

**COLONIAL FARMS WETLAND MITIGATION SITE
DRAFT ANNUAL MONITORING REPORT – YEAR 1**

Edgecombe County, NC

NCDEQ Contract No. 200207-01

NCDMS ID No. 100191

NCDWR Project No. 2021-0399v1

USACE Action ID: SAW-2021-00346

RFP No. 16-20200207



Tar-Pamlico River Basin

HUC 03020103

November 2022

Prepared For:

NC Department of Environmental Quality

Division of Mitigation Services

1652 Mail Service Center, Raleigh, NC 27699-1652



Mitigation Services
ENVIRONMENTAL QUALITY



MEMO

Jeremiah Dow, DMS

February 15, 2023

Subject: DMS Comments on the MY1 Report

Colonial Farm, Project ID #100191, DMS Contract 200207-01

DMS received the MY1 draft report on 11/30/2022 and a site visit was conducted on 10/17/2022 with the IRT as part of the MY0 review. DMS offers the following comments for the report:

1. The NCDWR Project No. is version 1, not version 2. Please correct the Title Page.
[The title page has been revised.](#)
2. Please replace Table 2 with the latest DMS Monitoring Report table labeled Table 2: Summary: Goals, Performance and Results (updated 10/1/2020) located on the DMS website.
[Table 2 has been revised in the report.](#)
3. Remove the request for a change to the hydroperiod for GW wells 3 and 9, i.e., remove the Table 2 footnote 6 and the Note under the footnote.
[Corresponding sections of the report have been revised per the above comment.](#)
4. Section 3.2 Wetland Assessment, 3rd bullet says "Rainfall data collected at the site was incomplete for the MY1 monitoring period. Rainfall data presented in this report was obtained from USGS gauge station 02082585." Why was data incomplete, and is future rainfall data going to come from on-site?
[The rainfall gauge at the Site was installed on April 30, 2022. Rainfall data from USGS gauge station 02082585 was accessed to present rainfall data for the preceding months in 2022. To maintain continuity in the presented data, rainfall data from the USGS gauge was presented for the entire monitoring year. Eco Terra plans to present rainfall data collected at the Site in future annual monitoring reports. This explanation has been added to the MY1 report.](#)
5. In the CCPV, recommend making Random Plots green like the permanent plots and reserving red for plots that may not meet success criteria in the future.
[Random plots on the CCPV have been revised to avoid confusion.](#)



6. Appendix A – please verify photo point 4a is to fulfill IRT request during the MY0 site visit to “Add photo point at the culvert outlet corner to document site conditions.” If so, we recommend in the future, based on IRT comments for other projects, taking the photo so the culvert outlet itself is clearly visible.

Photo point 4a was added at the request of the IRT. Future annual monitoring photos taken at the photo point will focus such that the culvert outlet and constructed ditch plug are both visible.

7. Appendix C

a. Based on response to comment 3 above, please remove Table 9b and incorporate the data into Table 9a, and remove the soil report that follows the hydrographs.

Table 9 has been revised per the above comment.

b. The hydrographs show no daily rainfall after September 10th. Is this accurate, or was the data left out?

Daily rainfall was not plotting correctly on the X-axis of the groundwater well plots. Each plot has been revised to correctly show the daily rainfall distribution.

c. GW 3 data collection stops in August. Was there a malfunction, and if so, has the well been repaired/replaced?

GW3 data was not plotted correctly. GW3 plot has been revised. Please let us know if you have any further comments or questions related to the MY1 Annual Report. We look forward to working with you and ensuring a successful project moving forward.

Regards,

D. Norton Webster, Eco Terra

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Prepared For:



NC Department of Environmental Quality

Division of Mitigation Services

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February 2023

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1.0 Project Overview

The Site is a 21.82-acre wetland mitigation project located in Edgecombe County, North Carolina. The Site is approximately 2.5 miles south of the City of Tarboro, on the east side of Colonial Road and is accessed via a dirt farm road. The Site is within the Tar-Pamlico 8-digit HUC 03020103, Town Creek watershed, more specifically in the 14-digit HUC 03020103010020. The 21.82-acre Site includes 14.381 acres of wetland re-establishment (REE) and 0.623 acres of wetland rehabilitation (RH) to provide a total of 15.004 acres of riparian wetland credits for the Tar-Pamlico 03020103 subbasin.

1.1 Project Mitigation Quantities and Credits

Site restoration activities included filling on-Site agricultural ditches, planting of native woody wetland vegetation, and establishment of a conservation easement to protect the site in perpetuity. Table 1a and 1b give the as-built quantities and credits for the Site.

Table 1a – 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
Wetland						
Wetland 1	0.032	0.032	R	RH	1.000	0.032
Wetland 2	0.389	0.389	R	RH	1.000	0.389
Wetland 3	0.202	0.202	R	RH	1.000	0.202
Wetland 4	14.381	14.381	R	REE	1.000	14.381
					Total:	15.004

Table 1b – Project Credit Summary

Restoration Level	Stream			Riparian Wetland	Non-Rip Wetland	Coastal Marsh
	Warm	Cool	Cold			
Restoration						
Re-establishment				14.381		
Rehabilitation				0.623		
Enhancement						
Enhancement I						
Enhancement II						
Creation						
Preservation						
Total:	0.000	0.000	0.000	15.004	0.000	0.000



1.2 Project Goals and Objectives

The Site was chosen due to the proximity of adjacent forested corridors servicing the Tar River, filtering overland runoff leaving agricultural fields within the greater sub-watershed, as well as the ability to restore and protect a riparian system and support overarching goals for the 2018 Tar-Pamlico River Basin Restoration Priorities (RBRP). Restoration of the Site will directly and indirectly address specific goals and stressors related to the goals identified in the RBRP. Table 2 lists the goals and objectives of the project.

Table 2 – Site Goals and Performance Standards

Goal	Objective	Expected Outcome	Performance Standard	Measurement	Cumulative Monitoring Results
Reduce Nutrients and Sediment in Agricultural Areas	Remove fertilizer and agricultural byproducts applied to wetland. Establish native woody wetland vegetation, securing soil in place, and reducing wind and runoff erosion.	Improve water quality through nutrient & sediment reduction.	N/A	Vegetation Plots ¹ -10 fixed -4 Random Visual assessment of the Site ^{3,4}	14 vegetation plots exceed MY3 success criteria (MY1 - 2022)
Restore Wetland Hydrology	Fill drainage ditches to restore Site hydrology.	Increase hydrology and shallow water table during the early growing season (12%), reduce nutrients and sediment in agricultural areas, and increase wetland habitats. Increase flood storage in restored wetlands.	Shallow groundwater within 12 inches of the soil surface for a minimum of 10% (24 consecutive growing season days, MY1-MY2) and 12% (28 consecutive growing season days, MY3-MY7).	13 Groundwater Gauges ²	1 groundwater well achieved hydroperiod performance standard (MY1 - 2022)
Improve Habitat and Connectivity	Establish native woody wetland vegetation. Promote connectivity to existing Tar River Corridor Natural Heritage Area.	Increase native wetland tree species diversity and habitats. Increase habitat connectivity from riparian forest wetland to UT to Tar River riparian corridor.	N/A	Visual assessment of the Site ^{3,4}	Visual assessment indicates high survivorship of planted stems across the Site (MY1 - 2022)

Goal	Objective	Expected Outcome	Performance Standard	Measurement	Cumulative Monitoring Results
Restore Wetland Vegetation	Establish native woody wetland vegetation in proposed wetland re-establishment areas.	Increase native wetland tree species quantity and diversity. Increase nutrient cycling and sequestering sediment, and riparian wetland water storage, decreasing peak runoff volumes in stream and reducing flooding.	Survival of 210 planted stems/ac (MY7). Interim survival of at least 320 planted stems/ac (MY3) and at least 260 stems/ac (MY5). Planted stems must average 7 ft in height (MY5) and 10 feet in height (MY7).	Vegetation Plots ¹ -10 fixed -4 Random	14 vegetation plots exceed MY3 success criteria (MY1 - 2022)
Protect the Site in Perpetuity	Record permanent Conservation Easement to protect the Site in perpetuity.	Protect Site from future impacts and encroachment and direct impacts to wetlands. Support all wetland functions in perpetuity.	Record Conservation Easement	Visual assessment for easement encroachment and Site integrity ⁵	No signs of Site encroachment have been noticed (MY1 - 2022)

¹ 14 vegetation plots were located at the Site per comments received from the IRT during Final Mitigation Plan development.

² Groundwater gauges 1-3 were installed pre-construction to establish baseline conditions for the Site. Groundwater data will be presented in annual monitoring reports.

³ The Site will be visually inspected twice a year minimum. All Site data will be included in the Annual Monitoring Report. If necessary, the Adaptive Management Plan will be implemented to address issues jeopardizing project success.

⁴ Exotic and nuisance vegetation will be noted and documented as necessary in Annual Reports.

⁵ Project encroachments will be noted and documented as necessary in Annual Reports.



1.3 Project Attributes

The Site is situated on a 309-acre parcel used for row crop production and is approximately 3000 feet west of the Tar River. Land uses in the vicinity of the Site largely consists of managed agricultural fields with interspersed shrub / scrub lands. A mature forest exists along most of the Site's southern boundary and serves as a forested habitat corridor connecting the Site to the Tar River. Site hydrology generally drains to the northeast and then to the Tar River (28-(80)) via a series of jurisdictional agricultural ditches. The Tar River is classified as Class C (C); nutrient sensitive waters (NSW). The river's 100-year floodplain borders the western boundary of the Site, and the entire Site is within the 500-year floodplain. Table 3 gives the project attributes.

Table 3: Project Attributes

Project Information				
Project Name	Colonial Farms Wetland Mitigation Site			
County	Edgecombe			
Project Area [Planted Area] (acres)	21.82 [20.74]			
Project Coordinates (latitude and longitude decimal degrees)	35.853767, -77.549397			
Project Watershed Summary Information				
Physiographic Province	Coastal Plain			
River Basin	Tar-Pamlico			
USGS Hydrologic Unit 8-digit; 14-digit	3020103; 03020103010020			
DWR Sub-basin	03-03-04			
Project Drainage Area (acres)	64.0			
Project Drainage Area Percentage of Impervious Area	0%			
Land Use Classification	Agriculture			
Wetland Summary Information				
Parameters	Wetland 1	Wetland 2	Wetland 3	Wetland 4
Pre-project (acres)	0.032	0.389	0.202	14.381
Post-project (acres)	0.032	0.389	0.202	14.381
Wetland Type (non-riparian, riparian)	Riparian	Riparian	Riparian	Riparian
Mapped Soil Series	Portsmouth	Portsmouth	Portsmouth	Portsmouth
Soil Hydric Status	Hydric (100%)	Hydric (100%)	Hydric (100%)	Hydric (100%)
Regulatory Considerations				
Parameters	Applicable?	Resolved?	Supporting Docs?	
Water of the United States - Section 404	Yes	Yes	Nationwide Permit	
Water of the United States - Section 401	Yes	Yes	401 Water Quality Certification	
Endangered Species Act	Yes	Yes	Cat. Ex.	
Historic Preservation Act	Yes	Yes	Cat. Ex.	
Coastal Zone Management Act (CZMA or CAMA)	No	Yes	Cat. Ex.	
Essential Fisheries Habitat	No	Yes	Cat. Ex.	

2.0 As-Built Condition (Baseline)

2.1 Site Planting

Carya aquatica (Water Hickory) was incorrectly listed in the MY0 report as *Carya ovata*. Eco Terra has revised and included Table 4 in this report at the request of the IRT.

