(MY1) FINAL MONITORING REPORT – *Riparian Buffer Mitigation*

STRAWBERRY HILL MITIGATION PROJECT

Johnston County, North Carolina
Neuse River Basin
HUC 03020201

NCDMS Project #100094 (Contract #7745)
USACE Action ID: SAW-2019-00124
DWR Project #2019-0159

Provided by:

Resource Environmental Solutions, LLC
for Environmental Banc & Exchange – Neuse I, LLC (EBX-Neuse I)

Provided for:
NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
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February 2023

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February 2, 2023

Jeremiah Dow
NC DEQ Division of Mitigation Services
217 West Jones Street
Raleigh, NC 27604

RE: DMS Comments on the MY1 Report Strawberry Hill, Project ID #100094, DMS Contract 7745

Listed below are comments provided by DMS on January 31, 2023 regarding the Strawberry Hill Stream and Riparian Buffer Mitigation Project Year 1 Monitoring Reports and RES' responses.

Stream Report Comments:

1. Section 1.5.2 (1st paragraph) seems to have mixed up the flow gauge location and stage recorder location in the discussion. The stage recorder is identified as being on JH1-A and flow gauge on JH1-B when it should be the opposite. Please correct.
This has been revised accordingly.

2. Please remove Section 1.5.4 from the stream report since it exclusively deals with the buffer-only section of the project.
The section has been removed.

3. Recommend removing Figure 2b from the stream report.
Figure 2b was included in the report in order to satisfy a previous DMS Digital File Comment from the MY0 report (See excerpt below from the MYO Comment Response Memo):

Digital File Comments:

1. It is not possible to ensure the easement is accurate when compared to the CCPV in the stream asset baseline report, the CCPV does include the entire easement. The digital easement submitted does represent the DMS recorded easement. A requirement of the CCPV is to include the easement boundary, please revise the CCPV in the Stream Baseline Report to include the entire easement boundary. It is complete in the Buffer Baseline Report.
Figure 2 has been divided into Figure 2a and 2b so that monitoring devices are legible on 2a and the entire conservation easement is visible on 2b.

Therefore, at this time, RES prefers to include the figure per the previous comment; however, if DMS concludes that the previous comment is erroneous, then RES can remove it in future years' monitoring reports.

4. In Appendix A, please remove any photos from the buffer-only easement from the stream report.
The photo pertaining to the buffer-only portion of the easement has been removed from Appendix A.

5. On Flow Gauge JH1-A hydrograph, recommend adding number of days of flow after the date range, i.e., 2/16/2022 - 4/4/2022 (47 days).
Number of days have been added to the hydrograph accordingly.

Buffer Report Comments:
6. Please update Section 1.3 with the correct riparian buffer restoration credits as reported in the MY0 report. The restoration credits should be 642,070.977 and total credits should be 650,162.286.
RES apologizes for the mistake. A previous version of Table 1 was accidentally copied-and-pasted into this report. The final report has been revised to include the accurate credits and correct version of Table 1 (also refer to comment #8 below).

7. Please remove Section 1.5. We would only expect a discussion of as-built condition in the MY0 Baseline report.
The Section has been deleted. Note that previous Section 1.6 is now Section 1.5.

8. Replace/update Table 1 in Appendix A so the correct credits are displayed
As mentioned in the above response to comment #6 above, the correct table has been included in Appendix A of the final report.

9. The veg plot field sheets located after Table 7 do not need to be included in the report
The field sheets have been removed from Appendix B.

Table of Contents

1 Project Summary

1.1 Project Location and Description

The Strawberry Hill Project is within the Neuse River Basin within the 8-digit HUC 03020201, 14-digit HUC 03020201140010 and DWR Sub-basin Number 03-04-02.

The Strawberry Hill Project is located in Johnston County in Smithfield, NC at the crossroads of Yelverton Grove Road and Brogden Road (**Figure 1**). To access the Project from Raleigh, take I-40 East to US-70 East. Then take US-70 BUS West until taking a right onto South 3rd Street in downtown Smithfield. Then take a left onto Brogden Road. Follow Brogden Road for 2.9 miles and the downstream extent of reach JH1-B will be on your left. The coordinates are 35.469579 °N and -78.323896 °W.

