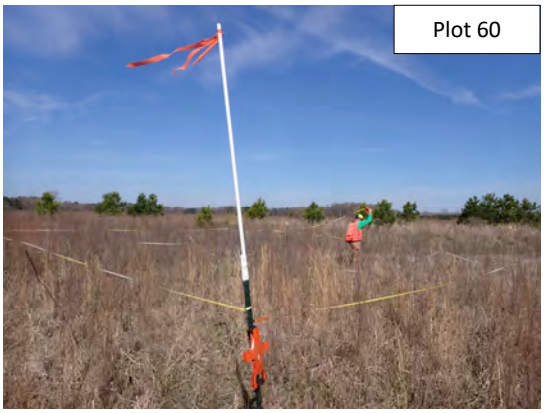
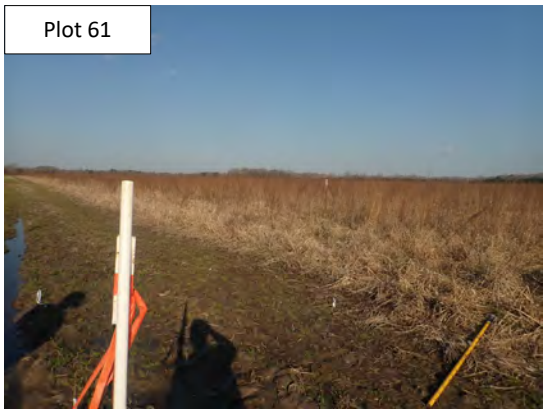


Plot 61



Pierce Terrace Site
MY0 (2023) Vegetation Monitoring Photographs (taken March 6-7, 2023)

Random Transect 1

Random Transect 2

Random Transect 3

Random Transect 4

Random Transect 5

Random Transect 6

Random Transect 7

Random Transect 8

Pierce Terrace Site
MY0 (2023) Vegetation Monitoring Photographs (taken March 6-7, 2023)

Random Transect 9

Random Transect 10

Random Transect 11

Random Transect 12

Random Transect 13

Random Transect 14

Random Transect 15

Random Transect 16

Pierce Terrace Site
MY0 (2023) Vegetation Monitoring Photographs (taken March 6-7, 2023)

Random Transect 17

Random Transect 18

Random Transect 19

Random Transect 20

Pierce Terrace Site
MY0 (2023) Vegetation Monitoring Photographs (taken March 6-7, 2023)

Photo Point 1

Photo Point 2

Photo Point 3

Photo Point 4

Photo Point 5

Photo Point 6

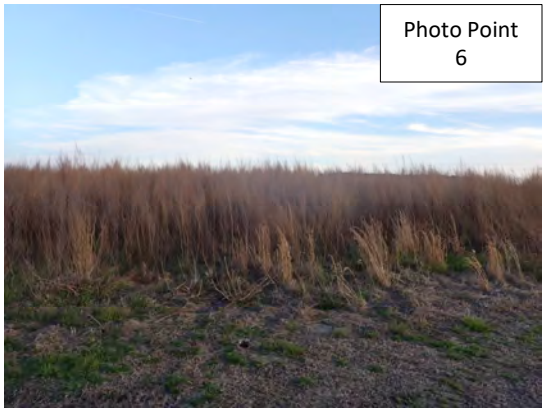


Photo Point 7

Photo Point 8

Pierce Terrace Site
MY0 (2023) Vegetation Monitoring Photographs (taken March 6-7, 2023)

Photo Point 9

Photo Point 10

Photo Point 11

Photo Point 12

Photo Point 13

Photo Point 14

Photo Point 15

Photo Point 16

Pierce Terrace Site
MY0 (2023) Vegetation Monitoring Photographs (taken March 6-7, 2023)

Photo Point 17

Photo Point 18

Photo Point 19

Photo Point 20

Appendix B: Vegetation Data

Table 5A. Planted Bare-Root Woody Vegetation
Table 5B. Permanent Seed Mixes
Table 6. Vegetation Plot Counts and Densities
Table 7A-G. Vegetation Plot Data Table from Vegetation Data Entry Tool

Table 5A. Planted Bare Root Woody Vegetation
Pierce Terrace Site

Vegetation Association	Non-riverine Wet Hardwood Forest		
Canopy Species[1] (125.74 acres)	**Facultative Rating**	**# planted (680 stems/acre)**	**% of total**
River birch (*Betula nigra*)	FACW	2,200	2.42%
Persimmon (*Diospyros virginiana)*[2]	FAC	2,500	2.76%
Green ash (*Fraxinus pennsylvanica)*	FACW	3,460	3.81%
Tulip poplar (*Liriodendron tulipifera*)	FACU	6,500	7.17%
Swamp tupelo (*Nyssa biflora)*	OBL	2,500	2.76%
Black gum (*Nyssa sylvatica*)	FAC	7,700	8.49%
Sycamore (*Platanus occidentalis*)	FACW	5,000	5.51%
Laurel oak (*Quercus laurifolia*)	FACW	~~8,635~~ 7,000	~~9.52%~~ 7.71%
Overcup oak (*Quercus lyrata*)	OBL	~~5,000~~ 6,650	~~5.51%~~ 7.32%
Swamp chestnut oak (*Quercus michauxii*)	FACW	6,735	7.43%
Water oak (*Quercus nigra*)	FAC	~~7,000~~ 8,650	~~7.72%~~ 9.53%
Cherrybark oak (*Quercus pagoda*)	FACW	~~8,635~~ 7,000	~~9.52%~~ 7.71%
Willow oak (*Quercus phellos*)	FACW	9,135	10.07%
Bald cypress (*Taxodium distichum)*	OBL	3,000	3.31%
Understory Species (125.74 acres)		**# planted (680 stems/acre)**	**% of total**
Hornbeam (*Carpinus caroliniana)*	FAC	2,500	2.76%
Sweetbay magnolia (*Magnolia virginiana*)	FACW	~~2,500~~ 4,000	~~2.76%~~ 4.41%
Swamp bay (*Persea palustris*)	FACW	~~2,500~~ 1,000	~~2.76%~~ 1.10%
Vegetation Association	**Non-riverine Swamp Forest**		
Canopy Species[1] (15.49 acres) – in addition to Site-wide planting		**# planted (335 stems/acre)**	**% of total**
Water tupelo (*Nyssa aquatica*)	OBL	1,300	1.43%
Swamp tupelo (*Nyssa biflora*)	OBL	1,300	1.43%
Pond cypress (*Taxodium ascendens*)	OBL	1,300	1.43%
Bald cypress (*Taxodium distichum*)	OBL	1,300	1.43%
TOTAL		**~~90,700~~ 90,800**	**100.0%**

Note: RED text reflects changes made based on plant availability from supplier.

Table 5B. Permanent Seed Mix
Pierce Terrace Site – Sitewide Seed Mix

Species	Wetland Indicator	Species	Wetland Indicator	Species	Wetland Indicator
Carex albolutescens	FACW	*Eupatorium fistulosum*	FACW	*Panicum anceps*	FAC
Carex lupulina	OBL	*Eupatorium perfoliatum*	FACW	*Panicum clandestinum*	FACW
Chamaecrista fasciculata	FACU	*Helenium flexuosum*	FACW	*Panicum rigidulum*	FACW
Chamaecrista nictitans	FACU	*Helianthus angustifolius*	FACW	*Pycnanthemum tenuifolium*	FACW
Coreopsis lanceolata	UPL	*Heliopsis helianthoides*	UPL	*Rhynchospora globularis*	FACW
Coreopsis tinctoria	FAC	*Hibiscus moscheutos*	OBL	*Rudbeckia hirta*	FACU
Desmodium canadense	FAC	*Juncus effusus*	OBL	*Scirpus cyperinus*	OBL
Echinacea purpurea	FACU	*Juncus tennuis*	FAC	*Tridens flavus*	FACU
Elymus riparius	FACW	*Liatris spicata*	FAC	*Verbena hastata*	FAC
Elymus virginicus	FAC	*Monarda fistulosa*	FACU	*Vernonia noveboracensis*	FACW

Table 6. Planted Vegetation Totals
Pierce Terrace Site

Plot #	Planted Stems/Acre	Success Criteria Met?
1	648	Yes
2	810	Yes
3	688	Yes
4	607	Yes
5	486	Yes
6	486	Yes
7	607	Yes
8	769	Yes
9	688	Yes
10	688	Yes
11	648	Yes
12	769	Yes
13	729	Yes
14	729	Yes
15	810	Yes
16	729	Yes
17	729	Yes
18	648	Yes
19	810	Yes
20	648	Yes
21	648	Yes
22	648	Yes
23	486	Yes
24	769	Yes
25	486	Yes
26	486	Yes
27	567	Yes
28	607	Yes
29	526	Yes
30	648	Yes
31	567	Yes
32	607	Yes
33	607	Yes
34	648	Yes

Table 6. Planted Vegetation Totals (Cont.)
Pierce Terrace Site

Plot #	Planted Stems/Acre	Success Criteria Met?
35	688	Yes
36	648	Yes
37	607	Yes
38	567	Yes
39	810	Yes
40	607	Yes
41	648	Yes
42	648	Yes
43	567	Yes
44	567	Yes
45	567	Yes
46	526	Yes
47	445	Yes
48	931	Yes
49	688	Yes
50	364	Yes
51	567	Yes
52	526	Yes
53	1093	Yes
54	567	Yes
55	648	Yes
56	1093	Yes
57	445	Yes
58	729	Yes
59	607	Yes
60	607	Yes
61	607	Yes
R-1	364	Yes
R-2	648	Yes
R-3	729	Yes
R-4	607	Yes
R-5	324	Yes
R-6	445	Yes
R-7	648	Yes

Table 6. Planted Vegetation Totals (Cont.)
Pierce Terrace Site

Plot #	Planted Stems/Acre	Success Criteria Met?
R-8	688	Yes
R-9	931	Yes
R-10	607	Yes
R-11	526	Yes
R-12	445	Yes
R-13	486	Yes
R-14	364	Yes
R-15	607	Yes
R-16	648	Yes
R-17	850	Yes
R-18	648	Yes
R-19	567	Yes
R-20	567	Yes
Average Planted Stems/Acre	631	Yes

Table 7A. Vegetation Plot Data Table from Vegetation Data Entry Tool

Planted Acreage	125.73
Date of Initial Plant	3/3/2023
Date(s) of Supplemental Plant(s)	NA
Date(s) Mowing	NA
Date of Current Survey	2023-03-13
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F		Veg Plot 5 F		Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 F		Veg Plot 10 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW							1	1							1	1	2	2		
	Carpinus caroliniana	American hornbeam	Tree	FAC																	1	1		
	Diospyros virginiana	common persimmon	Tree	FAC																				
	Fraxinus pennsylvanica	green ash	Tree	FACW							4	4							1	1	2	2	4	4
	Liriodendron tulipifera	tuliptree	Tree	FACU	2	2	1	1											6	6				
	Magnolia virginiana	sweetbay	Tree	FACW			1	1													1	1	2	2
	Nyssa aquatica	water tupelo	Tree	OBL			1	1	1	1	2	2	1	1	1	1			1	1				
	Nyssa biflora	swamp tupelo	Tree	OBL			2	2			2	2	1	1	1	1	1	1						
	Nyssa sp.																							
	Nyssa sylvatica	blackgum	Tree	FAC	2	2	2	2	2	2	3	3	2	2	3	3	3	3	1	1			2	2
	Persea palustris	swamp bay	Shrub	FACW							1	1									1	1		
	Platanus occidentalis	American sycamore	Tree	FACW					1	1	1	1					3	3	1	1				
	Quercus laurifolia	laurel oak	Tree	FACW	3	3	1	1	1	1			2	2	2	2	1	1	1	1	1	1	2	2
	Quercus lyrata	overcup oak	Tree	OBL			1	1	2	2											4	4	3	3
	Quercus michauxii	swamp chestnut oak	Tree	FACW	1	1	5	5	1	1			1	1	1	1	3	3	1	1	1	1		
	Quercus nigra	water oak	Tree	FAC					2	2			3	3					3	3			1	1
	Quercus pagoda	cherrybark oak	Tree	FACW	3	3	2	2	2	2					1	1			3	3	3	3		
	Quercus phellos	willow oak	Tree	FACW	5	5	4	4	5	5	1	1	1	1	2	2	2	2			1	1	2	2
	Taxodium ascendens	pond cypress	Tree	OBL													1	1						
	Taxodium distichum	bald cypress	Tree	OBL									1	1	1	1	1	1					1	1
Sum	Performance Standard				16	16	20	20	17	17	15	15	12	12	12	12	15	15	19	19	17	17	17	17
Mitigation Plan Performance Standard	Current Year Stem Count					16		20		17		15		12		12		15		19		17		17
	Stems/Acre					648		810		688		607		486		486		607		769		688		688
	Species Count					6		10		9		8		8		8		8		10		10		8
	Dominant Species Composition (%)					31		25		29		27		25		25		20		32		24		24
	Average Plot Height (ft.)					0		0		0		0		0		0		0		0		20		0
	% Invasives					0		0		0		0		0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					16		20		17		15		12		12		15		19		17		17
	Stems/Acre					648		810		688		607		486		486		607		769		688		688
	Species Count					6		10		9		8		8		8		8		10		10		8
	Dominant Species Composition (%)					31		25		29		27		25		25		20		32		24		24
	Average Plot Height (ft.)					0		0		0		0		0		0		0		0		20		0
	% Invasives					0		0		0		0		0		0		0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7B. Vegetation Plot Data Table from Vegetation Data Entry Tool

Planted Acreage	125.73
Date of Initial Plant	3/3/2023
Date(s) of Supplemental Plant(s)	NA
Date(s) Mowing	NA
Date of Current Survey	2023-03-13
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 11 F		Veg Plot 12 F		Veg Plot 13 F		Veg Plot 14 F		Veg Plot 15 F		Veg Plot 16 F		Veg Plot 17 F		Veg Plot 18 F		Veg Plot 19 F		Veg Plot 20 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW	1	1			5	5			1	1										
	Carpinus caroliniana	American hornbeam	Tree	FAC							2	2									1	1		
	Diospyros virginiana	common persimmon	Tree	FAC																				
	Fraxinus pennsylvanica	green ash	Tree	FACW									4	4										
	Liriodendron tulipifera	tuliptree	Tree	FACU			1	1	1	1			4	4	3	3	3	3	1	1	9	9		
	Magnolia virginiana	sweetbay	Tree	FACW							1	1									1	1		
	Nyssa aquatica	water tupelo	Tree	OBL			3	3			1	1												
	Nyssa biflora	swamp tupelo	Tree	OBL	2	2	2	2			1	1												
	Nyssa sp.																							
	Nyssa sylvatica	blackgum	Tree	FAC	2	2	2	2	2	2	1	1			2	2								
	Persea palustris	swamp bay	Shrub	FACW					3	3					2	2								
	Platanus occidentalis	American sycamore	Tree	FACW			1	1									2	2						
	Quercus laurifolia	laurel oak	Tree	FACW			1	1	3	3									2	2	1	1		
	Quercus lyrata	overcup oak	Tree	OBL	3	3	1	1			3	3	7	7	1	1	1	1	1	1			5	5
	Quercus michauxii	swamp chestnut oak	Tree	FACW			1	1			2	2			1	1	1	1	2	2			1	1
	Quercus nigra	water oak	Tree	FAC	2	2	1	1	1	1	2	2	1	1	2	2	3	3	5	5	2	2	3	3
	Quercus pagoda	cherrybark oak	Tree	FACW	2	2	1	1			2	2	3	3	5	5	7	7	2	2	1	1	3	3
	Quercus phellos	willow oak	Tree	FACW	3	3	3	3	1	1	3	3			2	2	1	1	3	3	2	2	4	4
	Taxodium ascendens	pond cypress	Tree	OBL			2	2																
	Taxodium distichum	bald cypress	Tree	OBL	1	1			2	2											3	3		
Sum	Performance Standard				16	16	19	19	18	18	18	18	20	20	18	18	18	18	16	16	20	20	16	16
Mitigation Plan Performance Standard	Current Year Stem Count					16		19		18		18		20		18		18		16		20		16
	Stems/Acre					648		769		729		729		810		729		729		648		810		648
	Species Count					8		12		8		10		6		8		7		7		8		5
	Dominant Species Composition (%)					19		16		28		17		35		28		39		31		45		31
	Average Plot Height (ft.)					0		0		0		0		0		0		0		0		0		0
	% Invasives					0		0		0		0		0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					16		19		18		18		20		18		18		16		20		16
	Stems/Acre					648		769		729		729		810		729		729		648		810		648
	Species Count					8		12		8		10		6		8		7		7		8		5
	Dominant Species Composition (%)					19		16		28		17		35		28		39		31		45		31
	Average Plot Height (ft.)					0		0		0		0		0		0		0		0		0		0
	% Invasives					0		0		0		0		0		0		0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7C. Vegetation Plot Data Table from Vegetation Data Entry Tool

Planted Acreage	125.73
Date of Initial Plant	3/3/2023
Date(s) of Supplemental Plant(s)	NA
Date(s) Mowing	NA
Date of Current Survey	2023-03-13
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 21 F		Veg Plot 22 F		Veg Plot 23 F		Veg Plot 24 F		Veg Plot 25 F		Veg Plot 26 F		Veg Plot 27 F		Veg Plot 28 F		Veg Plot 29 F		Veg Plot 30 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW			2	2	1	1			4	4	2	2	1	1						
	Carpinus caroliniana	American hornbeam	Tree	FAC	2	2					2	2												
	Diospyros virginiana	common persimmon	Tree	FAC																				
	Fraxinus pennsylvanica	green ash	Tree	FACW	1	1					1	1			4	4							2	2
	Liriodendron tulipifera	tuliptree	Tree	FACU	1	1			1	1			2	2					3	3				
	Magnolia virginiana	sweetbay	Tree	FACW	3	3													1	1				
	Nyssa aquatica	water tupelo	Tree	OBL									1	1										
	Nyssa biflora	swamp tupelo	Tree	OBL							1	1									1	1		
	Nyssa sp.																							
	Nyssa sylvatica	blackgum	Tree	FAC			1	1							1	1			1	1	2	2	1	1
	Persea palustris	swamp bay	Shrub	FACW											1	1								
	Platanus occidentalis	American sycamore	Tree	FACW							2	2	3	3	2	2	4	4						
	Quercus laurifolia	laurel oak	Tree	FACW	1	1			1	1	1	1					1	1	1	1	2	2	2	2
	Quercus lyrata	overcup oak	Tree	OBL	3	3	2	2	3	3	3	3					3	3	7	7	2	2	8	8
	Quercus michauxii	swamp chestnut oak	Tree	FACW	1	1	2	2	2	2	3	3			1	1	1	1					1	1
	Quercus nigra	water oak	Tree	FAC	1	1			3	3							1	1			4	4	2	2
	Quercus pagoda	cherrybark oak	Tree	FACW	3	3	1	1	1	1	2	2					2	2	1	1	1	1		
	Quercus phellos	willow oak	Tree	FACW			5	5			1	1	2	2	1	1								
	Taxodium ascendens	pond cypress	Tree	OBL			2	2			1	1					1	1						
	Taxodium distichum	bald cypress	Tree	OBL			1	1			2	2							1	1	1	1		
Sum	Performance Standard				16	16	16	16	12	12	19	19	12	12	12	12	14	14	15	15	13	13	16	16
Mitigation Plan Performance Standard	Current Year Stem Count					16		16		12		19		12		12		14		15		13		16
	Stems/Acre					648		648		486		769		486		486		567		607		526		648
	Species Count					9		8		7		11		5		7		8		7		7		6
	Dominant Species Composition (%)					19		31		25		16		33		33		29		47		31		50
	Average Plot Height (ft.)					0		0		1		1		0		1		0		0		40		0
	% Invasives					0		0		0		0		0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					16		16		12		19		12		12		14		15		13		16
	Stems/Acre					648		648		486		769		486		486		567		607		526		648
	Species Count					9		8		7		11		5		7		8		7		7		6
	Dominant Species Composition (%)					19		31		25		16		33		33		29		47		31		50
	Average Plot Height (ft.)					0		0		1		1		0		1		0		0		40		0
	% Invasives					0		0		0		0		0		0		0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7D. Vegetation Plot Data Table from Vegetation Data Entry Tool

Planted Acreage	125.73
Date of Initial Plant	3/3/2023
Date(s) of Supplemental Plant(s)	NA
Date(s) Mowing	NA
Date of Current Survey	2023-03-13
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 31 F		Veg Plot 32 F		Veg Plot 33 F		Veg Plot 34 F		Veg Plot 35 F		Veg Plot 36 F		Veg Plot 37 F		Veg Plot 38 F		Veg Plot 39 F		Veg Plot 40 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW	1	1	1	1	2	2	1	1	1	1	2	2	2	2						
	Carpinus caroliniana	American hornbeam	Tree	FAC									1	1									1	1
	Diospyros virginiana	common persimmon	Tree	FAC																				
	Fraxinus pennsylvanica	green ash	Tree	FACW					3	3			2	2							1	1		
	Liriodendron tulipifera	tuliptree	Tree	FACU					1	1	3	3	3	3			7	7	1	1	3	3	7	7
	Magnolia virginiana	sweetbay	Tree	FACW	1	1											5	5						
	Nyssa aquatica	water tupelo	Tree	OBL																	2	2		
	Nyssa biflora	swamp tupelo	Tree	OBL			1	1							3	3			2	2	1	1		
	Nyssa sp.																							
	Nyssa sylvatica	blackgum	Tree	FAC			1	1											3	3				
	Persea palustris	swamp bay	Shrub	FACW													1	1						
	Platanus occidentalis	American sycamore	Tree	FACW					2	2			2	2	2	2			4	4				
	Quercus laurifolia	laurel oak	Tree	FACW			1	1					1	1	1	1			1	1	1	1		
	Quercus lyrata	overcup oak	Tree	OBL	5	5	2	2	3	3	3	3	3	3	3	3								
	Quercus michauxii	swamp chestnut oak	Tree	FACW	1	1	3	3			1	1	2	2	1	1			1	1	4	4	2	2
	Quercus nigra	water oak	Tree	FAC			1	1			1	1			1	1					5	5	2	2
	Quercus pagoda	cherrybark oak	Tree	FACW	2	2	4	4			2	2	1	1							2	2	3	3
	Quercus phellos	willow oak	Tree	FACW	4	4			4	4	5	5	1	1	2	2			1	1	1	1		
	Taxodium ascendens	pond cypress	Tree	OBL																				
	Taxodium distichum	bald cypress	Tree	OBL			1	1							1	1			1	1				
Sum	Performance Standard				14	14	15	15	15	15	16	16	17	17	16	16	15	15	14	14	20	20	15	15
Mitigation Plan Performance Standard	Current Year Stem Count					14		15		15		16		17		16		15		14		20		15
	Stems/Acre					567		607		607		648		688		648		607		567		810		607
	Species Count					6		9		6		7		10		9		4		8		9		5
	Dominant Species Composition (%)					36		27		27		31		18		19		47		29		25		47
	Average Plot Height (ft.)					50		0		55		0		0		0		0		0		0		0
	% Invasives					0		0		0		0		0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					14		15		15		16		17		16		15		14		20		15
	Stems/Acre					567		607		607		648		688		648		607		567		810		607
	Species Count					6		9		6		7		10		9		4		8		9		5
	Dominant Species Composition (%)					36		27		27		31		18		19		47		29		25		47
	Average Plot Height (ft.)					50		0		55		0		0		0		0		0		0		0
	% Invasives					0		0		0		0		0		0		0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7E. Vegetation Plot Data Table from Vegetation Data Entry Tool

Planted Acreage	125.73
Date of Initial Plant	3/3/2023
Date(s) of Supplemental Plant(s)	NA
Date(s) Mowing	NA
Date of Current Survey	2023-03-13
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 41 F		Veg Plot 42 F		Veg Plot 43 F		Veg Plot 44 F		Veg Plot 45 F		Veg Plot 46 F		Veg Plot 47 F		Veg Plot 48 F		Veg Plot 49 F		Veg Plot 50 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW					1	1									2	2	2	2		
	Carpinus caroliniana	American hornbeam	Tree	FAC													1	1						
	Diospyros virginiana	common persimmon	Tree	FAC																				
	Fraxinus pennsylvanica	green ash	Tree	FACW					1	1	2	2							1	1				
	Liriodendron tulipifera	tuliptree	Tree	FACU	4	4			2	2	1	1					1	1			2	2		
	Magnolia virginiana	sweetbay	Tree	FACW					1	1									2	2				
	Nyssa aquatica	water tupelo	Tree	OBL																				
	Nyssa biflora	swamp tupelo	Tree	OBL							1	1												
	Nyssa sp.																							
	Nyssa sylvatica	blackgum	Tree	FAC					1	1	1	1	2	2										
	Persea palustris	swamp bay	Shrub	FACW					1	1	2	2	3	3					1	1	2	2		
	Platanus occidentalis	American sycamore	Tree	FACW					1	1	3	3					2	2	1	1	1	1		
	Quercus laurifolia	laurel oak	Tree	FACW															4	4	1	1		
	Quercus lyrata	overcup oak	Tree	OBL	5	5	6	6	4	4	1	1	3	3	4	4	1	1	1	1	1	1	7	7
	Quercus michauxii	swamp chestnut oak	Tree	FACW	1	1	2	2			2	2	3	3	2	2	1	1	4	4	1	1	1	1
	Quercus nigra	water oak	Tree	FAC	1	1	4	4									1	1			3	3	1	1
	Quercus pagoda	cherrybark oak	Tree	FACW	5	5	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
	Quercus phellos	willow oak	Tree	FACW			3	3	1	1			2	2	4	4	2	2	5	5				
	Taxodium ascendens	pond cypress	Tree	OBL																				
	Taxodium distichum	bald cypress	Tree	OBL																				
Sum	Performance Standard				16	16	16	16	14	14	14	14	14	14	13	13	11	11	23	23	17	17	11	11
Mitigation Plan Performance Standard	Current Year Stem Count					16		16		14		14		14		13		11		23		17		11
	Stems/Acre					648		648		567		567		567		526		445		931		688		364
	Species Count					5		5		10		9		6		5		8		10		10		4
	Dominant Species Composition (%)					31		38		29		21		21		31		18		22		18		64
	Average Plot Height (ft.)					0		0		0		0		0		0		0		0		0		0
	% Invasives					0		0		0		0		0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					16		16		14		14		14		13		11		23		17		11
	Stems/Acre					648		648		567		567		567		526		445		931		688		364
	Species Count					5		5		10		9		6		5		8		10		10		4
	Dominant Species Composition (%)					31		38		29		21		21		31		18		22		18		64
	Average Plot Height (ft.)					0		0		0		0		0		0		0		0		0		0
	% Invasives					0		0		0		0		0		0		0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7F. Vegetation Plot Data Table from Vegetation Data Entry Tool