Table 4: Site Planted Stems

Scientific Name	Common Name	Vegetative Strata	Planting Zone	Wetland Indicator Status	%	Quantity
<i>Quercus michauxii</i>	Swamp chestnut oak	Canopy	1	FACW	20%	3000
<i>Gordonia lasianthus</i>	Loblolly bay	Understory	2	FACW	--	--
<i>Quercus lyrata</i>	Overcup oak	Canopy	2	OBL	7%	1000
<i>Betula nigra</i>	River birch	Canopy	1	FACW	3%	500
<i>Cephalanthus occidentalis</i>	Buttonbush	Understory	2	OBL	5%	800
<i>Fraxinus pennsylvanica</i>	Green ash	Canopy	1	FACW	4%	600
<i>Liriodendron tulipifera</i>	Yellow poplar	Canopy	1	FACU	6%	900
<i>Quercus shumardii</i>	Shumard oak	Canopy	1	FAC	7%	1100
<i>Quercus pagoda</i>	Cherrybark oak	Canopy	1	FACW	--	--
<i>Carpinus caroliniana</i>	Ironwood	Understory	1	FACW	--	--
<i>Quercus phellos</i>	Willow oak	Canopy	2	FACW	7%	1000
<i>Quercus laurifolia</i>	Laurel oak	Canopy	1	FACW	--	--
<i>Quercus nigra</i>	Water oak	Canopy	1	FAC	7%	1000
<i>Nyssa biflora</i>	Swamp blackgum	Canopy	2	OBL	--	--
<i>Magnolia virginiana</i>	Sweetbay magnolia	Understory	2	FACW	--	--
<i>Ulmus americana</i>	American elm	Canopy	1	FAC	1%	200
<i>Persea palustris</i>	Swamp bay	Understory	2	FACW	--	--
<i>Platanus occidentalis</i>	Sycamore	Overstory	2	FACW	3%	500
<i>Taxodium distichum</i>	Bald-cypress	Overstory	2	OBL	10%	1500
<i>Nyssa aquatica</i>	Swamp tupelo	Overstory	2	FACW	8%	1200
<i>Carya aquatica</i>^{1,2}	Water hickory	Overstory	2	OBL	1%	200
<i>Celtis laevigata</i>¹	Sugarberry	Overstory	1	FACW	3%	500
<i>Cornus amomum</i>¹	Silky dogwood	Understory	2	FACW	<1%	50
<i>Diospyros virginiana</i>^{1,2}	Persimmon	Understory	1	FAC	5%	700

Total: 100% 14750

¹ Species not included in the conceptual planting plan in the approved Final Mitigation Plan dated February 2022.

² Species planted in the non-credit area.

Species listed in Table 4 with strike-through marks were included in the conceptual planting plan in the Final Mitigation Plan but were not planted at the Site.

3.0 Monitoring Year 1 Data Assessment

Site monitoring for MY1 took place from March – October 2022. Collected data for MY1 was analyzed and is summarized the following sections. MY1 data is presented in the appropriate appendices of this report.

3.1 Vegetation Assessment

- Vegetation assessment for MY1 was conducted in October 2022. Vegetation surveys of the 10 fixed and 4 random vegetation plots resulted in calculated stem densities ranging from 526-850 stems per acre and an 97% overall survival rate of planted stems from the as-built (baseline) condition. The calculated average stem density for the Site was 728 stems per acre, well above the interim success criteria of 320 stems per acres in MY3. All 14 vegetation plots exceeded the MY3 interim success criteria. Vegetation plot photographs are included in Appendix A and vegetation plot data is included in Appendix B.
- Mowing between planted rows of woody stems occurred once during the monitoring period to reduce herbaceous competition, allow for easier identification of planted stems in during MY1 vegetation data collection, provide a better visual understanding of the overall survival rate of planted stems, and increase effectiveness of herbicide treatments and supplemental planting if necessary.
- In the MY0 report Eco Terra requested variance from the approved planting species included in the Final Mitigation Plan. *Carya aquatica*, *Cletis laevigata*, *Cornus amomum*, and *Diospyros virginiana* were planted at the site to supplement the approved woody species in the Final Mitigation Plan due to lack of sufficient quantity of approved species. No formal response was received by Eco Terra regarding the requested variance. During the as-built IRT site walk on October 17, 2022, members of the IRT expressed concern with inclusion of *C. aquatica* and *D. virginiana* in the Site planting plan. *C. aquatica* is a species found in coastal plain settings in the southeast United States and occurrences of the species were observed at the Site prior to construction and in the reference forest community to the east of the Site. Occurrences of *D. virginiana* are seen in the reference forest community and prior to Site disturbance during construction occurrences of *D. virginiana* were observed on spoil piles adjacent to the central ditch which ran through the Site. During Site planting *D. virginiana* was strategically planted in higher landscape positions, mirroring observation of its natural occurrences, and volunteer re-sprouts can be found at the Site. At the time of the Final Mitigation Plan, Eco Terra was unaware of the availability for *C. aquatica* and *D. virginiana* and therefore they were not included in the proposed species list. Eco Terra believes all four species are appropriately planted at the Site and requests formal approval to count these species toward the stem count and overall success criteria of the Site.
- During the as-built IRT site walk members of the IRT requested that the approximately 0.40-acre of dense *Ligustrum sinense* (Chinese privet) in the southeast corner of the site be treated. No treatments were performed during the MY1 monitoring period. Herbicide treatment for *L. sinense* is being scheduled for the end of 2022 and early 2023 (MY2). Description and photo

documentation of the invasive species treatments will be included in the MY2 annual monitoring report.

- There are currently no areas of concern with respect to Site vegetation. The Site will continue to be monitored for invasive and aggressive pioneer species. Any future vegetation treatments will be conducted in accordance with the approved adaptive management plan and will be discussed the annual monitor reports.

3.2 Wetland Assessment

- Performance standard for wetlands at the Site during MY1 is groundwater elevation within 12 inches of the ground surface for 24 consecutive days (10% of the growing season). The estimated growing season for the Site, as determined by NRCS WETS tables for Edgecombe County, is March 20 to November 11. Groundwater wells (GW) 1-3 were installed pre-construction and remained in the ground during Site grading and planting. GW 4-12 and the reference well were installed on May 26, 2022, and GW 13 was installed on August 2, 2022. Only one (GW2) of the 13 installed GW achieved the MY1 performance standard. Summary of MY1 groundwater hydrology is included in Appendix D.
- Assessment of data collected by the reference groundwater well located in a forested wetland to the east of the Site indicates that groundwater within 12 inches of the ground surface had a maximum hydroperiod of 3 days (1% of the growing season) during the MY1 growing season. The area received less than average rainfall during 2022. Rainfall data analysis indicates that six of the first ten months in 2022 (January – October) experienced cumulative rainfall less than the 30th percentile value for the month.
- Rainfall data collection at the Site began on April 30, 2022. In order to present regional rainfall data for the preceding months of 2022, rainfall data was obtained from USGS gauge station 02082585 (Tar River at NC97), located approximately 15 miles northwest of the Site in Rocky Mount, NC. To maintain continuity in the presented data, rainfall data collected at the USGS gauge was presented for the entire monitoring year. Rainfall data collected at the Site will be presented in future annual monitoring reports.
- GW13 was placed outside of the proposed credit area to assess potential future credit area. The 0.856-acre area located on the western side of the property (Figure 1) was not included in the proposed credit area discussed in the Final Mitigation Plan but is being considered as a potential future credit generating area. During Site construction invasive Chinese privet was removed from this area and the area was graded, seeded, and planted the same as the remainder of the Site. Eco Terra will monitor groundwater (and vegetation) in this area and may request in future monitoring years that the area be included as part of the Site's credit generating area.

3.3 Visual Assessment

- Visual assessment of the Site indicates that the Site is stable and planted vegetation is in good health. The constructed ditch plug at the northeast corner of the Site shows no sign of deterioration from overland runoff or scour beneath the perched culvert passing beneath the farm road. There are no signs of erosion or excessive sediment deposition at the Site.

- The Site boundary has been well marked with signage and there is no evidence of encroachment. During the as-built IRT site walk, members of the IRT requested that a more substantial site boundary marker and photo point be added at the northeast corner of the Site. A photo point (PP4a) and easement corner marker were established in the location (Figure 1). Photographs taken from the 12 established photo points are presented in Appendix A.

3.4 MY1 Assessment Summary

- Overall, the Site is in good condition. Planted stems appear to be in good health and herbaceous ground cover is establishing across the Site. Stem density in the 14 vegetation plots ranged between 526-850 stems per acre, well above the MY3 performance standard of 320 stems per acre. Average stem height and vigor for the Site is 2.0 feet (51.3 cm) and 3.9/4.0 respectively.
- Only one of the 13 installed groundwater wells on site achieved the MY1 performance standard. Assuming a more standard precipitation pattern, hydrologic performance of the Site is expected to improve in MY2 as soil structure and organic material accumulation increases in the upper soil horizons and the water table in the vicinity of the Site continues to adjust to current land management practices.
- There have been no noticed signs of encroachment within the Site.

The IRT previously requested that MY1 for the Site be 2023, citing concerns with late planting and delayed hydrologic monitoring in 2022. Eco Terra believes that planted stem survival and hydrologic performance of the Site relative to the reference wetland gives reason to count 2022 as MY1.

Summary information of the Site for MY1 can be found in the report appendices. Raw data for the Site supporting the observations and conclusions in this report will be made available to DMS upon request.

4.0 Methodology

Hydrologic monitoring and instrument installation followed guidance put forth by the USACE (2003) and the USACE and NCIRT Stream and Wetland Compensatory Mitigation Update (2016). Vegetation monitoring followed the Carolina Vegetation Survey – EEP Level II Protocol (Lee et al., 2008). Visual assessment followed most recent guidance put forth by the USACE and NCIRT (USACE, 2016).

5.0 References

Eco Terra, LLC. 2022. Final Mitigation Plan – Colonial Farms Wetland Mitigation Site.

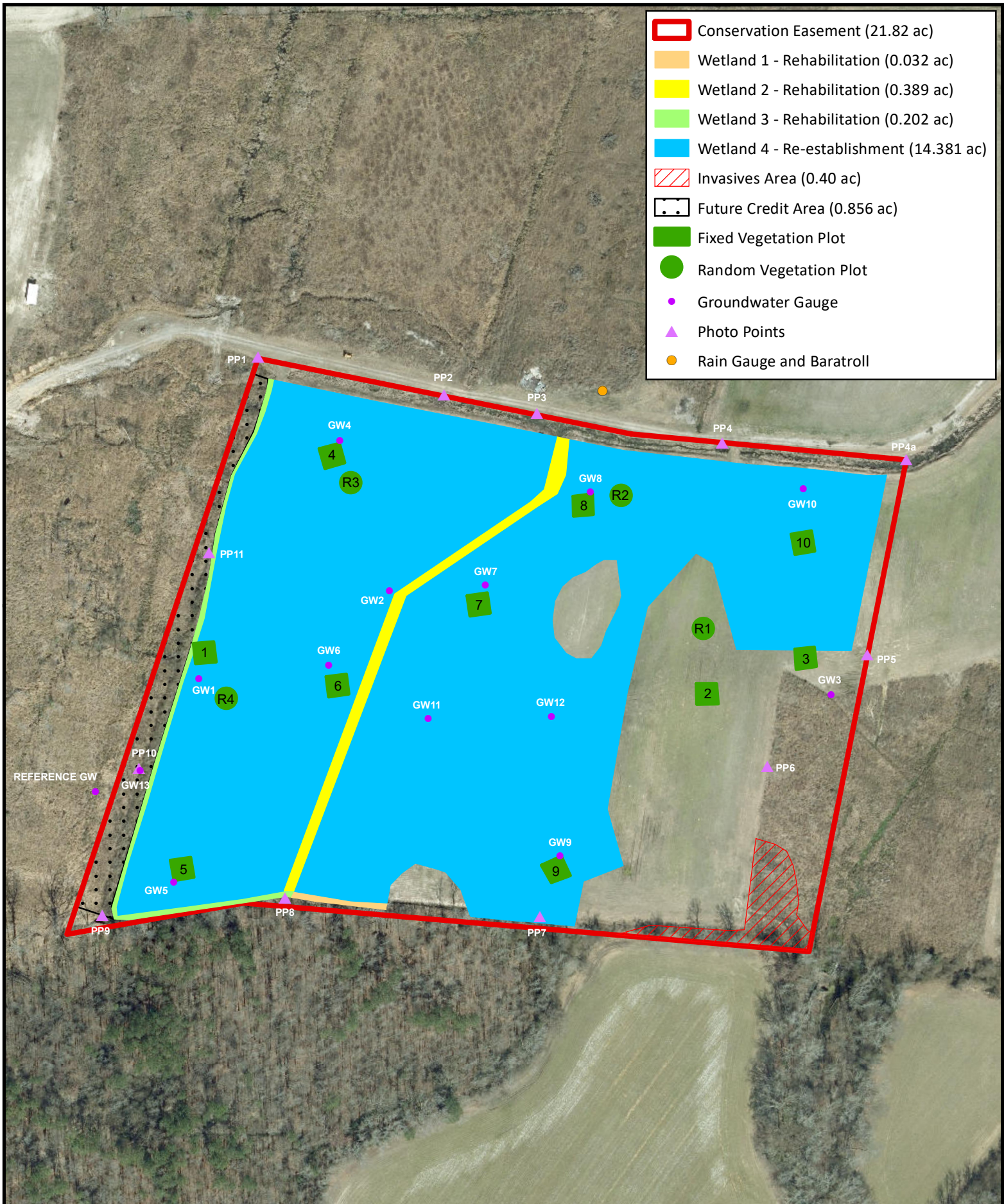
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US Army Corps of Engineers (USACE). 2003. Stream Mitigation Guidelines.