Environmental Banc & Exchange – Neuse I, LLC (EBX-Neuse I), a wholly-owned subsidiary of Resource Environmental Solutions (RES), is pleased to provide this Year 1 Monitoring Report as a component of the Strawberry Hill Mitigation Project (Project), a full-delivery stream and buffer mitigation project for the Division of Mitigation Services (DMS) (DMS #100094). This buffer component of the Project is designed to provide riparian buffer mitigation credits for unavoidable impacts due to development within the Neuse River Basin, United States Geological Survey (USGS) 8-digit Cataloguing Unit 03020201 (Neuse 01) (**Figure 1**). This Buffer Project provides mitigation in accordance with the Consolidated Buffer Mitigation Rule 15A NCAC 02B .0295 and Nutrient Offset Credit Trading Rule 15A NCAC 02B .0703. The Strawberry Hill Project also entails a stream mitigation component, generating stream mitigation credits through stream restoration. Conditions pertaining to the stream mitigation component of this Project will be provided in a separate baseline monitoring report.

The conservation easement of the Strawberry Hill Project totals 22.12 acres and includes two unnamed tributaries and three ditches that drain into Polecat Branch and eventually the Neuse River. Previous land use within the Project was primarily crop production and disturbed riparian forest. The Project area was used extensively for agricultural and forestry purposes for over 80 years. Land use adjacent to and surrounding the Project is either crop production or forest regeneration. Water quality stressors affecting the Project include pollution from crop production and lack of forested riparian buffer. Previous buffer conditions demonstrated significant degradation with the loss of stabilizing vegetation because of continued crop production and recent clear cut of adjacent riparian forest.

The goal of the buffer component of the Project is to restore and preserve ecological function to the existing streams and their associated riparian buffer areas by establishing appropriate plant communities while minimizing temporal and land disturbing impacts. Buffer and surrounding riparian area improvements will filter runoff from agricultural fields, thereby reducing nutrient and sediment loads to Project channels and provide water quality benefit to the overall watershed. Project attributes are summarized in **Table 1**.

1.2 Monitoring Protocol and Project Success Criteria

Annual vegetation monitoring and visual assessments are being conducted. Riparian vegetation monitoring is based on the "Carolina Vegetation Survey-Ecosystem Enhancement Program Protocol for Recording Vegetation: Level 2 Plot Sampling Only Version 4.2". Monitoring plots were installed a minimum of 100 meters squared in size and cover at least two percent of the planted mitigation area. These plots were randomly placed throughout the planted riparian buffer mitigation area (15.13 acres) and are representative of the riparian restoration conditions. The following data is recorded for all trees in the plots: species, height, planting date (or volunteer), and grid location. All stems in plots are flagged with flagging tape. Data is processed using the CVS data entry tool. In the field, the four corners of each plot were permanently marked with PVC at the origin and metal conduit at the other corners. Photos of each plot are to be taken from the origin each monitoring year. There are 13 fixed vegetation monitoring plots (**Figure 2**).

Photos are being taken at all vegetation plot origins each monitoring year and be provided in the annual reports. Visual inspections and photos are taken to ensure that areas are being maintained and compliant. The measures of vegetative success for the Project are the survival of at least four native hardwood tree species, where no one species is greater than 50 percent of stems, at a density of at least 260 stems per acre at the end of Year 5. Native volunteer species may be included to meet the performance standards as determined by NC Division of Water Resources (DWR).

A visual assessment of the conservation easement is also performed each year to confirm:

- Easement boundary markers/signage are in good condition throughout the site;
- No encroachment has occurred;
- No invasive species in areas were invasive species were treated,
- Diffuse flow is being maintained in the conservation easement areas; and
- There has not been any cutting, clearing, filling, grading, or similar activities that would negatively affect the functioning of the buffer.

Component/ Feature	Monitoring	Maintenance through project close-out
Vegetation	Annual vegetation monitoring	Vegetation shall be maintained to ensure the health and vigor of the targeted plant community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be treated by mechanical and/or chemical methods. Any vegetation requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations. Vegetation maintenance activities will be documented and reported in annual monitoring reports. Vegetation maintenance will continue through the monitoring period.
Invasive and Nuisance Vegetation	Visual Assessment	Invasive and noxious species will be monitored and treated so that none become dominant or alter the desired community structure of the Project. Locations of invasive and nuisance vegetation will be mapped.
Project Boundary	Visual Assessment	Project boundaries shall be identified in the field to ensure clear distinction between the mitigation project and adjacent properties. Boundaries are marked with signs identifying the property as a mitigation project and will include the name of the long-term steward and a contact number. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by Project conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as-needed basis. Easement monitoring and staking/ signage maintenance will continue in perpetuity as a stewardship activity.
Road Crossing	Visual Assessment	Road crossings within the Project may be maintained only as allowed by conservation easement or existing easement, deed restrictions, rights of way, or corridor agreements. Crossings in easement breaks are the responsibility of the landowner to maintain.