Planted Acreage	125.73
Date of Initial Plant	3/3/2023
Date(s) of Supplemental Plant(s)	NA
Date(s) Mowing	NA
Date of Current Survey	2023-03-13
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 51 F		Veg Plot 52 F		Veg Plot 53 F		Veg Plot 54 F		Veg Plot 55 F		Veg Plot 56 F		Veg Plot 57 F		Veg Plot 58 F		Veg Plot 59 F		Veg Plot 60 F		Veg Plot 61 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW			1	1	2	2	2	2	1	1	4	4	3	3	1	1						
	Carpinus caroliniana	American hornbeam	Tree	FAC																					1	1
	Diospyros virginiana	common persimmon	Tree	FAC			2	2																		
	Fraxinus pennsylvanica	green ash	Tree	FACW							1	1									5	5			1	1
	Liriodendron tulipifera	tuliptree	Tree	FACU	5	5	1	1							5	5			1	1	3	3	1	1	3	3
	Magnolia virginiana	sweetbay	Tree	FACW																					1	1
	Nyssa aquatica	water tupelo	Tree	OBL													1	1	1	1						
	Nyssa biflora	swamp tupelo	Tree	OBL					1	1															1	1
	Nyssa sp.																						2	2		
	Nyssa sylvatica	blackgum	Tree	FAC	1	1									1	1			2	2	3	3				
	Persea palustris	swamp bay	Shrub	FACW			2	2					1	1									1	1		
	Platanus occidentalis	American sycamore	Tree	FACW	2	2			4	4	1	1			2	2			1	1	1	1	1	1	1	1
	Quercus laurifolia	laurel oak	Tree	FACW			1	1	1	1			3	3												
	Quercus lyrata	overcup oak	Tree	OBL			1	1	5	5			3	3	1	1			1	1	1	1				
	Quercus michauxii	swamp chestnut oak	Tree	FACW					1	1	1	1	2	2	4	4			1	1	2	2	1	1	2	2
	Quercus nigra	water oak	Tree	FAC	1	1	1	1	2	2	3	3	2	2					2	2			4	4	1	1
	Quercus pagoda	cherrybark oak	Tree	FACW	2	2	2	2	3	3	1	1			9	9									2	2
	Quercus phellos	willow oak	Tree	FACW	3	3			4	4	3	3	3	3	1	1			8	8					1	1
	Taxodium ascendens	pond cypress	Tree	OBL			1	1	2	2			1	1			3	3								
	Taxodium distichum	bald cypress	Tree	OBL			1	1	2	2	2	2					4	4					5	5	1	1
Sum	Performance Standard				14	14	13	13	27	27	14	14	16	16	27	27	11	11	18	18	15	15	15	15	15	15
Mitigation Plan Performance Standard	Current Year Stem Count					14		13		27		14		16		27		11		18		15		15		15
	Stems/Acre					567		526		1093		567		648		1093		445		729		607		607		607
	Species Count					6		10		11		8		8		8		4		9		6		7		11
	Dominant Species Composition (%)					36		15		19		21		19		33		36		44		33		33		20
	Average Plot Height (ft.)					0		0		0		0		0		0		1		0		0		3		0
	% Invasives					0		0		0		0		0		0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					14		13		27		14		16		27		11		18		15		15		15
	Stems/Acre					567		526		1093		567		648		1093		445		729		607		607		607
	Species Count					6		10		11		8		8		8		4		9		6		7		11
	Dominant Species Composition (%)					36		15		19		21		19		33		36		44		33		33		20
	Average Plot Height (ft.)					0		0		0		0		0		0		1		0		0		3		0
	% Invasives					0		0		0		0		0		0		0		0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7G. Vegetation Plot Data Table from Vegetation Data Entry Tool

Planted Acreage	125.73
Date of Initial Plant	3/3/2023
Date(s) of Supplemental Plant(s)	NA
Date(s) Mowing	NA
Date of Current Survey	2023-03-13
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 R Total	Veg Plot 2 R Total	Veg Plot 3 R Total	Veg Plot 4 R Total	Veg Plot 5 R Total	Veg Plot 6 R Total	Veg Plot 7 R Total	Veg Plot 8 R Total	Veg Plot 9 R Total	Veg Plot 10 R Total	Veg Plot 11 R Total	Veg Plot 12 R Total	Veg Plot 13 R Total	Veg Plot 14 R Total	Veg Plot 15 R Total	Veg Plot 16 R Total	Veg Plot 17 R Total	Veg Plot 18 R Total	Veg Plot 19 R Total	Veg Plot 20 R Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW			1				1	3	4											
	Carpinus caroliniana	American hornbeam	Tree	FAC																				
	Diospyros virginiana	common persimmon	Tree	FAC																				
	Fraxinus pennsylvanica	green ash	Tree	FACW		2				1			2				1					2	2	1
	Liriodendron tulipifera	tuliptree	Tree	FACU	1			1						1		2	2	2	1	1	1	2	1	
	Magnolia virginiana	sweetbay	Tree	FACW		2	3			1			3		1				1				1	
	Nyssa aquatica	water tupelo	Tree	OBL																				
	Nyssa biflora	swamp tupelo	Tree	OBL									1	1					1					
	Nyssa sp.																							
	Nyssa sylvatica	blackgum	Tree	FAC		1		1						1			1		1	3	2			1
	Persea palustris	swamp bay	Shrub	FACW																		1	1	
	Platanus occidentalis	American sycamore	Tree	FACW							3	1		1	1		1	1						1
	Quercus laurifolia	laurel oak	Tree	FACW				3				3		3	2	3	1	1		2		2		1
	Quercus lyrata	overcup oak	Tree	OBL	4	3	9	3	3	3	1		4		3				7	2	3	2	5	2
	Quercus michauxii	swamp chestnut oak	Tree	FACW		2		3			3	2	2	2	3	1			2	1	5	3	2	1
	Quercus nigra	water oak	Tree	FAC	1	1			1	2		2						2			5	3		1
	Quercus pagoda	cherrybark oak	Tree	FACW	2	3	4	1	3	1	1		1	1	3	3			1		3		2	
	Quercus phellos	willow oak	Tree	FACW		2	1	3		2	6	6		4		1	4	3	1	3		1		6
	Taxodium ascendens	pond cypress	Tree	OBL									3							2				
	Taxodium distichum	bald cypress	Tree	OBL	1				1	1	1		3	1		1	2			2	2			
Sum	Performance Standard				9	16	18	15	8	11	16	17	23	15	13	11	12	9	15	16	21	16	14	14
Mitigation Plan Performance Standard	Current Year Stem Count				9	16	18	15	8	11	16	17	23	15	13	11	12	9	15	16	21	16	14	14
	Stems/Acre				364	648	729	607	324	445	648	688	931	607	526	445	486	364	607	648	850	648	567	567
	Species Count				5	8	5	7	4	7	7	6	9	9	6	6	7	5	8	8	7	8	7	8
	Dominant Species Composition (%)				44	19	50	20	38	27	38	35	17	27	23	27	33	33	47	19	24	19	36	43
	Average Plot Height (ft.)				1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
	% Invasives				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Post Mitigation Plan Performance Standard	Current Year Stem Count				9	16	18	15	8	11	16	17	23	15	13	11	12	9	15	16	21	16	14	14
	Stems/Acre				364	648	729	607	324	445	648	688	931	607	526	445	486	364	607	648	850	648	567	567
	Species Count				5	8	5	7	4	7	7	6	9	9	6	6	7	5	8	8	7	8	7	8
	Dominant Species Composition (%)				44	19	50	20	38	27	38	35	17	27	23	27	33	33	47	19	24	19	36	43
	Average Plot Height (ft.)				1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
	% Invasives				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Appendix C: Hydrologic Data

Groundwater Gauge Soil Profiles
Pre-construction Gauge Data

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 1 (36.429229, -76.656612)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-9	10 YR 5/1	99	10 YR 5/6	1	C	PL	sandy loam
9-15	10 YR 6/2	40	10 YR 6/6	5	C	M	sandy clay loam
	10 YR 6/1	45					
15-22	10 YR 6/1	93	10 YR 6/8	7	C	M	sand clay
22+	10 YR 6/1	95	10 YR 7/1	5	C	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 2 (36.430049, -76.656621)**

Investigator: W. Grant Lewis

Soil Series: Leon Sand

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-11	10 YR 5/2	99	10 YR 6/5	1	C	M	loamy sand
11-16	10 YR 6/3	98	10 YR 5/6	2	C	M	sandy clay
16-20	10 YR 5/3	90	10 YR 6/6	10	C	M	sandy clay
20+	10 YR 6/2	60	10 YR 6/8	40	C	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 3 (36.430843, -76.656257)**

Investigator: W. Grant Lewis

Soil Series: Leon Sand

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-10	10 YR 6/2	100					loamy sand
10-18	2.5 Y 7/3	96	2.5 Y 6/2	4	D	M	sandy clay
18-22	2.5 Y 7/3	40	2.5 Y 5/2	40	D	M	sandy clay
			10 YR 6/6	20	C	M	
22+	10 YR 6/1	90	10 YR 6/6	10	C	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 4 (36.43183, -76.656379)**

Investigator: W. Grant Lewis

Soil Series: Leon Sand

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-10	10 YR 4/2	100					sandy loam
10-18	10 YR 6/3	80	10 YR 4/1	20	D	M	sandy clay loam
18-22	2.5 Y 5/4	100					sandy clay loam
22+	2.5 Y 6/2	85	10 YR 8/6	15	C	M	sandy clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 5 (36.431562, -76.655545)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 4/2	100					loamy sand
6-10	10 YR 7/1	100					sandy loam
10-18	10 YR 6/1	85	10 YR 5/4	15	C	M	sandy clay loam
18+	10 YR 6/1	40	10 YR 8/5	20	C	M	sandy clay
	10 YR 4/2	40					

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 6 (36.432634, -76.655075)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-9	10 YR 4/2	100					loamy sand
9-16	2.5 Y 5/3	85	2.5 Y 4/2	10	D	M	sandy clay loam
			10 YR 5/6	5	C	M	
16-20	2.5 Y 5/2	55	10 YR 6/6	5	C	M	sandy c,lay
	2.5 Y 3/2	40					
20+	10 YR 7/2	80	10 YR 5/6	20	C	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 7 (36.432762, -76.655690)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 5/2	100					loamy sand
10-18	2.5 Y 7/2	95	2.5 Y 6/2	5	D	M	sandy clay
18+	2.5 Y 7/1	60	2.5 Y 6/2	25	D	M	sandy clay
			10 YR 6/6	15	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 8 (36.433646, -76.654734)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 5/2	100					sandy loam
10-16	2.5 Y 6/2	70	2.5 Y 5/6	25	C	M	sandy clay loam
			2.5 Y 3/3	5	C	M	
16+	2.5 Y 6/2	70	10 YR 6/6	25	C	M	sandy c,lay
			10 YR 3/2	5	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 9 (36.43387, -76.65559)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro Variant

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-11	10 YR 4/2	100					loamy sand
11-16	2.5 Y 6/2	100					loamy sand
16+	2.5 Y 5/3	85	2.5 Y 7/2	10	D	M	sandy clay
			10 YR 6/8	5	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 10 (36.43432, -76.65452)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 4/2	100					loamy sand
10-14	2.5 Y 7/2	85	10 YR 6/6	15	C	M	sandy loam
14-22	2.5 Y 7/2	70	10 YR 6/6	25	C	M	sandy clay
			10 YR 3/2	5	C	M	
22+	2.5 Y 7/1	75	10 YR 5/6	25	C	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 11 (36.43448, -76.65533)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro Variant

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 4/1	100					loamy sand
10-21	10 YR 6/3	97	10 YR 6/8	3	C	M	sandy clay
21+	10 YR 6/2	70	10 YR 7/3	25	C	M	sandy clay
			10 YR 6/6	5	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
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919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 12 (36.4345, -76.65653)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro Variant

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-10	10 YR 5/2	100					loamy sand
10-20	2.5 Y 6/4	98	2.5 Y 5/6	2	C	M	sandy clay
20+	2.5 Y 6/2	97	2.5 Y 6/8	3	C	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 13 (36.434976, -76.654744)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 4/3	100					sandy loam
8-10	10 YR 6/3	100					loamy sand
10+	10 YR 6/3	60	10 YR 5/1	35	D	M	clay
			10 YR 4/6	5	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 14 (36.434941, -76.653508)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes: water table at 18"
saturation ~10"

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 3/2	100					sandy loam
10-22	10 YR 5/2	90	10 YR 3/2	10	D	M	clay loam
22+	10 YR 5/2	90	10 YR 5/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 15 (36.435590, -76.653338)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes: water table at 18" saturation ~10"

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 3/3	100					sandy loam
8-18	10 YR 5/2	80	10 YR 3/3	10	D	M	clay loam
			10 YR 4/6	10	C	M	
18-25	7.5 YR 6/1	85	10 YR 4/6	15	C	M	clay loam
25+	10 YR 5/2	90	10 YR 5/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 16 (36.435557, -76.654240)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro Fine Sandy Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-18	10 YR 4/3	100					sandy clay loam
18-24	10 YR 3/4	90	10 YR 5/6	10	C	M	clay
24+	10 YR 3/2	95	10 YR 5/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 17 (36.436224, -76.653844)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro Fine Sandy Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 3/4	100					loam
8-18	10 YR 4/1	80	10 YR 4/6	20	C	M	clay
18+	10 YR 5/1	90	10 YR 5/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 18 (36.436870, -76.653402)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro Fine Sandy Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 3/3	100					loam
10-22	10 YR 3/3	60	10 YR 3/1	35	D	M	clay
			10 YR 4/6	5	C	M	
22+	10 YR 4/2	80	10 YR 5/1	15	D	M	clay
			10 YR 4/6	5	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 19 (36.436097, -76.652438)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro Fine Sandy Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-9	10 YR 3/3	100					sandy clay
9-12	10 YR 5/1	90	10 YR 4/6	5	C	M	clay
12-20	10 YR 4/1	95	10 YR 4/6	5	C	M	clay
20+	10 YR 5/1	90	10 YR 5/6	10	S	M	silty clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

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Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 20 (36.436905, -76.651706)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro Fine Sandy Loam

Notes: water table at 18"

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 3/3	100					silt loam
8-20	10 YR 3/1	90	10 YR 4/6	10	C	M	silt loam
20+	10 YR 3/2	90	10 YR 4/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

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Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 21 (36.436957, -76.650283)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro Fine Sandy Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 3/3	100					sandy loam
6-18	10 YR 3/2	95	10 YR 5/6	5	C	M	silt loam
18+	10 YR 3/2	80	6N	15	D	M	clay
			10 YR 5/6	5	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 22 (36.436351, -76.650566)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 5/3	100					sandy loam
8-20	10 YR 4/2	90	10 YR 5/6	10	C	M	clay
20+	10 YR 4/2	95	10 YR 5/6	5	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 23 (36.436261, -76.649844)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 5/3	100					sandy loam
6-18	10 YR 4/2	85	10 YR 5/6	15	C	M	clay
18+	10 YR 5/2	95	10 YR 5/6	5	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 24 (36.436702, -76.649119)**

Investigator: W. Grant Lewis

Soil Series: Craven Fine Sandy Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 5/3	100					sandy loam
8-24	10 YR 6/1	90	10 YR 5/6	10	C	M	clay
24+	10 YR 5/1	90	10 YR 5/6	10	C	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 25 (36.435776, -76.648243)**

Investigator: W. Grant Lewis

Soil Series: Craven Fine Sandy Loam

Notes:

Non-riverine swamp forest - 12% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 5/3	100					sandy loam
6-18	10 YR 5/3	60	10 YR 5/2	35	D	M	clay
			10 YR 4/6	5	C	M	
18+	10 YR 5/3	60	10 YR 5/2	37	D	M	clay
			10 YR 4/6	3	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 26 (36.435027, -76.648163)**

Investigator: W. Grant Lewis

Soil Series: Craven Fine Sandy Loam

Notes: saturated

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 5/3	100					sandy loam
8-12	10 YR 6/3	80	10 YR 4/4	20	D	M	clay
12+	10 YR 5/2	95	10 YR 5/6	5	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 27 (36.435234, -76.648978)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine swamp forest - 12% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 6/2	100					loam
10-20	10 YR 6/2	95	10 YR 4/6	5	C	M	sandy clay
20+	10 YR 5/2	95	10 YR 4/6	5	C	M	sand clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 28 (36.434985, -76.949996)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 4/2	100					loam
6-18	10 YR 5/2	90	10 YR 4/6	10	C	M	clay
18+	10 YR 5/2	85	10 YR 4/6	15	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 29 (36.434576, -76.647239)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 4/2	100					loam
10-20	10 YR 5/2	90	10 YR 4/6	10	C	M	clay
20+	10 YR 5/1	90	10 YR 4/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 30 (36.434373, -76.648643)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 4/2	100					loam
8-12	10 YR 5/2	90	10 YR 4/6	10	C	M	sandy clay
12+	10 YR 6/1	95	10 YR 5/6	5	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 31 (36.433778, -76.648041)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 4/3	100					loam
8-18	10 YR 4/2	90	10 YR 5/6	10	C	M	loam
18+	10 YR 4/2	85	10 YR 5/6	15	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 32 (36.433756, -76.649580)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 4/2	100					loam
8-18	10 YR 4/2	90	10 YR 4/6	10	C	M	loam
18-24	10 YR 5/1	90	10 YR 6/6	10	C	M	clay
24+	10 YR 5/1	90	10 YR 4/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 33 (36.433188, -76.648488)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 6/3	100					loam
6-16	10 YR 5/1	90	10 YR 5/6	10	C	M	loam
16+	10 YR 5/1	85	10 YR 5/6	15	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 34 (36.432815, -76.649688)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 4/3	100					loam
10-22	10 YR 4/2	90	10 YR 5/6	10	C	M	loam
22+	10 YR 4/2	95	10 YR 5/6	5	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 35 (36.432146, -76.649605)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes: upper 8" appears to have been disturbed during construction

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 4/4	100					loam
8-12	10 YR 4/2	100					clay
12-18	10 YR 5/2	70	10 YR 5/6	30	C	M	clay
18+	10 YR 5/1	95	10 YR 5/6	5	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 36 (36.430620, -76.651513)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 3/3	100					loam
6-16	10 YR 4/2	90	10 YR 5/6	10	C	M	clay loam
16+	10 YR 5/2	95	10 YR 5/6	5	C	M	clay
18+	10 YR 5/1	95	10 YR 5/6	5	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 37 (36.429882, -76.652455)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 3/3	100					clay loam
8-20	10 YR 5/1	90	10 YR 5/6	10	C	M	clay loam
20+	10 YR 5/1	80	10 YR 5/6	20	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
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919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 38 (36.429968, -76.653798)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 3/2	100					loam
6-14	10 YR 3/2	95	10 YR 4/6	5	C	M	clay loam
14-24	10 YR 3/1	85	10 YR 4/6	15	C	M	clay
24+	10 YR 4/1	90	10 YR 4/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 39 (36.429535, -76.655138)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine swamp forest - 12% hydroperiod

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-5	10 YR 3/2	100					loam
5-12	10 YR 3/2	95	10 YR 4/6	5	C	M	clay loam
12-24+	10 YR 4/1	85	10 YR 4/6	15	C	M	clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 40 (36.431721, -76.649209)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 5/2	100					clay loam
10-25	10 YR 6/1	95	10 YR 4/6	5	C	M	clay
25+	10 YR 6/1	93	10 YR 6/6	7	C	M	silty clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
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919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 41 (36.432357, -76.648525)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 3/1	100					silty clay loam
10-18	10 YR 5/1	95	10 YR 6/6	5	C	M	clay loam
18-24	10 YR 5/1	90	10 YR 5/6	10	C	M	silty clay loam
24+	10 YR 4/1	95	10 YR 5/6	5	C	M	silty clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 42 (36.432773, -76.648231)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 3/1	100					loam
6-12	10 YR 4/2	90	10 YR 6/8	10	C	M	clay loam
12+	10 YR 5/1	80	10 YR 5/6	20	C	M	silty clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 43 (36.433606, -76.647332)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	**Color**	**%**	**Color**	**%**	**Type**	**Location**	**Texture**
0-6	10 YR 3/1	100					loam
6-12	10 YR 4/2	90	10 YR 6/8	10	C	M	clay loam
12-22	10 YR 5/1	95	10 YR 5/6	5	C	M	silty clay loam
22+	10 YR 4/1	90	10 YR 5/6	10	C	M	silty clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 44 (36.434239, -76.646592)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 3/2	100					loam
6-18	10 YR 4/2	95	10 YR 6/8	5	C	M	clay loam
18-24+	10 YR 5/1	85	10 YR 5/6	15	C	M	silty clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 45 (36.434481, -76.645403)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 5/3	100					silt loam
8-20	10 YR 5/1	85	10 YR 5/8	15	C	M	clay loam
20+	7.5 YR 5/1	85	10 YR 4/6	15	C	M	clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 46 (36.433656, -76.646172)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes: very fine sand

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 5/3	100					loam
6-18	10 YR 4/2	80	10 YR 5/8	20	C	M	sandy clay
18+	7.5 YR 4/2	90	10 YR 4/6	15	20	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 47 (36.433367, -76.645213)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-5	10 YR 5/3	100					loam
5-15	10 YR 4/2	97	10 YR 5/8	3	C	M	sandy clay
15-24+	7.5 YR 4/2	90	10 YR 4/6	15	20	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 48 (36.432564, -76.645404)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes: very fine sand

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-5	10 YR 5/3	100					loam
5-10	10 YR 4/2	97	10 YR 5/8	3	C	M	sandy clay
10-20	10 YR 4/2	97	10 YR 5/6	3	C	M	sandy clay
20-26+	10 YR 4/1	90	10 YR 4/6	15	20	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 49 (36.431731, -76.645418)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes: very fine sand

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	10 YR 4/2	100					sandy clay loam
10-28+	10 YR 4/2	85	10 YR 4/6	15	C	M	clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
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919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 50 (36.431888, -76.647358)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 5/2	100					loam
8+	10 YR 5/2	93	10 YR 6/6	7	C	M	silty clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 51 (36.432828, -76.646782)**

1465789+ W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 3/1	100					loam
6-12	10 YR 4/2	90	10 YR 6/8	10	C	M	clay loam
12+	10 YR 5/2	80	10 YR 5/6	20	C	M	silty clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 52 (36.431830, -76.648451)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 3/1	100					loam
8-20	10 YR 4/2	90	10 YR 6/8	10	C	M	clay loam
20+	10 YR 5/1	80	10 YR 5/6	20	C	M	silty clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
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919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 53 (36.431473, -76.650288)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes: upper 8" appears to have been disturbed during construction

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 4/2	100					loam
8-20	10 YR 5/1	90	10 YR 4/6	5	C	M	silty clay loam
20-30+	10 YR 5/1	80	10 YR 4/6	20	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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Raleigh, North Carolina 27603
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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 54 (36.432569, -76.650838)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine swamp forest - 12% hydroperiod

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-8	10 YR 4/3	100					loam
8-20	10 YR 4/2	90	10 YR 5/6	10	C	M	clay loam
20-25+	10 YR 4/2	95	10 YR 5/6	5	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 55 (36.42969, -76.65605)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-14	10 YR 5/2	100					sandy loam
14-16	10 YR 6/1	90	10 YR 6/5	10	C	M	sandy clay loam
16-22	10 YR 4/1	95	10 YR 6/5	5	C	M	sandy clay loam
22+	10 YR 5/1	80	10 YR 6/5	20	C	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 56 (36.4319, -76.65585)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro variant

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-10	2.5 Y 6/3	100					loamy sand
10-16	2.5 Y 6/3	90	2.5 Y 5/2	10	D	M	sandy clay loam
16-20	2.5 Y 6/3	90	2.5 Y 5/2	10	D	M	sandy clay
20+	2.5 Y 5/3	70	2.5 Y 6/1	25	D	M	sandy clay
			10 YR 6/6	5	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 57 (36.4328, -76.65656)**

Investigator: W. Grant Lewis

Soil Series: Goldsboro Variant

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-8	10 YR 5/2	100					loamy sand
8-14	2.5 Y 6/3	95	10 YR 6/6	3	C	M	sandy clay
			10 YR 5/2	2	D	M	
14+	2.5 Y 6/3	98	10 YR 6/6	2	C	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 58 (36.43298, -76.65398)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine swamp forest - 12% hydroperiod

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-6	10 YR 4/1	100					sandy loam
6-16	10 YR 4/1	100					loamy sand
16+	10 YR 6/1	80	10 YR 5/2	15	D	M	sandy clay
			10 YR 6/8	5	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 59 (36.434746, -76.652648)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine swamp forest - 12% hydroperiod

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-10	10 YR 3/3	100					sandy loam
10-22	10 YR 5/2	90	10 YR 3/2	10	D	M	clay loam
22-28+	10 YR 5/2	90	10 YR 5/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 60 (36.435826, -76.651343)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 4/2	100					sand
8-18	10 YR 6/2	95	10 YR 4/6	5	C	M	loamy sand
18-24+	10 YR 6/2	80	10 YR 6/8	20	C	M	clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 61 (36.435917, -76.649099)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 4/2	100					sand
8-18	10 YR 6/2	95	10 YR 4/6	5	C	M	loamy sand
18-28+	10 YR 6/2	80	10 YR 6/8	20	C	M	clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 62 (36.431733, -76.646367)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-10	10 YR 5/2	100					sand
10-24	10 YR 6/1	95	10 YR 4/6	5	C	M	sandy clay loam
24+	10 YR 6/1	80	10 YR 6/8	20	C	M	sandy clay loam

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

SOIL BORING LOG

Date: 12/7/2022

Project/Site: Pierce Terrace

County, State: Gates County, NC

Sampling Point/
Coordinates: **Soil Profile - Groundwater Gauge 63 (36.432621, -76.649018)**

Investigator: W. Grant Lewis

Soil Series: Bladen Loam

Notes:

Non-riverine wet hardwood forest - 10% hydroperiod

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-6	10 YR 6/3	100					loam
6-16	10 YR 5/1	90	10 YR 5/6	10	C	M	loam
16+	10 YR 5/1	85	10 YR 5/6	15	C	M	clay

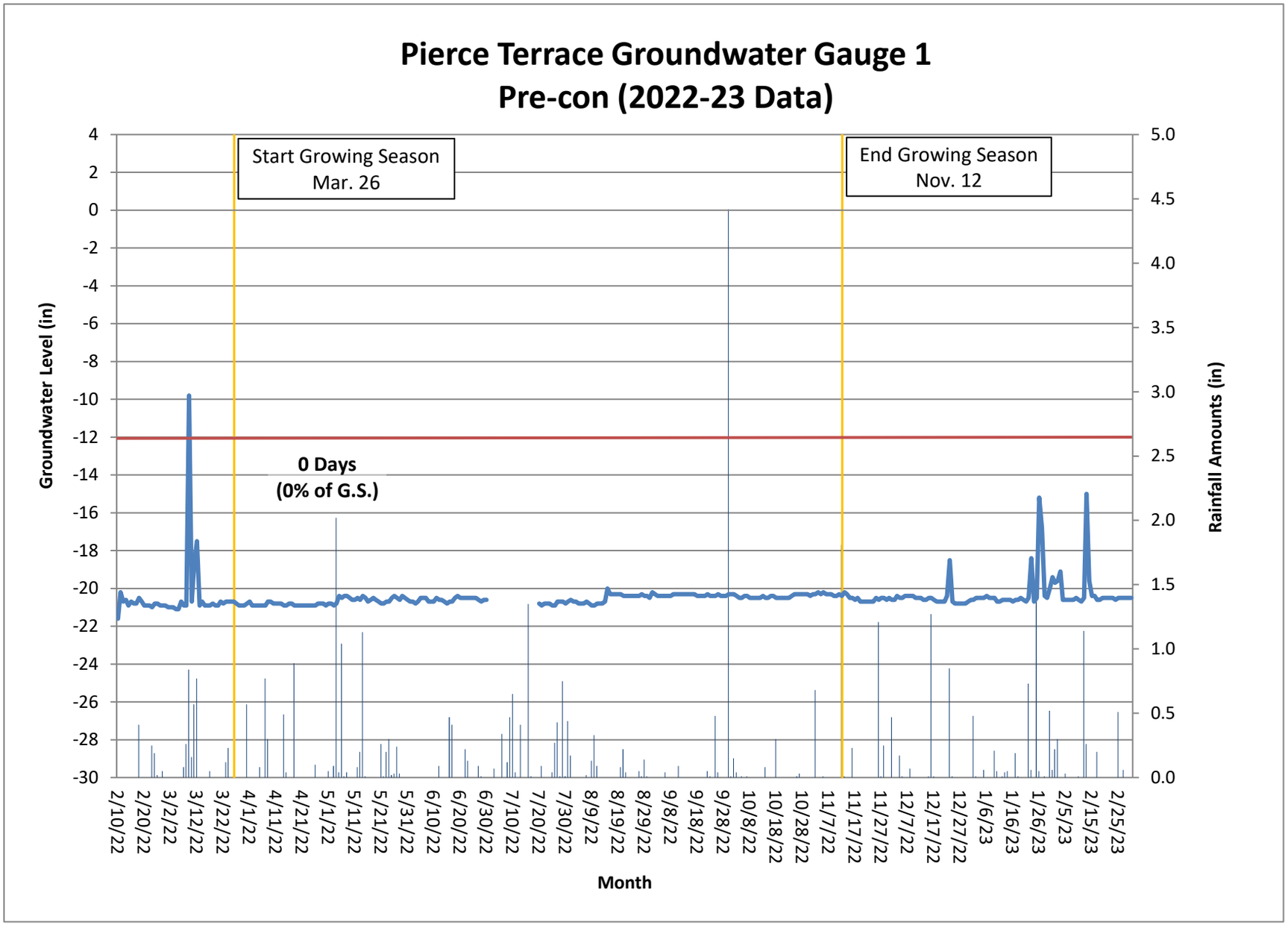
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix.