US Army Corps of Engineers (USACE) and North Carolina Interagency Review team (NCIRT). 2016. Wilmington District Stream and Wetland Compensatory Mitigation Update. North Carolina Interagency Review Team – October 24, 2016. Available: <http://saw-reg.usace.army.mil/PN/2016/Wilmington-District-Mitigation-Update.pdf>



COLONIAL WETLAND MITIGATION SITE
MONITORING YEAR 1 - CURRENT CONDITIONS SITE MAP
 Tar-Pamlico 03020103
 Edgecombe County, North Carolina

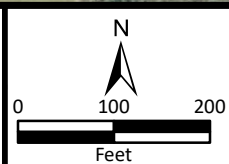


FIGURE
1

APPENDIX A

Visual Assessment Data

Table 5: Visual Vegetation Assessment

Colonial Farms Wetland Mitigation Site

DMS ID No. 100191

Monitoring Year 1 – November 2022

Planted Acreage = 20.74 ac

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.	0.10 acres	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 = 21.82 ac

Vegetation Category	Definitions	Mapping Threshold	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern 1. Chinese Privet - <i>Ligustrum sinense</i>	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	0.40	1.8%
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 Encroachments Noted	

Vegetation Plot Photographs

COLONIAL FARMS WETLAND MITIGATION SITE – MY1 VEGETATION PLOT PHOTO LOG



Vegetation Plot 1 – taken 10/25/2022



Vegetation Plot 2 – taken 10/25/2022



Vegetation Plot 3 – taken 10/25/2022



Vegetation Plot 4 – taken 10/25/2022



Vegetation Plot 5 – taken 10/25/2022



Vegetation Plot 6 – taken 10/25/2022



Vegetation Plot 7 – taken 10/25/2022



Vegetation Plot 8 – taken 10/25/2022



Vegetation Plot 9 – taken 10/25/2022



Vegetation Plot 10 – taken 10/25/2022



Random Vegetation Plot 1 – taken 10/25/2022



Random Vegetation Plot 2 – taken 10/25/2022



Random Vegetation Plot 3 – taken 10/25/2022



Random Vegetation Plot 4 – taken 10/25/2022

Photo Point Photographs

COLONIAL FARMS WETLAND MITIGATION SITE – MY1 PHOTO POINT LOG



Photo Point 1 – taken 10/25/2022



Photo Point 2 – taken 10/25/2022



Photo Point 3 – taken 10/25/2022



Photo Point 4 – taken 10/25/2022



Photo Point 4a – taken 10/25/2022



Photo Point 10 – taken 10/25/2022



Photo Point 6 – taken 10/25/2022



Photo Point 7 – taken 10/25/2022



Photo Point 8 – taken 10/25/2022



Photo Point 9 – taken 10/25/2022



Photo Point 10 – taken 10/25/2022



Photo Point 11 – taken 10/25/2022



Site Aerial (view SE) – taken 10/25/2022

APPENDIX B

Vegetation Plot Data

Table 6a: Vegetation Plot Data

Colonial Farms Wetland Mitigation Site
 DMS ID No. 100191
 Monitoring Year 1 – November 2022

	Scientific Name	Common Name	Tree / Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	<i>Betula nigra</i>	River Birch, Red Birch	Tree	FACW			1	1	1	1		
	<i>Cephalanthus occidentalis</i>	Buttonbush	Shrub Tree	OBL	3	3	1	1				
	<i>Fraxinus pennsylvanica</i>	Green Ash	Tree	FACW								
	<i>Liriodendron tulipifera</i>	Yellow Poplar	Tree	FACU	2	2						
	<i>Nyssa aquatica</i>	Water Tupelo	Tree	FACW	5	5			1	1	5	5
	<i>Platanus occidentalis</i>	Sycamore	Tree	FACW								
	<i>Quercus lyrata</i>	Overcup Oak	Tree	OBL	1	1			1	1	3	3
	<i>Quercus michauxii</i>	Swamp Chestnut Oak	Tree	FACW	2	2	4	4	5	5	1	1
	<i>Quercus nigra</i>	Water oak	Tree	FAC								
	<i>Quercus phellos</i>	Willow Oak	Tree	FACW								
	<i>Quercus shumardii</i>	Shumard Oak	Shrub Tree	FAC			2	2			1	1
	<i>Taxodium distichum</i>	Bald-cypress	Tree	OBL	4	4			5	5	8	8
Sum	Performance Standard				17	17	8	8	13	13	18	18
Post Mitigation Plan Species	<i>Carya aquatica</i>	Water Hickory	Tree	OBL								
	<i>Celtis laevigata</i>	Sugarberry	Shrub Tree	FACW			11	11				
	<i>Cornus amomum</i>	Silky Dogwood	Shrub Tree	FACW								
	<i>Diospyros virginiana</i>	Persimmon	Shrub Tree	FAC								
Sum	Proposed Standard				17	17	19	19	13	13	18	18
Mitigation Plan Performance Standard	Current Year Stem Count					17		8		13		18
	Stems/Acre					688		323		526		728
	Species Count					6		4		5		5
	Dominant Species Composition (%)					29%		50%		38%		44%
	Average Plot Height (ft)					2.1		1.9		2.0		2.1
	% Invasives					0%		0%		0%		0%
Post Mitigation Plan Performance Standard	Current Year Stem Count					17		19		13		18
	Stems/Acre					688		769		526		728
	Species Count					6		5		5		5
	Dominant Species Composition (%)					29%		58%		38%		44%
	Average Plot Height (ft)					2.1		2.0		2.0		2.1
	% Invasives					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 6b: Vegetation Plot Data

Colonial Farms Wetland Mitigation Site
 DMS ID No. 100191
 Monitoring Year 1 – November 2022

	Scientific Name	Common Name	Tree / Shrub	Indicator Status	Veg Plot 5 F		Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	<i>Betula nigra</i>	River Birch, Red Birch	Tree	FACW								
	<i>Cephalanthus occidentalis</i>	Buttonbush	Shrub Tree	OBL			2	2	1	1	3	3
	<i>Fraxinus pennsylvanica</i>	Green Ash	Tree	FACW			1	1	4	4		
	<i>Liriodendron tulipifera</i>	Yellow Poplar	Tree	FACU					3	3		
	<i>Nyssa aquatica</i>	Water Tupelo	Tree	FACW			7	7			8	8
	<i>Platanus occidentalis</i>	Sycamore	Tree	FACW								
	<i>Quercus lyrata</i>	Overcup Oak	Tree	OBL			1	1	4	4	1	1
	<i>Quercus michauxii</i>	Swamp Chestnut Oak	Tree	FACW	7	7			4	4	3	3
	<i>Quercus nigra</i>	Water oak	Tree	FAC								
	<i>Quercus phellos</i>	Willow Oak	Tree	FACW	8	8						
<i>Quercus shumardii</i>	Shumard Oak	Shrub Tree	FAC	3	3			1	1			
<i>Taxodium distichum</i>	Bald-cypress	Tree	OBL			7	7	2	2	2	2	
Sum	Performance Standard				18	18	18	18	19	19	17	17
Post Mitigation Plan Species	<i>Carya aquatica</i>	Water Hickory	Tree	OBL	1	1					1	1
	<i>Celtis laevigata</i>	Sugarberry	Shrub Tree	FACW								
	<i>Cornus amomum</i>	Silky Dogwood	Shrub Tree	FACW								
	<i>Diospyros virginiana</i>	Persimmon	Shrub Tree	FAC								
Sum	Proposed Standard				19	19	18	18	19	19	18	18
Mitigation Plan Performance Standard	Current Year Stem Count					18		18		19		17
	Stems/Acre					728		728		769		688
	Species Count					3		5		7		5
	Dominant Species Composition (%)					44%		39%		21%		47%
	Average Plot Height (ft)					1.8		2.2		2.0		2.1
	% Invasives					0%		0%		0%		0%
Post Mitigation Plan Performance Standard	Current Year Stem Count					19		18		19		18
	Stems/Acre					769		728		769		728
	Species Count					4		5		7		6
	Dominant Species Composition (%)					42%		39%		21%		44%
	Average Plot Height (ft)					1.8		2.2		2.0		2.1
	% Invasives					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 6c: Vegetation Plot Data

Colonial Farms Wetland Mitigation Site
 DMS ID No. 100191
 Monitoring Year 1 – November 2022

	Scientific Name	Common Name	Tree / Shrub	Indicator Status	Veg Plot 9 F		Veg Plot 10 F	
					Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	<i>Betula nigra</i>	River Birch, Red Birch	Tree	FACW				
	<i>Cephalanthus occidentalis</i>	Buttonbush	Shrub Tree	OBL	7	7		
	<i>Fraxinus pennsylvanica</i>	Green Ash	Tree	FACW				
	<i>Liriodendron tulipifera</i>	Yellow Poplar	Tree	FACU				
	<i>Nyssa aquatica</i>	Water Tupelo	Tree	FACW	1	1		
	<i>Platanus occidentalis</i>	Sycamore	Tree	FACW				
	<i>Quercus lyrata</i>	Overcup Oak	Tree	OBL	2	2		
	<i>Quercus michauxii</i>	Swamp Chestnut Oak	Tree	FACW			3	3
	<i>Quercus nigra</i>	Water oak	Tree	FAC				
	<i>Quercus phellos</i>	Willow Oak	Tree	FACW				
	<i>Quercus shumardii</i>	Shumard Oak	Shrub Tree	FAC	3	3	9	9
	<i>Taxodium distichum</i>	Bald-cypress	Tree	OBL	3	3		
Sum	Performance Standard				16	16	12	12
Post Mitigation Plan Species	<i>Carya aquatica</i>	Water Hickory	Tree	OBL	4	4		
	<i>Celtis laevigata</i>	Sugarberry	Shrub Tree	FACW			4	4
	<i>Cornus amomum</i>	Silky Dogwood	Shrub Tree	FACW				
	<i>Diospyros virginiana</i>	Persimmon	Shrub Tree	FAC				
Sum	Proposed Standard				20	20	16	16
Mitigation Plan Performance Standard	Current Year Stem Count					16		12
	Stems/Acre					647		485
	Species Count					5		2
	Dominant Species Composition (%)					44%		75%
	Average Plot Height (ft)					1.8		2.0
	% Invasives					0%		0%
Post Mitigation Plan Performance Standard	Current Year Stem Count					20		16
	Stems/Acre					809		647
	Species Count					6		3
	Dominant Species Composition (%)					35%		56%
	Average Plot Height (ft)					1.8		2.0
	% Invasives					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 6d: Vegetation Plot Data

Colonial Farms Wetland Mitigation Site
DMS ID No. 100191
Monitoring Year 1 – November 2022

	Scientific Name	Common Name	Tree / Shrub	Indicator Status	Veg Plot R1	Veg Plot R2	Veg Plot R3	Veg Plot R4
					Total	Total	Total	Total
Species Included in Approved Mitigation Plan	<i>Betula nigra</i>	River Birch, Red Birch	Tree	FACW		2		
	<i>Cephalanthus occidentalis</i>	Buttonbush	Shrub Tree	OBL		3		
	<i>Fraxinus pennsylvanica</i>	Green Ash	Tree	FACW		1	9	3
	<i>Liriodendron tulipifera</i>	Yellow Poplar	Tree	FACU			2	1
	<i>Nyssa aquatica</i>	Water Tupelo	Tree	FACW				1
	<i>Platanus occidentalis</i>	Sycamore	Tree	FACW		1		
	<i>Quercus lyrata</i>	Overcup Oak	Tree	OBL				
	<i>Quercus michauxii</i>	Swamp Chestnut Oak	Tree	FACW	1	8	4	5
	<i>Quercus nigra</i>	Water oak	Tree	FAC			2	2
	<i>Quercus phellos</i>	Willow Oak	Tree	FACW				4
	<i>Quercus shumardii</i>	Shumard Oak	Shrub Tree	FAC	9		2	2
	<i>Taxodium distichum</i>	Bald-cypress	Tree	OBL		3		
Sum	Performance Standard				10	18	19	18
Post Mitigation Plan Species	<i>Carya aquatica</i>	Water Hickory	Tree	OBL				3
	<i>Celtis laevigata</i>	Sugarberry	Shrub Tree	FACW				
	<i>Cornus amomum</i>	Silky Dogwood	Shrub Tree	FACW				
	<i>Diospyros virginiana</i>	Persimmon	Shrub Tree	FAC	5	3		
Sum	Proposed Standard				15	21	19	21
Mitigation Plan Performance Standard	Current Year Stem Count				10	18	19	18
	Stems/Acre				404	728	769	728
	Species Count				2	6	5	7
	Dominant Species Composition (%)				90%	44%	47%	28%
	Average Plot Height (ft)				1.9	2.0	2.3	1.9
	% Invasives				0%	0%	0%	0%
Post Mitigation Plan Performance Standard	Current Year Stem Count				15	21	19	21
	Stems/Acre				607	850	769	850
	Species Count				3	7	5	8
	Dominant Species Composition (%)				60%	38%	47%	24%
	Average Plot Height (ft)				1.9	1.9	2.3	1.9
	% Invasives				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 7: Vegetation Performance Standards Summary

Colonial Farms Wetland Mitigation Site

DMS ID No. 100191

Monitoring Year 1 – November 2022

	Veg Plot 1 F				Veg Plot 2 F				Veg Plot 3 F			
	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	688	2.1	6	0	769	2.0	5	0	526	2.0	5	0
Monitoring Year 0	688	1.8	6	0	323	1.5	4	0	566	1.6	5	0
	Veg Plot 4 F				Veg Plot 5 F				Veg Plot 6 F			
	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	728	2.1	5	0	769	1.8	4	0	728	2.2	5	0
Monitoring Year 0	728	1.7	4	0	769	1.5	4	0	769	1.6	5	0
	Veg Plot 7 F				Veg Plot 8 F				Veg Plot 9 F			
	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	769	2.0	7	0	688	2.1	5	0	809	1.8	6	0
Monitoring Year 0	769	1.6	7	0	728	1.7	5	0	809	1.3	5	0
	Veg Plot 10 F				Veg Plot R1				Veg Plot R1			
	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	647	2.0	3	0	607	1.9	3	0	850	1.9	7	0
Monitoring Year 0	526	1.6	2	0	688	1.8	5	0	607	1.5	5	0
	Veg Plot R3				Veg Plot R4							
	Stems/Acre	Avg Ht (ft)	# Species	% Invasive	Stems/Acre	Avg Ht (ft)	# Species	% Invasive				
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	769	2.3	5	0	850	1.9	8	0				
Monitoring Year 0	526	1.4	5	0	485	1.6	3	0				

*Each monitoring year represents a different plot for the random vegetation plot "groups". Random plots are denoted with an R, and fixed plots with an F.

APPENDIX C

Hydrologic Data and Soil Descriptions

Table 8: Rainfall Summary

Colonial Farms Wetland Mitigation Site
 DMS ID No. 100191
 Monitoring Year 1 – 2022

Month	Cumulative Rainfall (in)							
	30th / 70th Percentile	MY1 2022	MY2 2023	MY3 2024	MY4 2025	MY5 2026	MY6 2027	MY7 2027
January	3.31 / 4.94	1.76						
February	2.43 / 4.17	1.75						
March	3.19 / 4.90	2.26						
April	1.90 / 3.73	2.21						
May	2.67 / 4.41	2.84						
June	2.53 / 4.46	2.36						
July	3.04 / 5.31	4.14						
August	3.46 / 5.94	3.18						
September	2.48 / 5.38	4.63						
October	1.33 / 3.67	0.69						
November	1.72 / 3.11							
December	2.00 / 3.67							

Red values indicate recorded rainfall less than the 30th percentile value.

Blue values indicate recorded rainfall greater than the 70th percentile value.

30th and 70th percentile rainfall values based on NRCS WETS station Tarboro 1 S, NC

Rainfall data obtained from USGS 02082585 (Tar River at NC97)

Table 9: Groundwater Gauge Summary

Colonial Farms Wetland Mitigation Site
 DMS ID No. 100191
 Monitoring Year 1 – 2022

Soil Series: Portsmouth

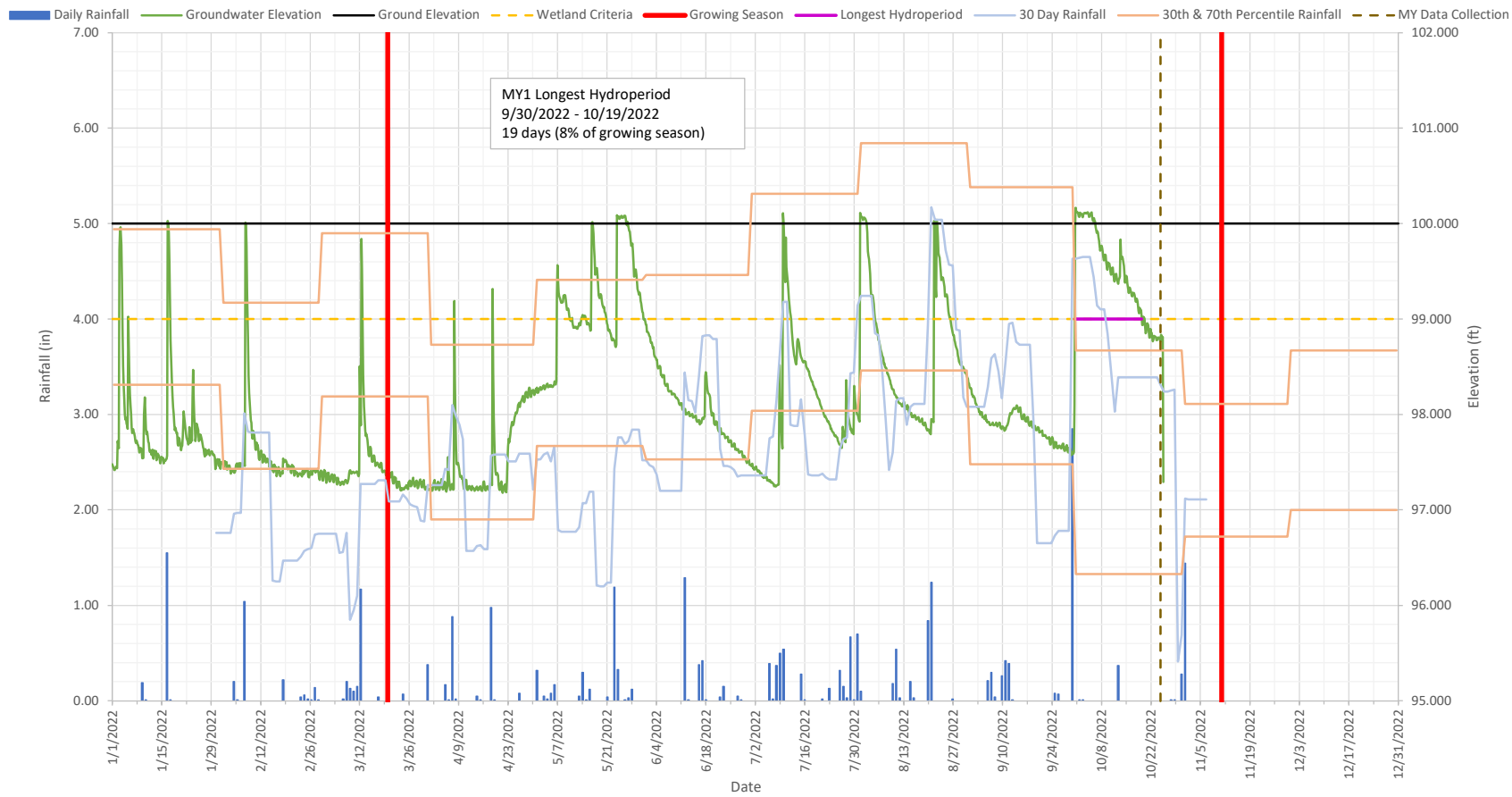
Growing Season 3/20 - 11/11 236 days	Performance Standard	Longest Hydroperiod												
		GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8	GW9	GW10	GW11	GW12	GW13
MY1 - 2022	24 days 10%	19 days 8%	35 days 15%	6 days 3%	2 days 1%	8 days 3%	18 days 8%	18 days 8%	9 days 4%	0 days 0%	2 days 1%	0 days 0%	1 day <1%	19 days 8%
MY2 - 2023														
MY3 - 2024	28 days 12%													
MY4 - 2025														
MY5 - 2026														
MY6 - 2027														
MY7 - 2028														

WETS Station: Tarboro 1 S, NC

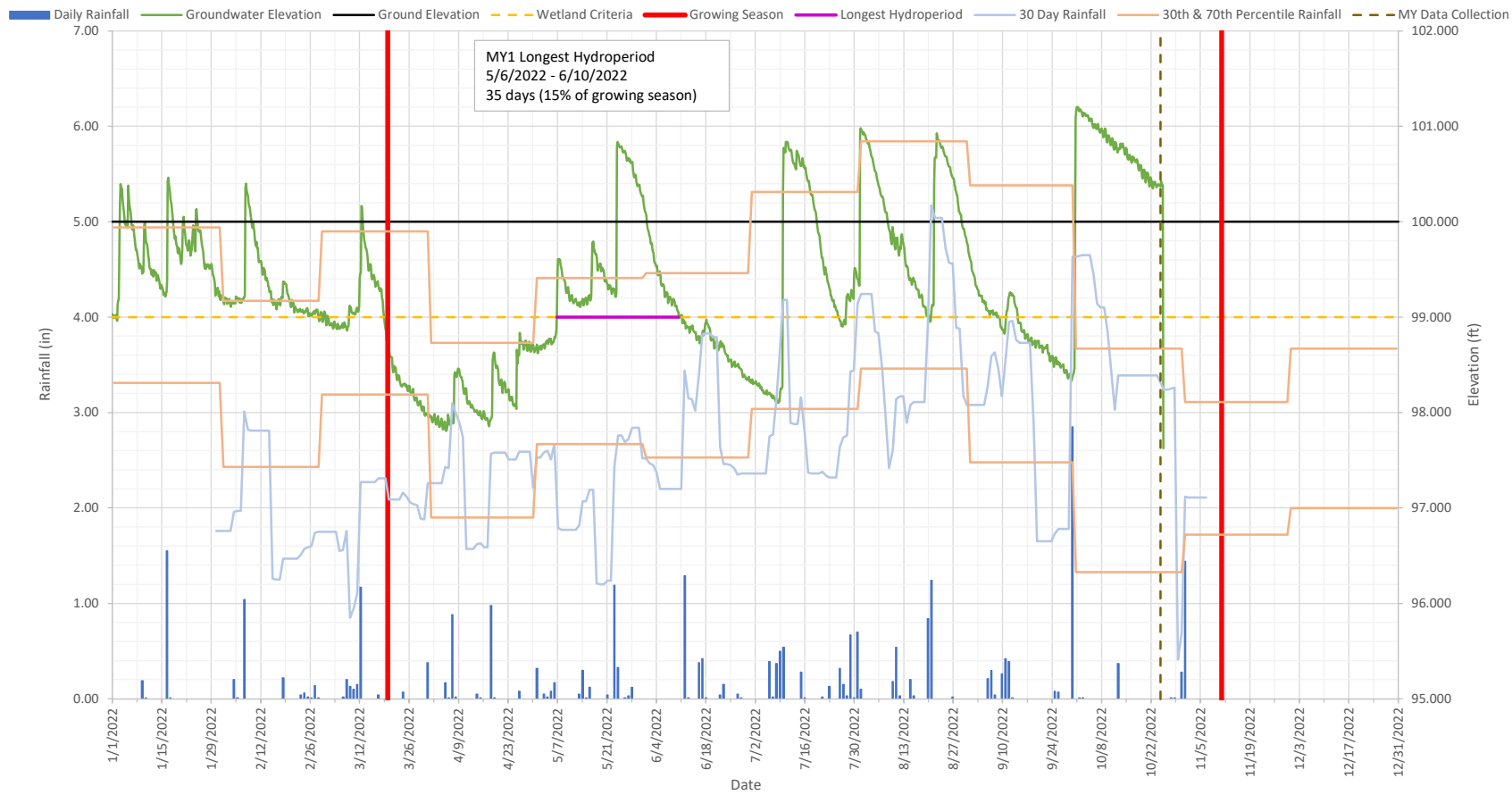
MY1 Monitoring dates: 3/10/2022 - 10/12/2022