North Carolina Licensed Soil Scientist

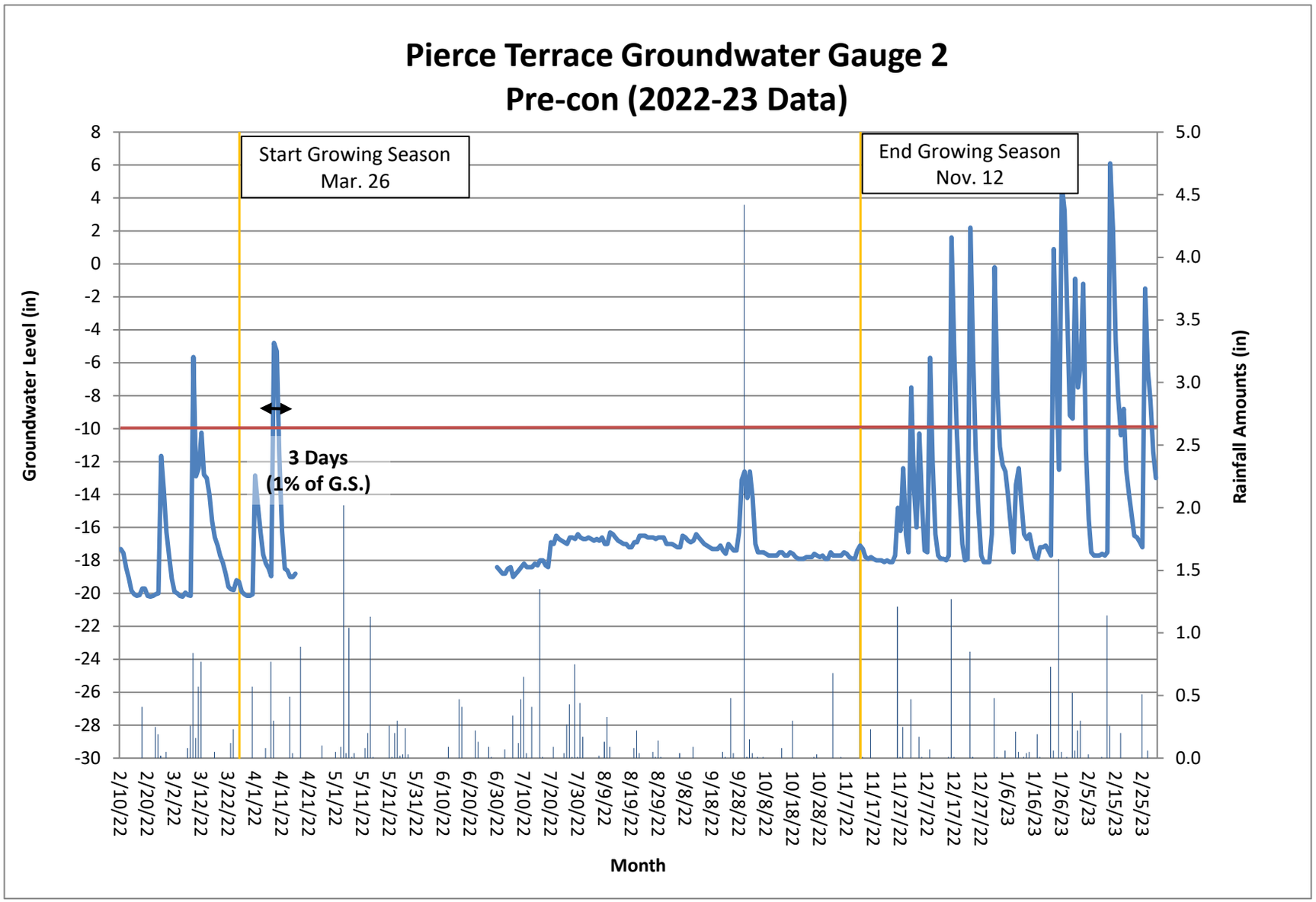
Number: 1233

Signature: W Grant Lewis

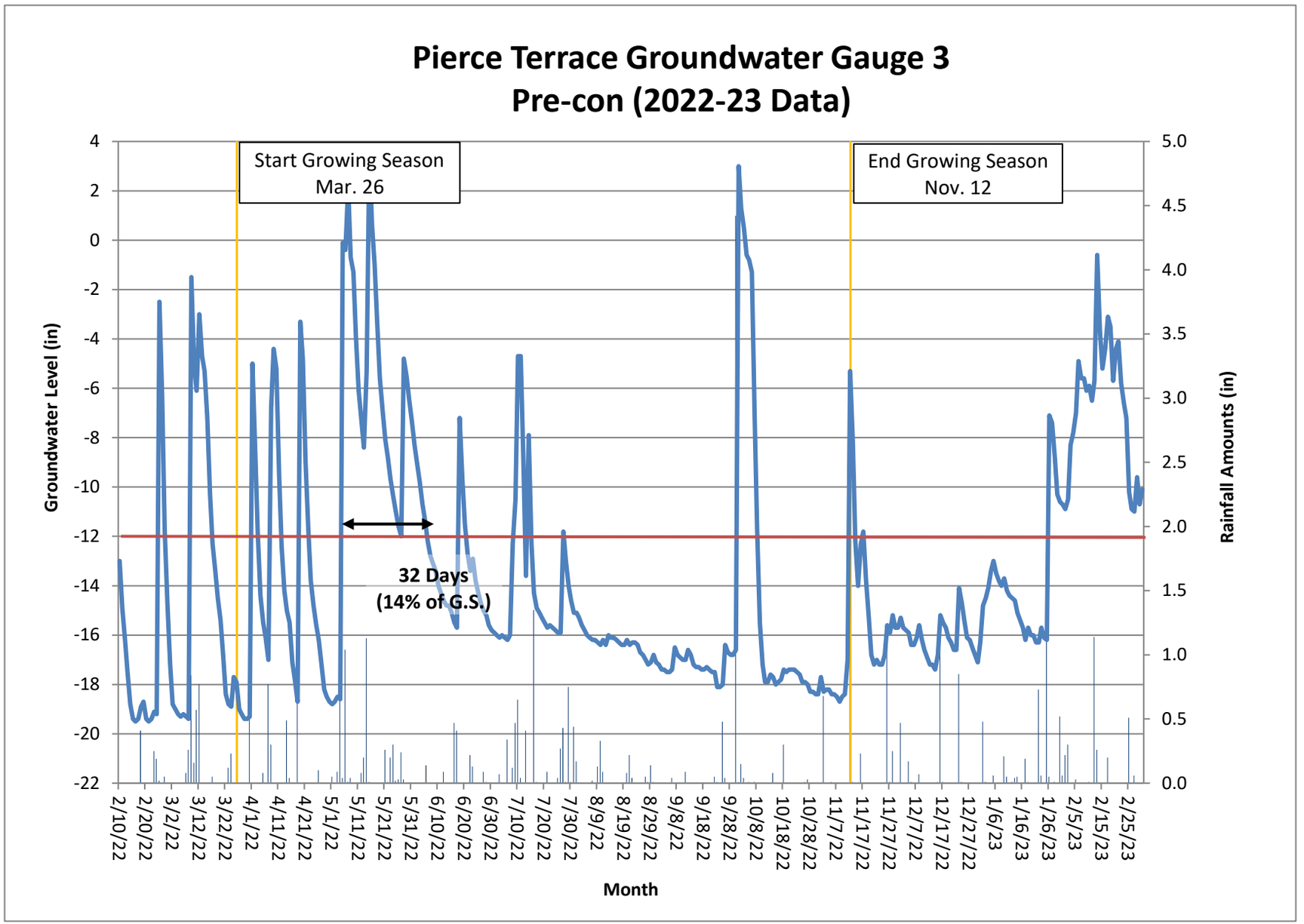
Name/Print: W. Grant Lewis



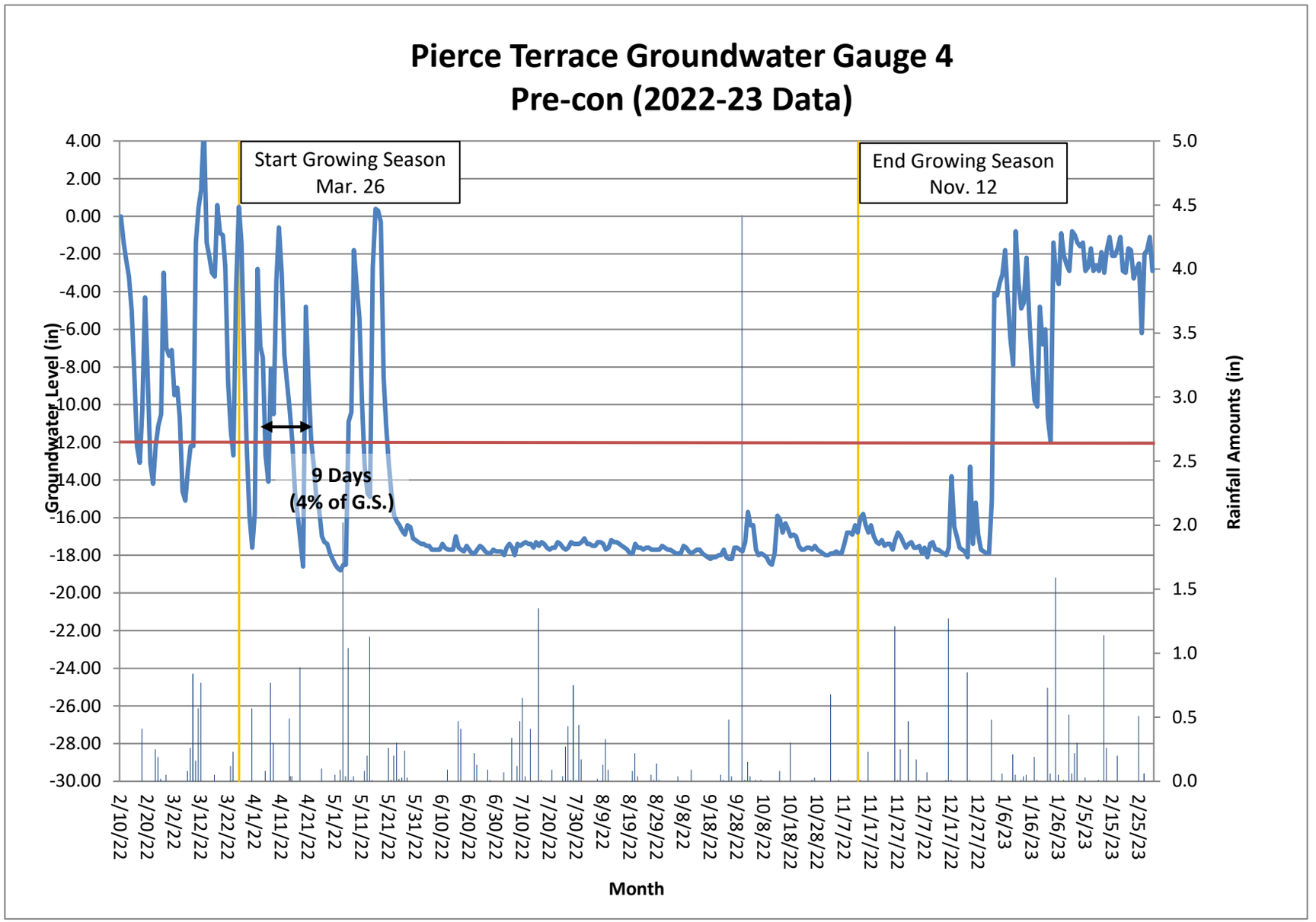
Non-riverine Wet Hardwood Forest - Wetland Hydroperiod Success Criteria is 10% of Growing Season



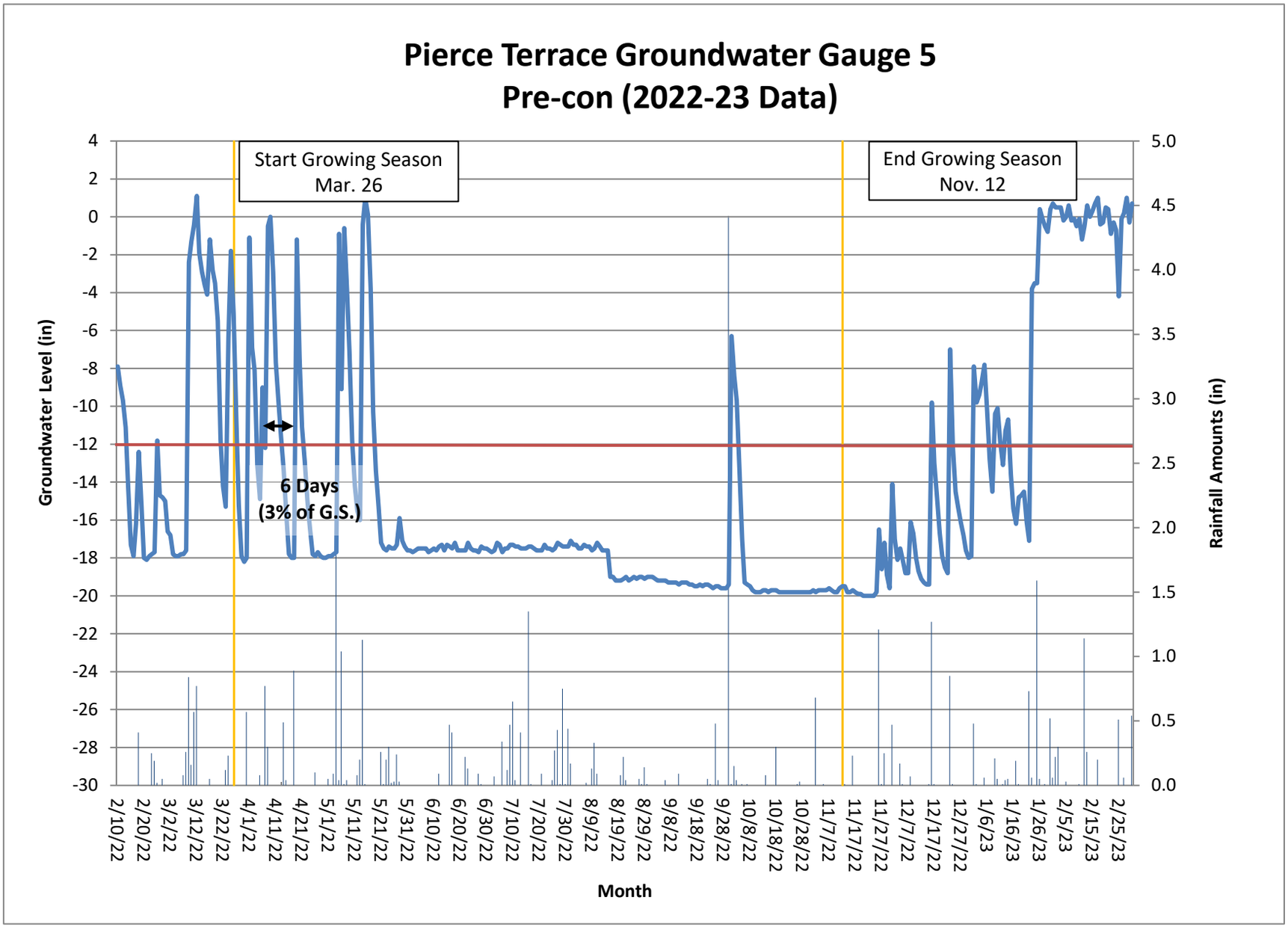
Non-riverine Wet Hardwood Forest - Wetland Hydroperiod Success Criteria is 10% of Growing Season



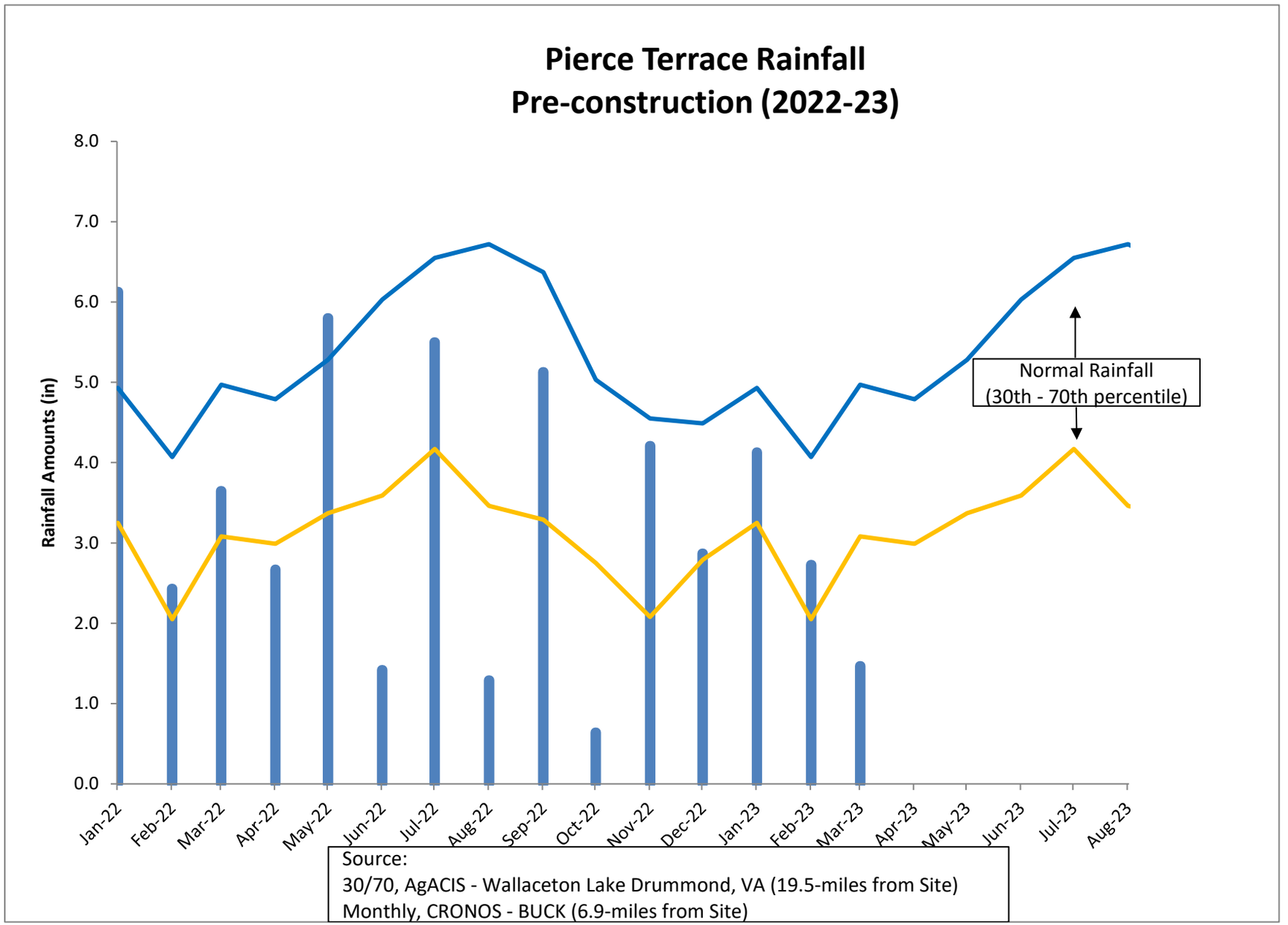
Non-riverine Swamp Forest - Wetland Hydroperiod Success Criteria is 12% of Growing Season



Non-riverine Wet Hardwood Forest - Wetland Hydroperiod Success Criteria is 10% of Growing Season



Non-riverine Wet Hardwood Forest - Wetland Hydroperiod Success Criteria is 10% of Growing Season


Pierce Terrace Rainfall
Pre-construction (2022-23)
Rainfall Amounts (in)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
Apr-23
May-23
Jun-23
Jul-23
Aug-23
Normal Rainfall
(30th - 70th percentile)
Source:
30/70, AgACIS - Wallaceton Lake Drummond, VA (19.5-miles from Site)
Monthly, CRONOS - BUCK (6.9-miles from Site)

Appendix D: Project Timeline and Contact Info

Table 8. Project Timeline
Table 9. Project Contacts

Table 8. Project Timeline

Activity or Deliverable	Data Collection Complete	Completion or Delivery
Project Instituted (NCDMS Contract No. 7907-01)	NA	May 6, 2019
Mitigation Plan Approved	NA	May 2022
Construction Completed	NA	August 29, 2022
Planting Completed	NA	March 3, 2023
As-built Survey Completed	NA	March 2023
MY-0 Baseline Report	March 2023	March 2023
MY-1+ Monitoring Reports		

Table 9. Project Contacts

Pierce Terrace Wetland Mitigation Site/100139	
Full Delivery Provider	Restoration Systems, LLC 1101 Haynes Street, Suite 211 Raleigh, NC 27604
Mitigation Provider POC	Raymond Holz 919-755-9490
Designer	Sungate Design Group, P.A. 905 Jones Franklin Rd Raleigh, NC 27606
Primary project design POC	Josh Dalton 919-710-8333
Monitoring	Axiom Environmental, Inc. 218 Snow Ave Raleigh, NC 27603
Primary project monitoring POC	Grant Lewis 919-215-1693
Surveyor & Land Quality Permit	k2 Design Group 5688 U.S. Hwy 70 East Goldsboro, NC 27534
Surveryor POC	John Rudolph (L-4194) 919-755-9490
Planting Contractor	Restoration Systems, LLC 1101 Haynes Street, Suite 211 Raleigh, NC 27604
Primary planting POC	Josh Merritt 919-755-9490
Construction Contractor	Land Mechanic Design 126 Circle G Lane Willow Spring, NC 27592
Primary project construction POC	Charles Hill 919-639-6132
General Contractor	Restoration Systems, LLC 1101 Haynes Street, Suite 211 Raleigh, NC 27604
General Contractor POC	Worth Creech (GC #64807) 919-755-9490

Appendix E. Record Drawings (As-built Survey)

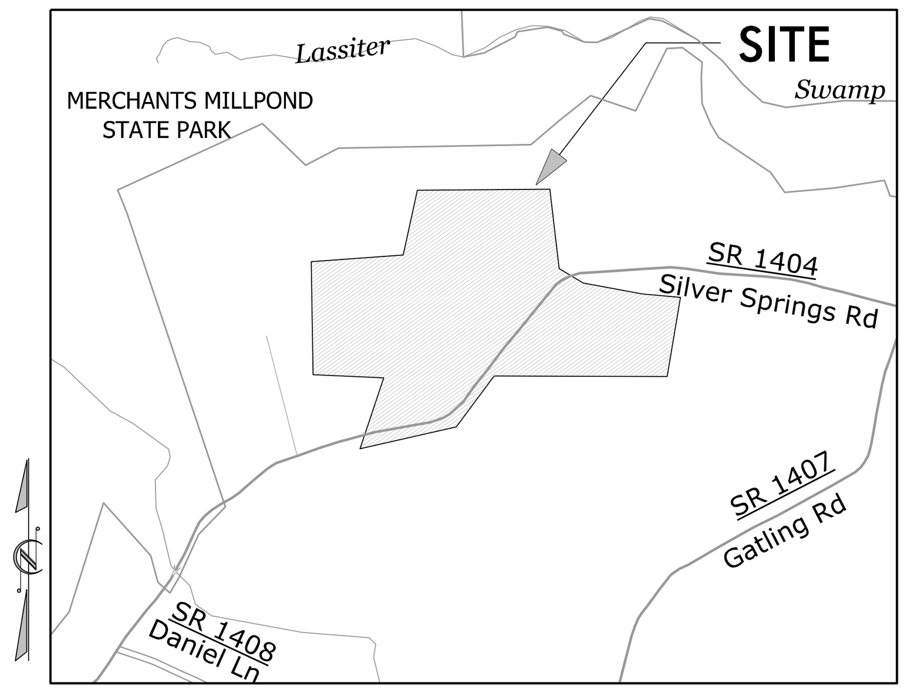
As-built Drawings
As-built Survey

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	PIERCE TERRACE SITE	1	

RECORD DRAWING

AS–BUILT PLANS
PIERCE TERRACE SITE

DWR PROJECT 2020–00034



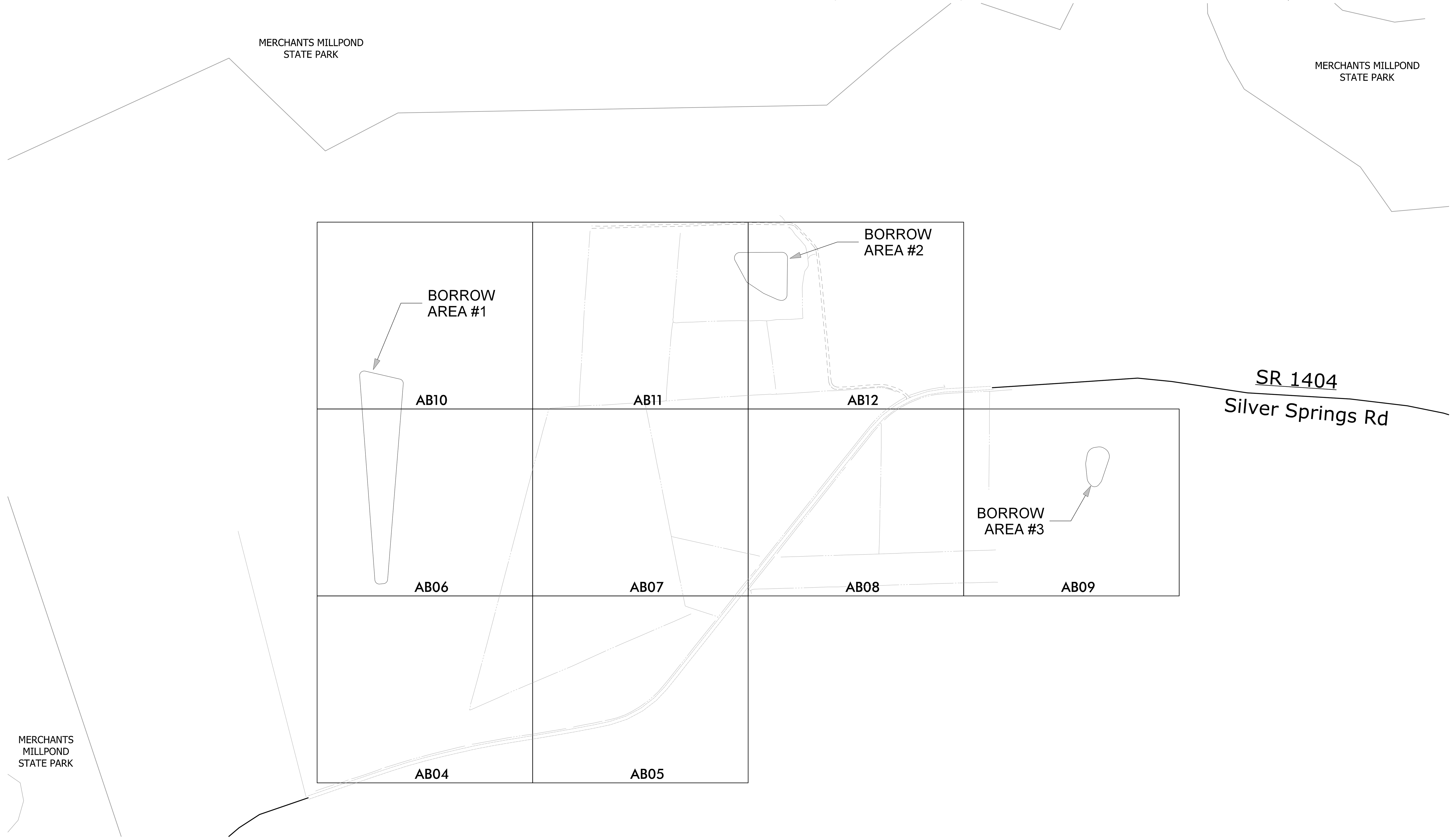
VICINITY MAP
Not to Scale

LOCATION: GATES COUNTY, NORTH CAROLINA

TYPE OF WORK: WETLAND RESTORATION AND MITIGATION (CLEARING, GRUBBING, GRADING, AND EROSION CONTROL)

INDEX OF SHEETS

SHEET NUMBER	SHEET
AB01	As-Built Title Sheet
AB02	As-Built Conservation Easement
AB03	As-Built Wetland Mitigation Assets
AB04 THRU AB12	As-Built Site Improvement Plans



SURVEYORS CERTIFICATION(S)

Surveyor's disclaimer: No attempt was made to locate any cemeteries, wetlands, hazardous material sites, underground utilities or any other features above, or below ground other than those shown. However, no visible evidence of cemeteries or utilities, aboveground or otherwise, was observed by the undersigned (other than those shown).

I certify that the survey is of an existing parcel or parcels of land or one or more existing easements and does not create a new street or change an existing street.

I JOHN A. RUDOLPH , certify that this plat was prepared under my supervision from an actual field survey made under my supervision, of as-built conditions.

That the boundaries not surveyed are clearly indicated as such and were plotted from information as referenced hereon; That the ratio of precision as calculated was 1:7,500+ and that the global navigational satellite system (GNSS) was used to perform this survey and the following information was used:

Class of Survey: CLASS B (HORIZONTAL) CLASS B (VERTICAL)
Positional Accuracy: 0.12 feet (HORIZONTAL)
Type of GPS field procedure: RTK
Dates of survey: May and June 2022
Datum/Epoch: NAD 1983(2011)
Published/Fixed Control Use: OPUS
Geoid Model: 2012B CONUS
Combined Grid Factor: 0.99995565 GROUND TO GRID
Units: US SURVEY FEET

That this plat meets the requirements of the standards of practice for land surveying in North Carolina. Witness my hand and seal this 29th day of June , 2022.

SEAL OR STAMP

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4194 JOHN ASHLEY RUDOLPH

Professional Land Surveyor — L-4194 License Number

CHOWAN RIVER BASIN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT: PIERCE TERRACE SITE

Restoration Systems
1101 Haynes St.
Suite 211
Raleigh, NC 27604

WORTH CREECH
SITE CONSTRUCTION MANAGER

Prepared In the Office of:
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

JOSHUA G. DALTON, P.E.
PROJECT ENGINEER

DATE:

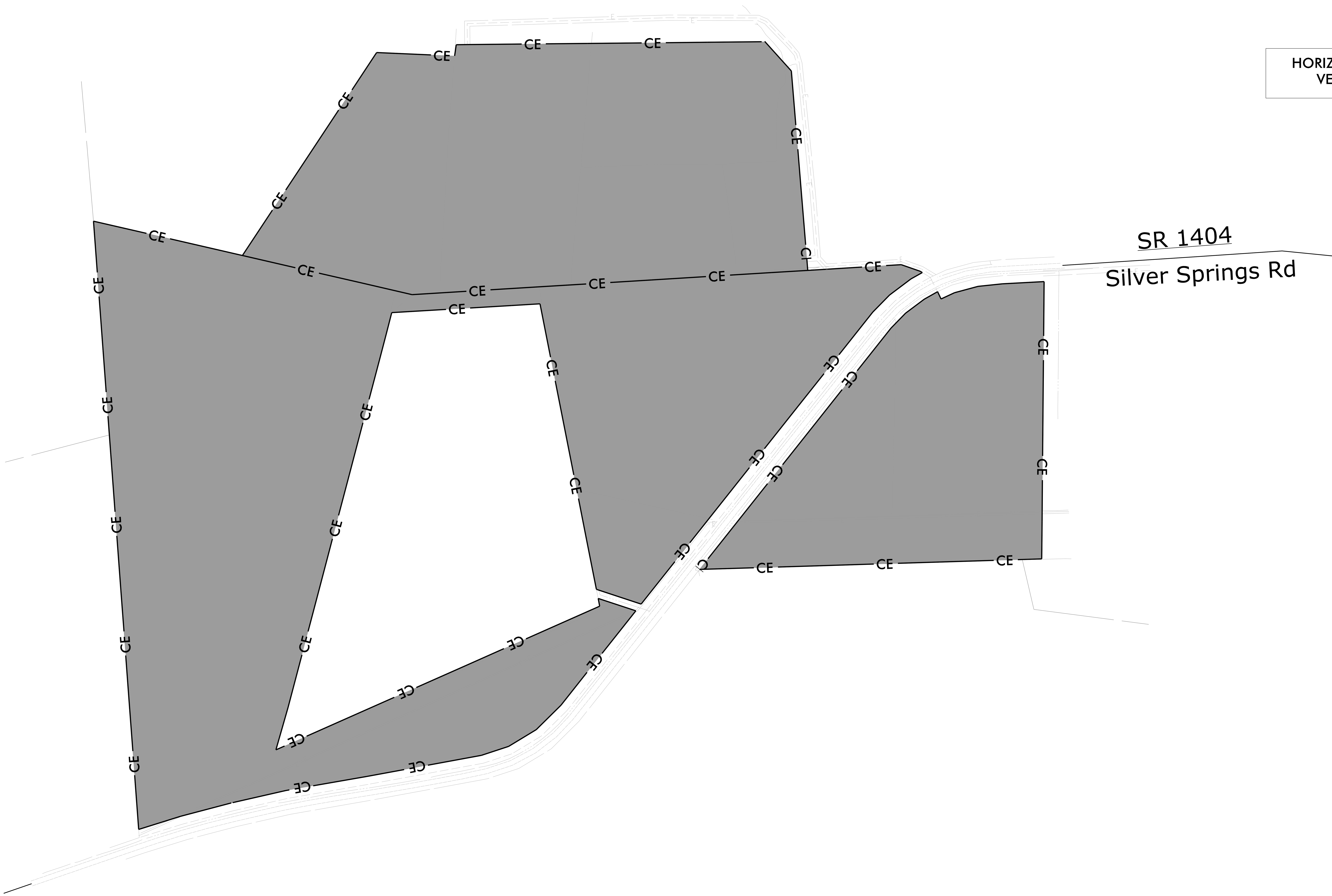
6/29/2023
PCTERRdypshAB01.dgn
jharvey

RECORD DRAWING

200′ 100′ 0 200′ 400′
SCALE: 1″ = 200′

NAD 83

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988



CE — CONSERVATION EASEMENT

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

RESTORATION SYSTEMS | LLC

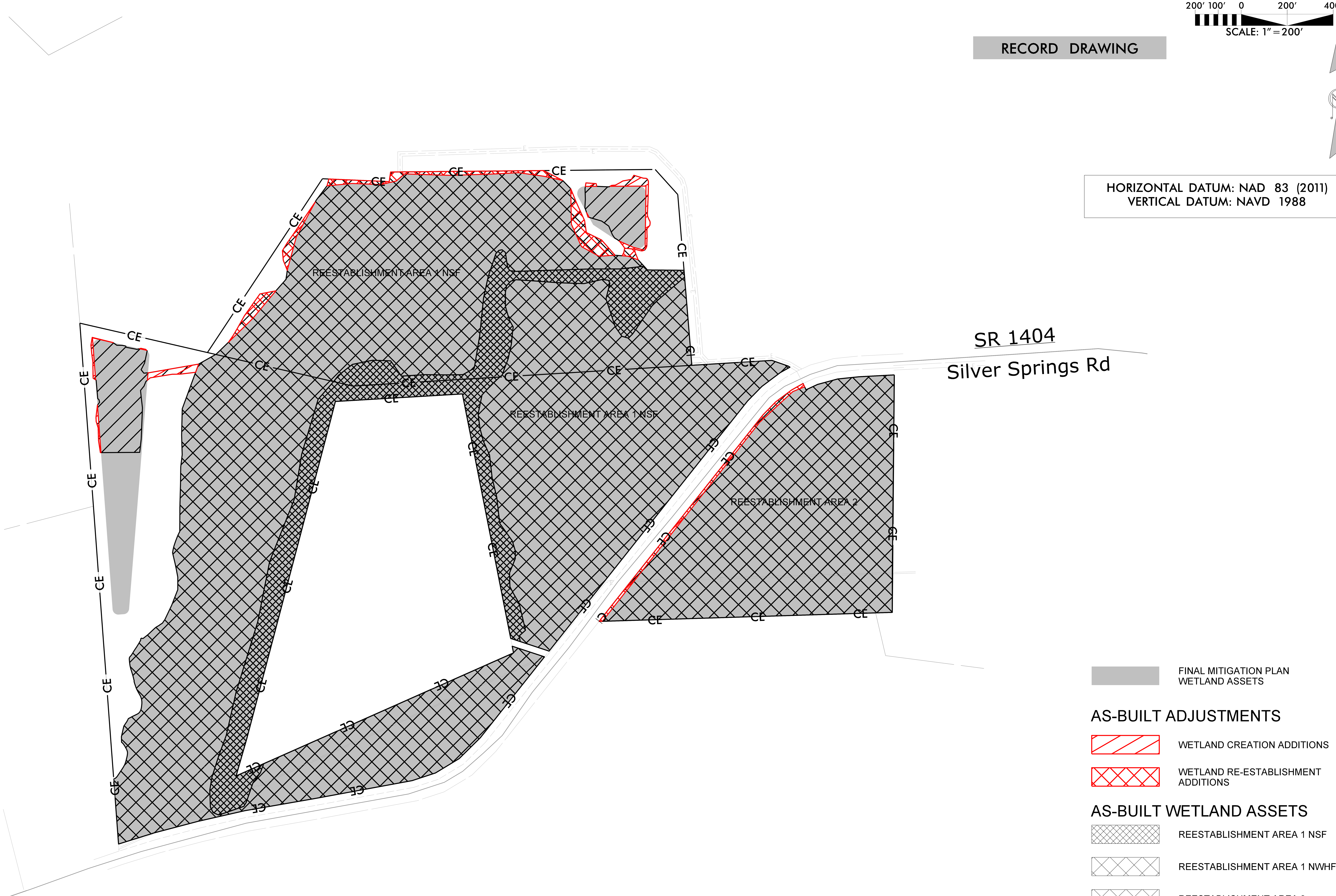
PIERCE TERRACE

GATES COUNTY, NC

AS-BULT CONSERVATION EASEMENT

PROJECT #:	1154-21011
DRAWING NAME:	PCTERRDYPSHAB02
DATE:	6/29/2023
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	AB–02

RECORD DRAWING



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FINAL MITIGATION PLAN WETLAND ASSETS

AS-BUILT ADJUSTMENTS

- WETLAND CREATION ADDITIONS
- WETLAND RE-ESTABLISHMENT ADDITIONS

AS-BUILT WETLAND ASSETS

- REESTABLISHMENT AREA 1 NSF
- REESTABLISHMENT AREA 1 NWHF
- REESTABLISHMENT AREA 2
- CREATION

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

RESTORATION SYSTEMS | LLC

PIERCE TERRACE
GATES COUNTY, NC

AS-BUILT WETLAND MITIGATION ASSETS

PROJECT #: 1154-21011
DRAWING NAME: PCTERRDYPSHAB03
DATE: 6/29/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. AB–03

6/29/2023
PCTERRdypshAB03.dgn

RECORD DRAWING

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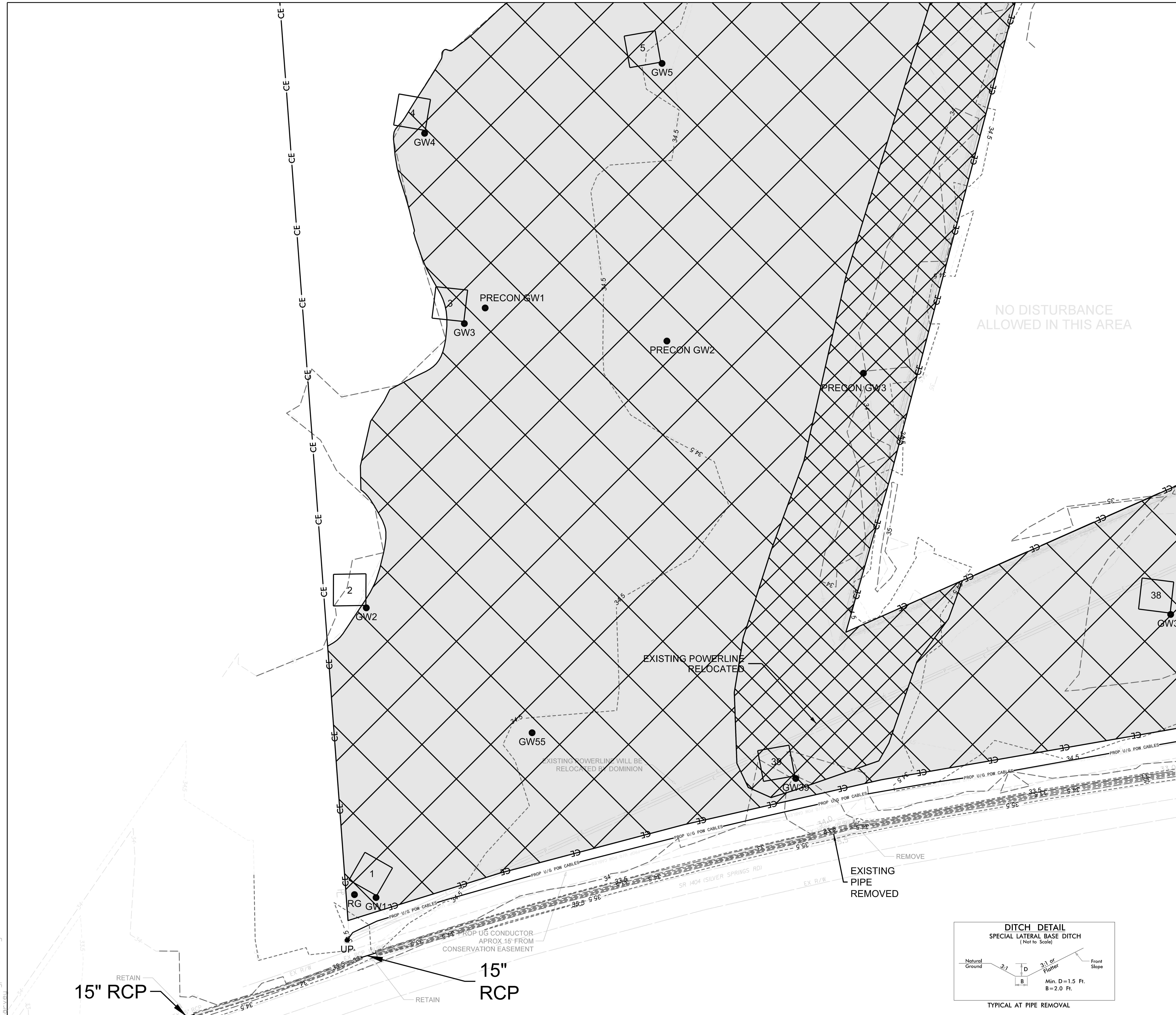
SCALE: 1" = 50'

NAD 83



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN
(EXISTING AND PROPOSED)
AT 0.5' INTERVAL

NOTE

WHEN GROUNDWATER GAUGE EXISTS NEAR PERMANENT VEGETATION PLOT, VEGETATION PLOT ORIGIN POINT IS LOCATED AT SAME CORNER AS GROUNDWATER GAUGE (THOSE NOT SHOWN).

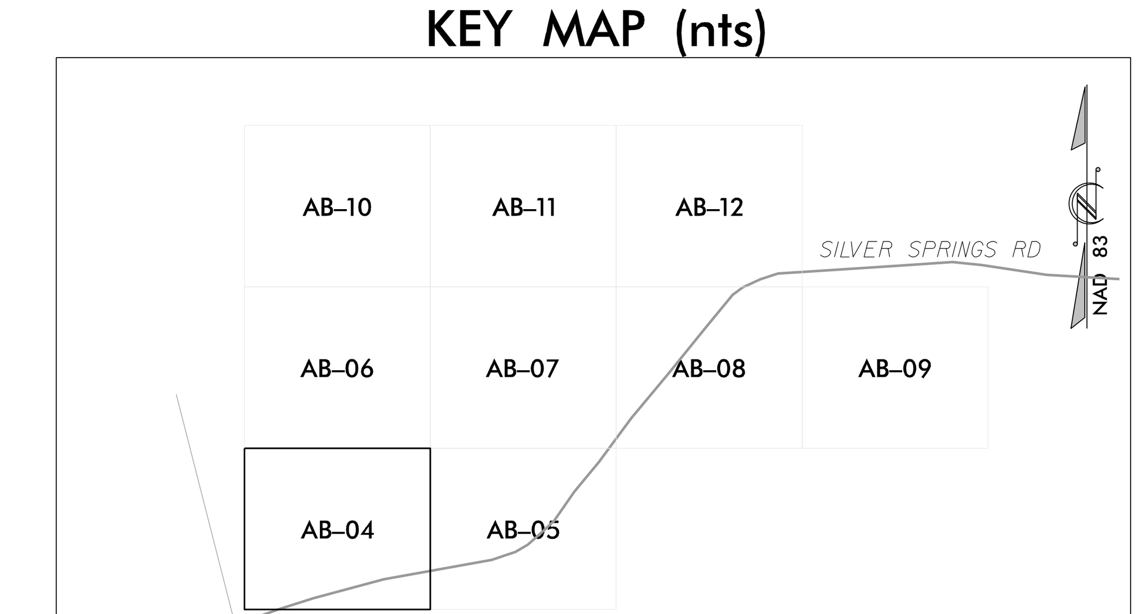
FINAL MITIGATION PLAN WETLAND ASSETS

REESTABLISHMENT AREA 1 NSF

REESTABLISHMENT AREA 1 NSF

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KEY MAP (nts)



SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

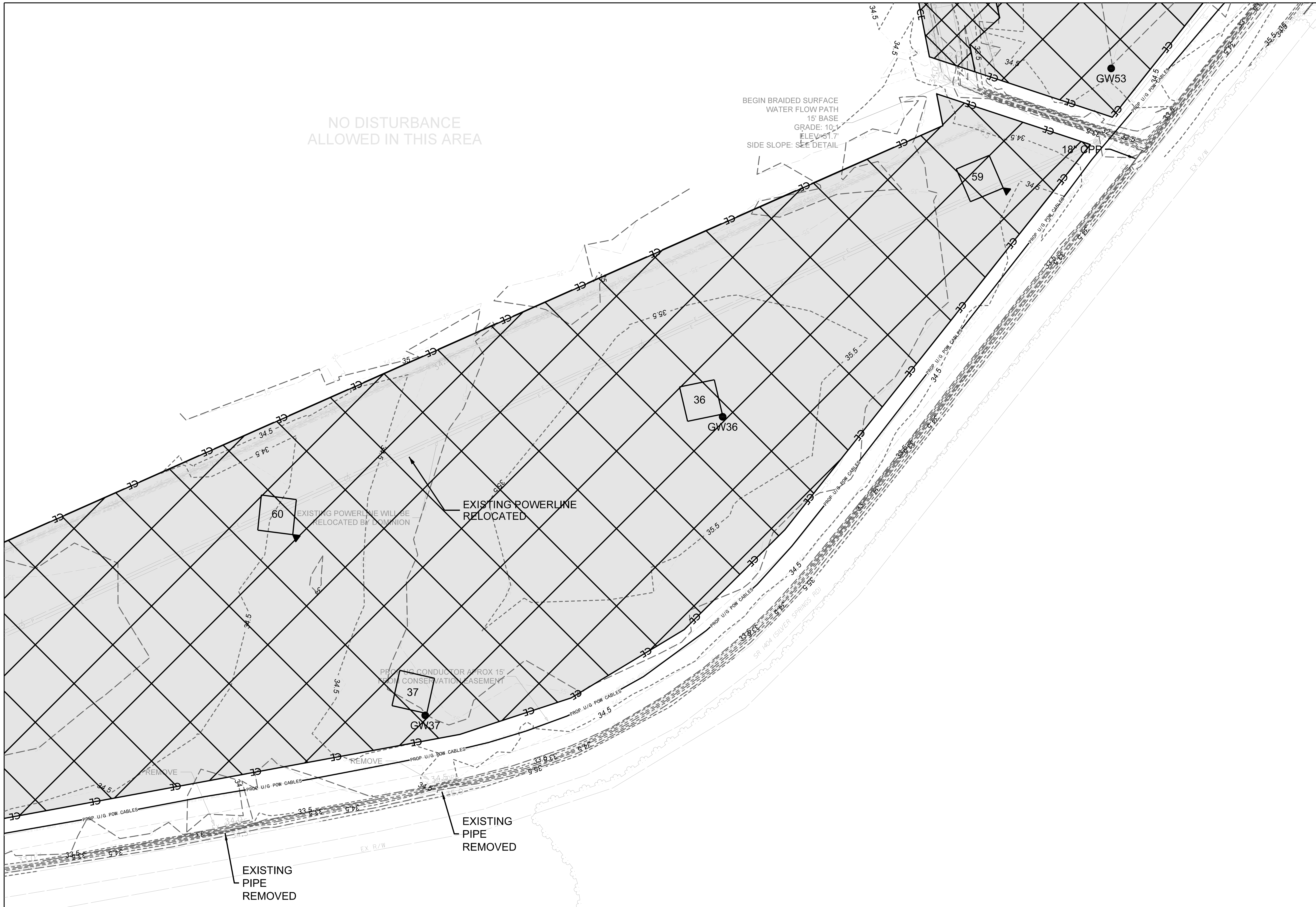
RESTORATION SYSTEMS | LLC

PIERCE TERRACE
GATES COUNTY, NC

AS-BUILT SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHAB04
DATE: 6/29/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **AB-04**



SCALE: 1" = 50'

25' 12.5' 0 25' 50'

NAD 83

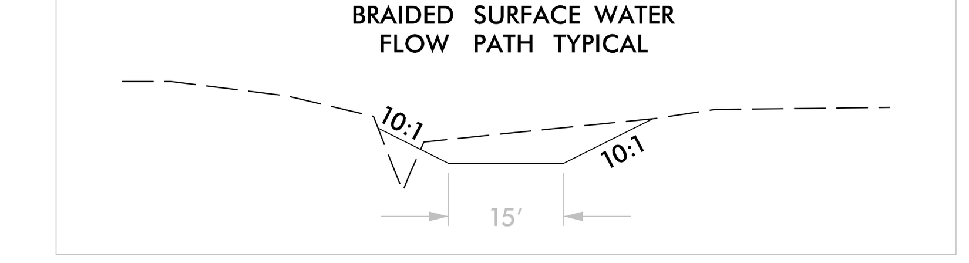
RECORD DRAWING

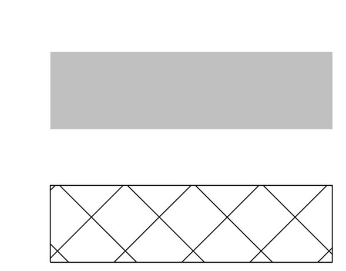
HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN
(EXISTING AND PROPOSED)
AT 0.5' INTERVAL

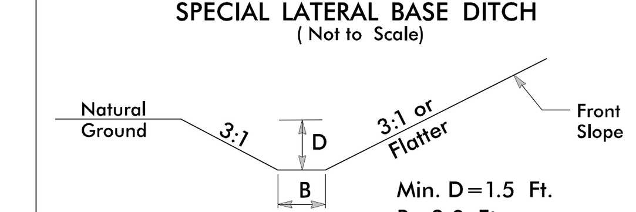
NOTE

WHEN GROUNDWATER GAUGE EXISTS NEAR PERMANENT VEGETATION PLOT, VEGETATION PLOT ORIGIN POINT IS LOCATED AT SAME CORNER AS GROUNDWATER GAUGE (THOSE NOT SHOWN).