Colonial Farms Wetland Mitigation Site - MY1 2022

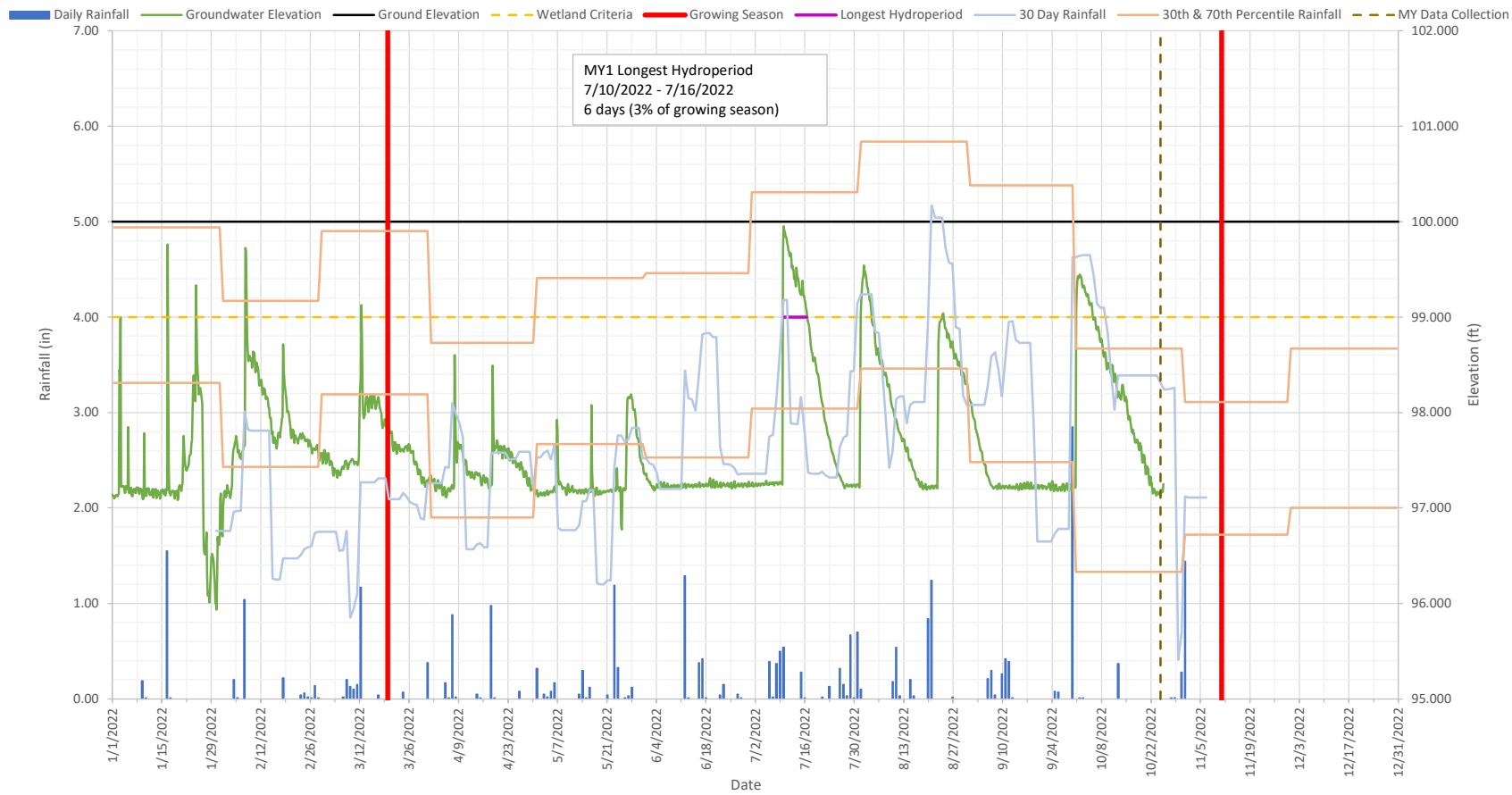
Groundwater Well 1



Colonial Farms Wetland Mitigation Site - MY1 2022 Groundwater Well 2

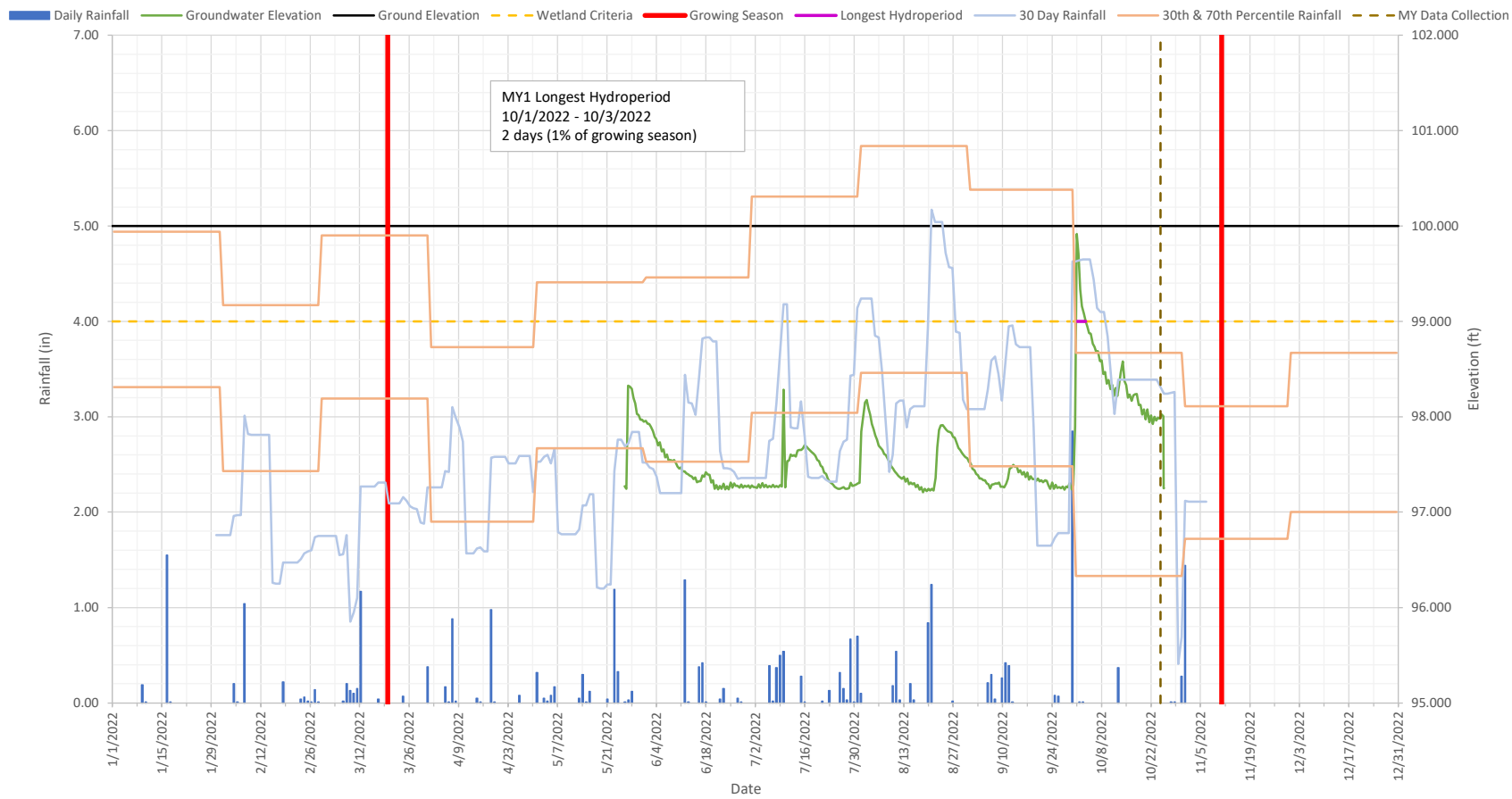


Colonial Farms Wetland Mitigation Site - MY1 2022 Groundwater Well 3

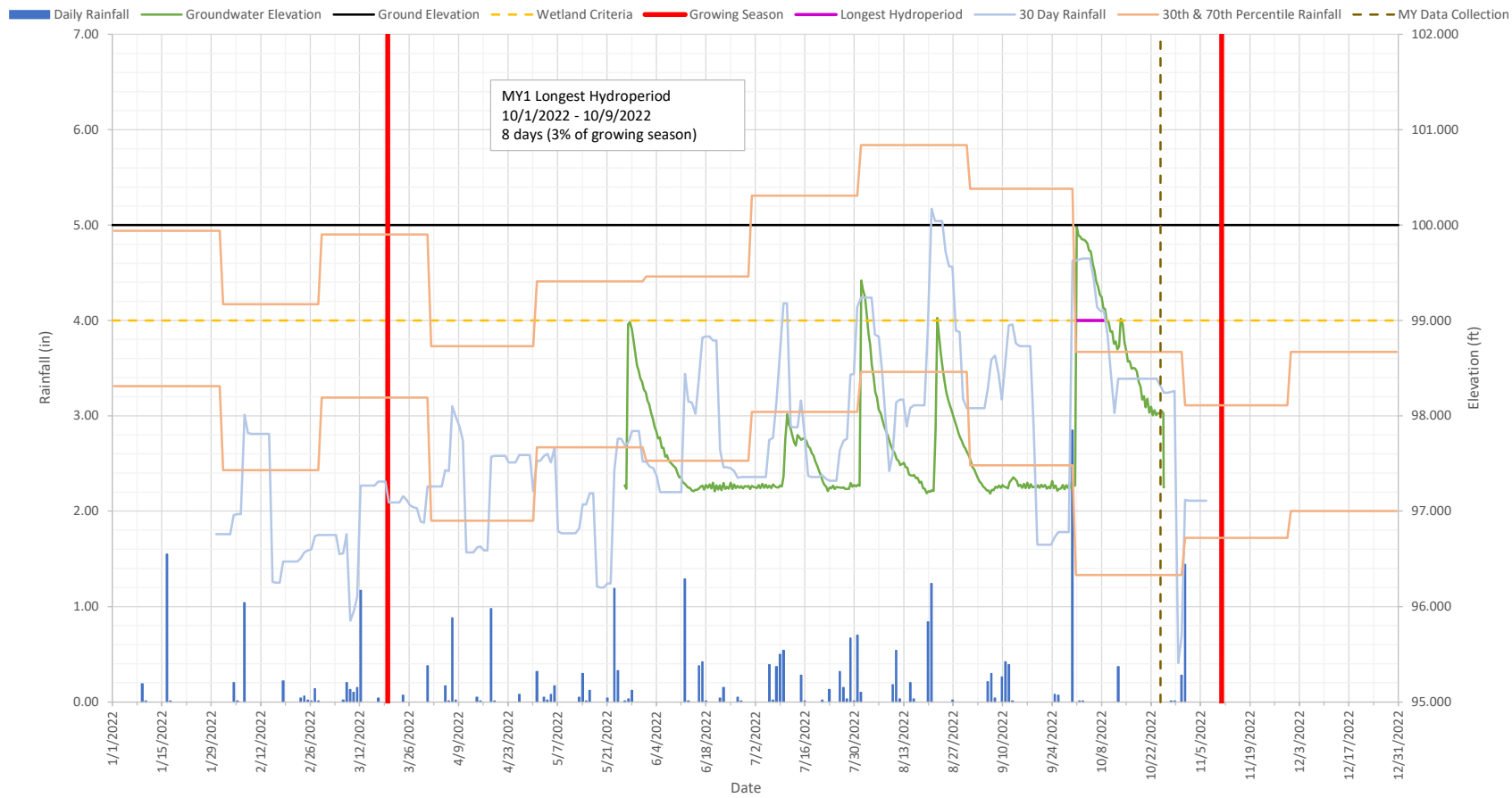