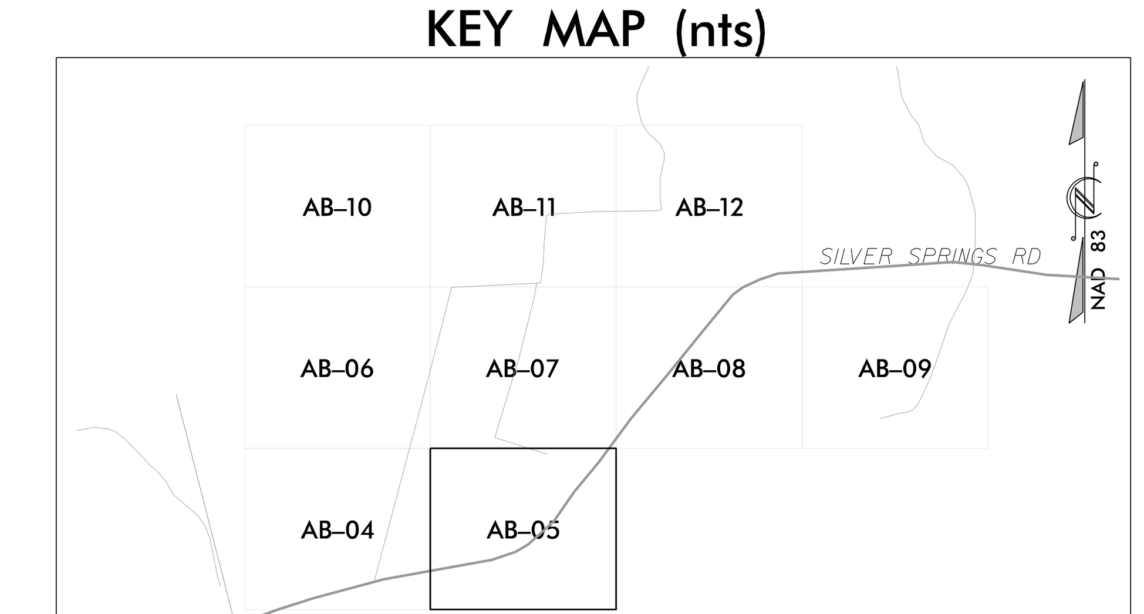


DITCH DETAIL
SPECIAL LATERAL BASE DITCH
(Not to Scale)



TYPICAL AT PIPE REMOVAL

KEY MAP (nts)



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

RESTORATION SYSTEMS | LLC

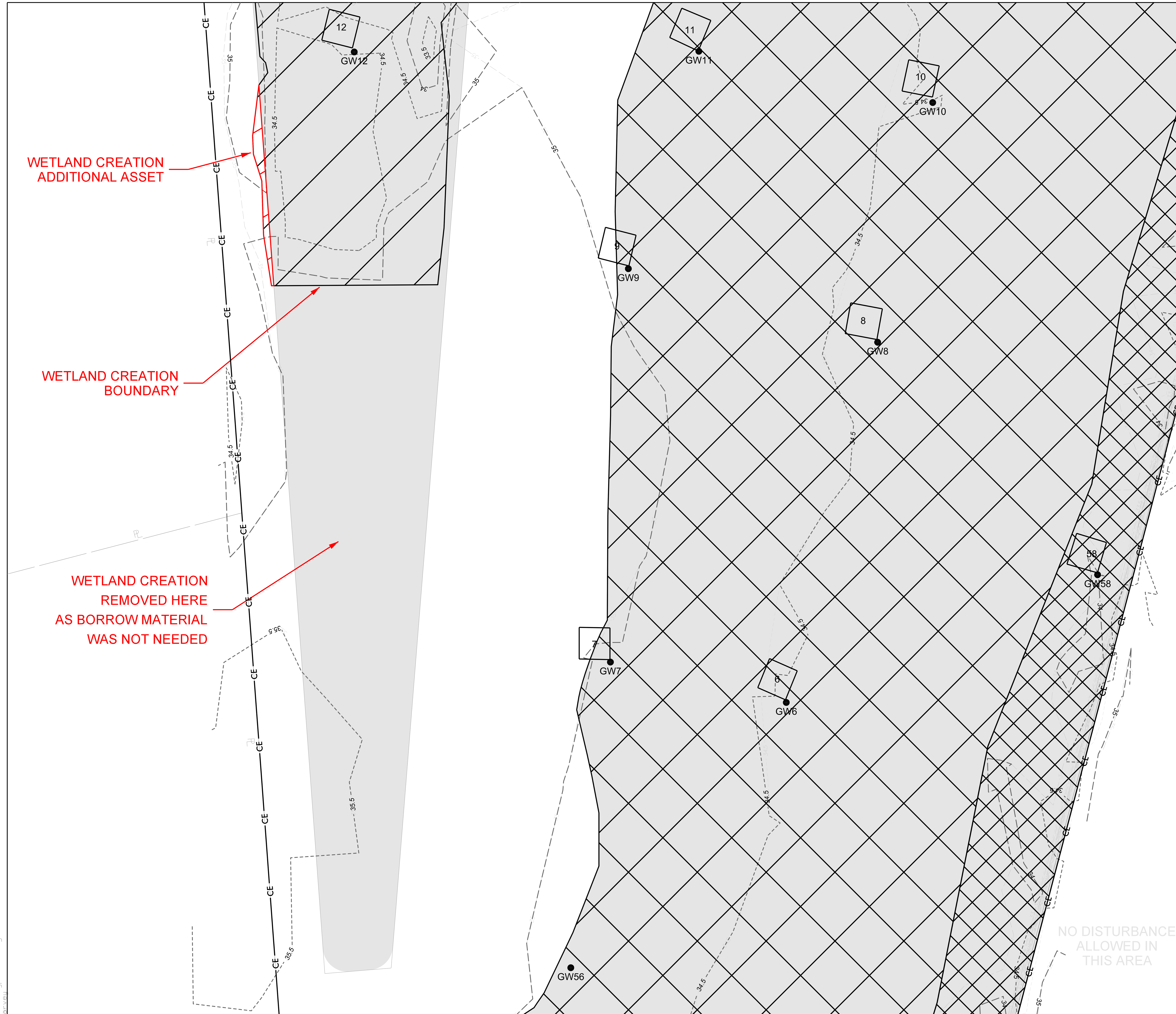
PIERCE TERRACE
GATES COUNTY, NC

AS-BUILT SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHAB05
DATE: 6/29/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
AB–05

6/29/2023
PCTERRdypshAB05.dgn



SCALE: 1" = 50'

NAD 83

RECORD DRAWING

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN (EXISTING AND PROPOSED) AT 0.5' INTERVAL

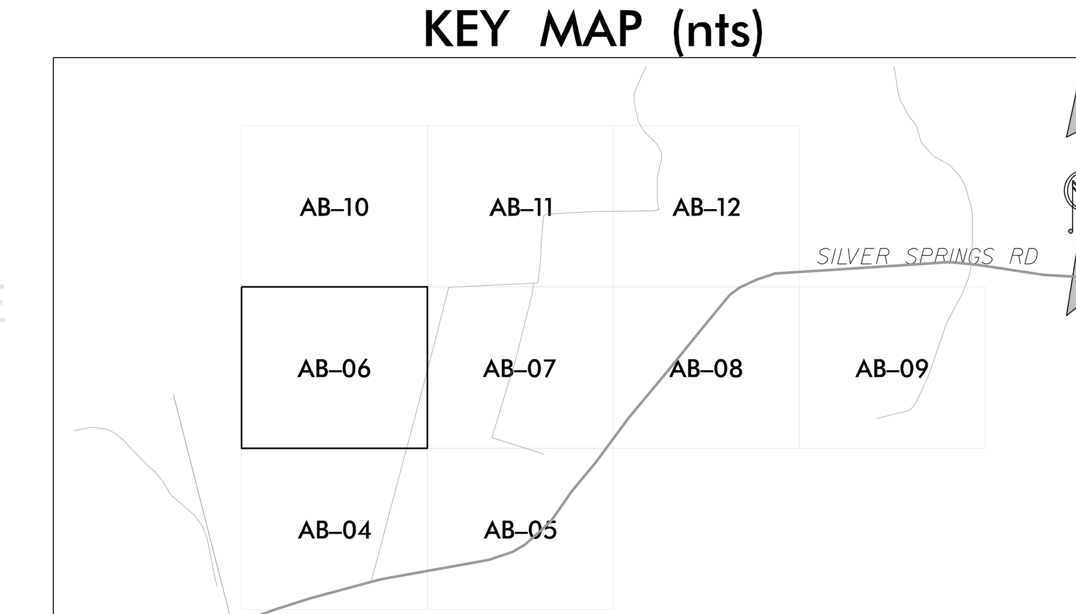
NOTE

WHEN GROUNDWATER GAUGE EXISTS NEAR PERMANENT VEGETATION PLOT, VEGETATION PLOT ORIGIN POINT IS LOCATED AT SAME CORNER AS GROUNDWATER GAUGE (THOSE NOT SHOWN).

- FINAL MITIGATION PLAN WETLAND ASSETS
- REESTABLISHMENT AREA 1 NSF
- REESTABLISHMENT AREA 1 NWHF
- WETLAND CREATION ADDITIONS
- CREATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KEY MAP (nts)



SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

RESTORATION SYSTEMS | LLC

PIERCE TERRACE

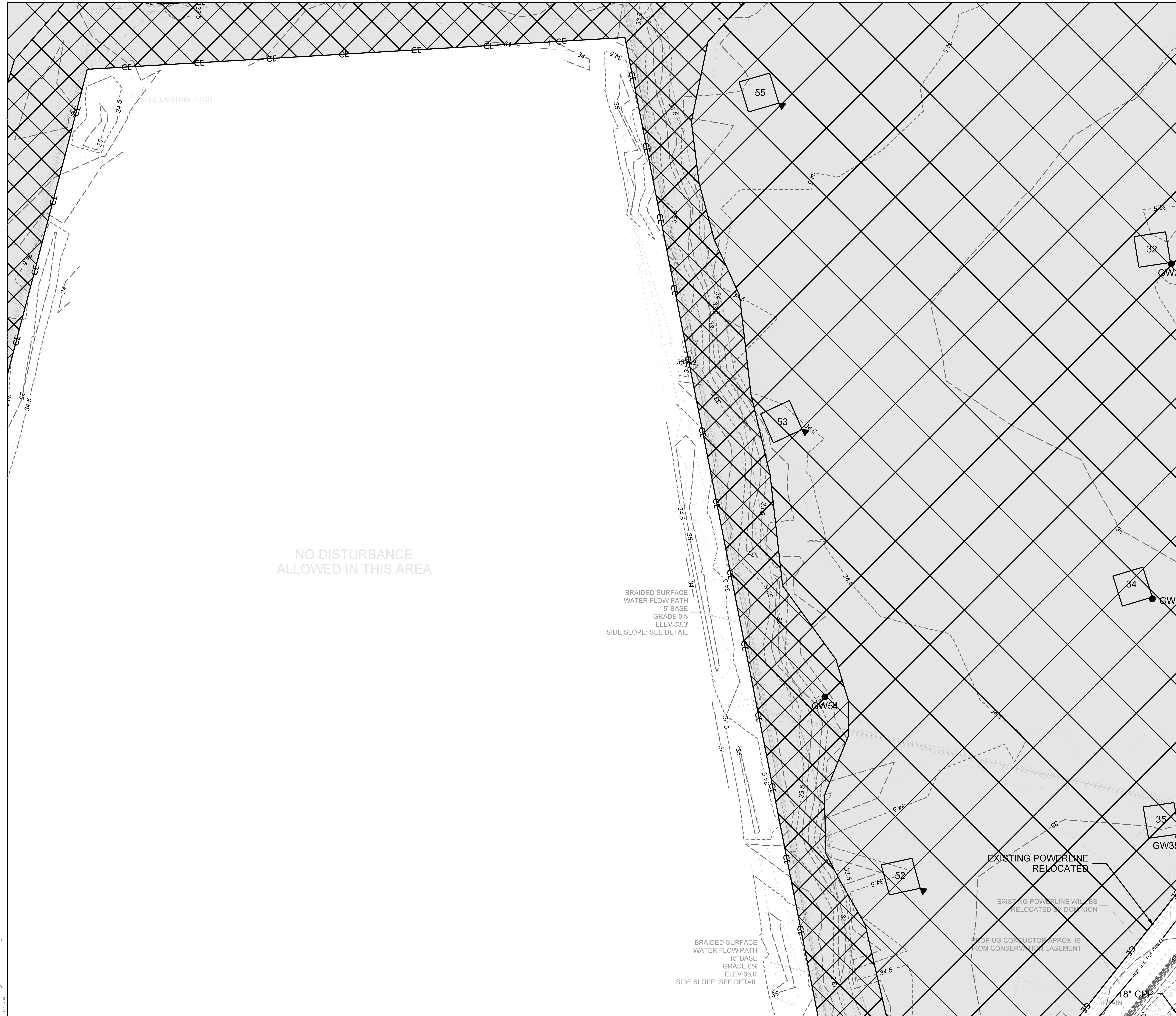
GATES COUNTY, NC

AS-BUILT SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHAB06
DATE: 6/29/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. AB–06

6/29/2023
PCTERRdypshAB06.dgn



25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

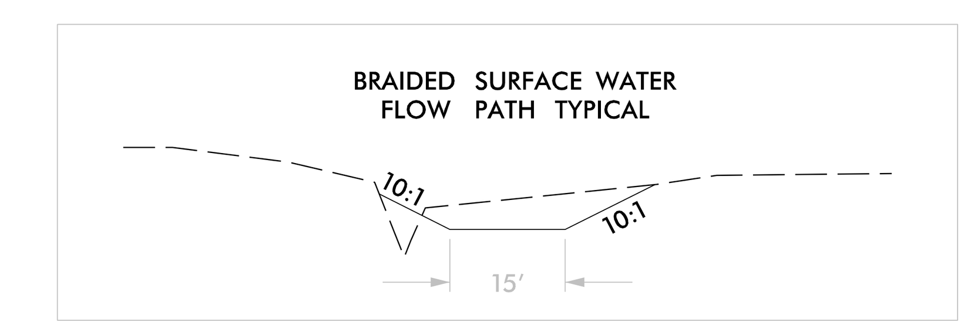
RECORD DRAWING

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN
(EXISTING AND PROPOSED)
AT 0.5' INTERVAL

NOTE

WHEN GROUNDWATER GAUGE EXISTS NEAR PERMANENT VEGETATION PLOT, VEGETATION PLOT ORIGIN POINT IS LOCATED AT SAME CORNER AS GROUNDWATER GAUGE (THOSE NOT SHOWN).



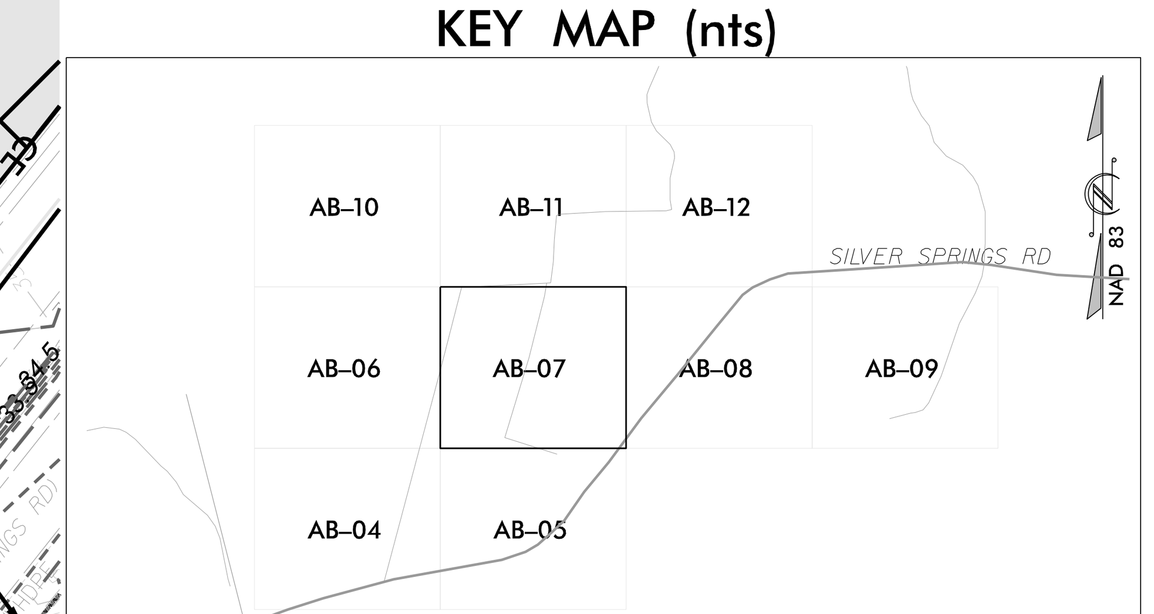
FINAL MITIGATION PLAN WETLAND ASSETS

REESTABLISHMENT AREA 1 NSF

REESTABLISHMENT AREA 1 NWHF

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KEY MAP (nts)



SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

RS RESTORATION SYSTEMS | LLC

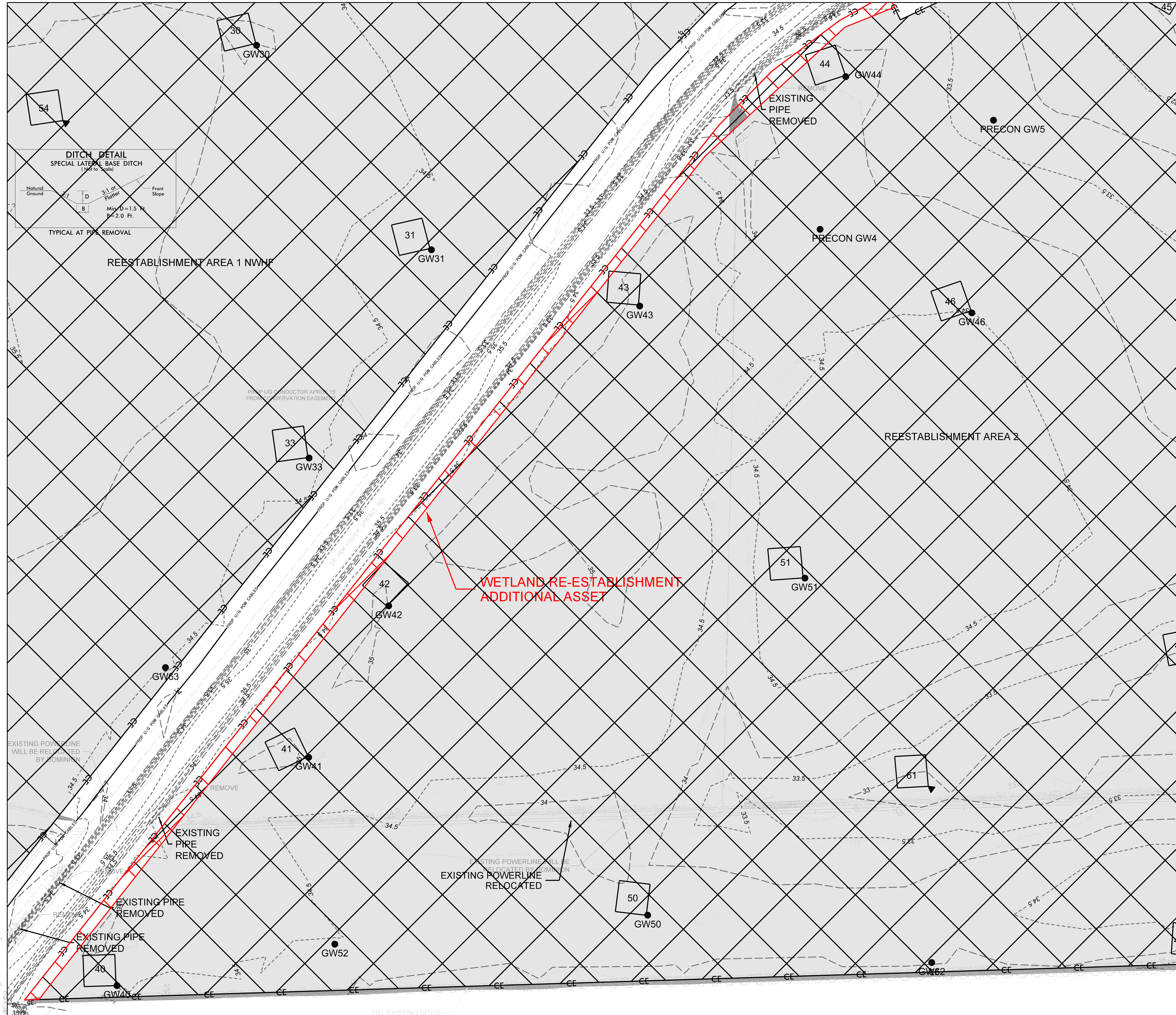
PIERCE TERRACE
GATES COUNTY, NC

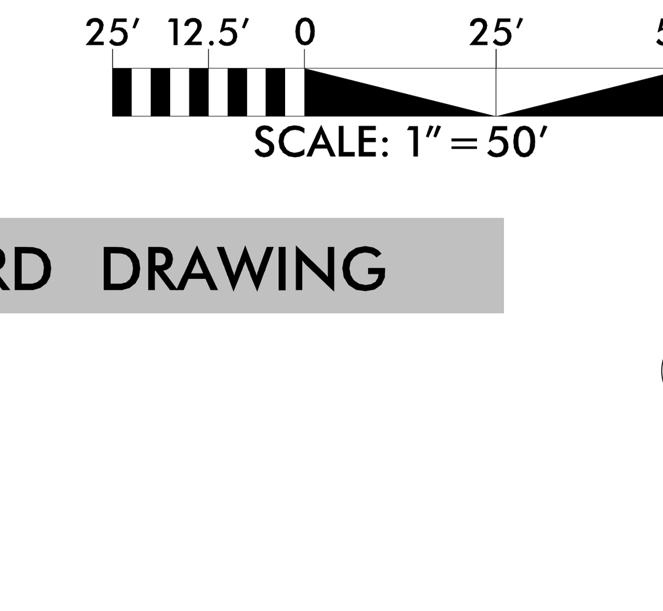
AS-BUILT SITE IMPROVEMENT PLAN

PROJECT #: 1154-21011
DRAWING NAME: PCTERRDYPSHAB07
DATE: 6/29/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
AB-07

6/29/2023
PCTERRdypshAB07.dgn





RECORD DRAWING

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN
(EXISTING AND PROPOSED)
AT 0.5' INTERVAL

NOTE

WHEN GROUNDWATER GAUGE EXISTS NEAR PERMANENT VEGETATION PLOT, VEGETATION PLOT ORIGIN POINT IS LOCATED AT SAME CORNER AS GROUNDWATER GAUGE (THOSE NOT SHOWN).

FINAL MITIGATION PLAN WETLAND ASSETS

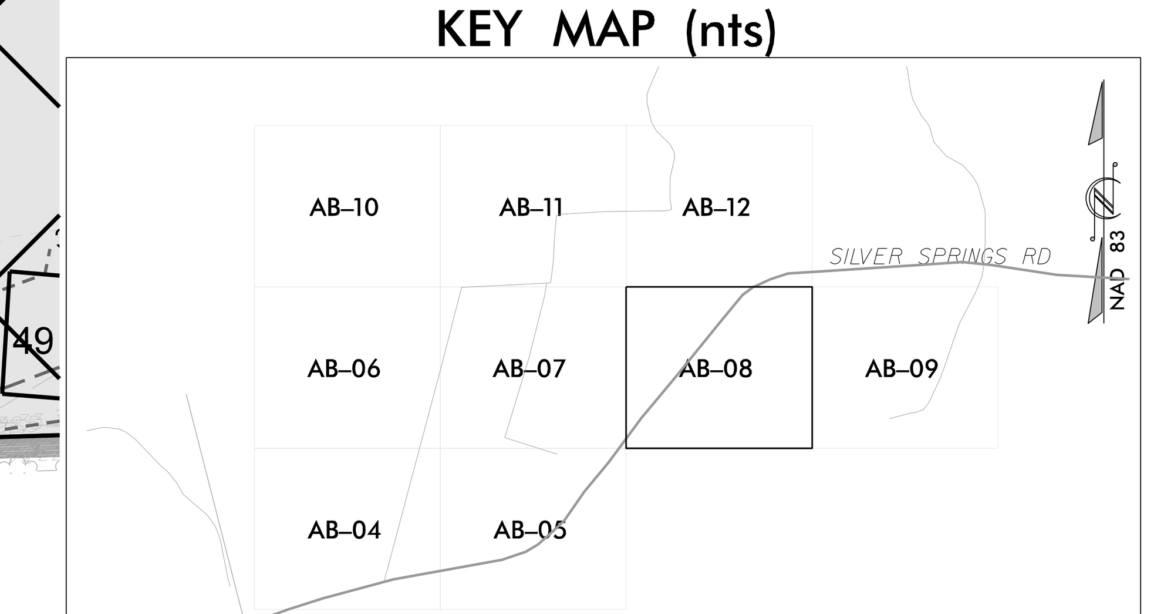
WETLAND RE-ESTABLISHMENT ADDITIONS

REESTABLISHMENT AREA 1 NWHF

REESTABLISHMENT AREA 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KEY MAP (nts)



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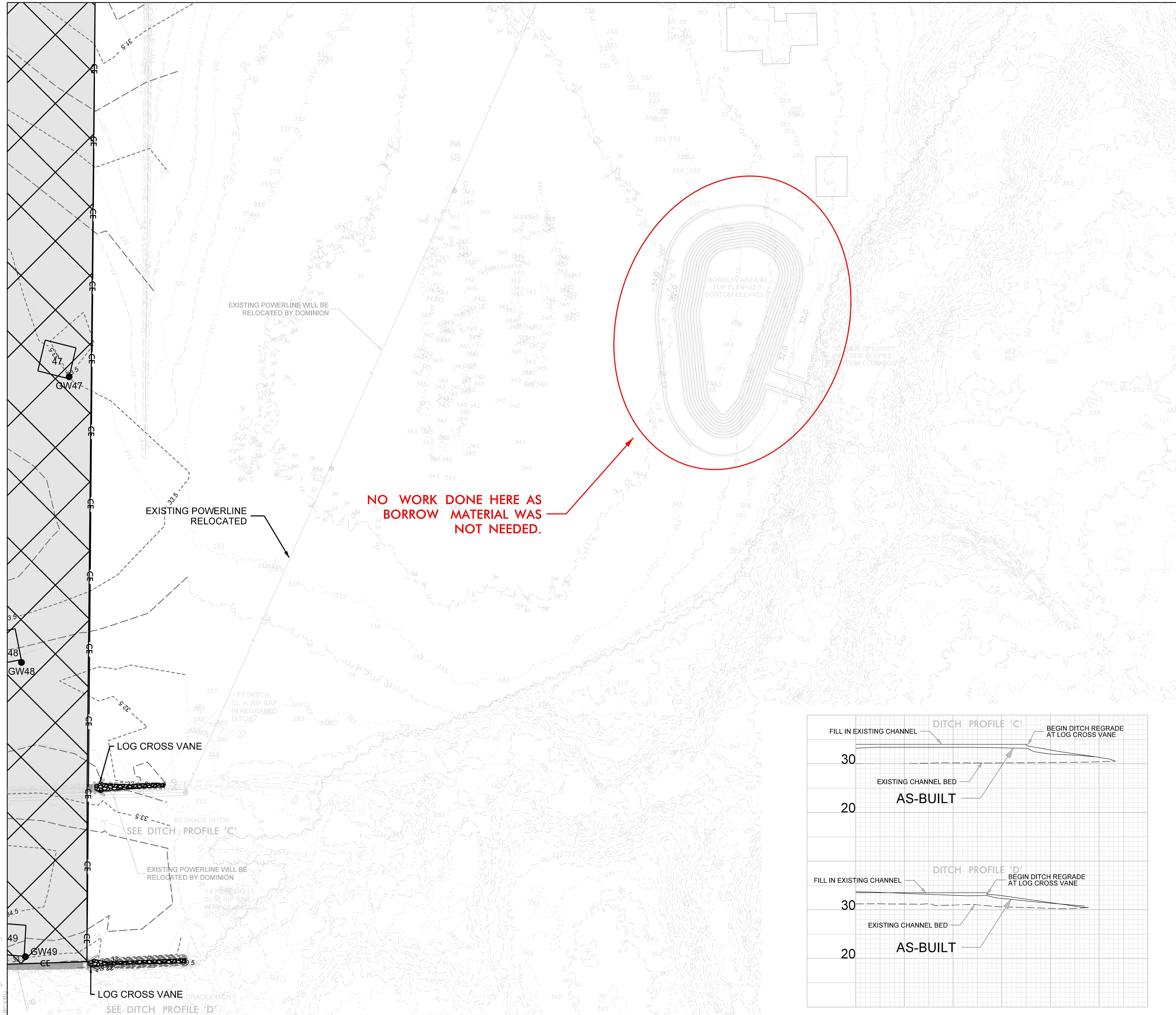
RESTORATION SYSTEMS | LLC

PIERCE TERRACE
GATES COUNTY, NC
AS-BULT SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHAB08
DATE: 6/29/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **AB-08**



25' 12.5' 0 25' 50'

SCALE: 1" = 50'

NAD 83

RECORD DRAWING

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN
(EXISTING AND PROPOSED)
AT 0.5' INTERVAL

NOTE

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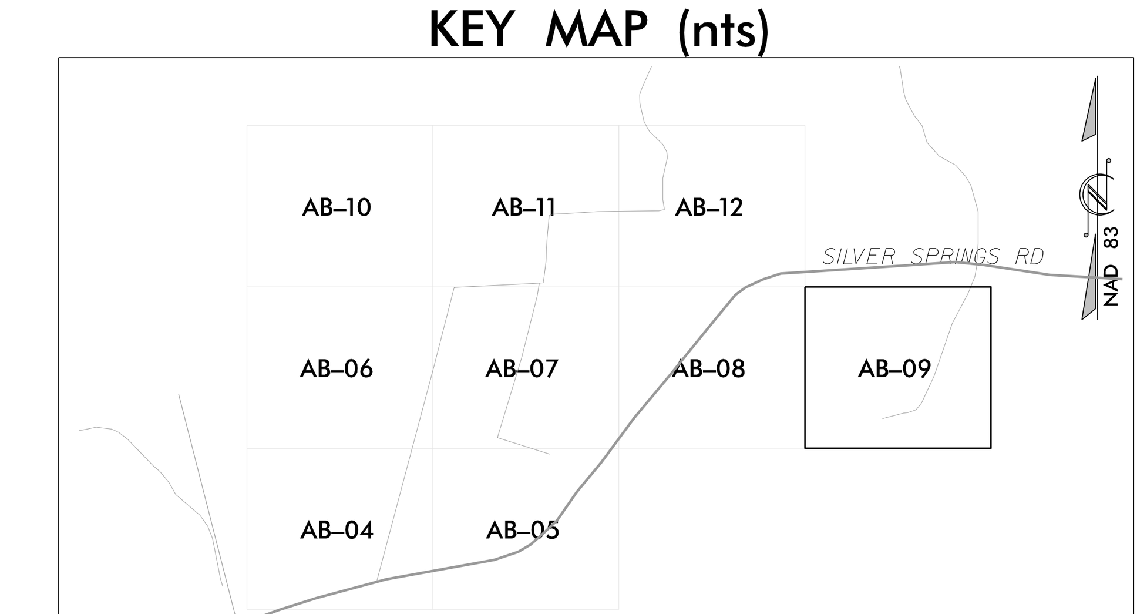
FINAL MITIGATION PLAN WETLAND ASSETS

REESTABLISHMENT AREA 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KEY MAP (nts)



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RESTORATION SYSTEMS | LLC

PIERCE TERRACE

GATES COUNTY, NC

AS-BUILT SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHAB09
DATE: 6/29/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **AB–09**

25′ 12.5′ 0 25′ 50′
SCALE: 1″ = 50′

NAD 83

RECORD DRAWING

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN
(EXISTING AND PROPOSED)
AT 0.5' INTERVAL

WETLAND RE-ESTABLISHMENT
ADDITIONAL ASSET

WETLAND RE-ESTABLISHMENT
ADDITIONAL ASSET

WETLAND CREATION
ADDITIONAL ASSET

WETLAND CREATION
ADDITIONAL ASSET

17
GW17
16
GW16
13
GW13

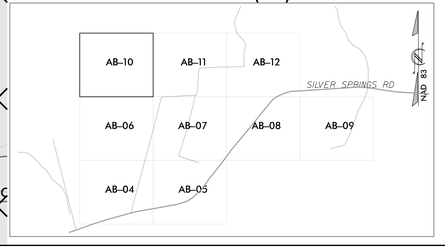
NOTE

WHEN GROUNDWATER GAUGE EXISTS NEAR PERMANENT VEGETATION PLOT, VEGETATION PLOT ORIGIN POINT IS LOCATED AT SAME CORNER AS GROUNDWATER GAUGE (THOSE NOT SHOWN).