Colonial Farms Wetland Mitigation Site - MY1 2022

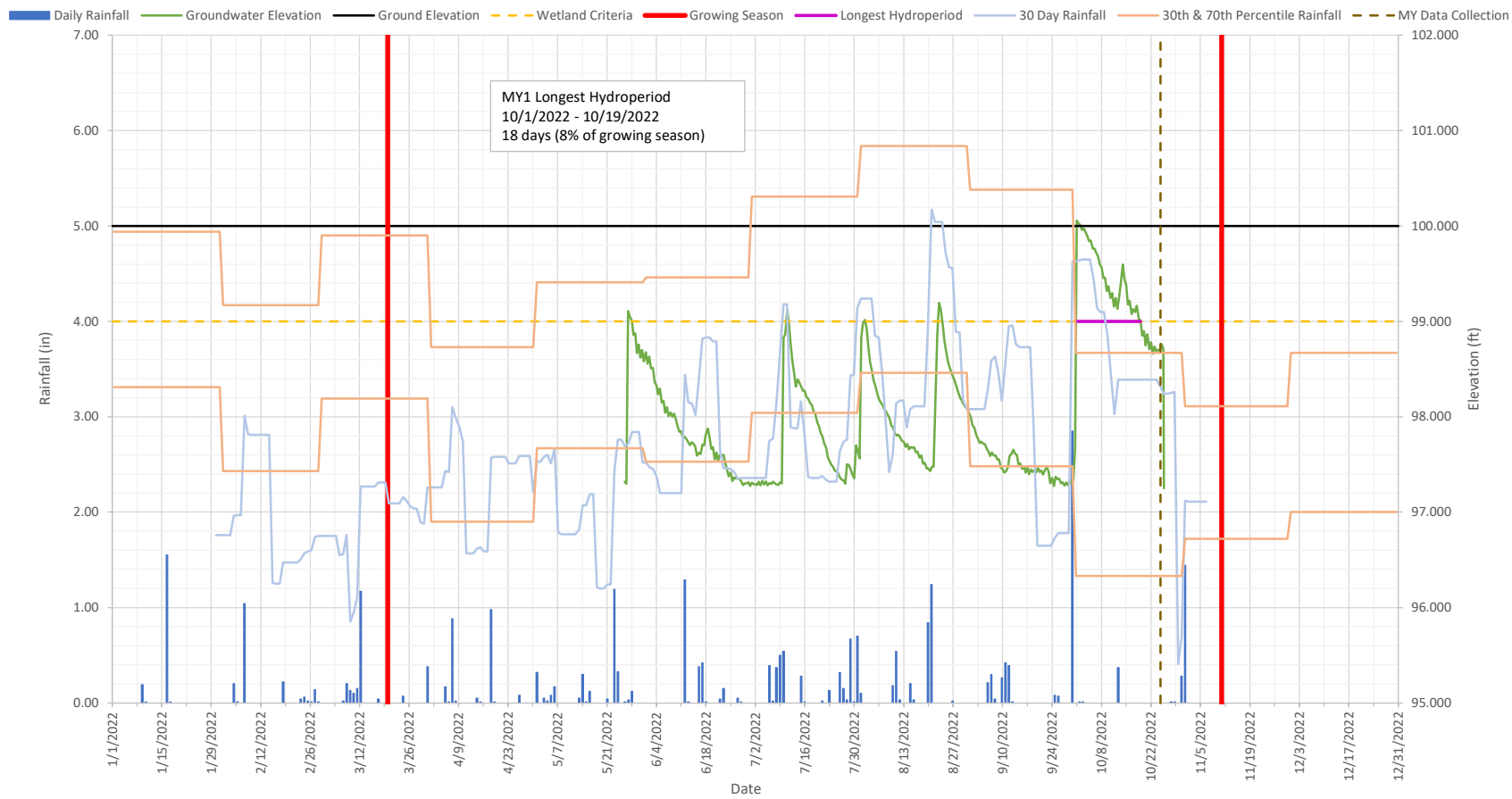
Groundwater Well 4



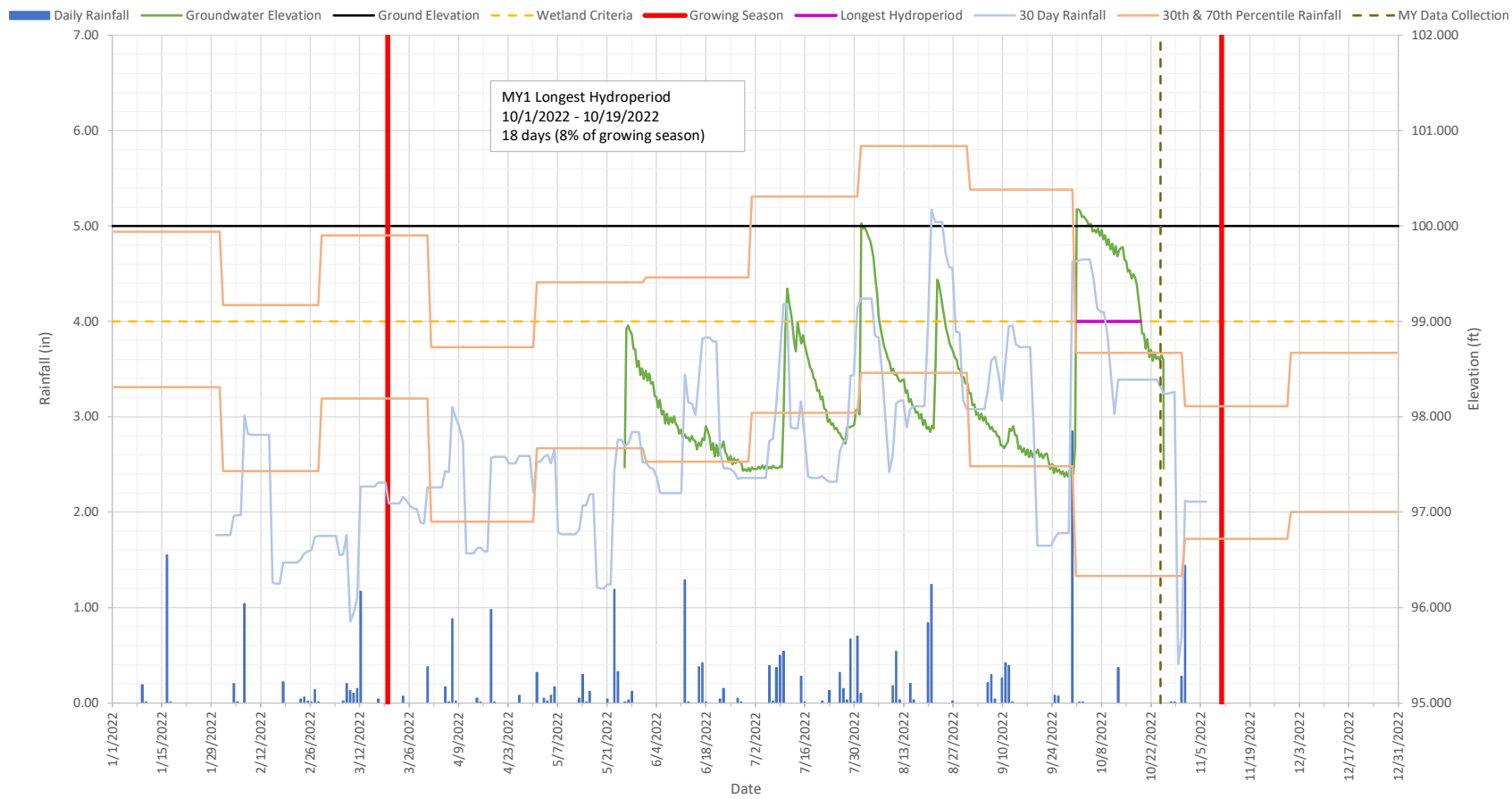
Colonial Farms Wetland Mitigation Site - MY1 2022 Groundwater Well 5



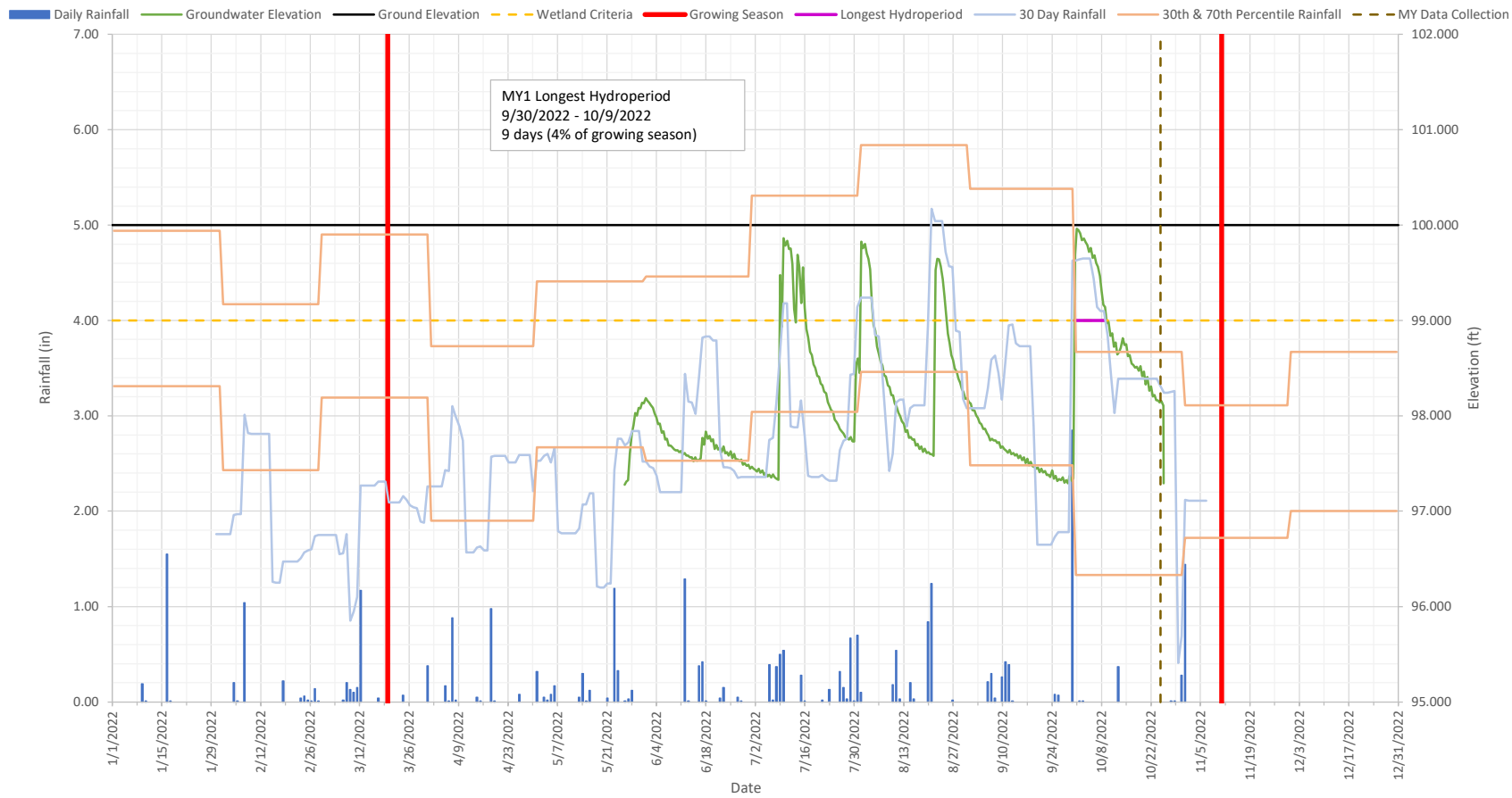
Colonial Farms Wetland Mitigation Site - MY1 2022 Groundwater Well 6