- FINAL MITIGATION PLAN WETLAND ASSETS
- WETLAND CREATION ADDITIONS
- WETLAND RE-ESTABLISHMENT ADDITIONS
- REESTABLISHMENT AREA 1 NSF
- CREATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KEY MAP (nts)



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RESTORATION SYSTEMS, LLC

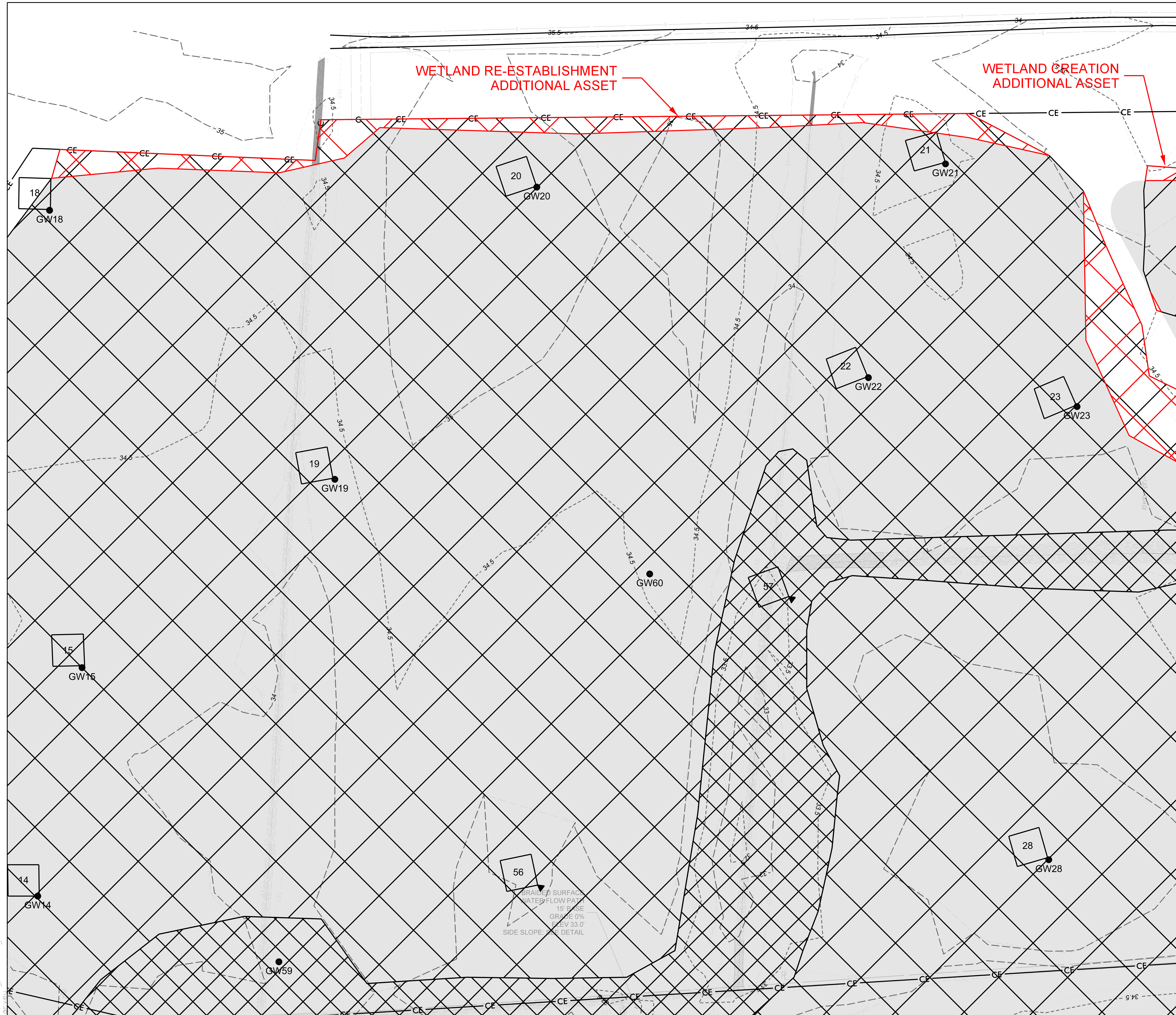
PIERCE TERRACE
GATES COUNTY, NC

AS-BUILT SITE IMPROVEMENT PLAN

PROJECT # :
1154-21011
DRAWING NAME:
PCTERRDYPSHAB10
DATE:
6/29/2023
DRAWN BY:
JRH
REVIEWED BY:
JGD
REVISIONS:

SHEET NO.
AB–10

6/29/2023
PCTERRdypshAB10.dgn
jrah.vsel



25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

RECORD DRAWING

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN
(EXISTING AND PROPOSED)
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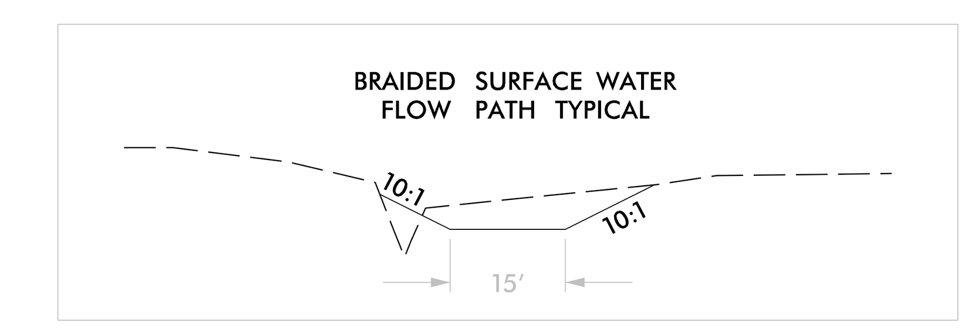

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- WETLAND RE-ESTABLISHMENT ADDITIONS
- REESTABLISHMENT AREA 1 NSF
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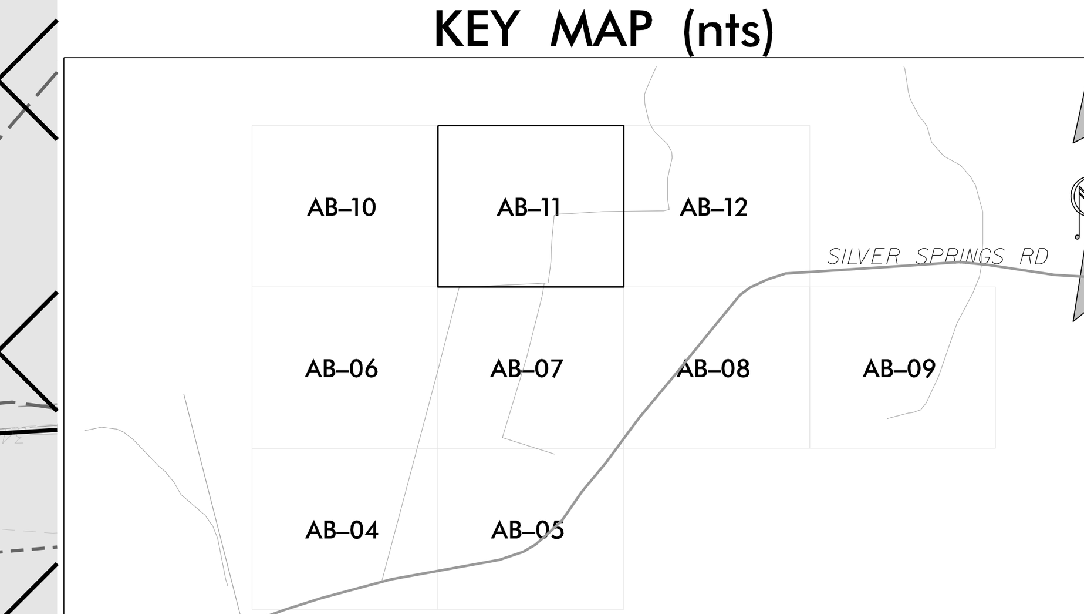
KEY MAP (nts)



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RS RESTORATION SYSTEMS | LLC

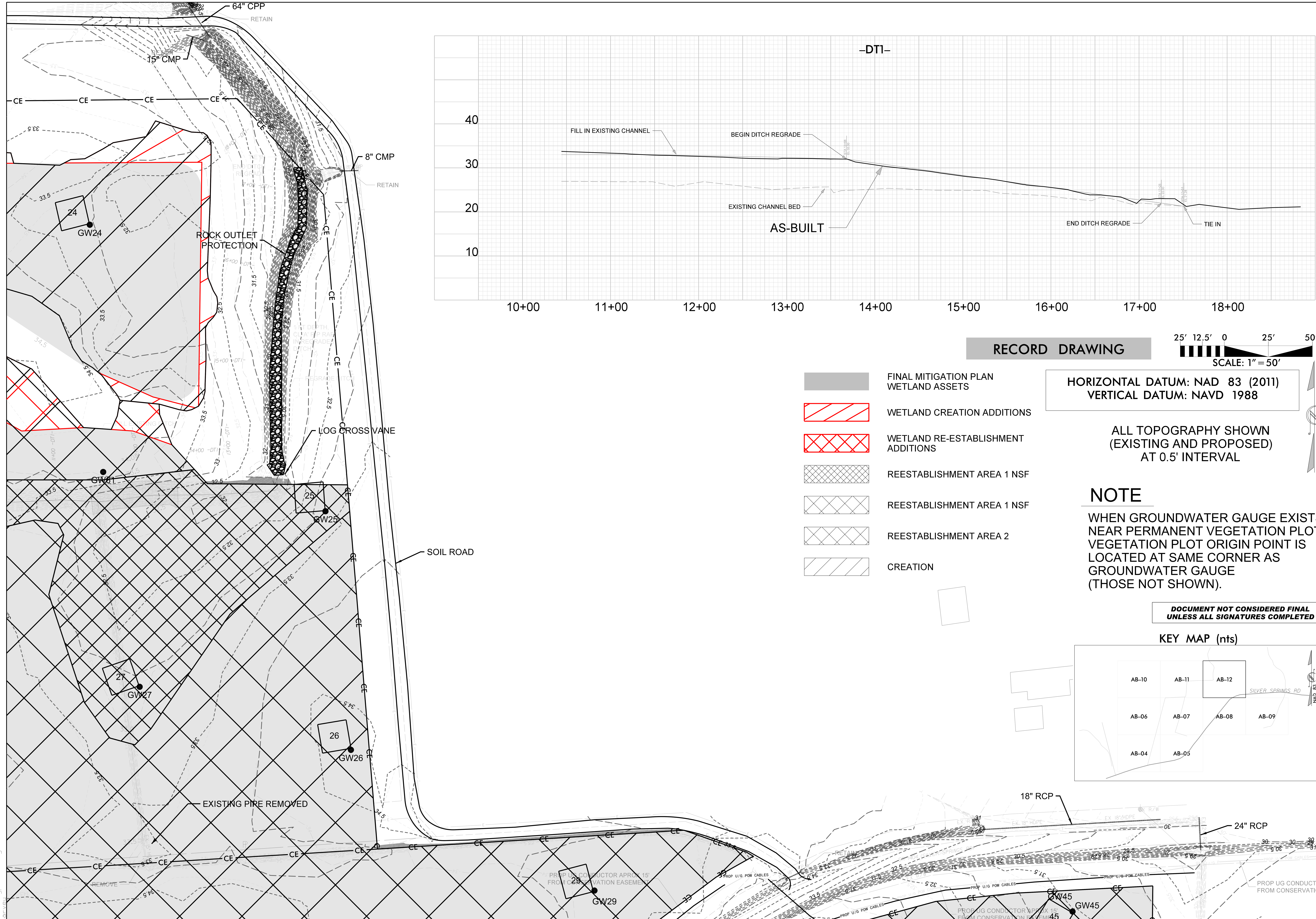
PIERCE TERRACE
GATES COUNTY, NC

AS-BUILT SITE IMPROVEMENT PLAN

PROJECT #: 1154-21011
DRAWING NAME: PCTERRDYPSHAB11
DATE: 6/29/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **AB-11**

6/29/2023
PCTERRdypshAB11.dgn



RECORD DRAWING

SCALE: 1" = 50'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

	FINAL MITIGATION PLAN WETLAND ASSETS
	WETLAND CREATION ADDITIONS
	WETLAND RE-ESTABLISHMENT ADDITIONS
	REESTABLISHMENT AREA 1 NSF
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	REESTABLISHMENT AREA 2
	CREATION

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KEY MAP (nts)

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RESTORATION SYSTEMS | LLC

PIERCE TERRACE
GATES COUNTY, NC

AS-BUILT SITE IMPROVEMENT PLAN

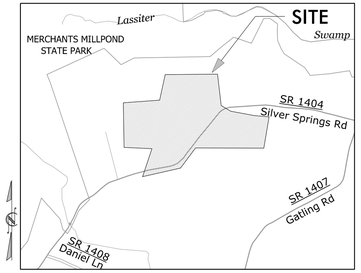
PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHAB12
DATE: 6/29/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **AB–12**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	PIERCE TERRACE SITE	1	

AS–BUILT SURVEY PLANS
PIERCE TERRACE SITE

DWR PROJECT 2020–00034



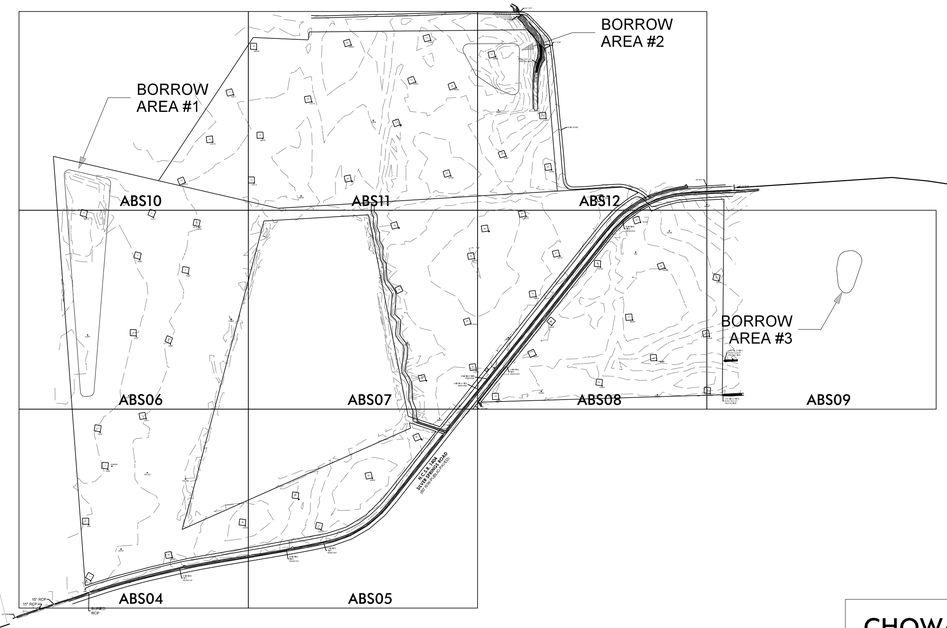
VICINITY MAP
Not to Scale

LOCATION: GATES COUNTY, NORTH CAROLINA

TYPE OF WORK: WETLAND RESTORATION AND MITIGATION (CLEARING, GRUBBING, GRADING, AND EROSION CONTROL)

MERCHANTS MILLPOND
STATE PARK

MERCHANTS MILLPOND
STATE PARK



MERCHANTS
MILLPOND
STATE PARK

CHOWAN RIVER BASIN

NAD 83

INDEX OF SHEETS

SHEET NUMBER	SHEET
ABS01	As-Built Survey Title Sheet
ABS02	As-Built Survey Conservation Easement
ABS04 THRU ABS12	As-Built Survey Site Improvement Plans

SURVEYORS CERTIFICATION(S)

Surveyor's disclaimer: No attempt was made to locate any cemeteries, wetlands, hazardous material sites, underground utilities or any other features above, or below ground other than those shown. However, no visible evidence of cemeteries or utilities, aboveground or otherwise, was observed by the undersigned (other than those shown).

I certify that the survey is of an existing parcel or parcels of land or one or more existing easements and does not create a new street or change an existing street.

I JOHN A. RUDOLPH , certify that this plat was prepared under my supervision from an actual field survey made under my supervision, of as-built conditions.

That the boundaries not surveyed are clearly indicated as such and were plotted from information as referenced hereon; That the ratio of precision as calculated was 1:7,500+ and that the global navigational satellite system (GNSS) was used to perform this survey and the following information was used:
Class of Survey: CLASS B (HORIZONTAL) CLASS B (VERTICAL)
Positional Accuracy: 0.12 feet (HORIZONTAL)
Type of GPS field procedure: RTK
Dates of survey: May and June 2022
Datum/Epoch: NAD 1983(2011)
Published/Fixed Control Use: OPUS
Geoid Model: 2012B CONUS
Combined Grid Factor: 0.99995565 GROUND TO GRID
Units: US SURVEY FEET

That this plat meets the requirements of the standards of practice for land surveying in North Carolina. Witness my hand and seal this 29th day of June , 2022.

SEAL OR STAMP

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4194 JOHN ASHLEY RUDOLPH PRELIMINARY NOT FOR CONSTRUCTION

L-4194
Professional Land Surveyor — License Number

k2 design group
774 S. Beston Road
La Grange, NC 28551
252.582.3097
www.k2designgroup.com
License # C-2111

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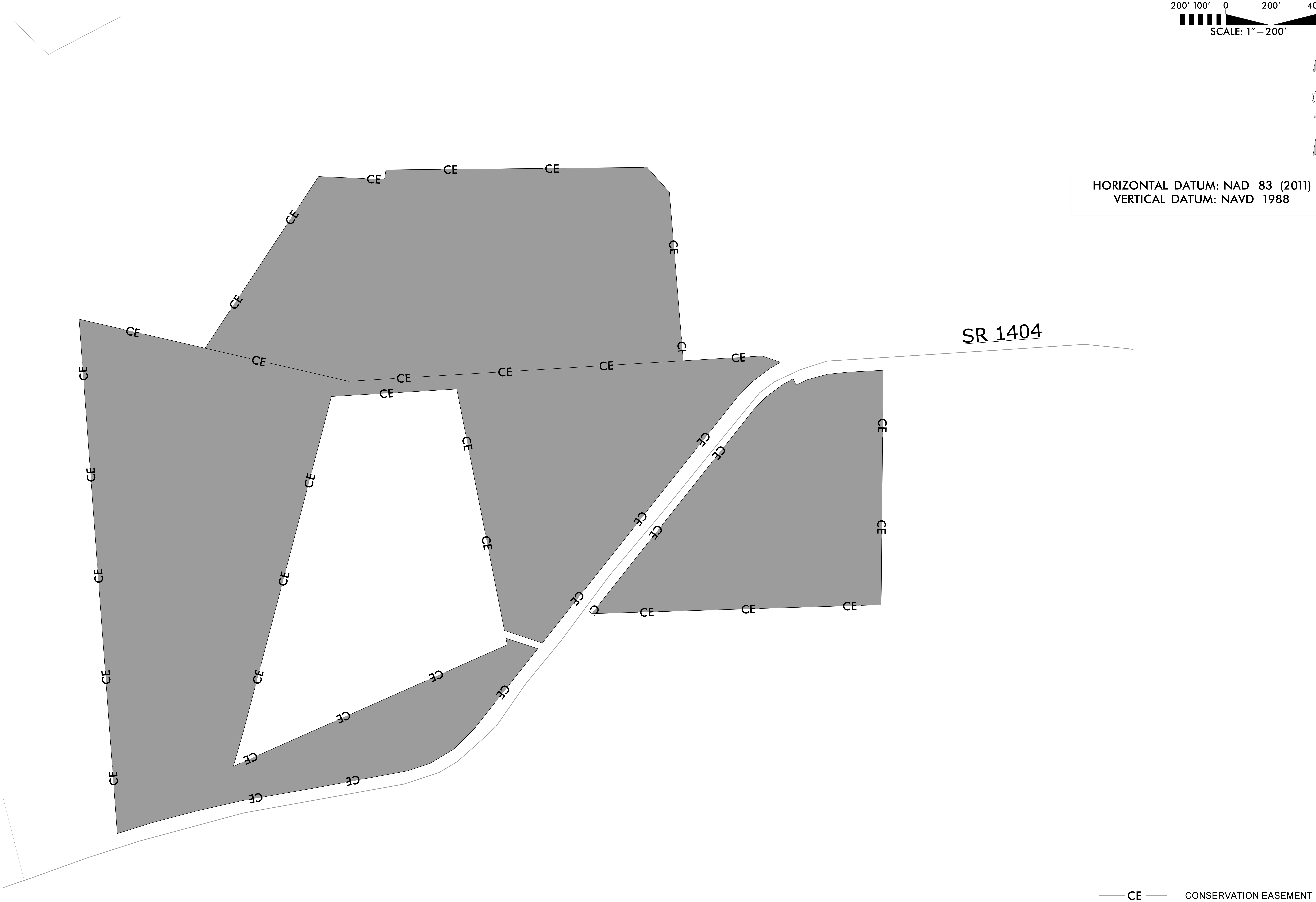
CONTRACT: PIERCE TERRACE SITE

Restoration Systems
1101 Haynes St.
Suite 211
Raleigh, NC 27604

WORTH CREECH
SITE CONSTRUCTION MANAGER

DATE:

6/19/2023
PCTERRdypsthABS01.dgn
jharvey



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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License # C-2111

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RS RESTORATION SYSTEMS | LLC

PIERCE TERRACE

GATES COUNTY, NC

AS-BULT SURVEY CONSERVATION EASEMENT

PROJECT # : 1154-21011

DRAWING NAME: PCTERRDYPSHABS02

DATE: 6/19/2023

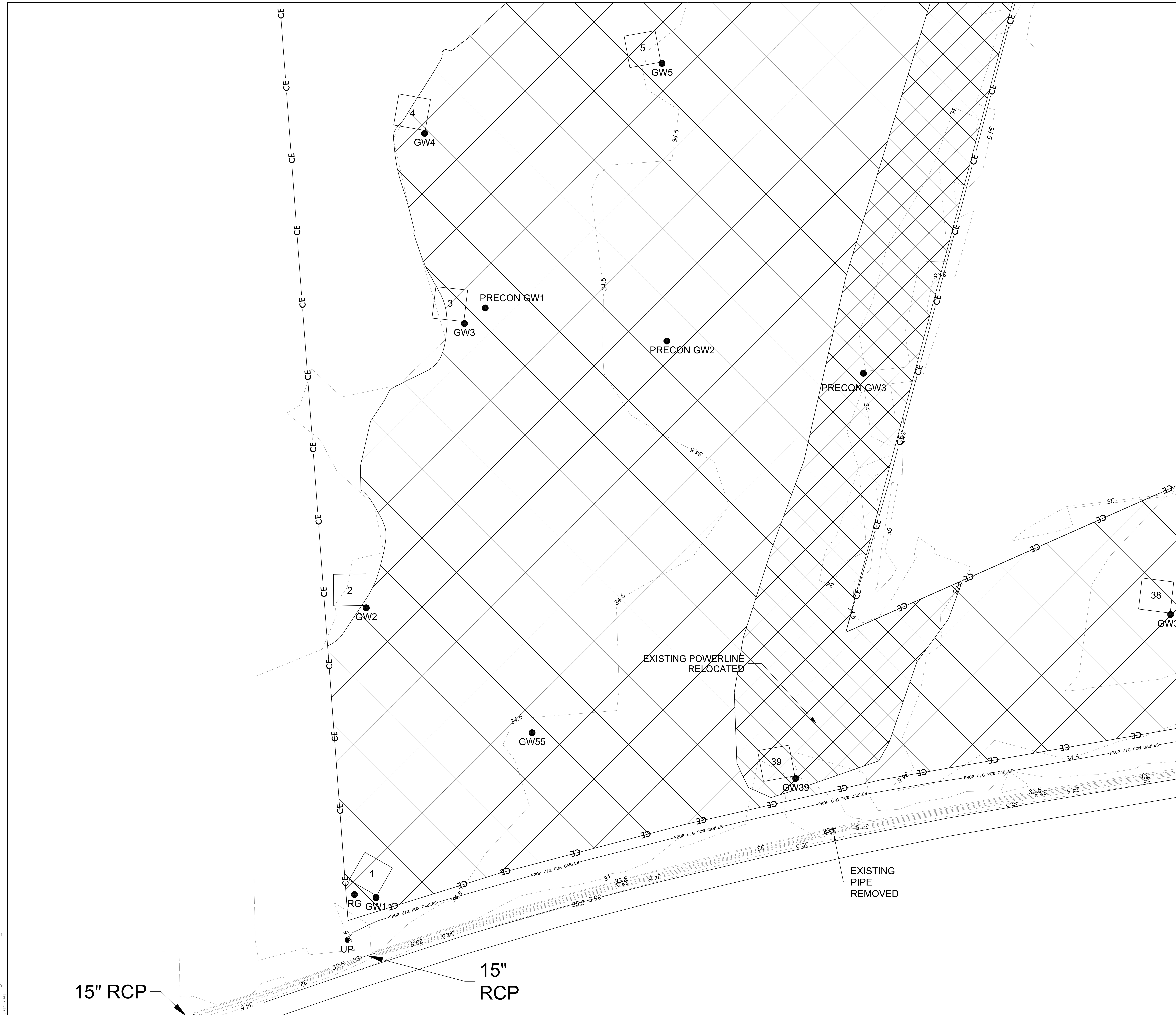
DRAWN BY: JRH

REVIEWED BY: JGD

REVISIONS:

SHEET NO. **ABS–02**

6/19/2023
PCTERRdypshABS02.dgn



25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN
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AT 0.5' INTERVAL