Colonial Farms Wetland Mitigation Site - MY1 2022 Groundwater Well 7

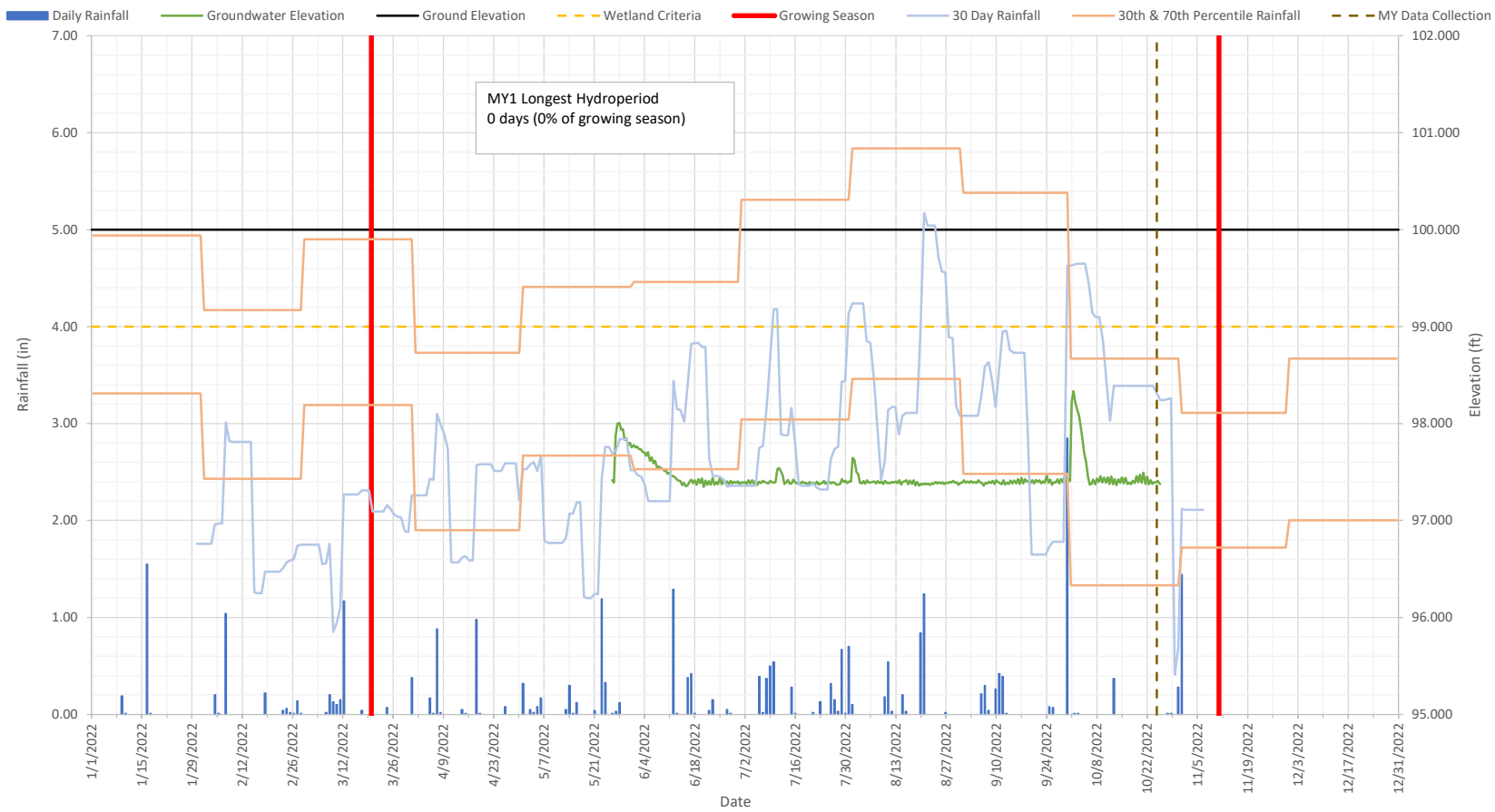


Colonial Farms Wetland Mitigation Site - MY1 2022 Groundwater Well 8



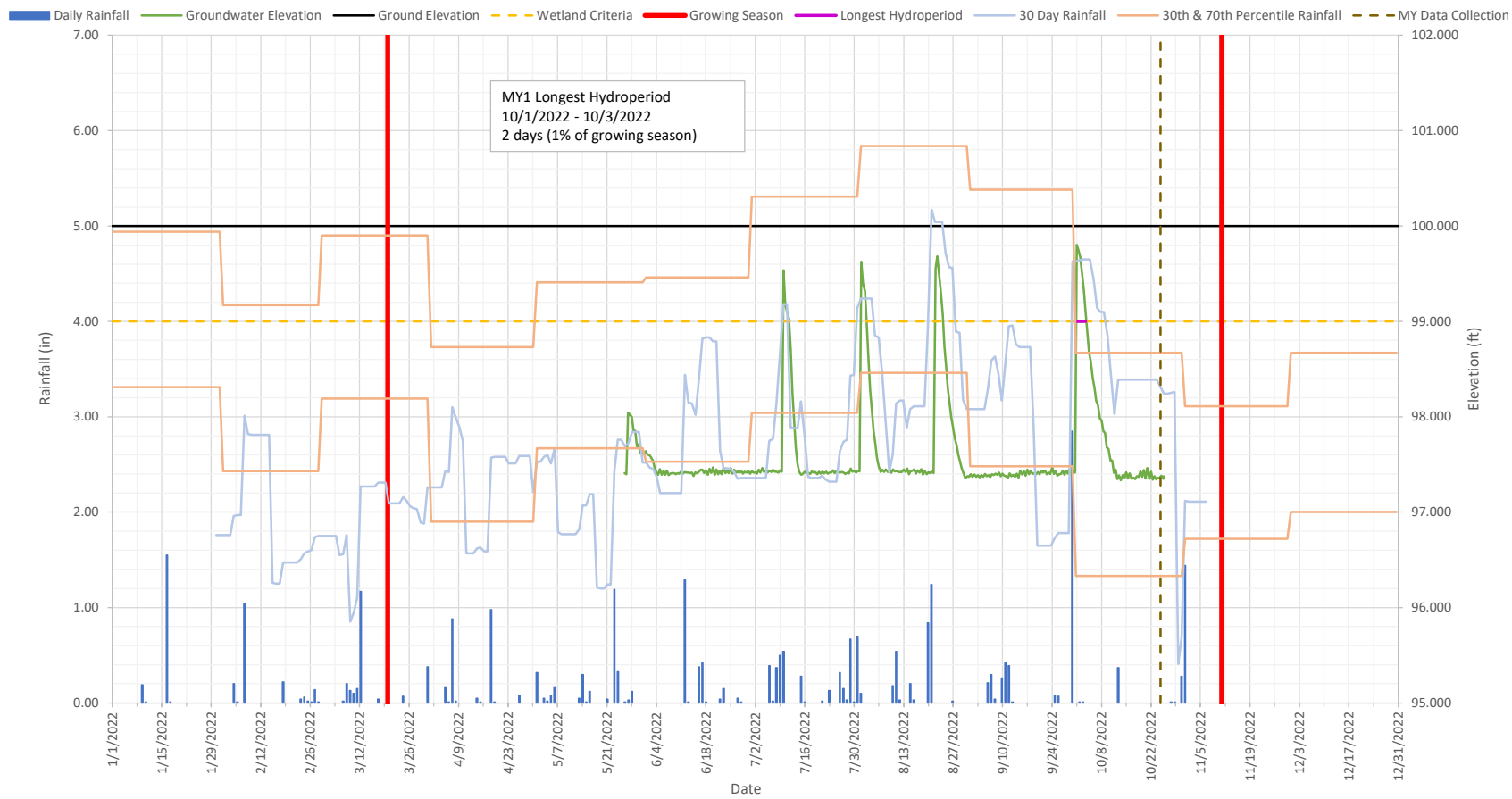
Colonial Farms Wetland Mitigation Site - MY1 2022

Groundwater Well 9



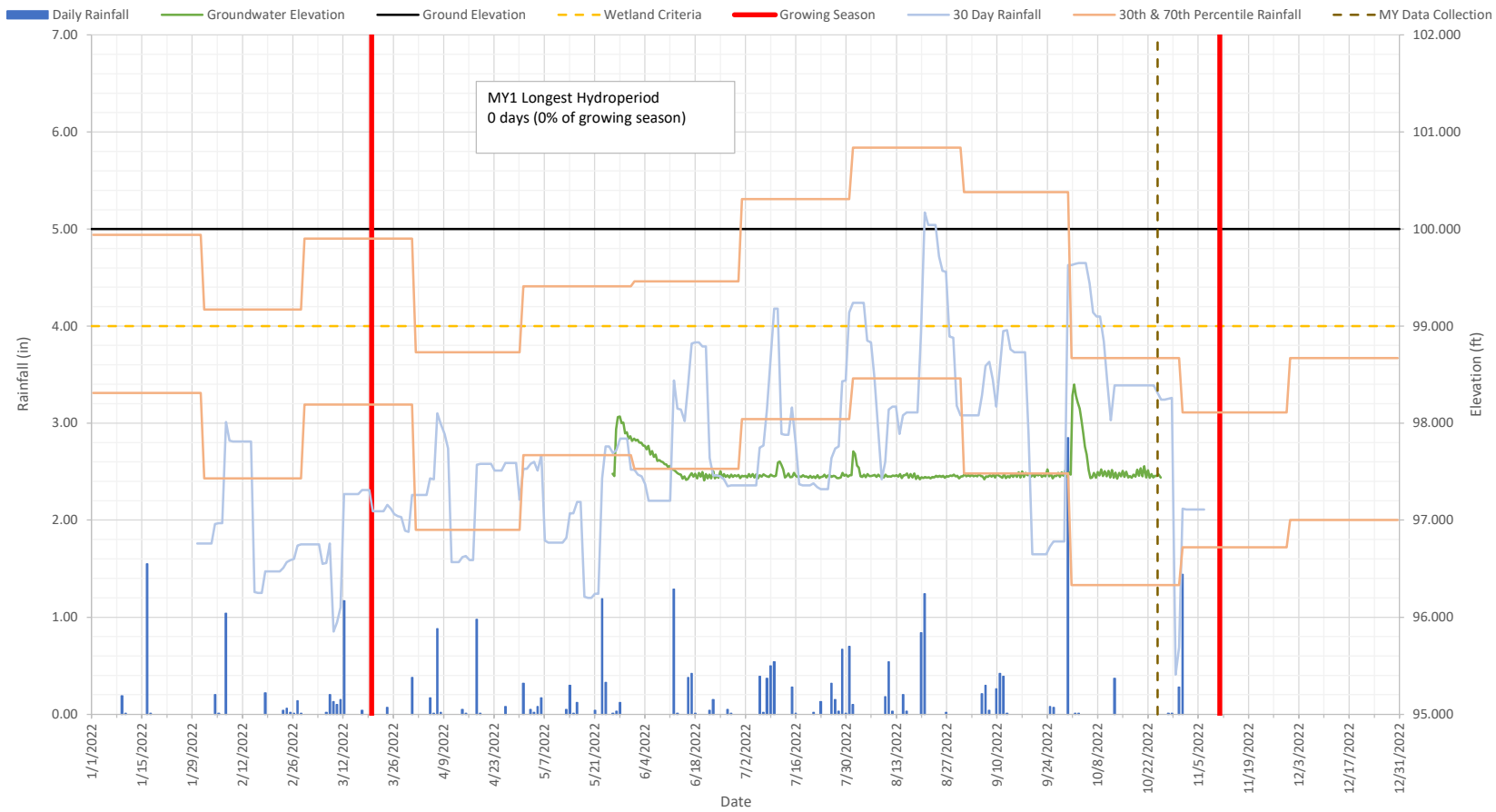
Colonial Farms Wetland Mitigation Site - MY1 2022

Groundwater Well 10

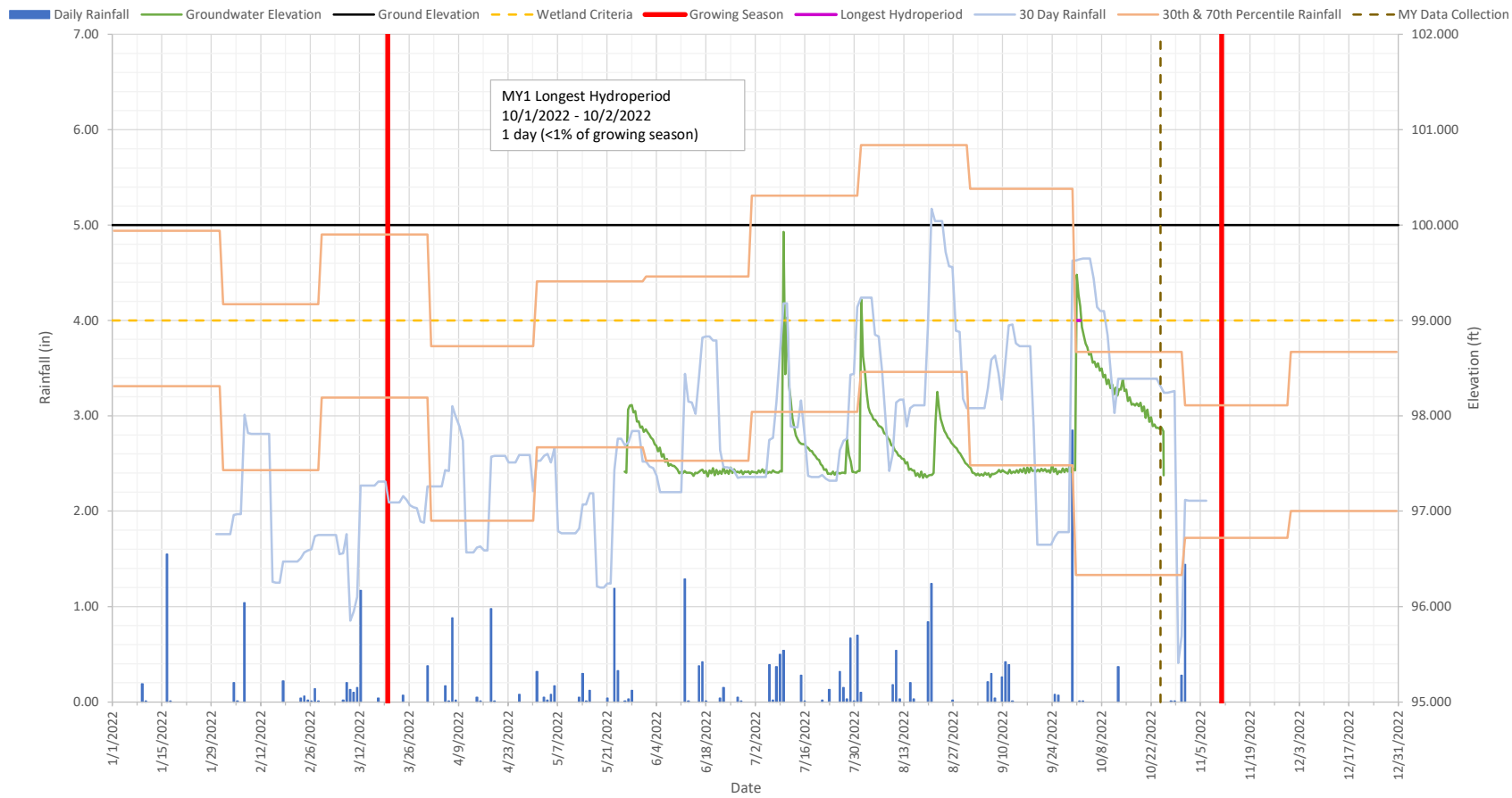


Colonial Farms Wetland Mitigation Site - MY1 2022

Groundwater Well 11

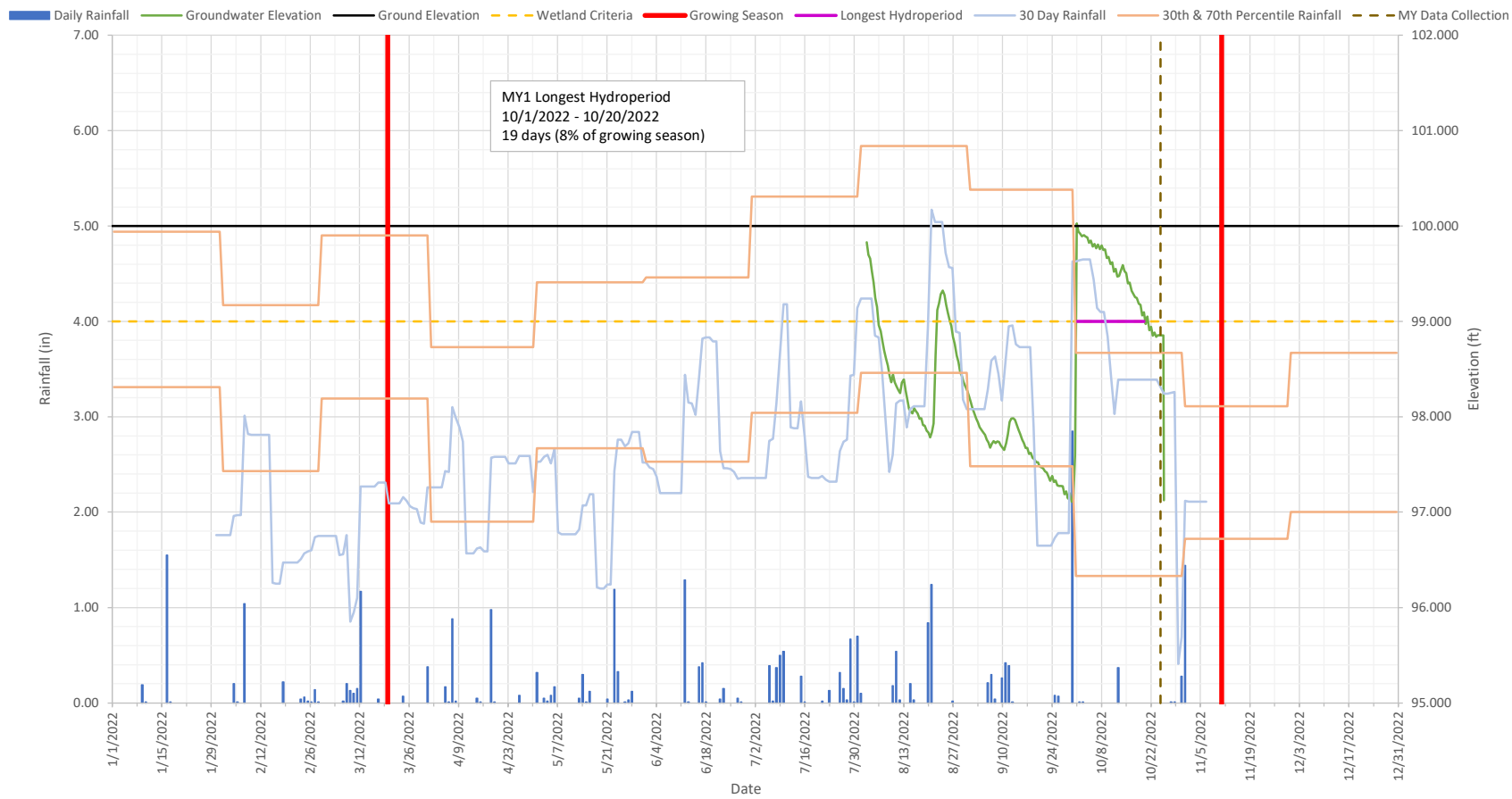


Colonial Farms Wetland Mitigation Site - MY1 2022 Groundwater Well 12

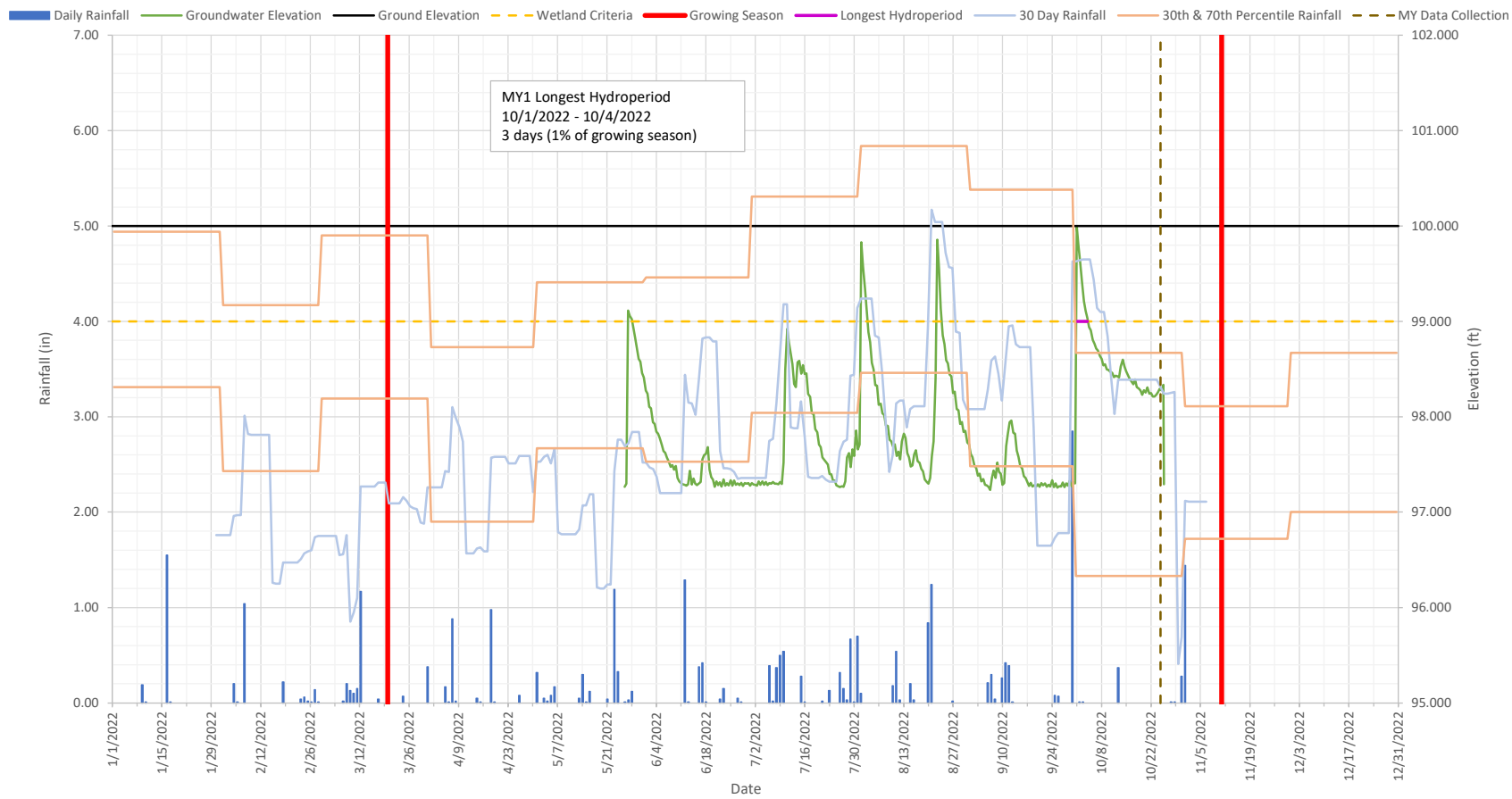


Colonial Farms Wetland Mitigation Site - MY1 2022

Groundwater Well 13



Colonial Farms Wetland Mitigation Site - MY1 2022 Reference Groundwater Well



APPENDIX D

Project Timeline and Contacts Info

Table 10: Project Activity and Reporting History

Colonial Farms Wetland Mitigation Site

DMS ID No. 100191

Monitoring Year 1 – November 2022

Activity or Report	Data Collection Complete	Completion or Scheduled Delivery
Project Instituted	N/A	February 11, 2021
Mitigation Plan Approved	N/A	February 24, 2022
Construction (Grading) Completed	N/A	May 6, 2022
As-Built Survey Completed	May 2022	May 2022
Planting Completed	N/A	April 28, 2022
Baseline Monitoring Document (Year 0) - Vegetation Survey	March 2022	August 2022
Year 1 Monitoring - Vegetation Survey	October 2022	November 2022
Year 2 Monitoring - Vegetation Survey	2023	November 2023
Year 3 Monitoring - Vegetation Survey	2024	November 2024
Year 4 Monitoring - Vegetation Survey	2025	November 2025
Year 5 Monitoring - Vegetation Survey	2026	November 2026
Year 6 Monitoring - Vegetation Survey	2027	November 2027
Year 7 Monitoring - Vegetation Survey	2028	November 2028

Table 11: Project Contacts

Colonial Farms Wetland Mitigation Site

DMS ID No. 100190

Monitoring Year 1 – November 2022

<p style="text-align: center;"><u>Designer</u> Eco Terra - Scott Frederick, LSS</p>	<p>Eco Terra, LLC 117 Centrewest Ct Cary, NC 27513 919.922.9508</p>
<p style="text-align: center;"><u>Engineer</u> McAdams - Rebecca Stubbs, PE</p>	<p>McAdams 2905 Meridian Parkway Durham, NC 27713 919.361.5000</p>
<p style="text-align: center;"><u>Construction Contractor</u> WVM, Inc</p>	<p>WVM, Inc 3018 Church St. Ext Winterville, NC 28590 252.439.8588</p>
<p style="text-align: center;"><u>Monitoring</u> Eco Terra - Scott Frederick, LSS</p>	<p>Eco Terra, LLC 117 Centrewest Ct Cary, NC 27513 919.922.9508</p>

APPENDIX E

Additional Project Info

17 October 2022

Colonial Mitigation Site

Edgecombe County

Tar-Pamlico 03020103

USACE Action ID#: SA-2021-00346

DWR Project #: 2021-0399

DMS Project #: 100191

As-Built IRT Field Review

Jeremiah Dow – NC Division of Mitigation Services

Todd Tugwell – US Army Corps of Engineers

Kim Isenhour – US Army Corps of Engineers

Casey Haywood – US Army Corps of Engineers

Erin Davis – NC Division of Water Resources

Travis Wilson – NC Wildlife Resources Commission

Norton Webster – Eco Terra, LLC

- Before conducting site visit need to address all measures prescribed in the mitigation plan which includes invasive plant treatment
- Treat *Ligustrum sinense* on and around site and photo document results
- Need a more visible and taller corner marker at the outlet structure
- Closely monitor gages along road (GW4, GW8 and GW10) near ditch. May need to add well transect if there appears to be a hydrologic influence.
- May need to delineate extent of jurisdictional wetlands at closeout if issue with hydrology.
- Added a few species to the final mitigation plan that were not approved. Need to get prior approval.
- Questioning extent and distribution of *Carya aquatica* (Plans show *C. ovata* but is *C. aquatica*)
- *Diospyros virginiana* is not an interior species
- Add photo point at the culvert outlet corner to document site conditions
- Future years monitor vegetation with random plots in the filled ditch locations