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REESTABLISHMENT AREA 1 NSF

REESTABLISHMENT AREA 1 NWHF

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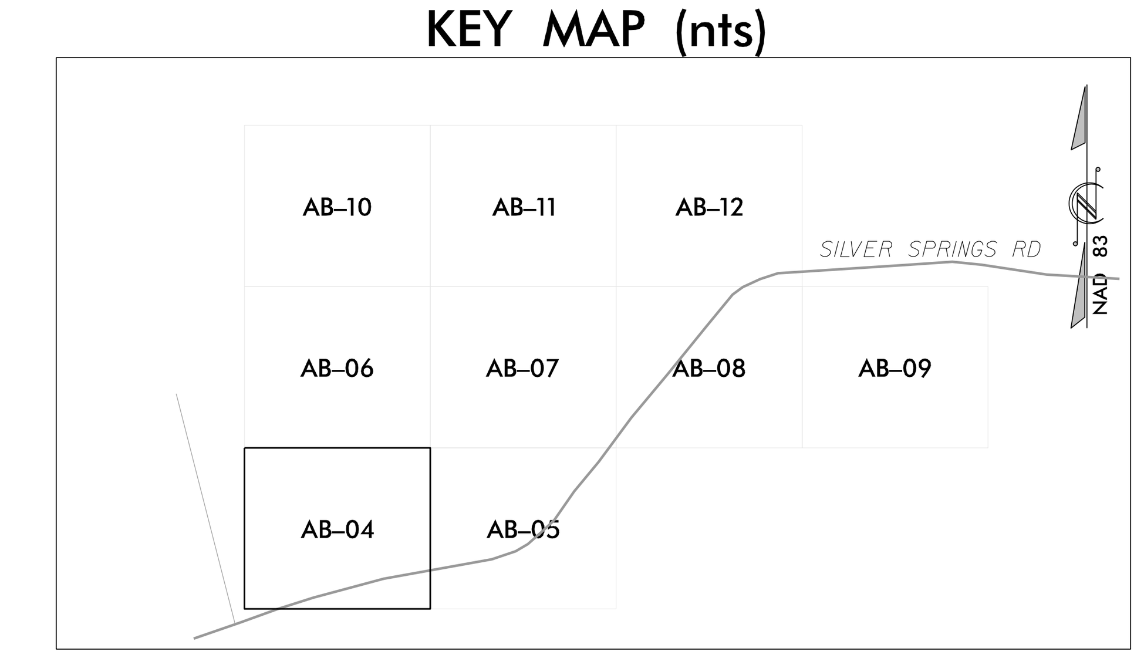
KEY MAP (nts)



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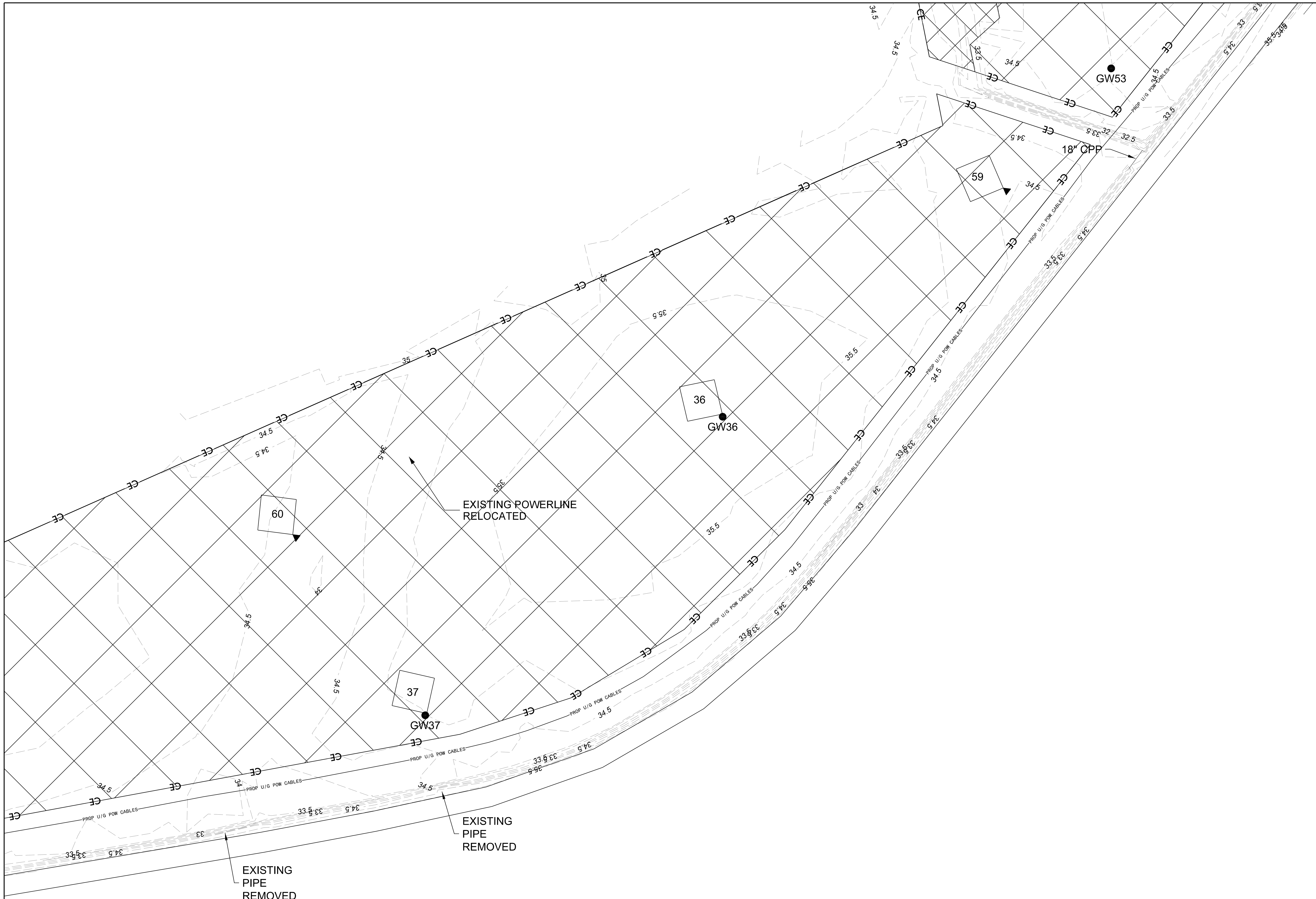
RS RESTORATION SYSTEMS | LLC

PIERCE TERRACE
GATES COUNTY, NC

AS-BUILT SURVEY SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHABS04
DATE: 6/19/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
ABS-04



25' 12.5' 0 25' 50'
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NAD 83

HORIZONTAL DATUM: NAD 83 (2011)
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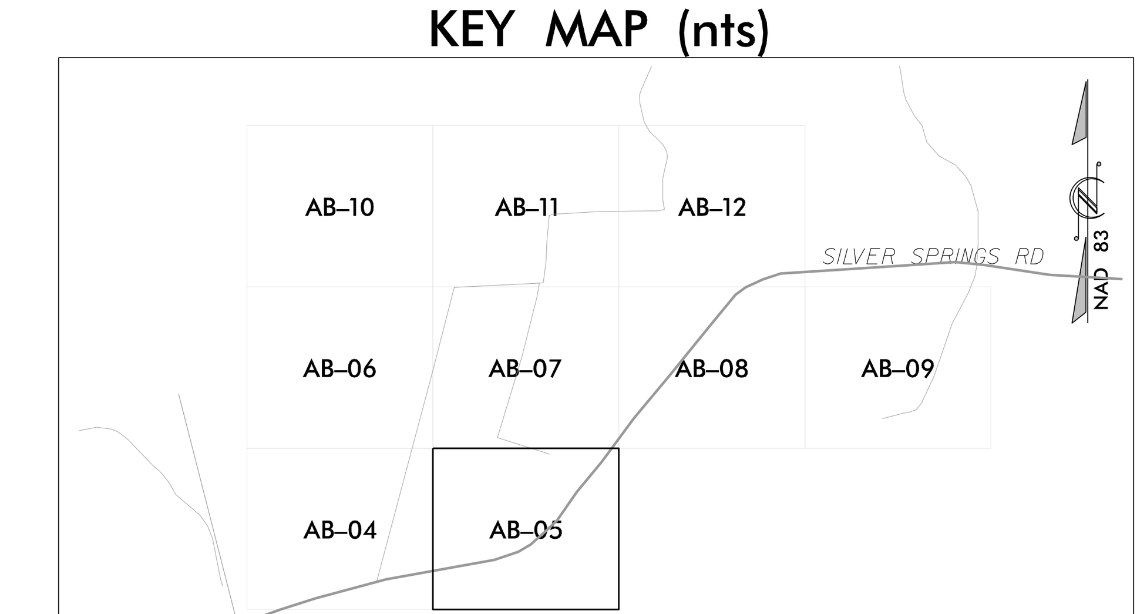

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RS RESTORATION SYSTEMS | LLC

PIERCE TERRACE

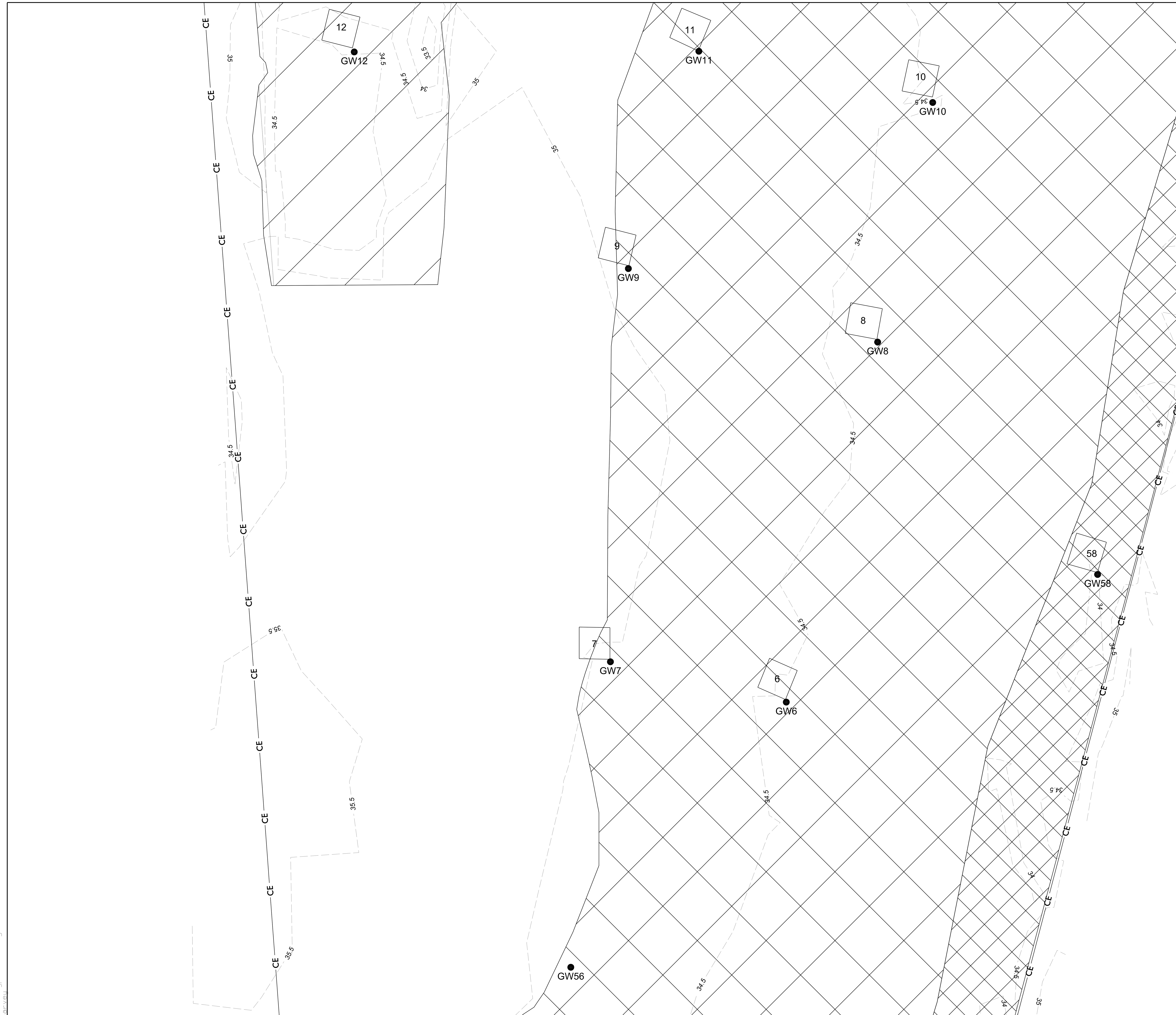
GATES COUNTY, NC

AS-BUILT SURVEY SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHABS05
DATE: 6/19/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **ABS–05**

6/19/2023
PCTERRdypshABS05.dgn



25′ 12.5′ 0 25′ 50′
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NAD 83

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REESTABLISHMENT AREA 1 NSF

REESTABLISHMENT AREA 1 NWHF

CREATION

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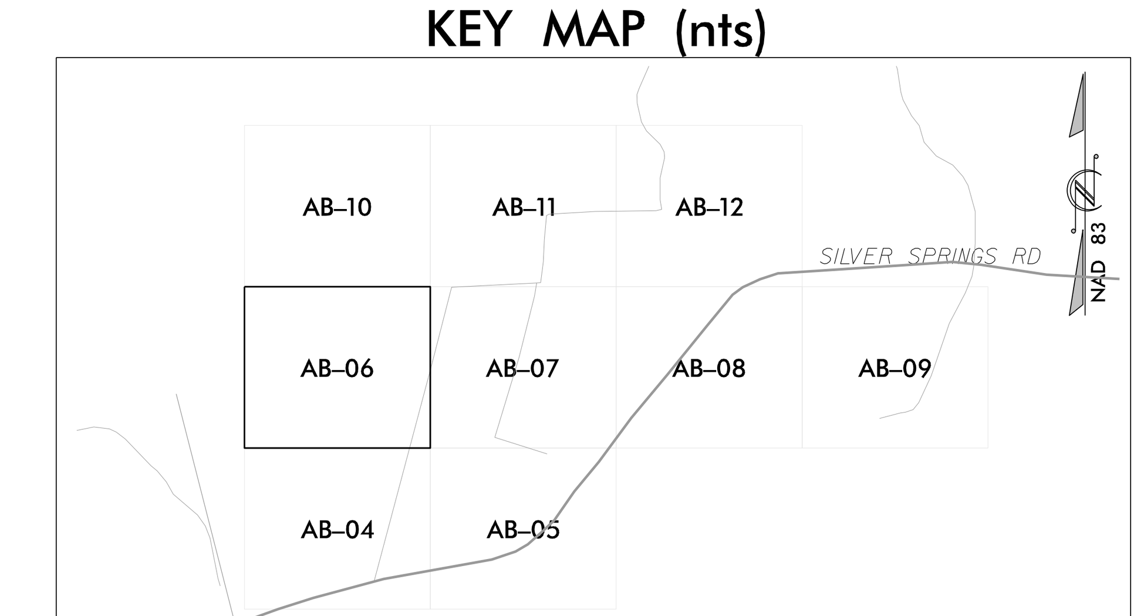

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RS RESTORATION SYSTEMS | LLC

PIERCE TERRACE

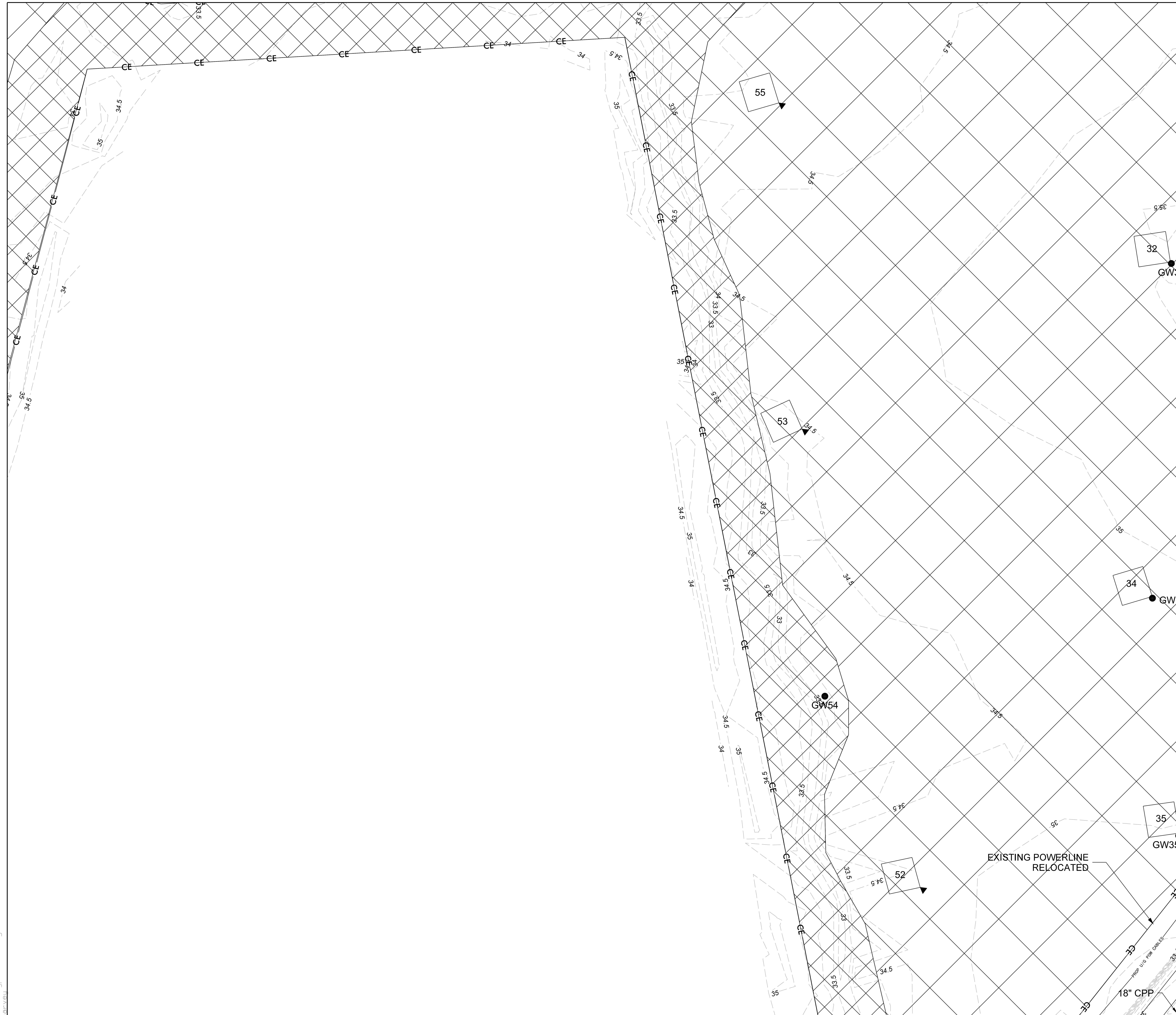
GATES COUNTY, NC

AS-BUILT SURVEY SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHABS06
DATE: 6/19/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
ABS–06

6/19/2023
PCTERRDYPSHABS06.dgn



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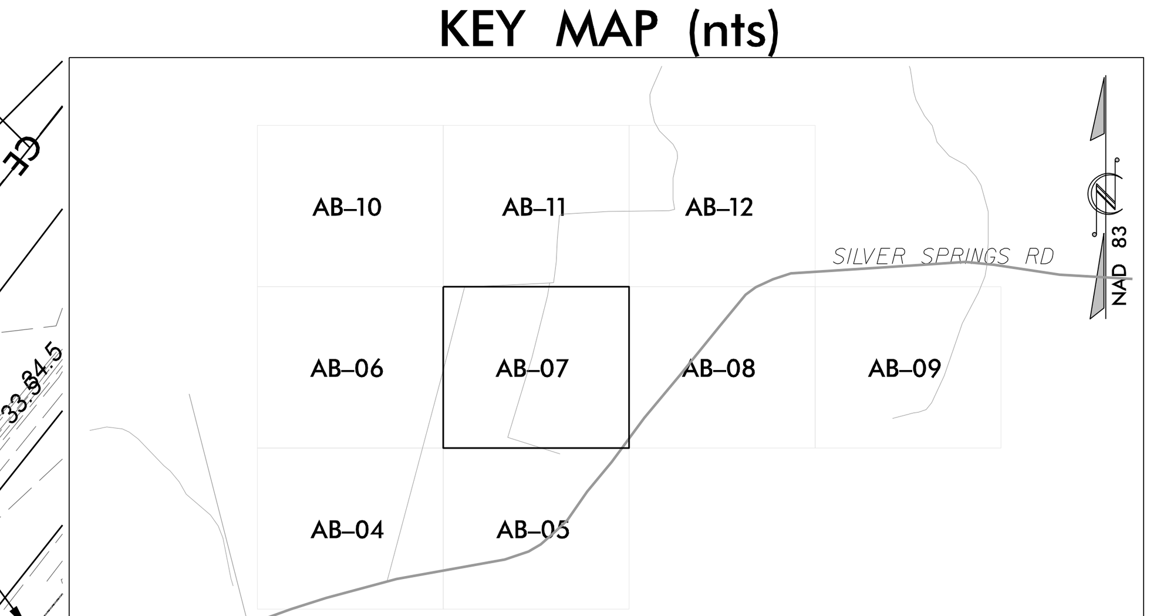

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RS RESTORATION SYSTEMS | LLC

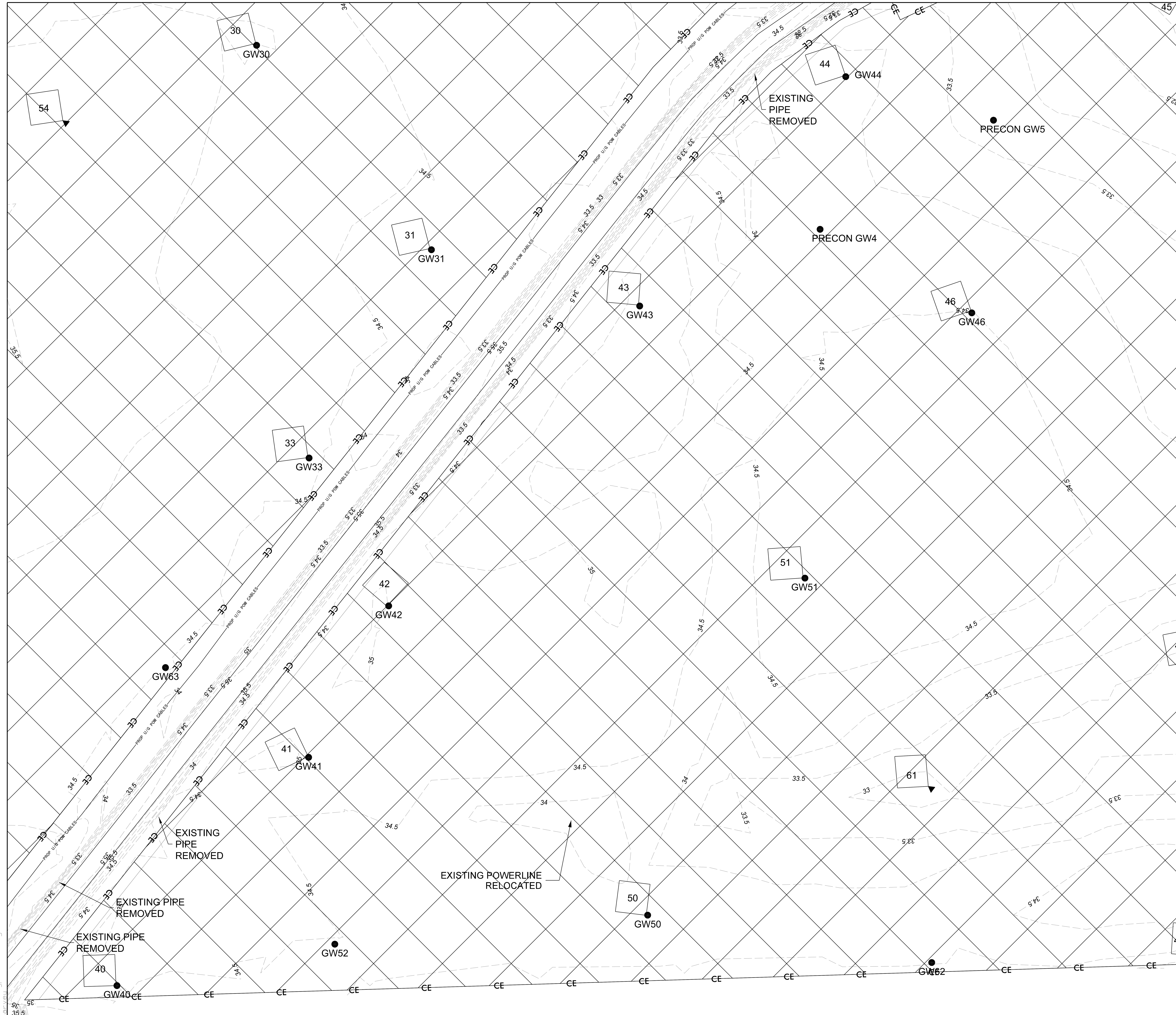
PIERCE TERRACE

GATES COUNTY, NC

AS-BUILT SURVEY SITE IMPROVEMENT PLAN

PROJECT #: 1154-21011
DRAWING NAME: PCTERRDYPSHABS07
DATE: 6/19/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
ABS–07



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SCALE: 1" = 50'

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KEY MAP (nts)

AB-10	AB-11	AB-12	
AB-06	AB-07	AB-08	AB-09
AB-04	AB-05		

SILVER SPRINGS RD

SUNGATE DESIGN GROUP, P.A.
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

RESTORATION SYSTEMS | LLC

PIERCE TERRACE

GATES COUNTY, NC

AS-BULT SURVEY SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011

DRAWING NAME: PCTERRDYPSHABS08

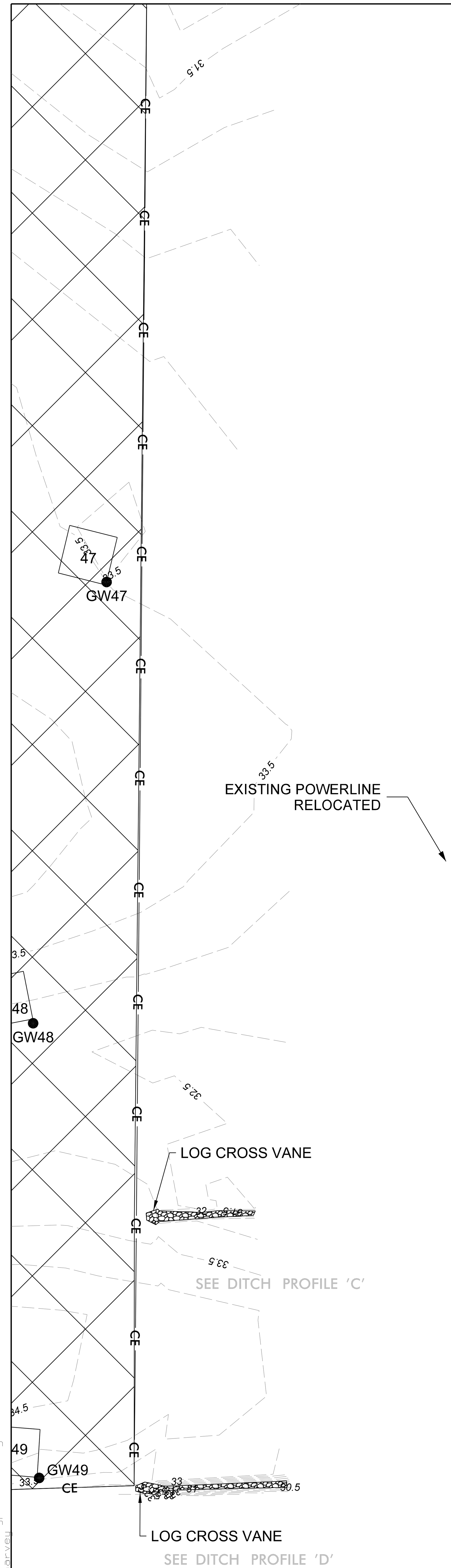
DATE: 6/19/2023

DRAWN BY: JRH

REVIEWED BY: JGD

REVISIONS:

SHEET NO. **ABS-08**



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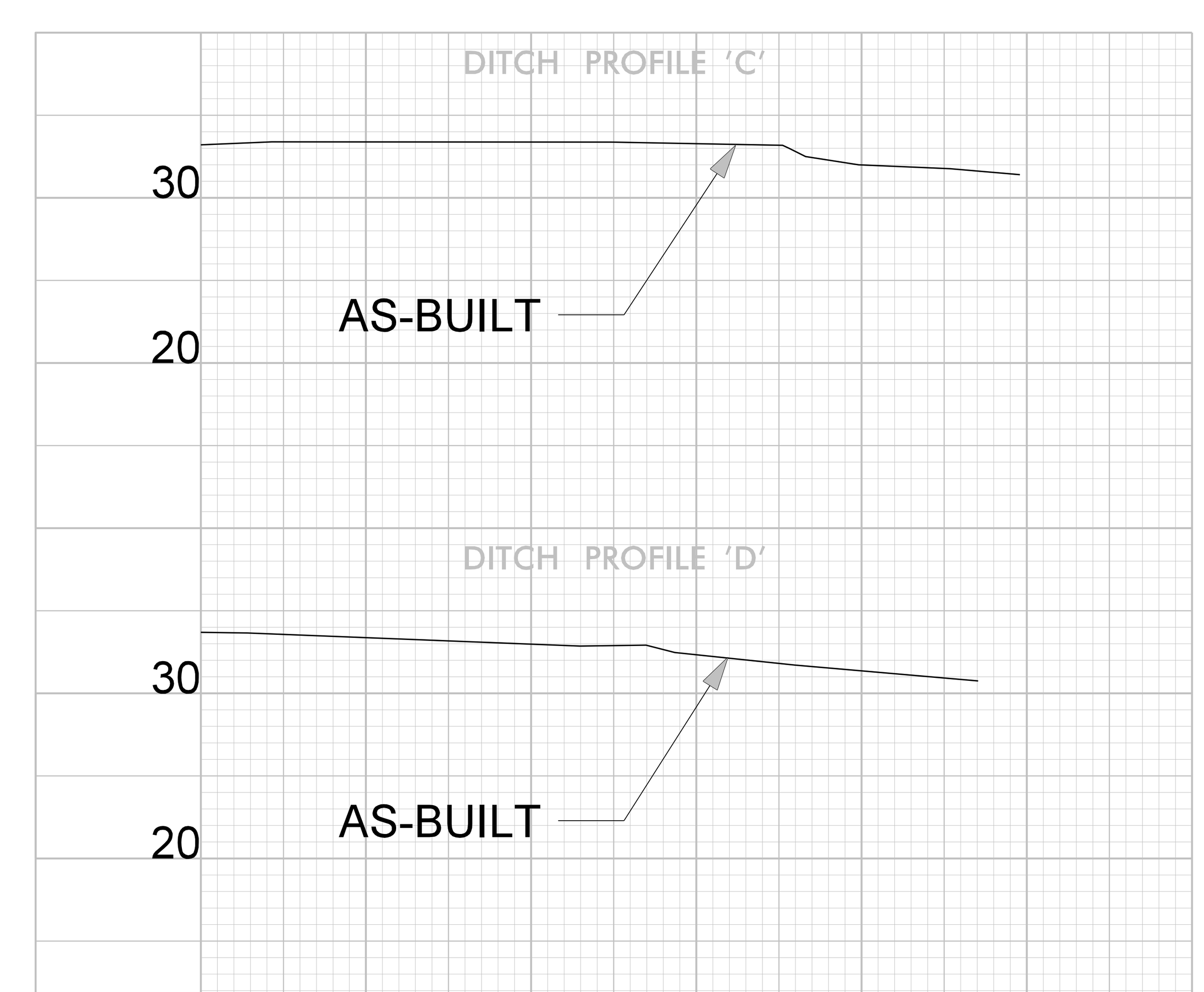

REESTABLISHMENT AREA 2

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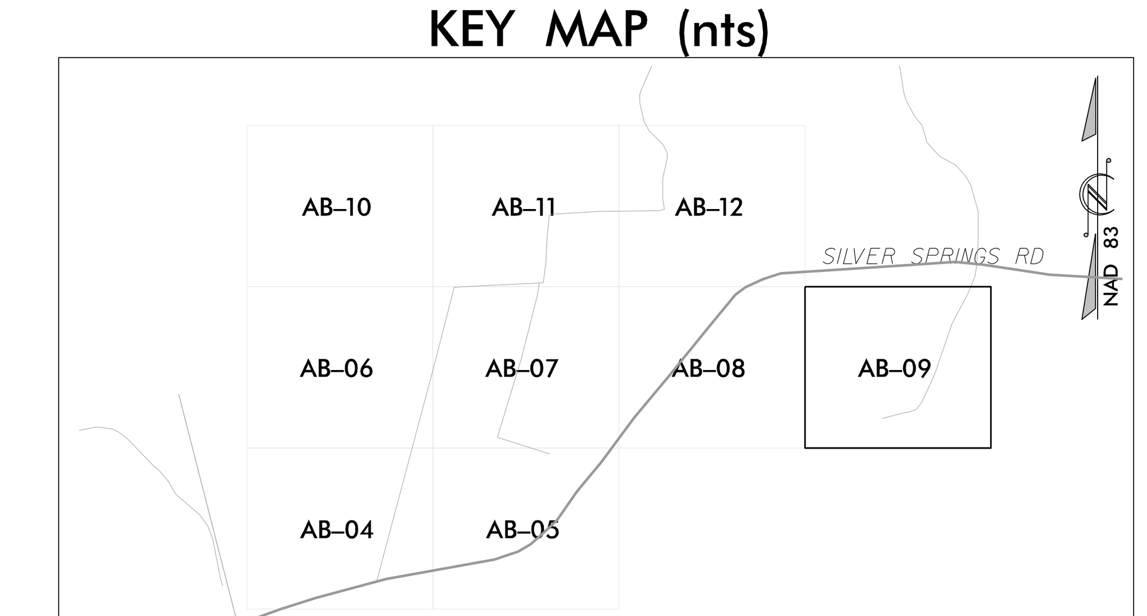

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RS RESTORATION SYSTEMS | LLC

PIERCE TERRACE

GATES COUNTY, NC

AS-BUILT SURVEY SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHABS09
DATE: 6/19/2023
DRAWN BY: JRH
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REVISIONS:

SHEET NO.
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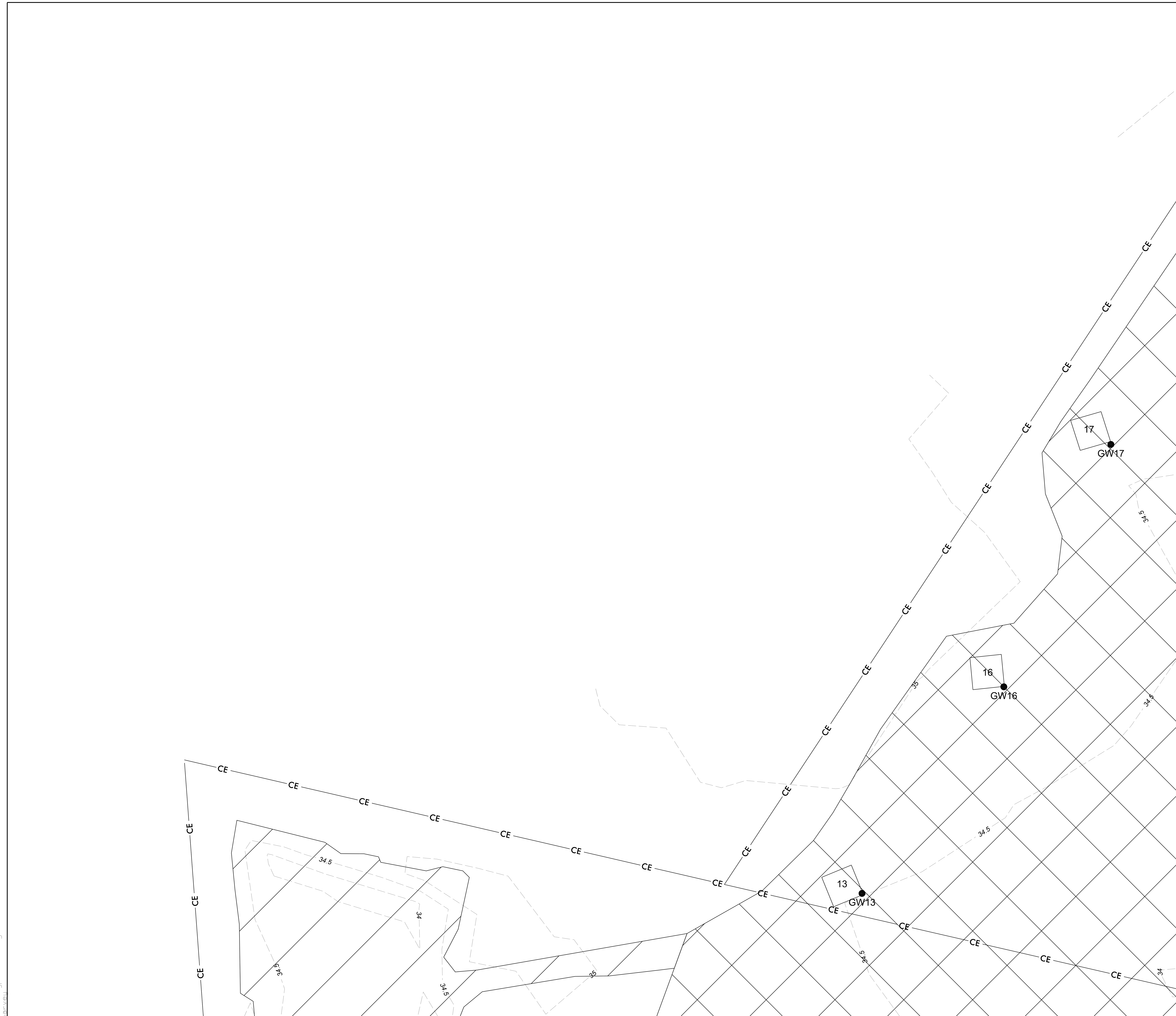
6/19/2023
PCTERRdypshABS09.dgn



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN
(EXISTING AND PROPOSED)
AT 0.5' INTERVAL

NOTE

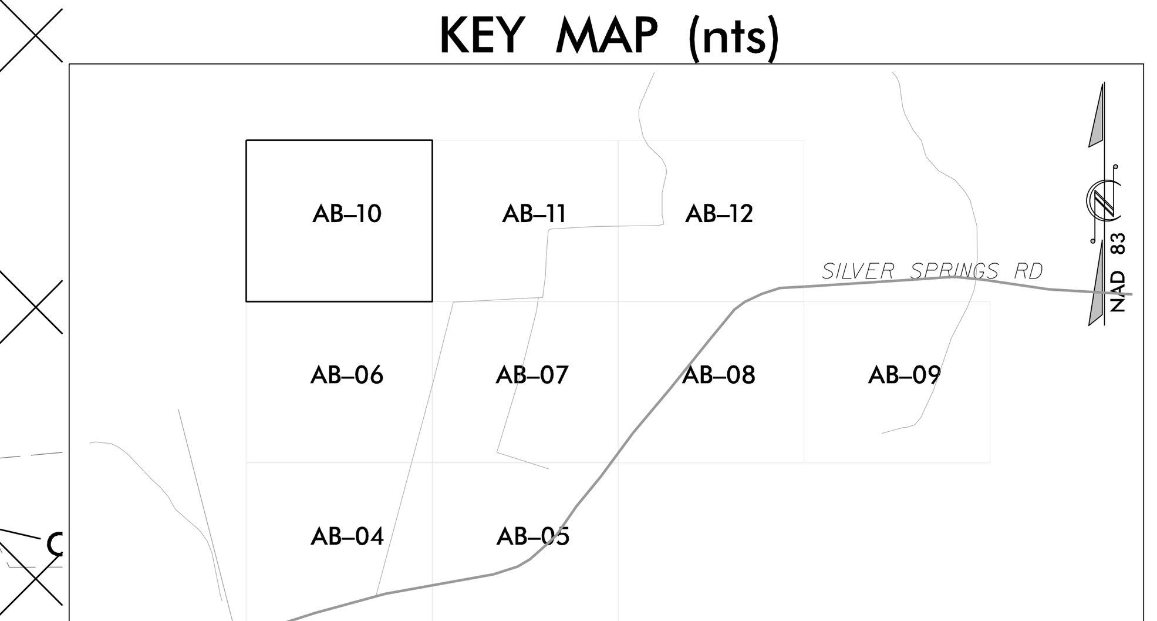
WHEN GROUNDWATER GAUGE EXISTS NEAR PERMANENT VEGETATION PLOT, VEGETATION PLOT ORIGIN POINT IS LOCATED AT SAME CORNER AS GROUNDWATER GAUGE (THOSE NOT SHOWN).

REESTABLISHMENT AREA 1 NWHF

CREATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KEY MAP (nts)



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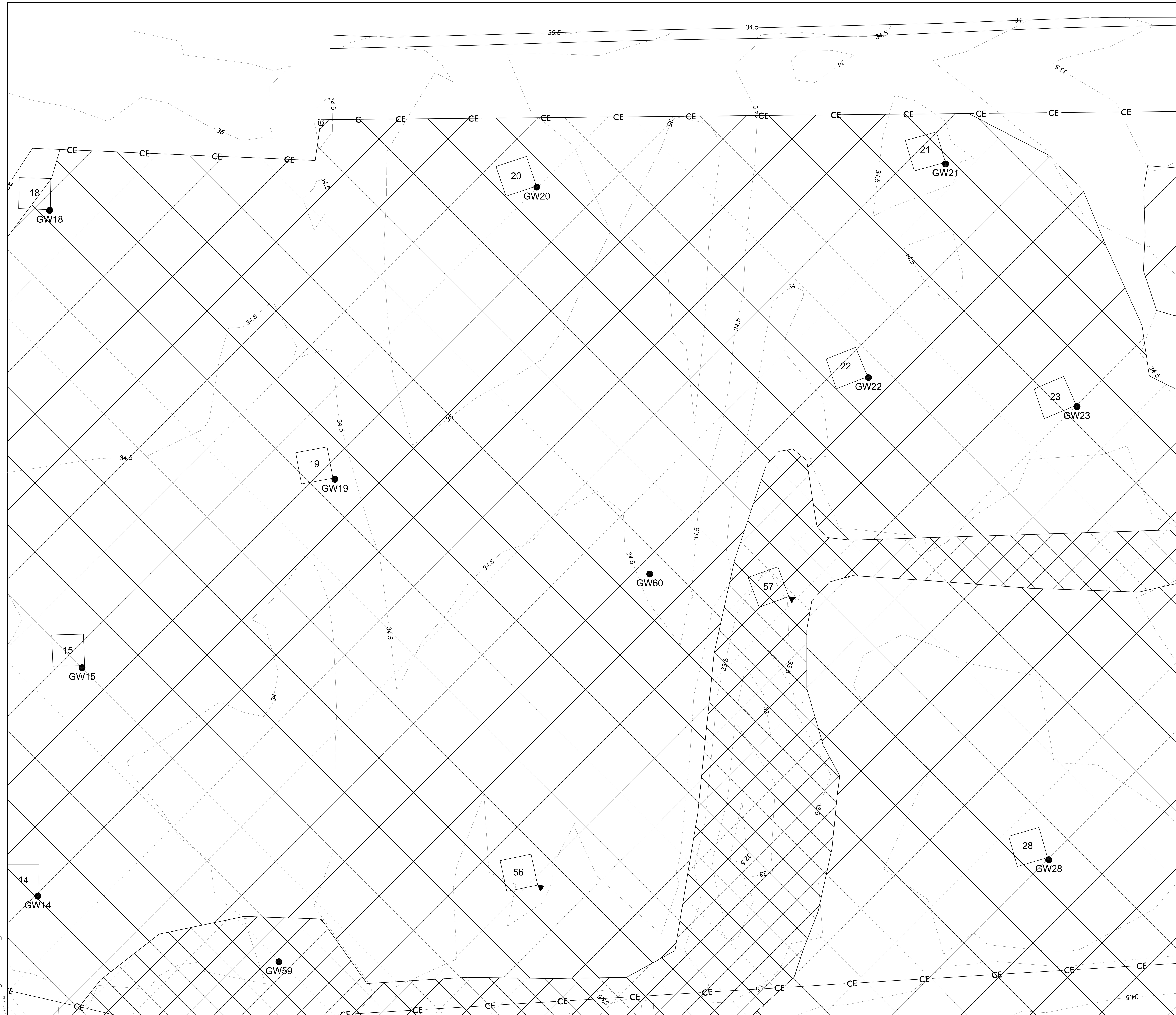
PIERCE TERRACE

GATES COUNTY, NC

S-BUILT SURVEY SITE IMPROVEMENT PLAN

PROJECT #: 1154-21011
DRAWING NAME: PCTERRDYPSHABS10
DATE: 6/19/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:
SHEET NO. **ABS–10**

6/19/2023
PCTERRdypshABS10.dgn



25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

ALL TOPOGRAPHY SHOWN
(EXISTING AND PROPOSED)
AT 0.5' INTERVAL

NOTE

WHEN GROUNDWATER GAUGE EXISTS NEAR PERMANENT VEGETATION PLOT, VEGETATION PLOT ORIGIN POINT IS LOCATED AT SAME CORNER AS GROUNDWATER GAUGE (THOSE NOT SHOWN).

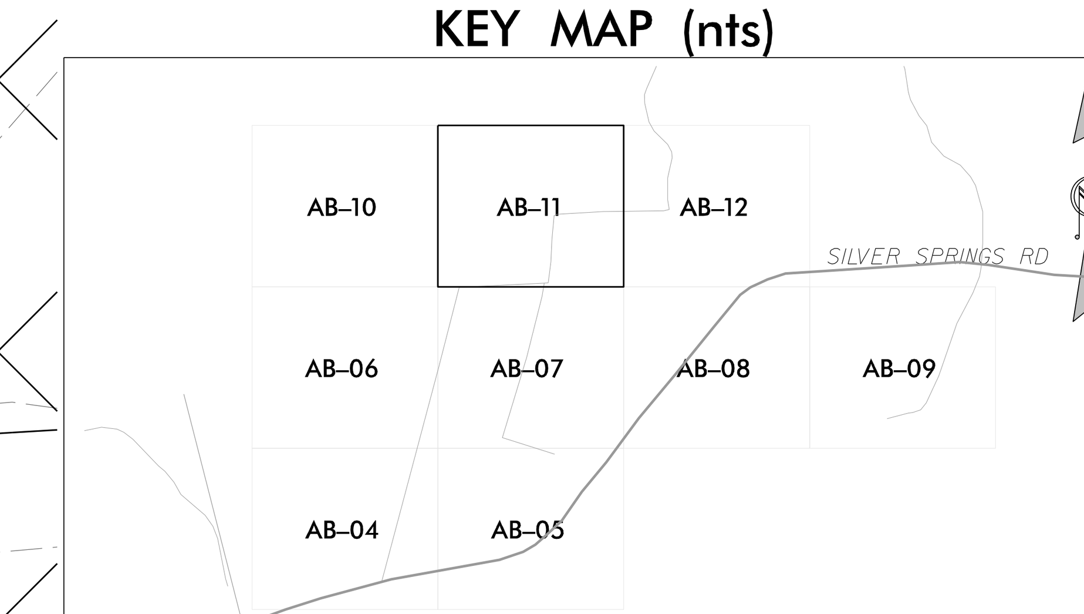
REESTABLISHMENT AREA 1 NSF

REESTABLISHMENT AREA 1 NWHF

CREATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KEY MAP (nts)



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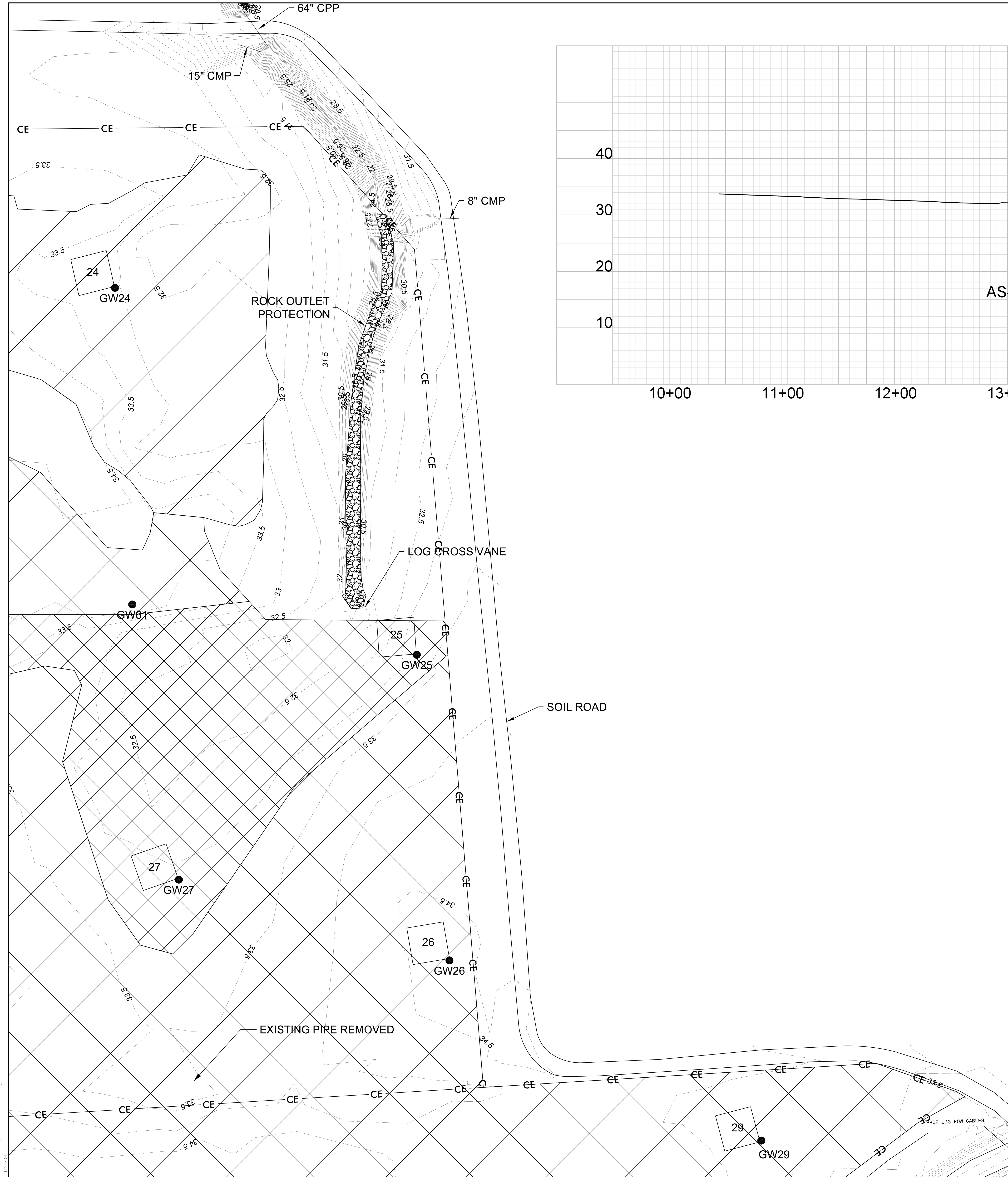
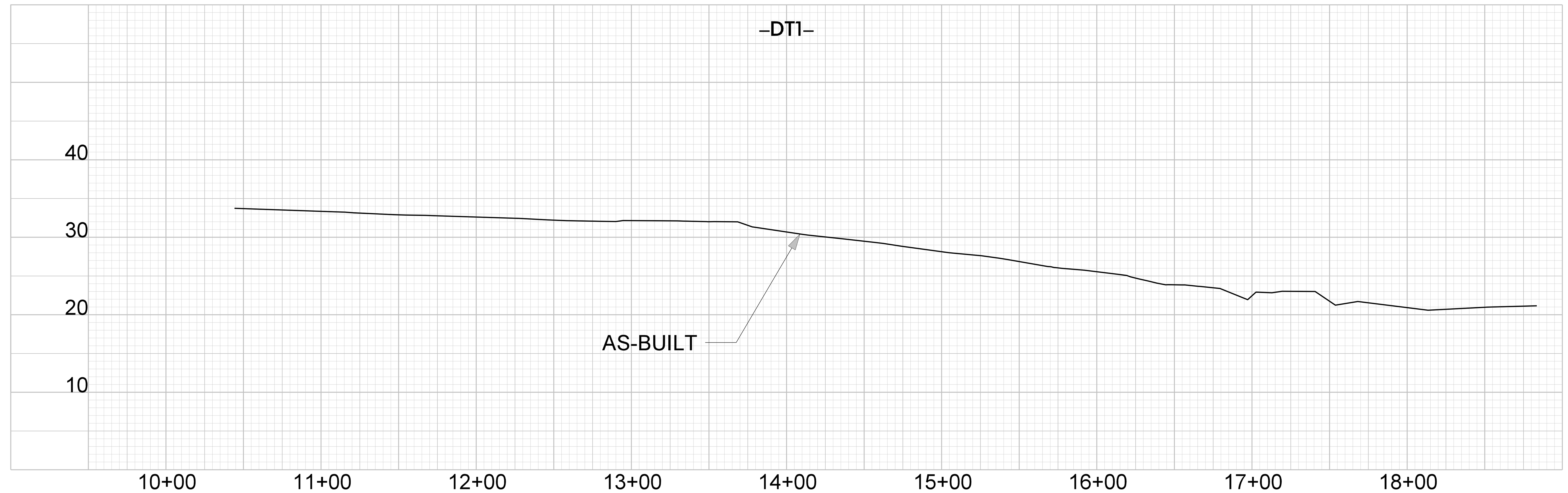
PIERCE TERRACE
GATES COUNTY, NC

AS-BUILT SURVEY SITE IMPROVEMENT PLAN

PROJECT #: 1154-21011
DRAWING NAME: PCTERRDYPSHABSII
DATE: 6/19/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
ABS-11





25' 12.5' 0 25' 50'
SCALE: 1" = 50'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

NAD 83

ALL TOPOGRAPHY SHOWN (EXISTING AND PROPOSED) AT 0.5' INTERVAL

Legend	
(cross-hatch)	REESTABLISHMENT AREA 1 NSF
(diamond hatch)	REESTABLISHMENT AREA 1 NWHF
(diagonal hatch)	CREATION

NOTE

WHEN GROUNDWATER GAUGE EXISTS NEAR PERMANENT VEGETATION PLOT, VEGETATION PLOT ORIGIN POINT IS LOCATED AT SAME CORNER AS GROUNDWATER GAUGE (THOSE NOT SHOWN).

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KEY MAP (nts)

AB-10 AB-11 AB-12
AB-06 AB-07 AB-08 AB-09
AB-04 AB-05
SILVER SPRINGS RD

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PIERCE TERRACE
GATES COUNTY, NC
AS-BUILT SURVEY SITE IMPROVEMENT PLAN

PROJECT # : 1154-21011
DRAWING NAME: PCTERRDYPSHABS12
DATE: 6/19/2023
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. ***ABS-12***