1.3 Project Components

This Project generates 642,070.977 riparian buffer restoration credits on pre-existing non-forested land, and 8,091.309 buffer preservation credits. The total area of riparian preservation is less than 25 percent of the total area of riparian buffer mitigation in accordance with 15A NCAC 02B .0295 (o)(5). The total riparian buffer mitigation credits that the Strawberry Hill Mitigation Project generate are summarized below, but the detailed Project credit breakdown, including buffer credits that are convertible to nutrient offset credit, utilizing the DWR "Project Credit Table Template (Updated February 2022)," is provided in **Table 1; Appendix A**.

Mitigation Totals	Area Square Feet	Credits
Restoration	652,991	642,070.977
Preservation	81,431	8,091.309
Total Riparian Buffer	**734,422**	**650,162.286**

1.4 Riparian Mitigation Approach

The buffer mitigation is in accordance with the Consolidated Buffer Mitigation Rule 15A NCAC 02B .0295 and Nutrient Offset Credit Trading Rule 15A NCAC 02B .0703. In addition to traditional riparian restoration, the Project also incorporates the alternative buffer mitigation options: Preservation of Buffers on Subject Streams, as outlined in 15A NCAC 02B .0295 (o) (5), and Restoration and Enhancement of Ditches, as outlined in 15A NCAC 02B .0295 (o) (8).

Riparian restoration along the Project streams and ditches is accomplished through the planting, establishment, and protection of a hardwood forest community. Restoration activities included planting a composition of native bare-root tree species along streams and ditches based on reference data. The result will be a riparian area that functions to mitigate nutrient and sediment inputs from the surrounding uplands.

Preservation occurs in some areas along Reach JH1-A and JH1-B. Some of these preservation areas were associated with stream restoration under the stream mitigation component of the Project; therefore, some of the areas were cleared during construction of the new stream corridor. However, these impacted areas were planted under the same criteria as restoration areas.

1.5 Monitoring Performance (MY1)

Year 1 monitoring of 13 fixed vegetation plots was completed on November 16th, 2022. Vegetation tables are in **Appendix B** and associated photos are in **Appendix C**. MY1 monitoring data indicates that all plots are exceeding the success criteria of 260 planted stems per acre. Planted stem densities ranged from 324 to 809 planted stems per acre with a mean of 563 planted stems per acre across all plots. A total of 12 species were documented within the plots. One volunteer species (*Sambucus canadensis*, or common elderberry) was noted in one of the vegetation plots, while more volunteers are expected to establish in upcoming years. The average tree height observed was 1.5 feet.

Visual assessment of vegetation outside of the monitoring plots indicates that the herbaceous vegetation is becoming well established throughout the project and no invasive species were observed. Easement boundary markers and signs are clearly visible and in good condition. However, there was some encroachment observed. RES identified some encroachment associated with ditches JH2 and JH3 along Stevens Sausage Road. One encroachment involves a path being actively driven parallel to ditch JH2 and is impeding vegetation growth. RES will be installing additional t-post markers along with horse tape to provide a physical barrier to prevent future encroachment here and will also be replanting the driving path footprint with containerized trees to ensure adequate tree density and vigor. The other encroachment involves two easement corners, on JH2 and JH3, that are being driven through by farm equipment as the farmer is attempting to access the adjacent cropland. RES is actively resolving the issue with the landowner and farmer and will also be coordinating the relocation of a roadside ditch crossing that will enable the farm equipment to access the fields at another location, away from the easement. All activities and resulting outcomes will be communicated in the next (MY2) monitoring report. Locations of encroachment areas are depicted in **Appendix A, Figure 2** and some photos of encroachment and other general site photos are in **Appendix C**. Additionally, there is no undocumented concentrated flow in the easement area.

2 Reference

Lee Michael T., Peet Robert K., Roberts Steven D., and Wentworth Thomas R., 2008. *CVS-EEP Protocol for Recording Vegetation Level*. Version 4.2

NC Environmental Management Commission. 2014. Rule 15A NCAC 02B.0295 - Mitigation Program Requirements for the Protection and Maintenance of Riparian Buffers.

NC Environmental Management Commission. 2020. Rule 15A NCAC 02B.0714 – Neuse River Basin: Nutrient Sensitive Waters Management Strategy: Protection and Maintenance of Existing Riparian Buffers.

Resource Environmental Solutions, LLC (2020). Strawberry Hill Mitigation Project – Final Mitigation Plan – Appendix A – Final Buffer Mitigation Plan.

Schafale, M.P. 2012. Classification of the Natural Communities of North Carolina, Fourth Approximation. North Carolina Natural Heritage Program, Division of Parks and Recreation, NCDENR, Raleigh, NC.

Appendix A

Project Background Tables and Site Maps

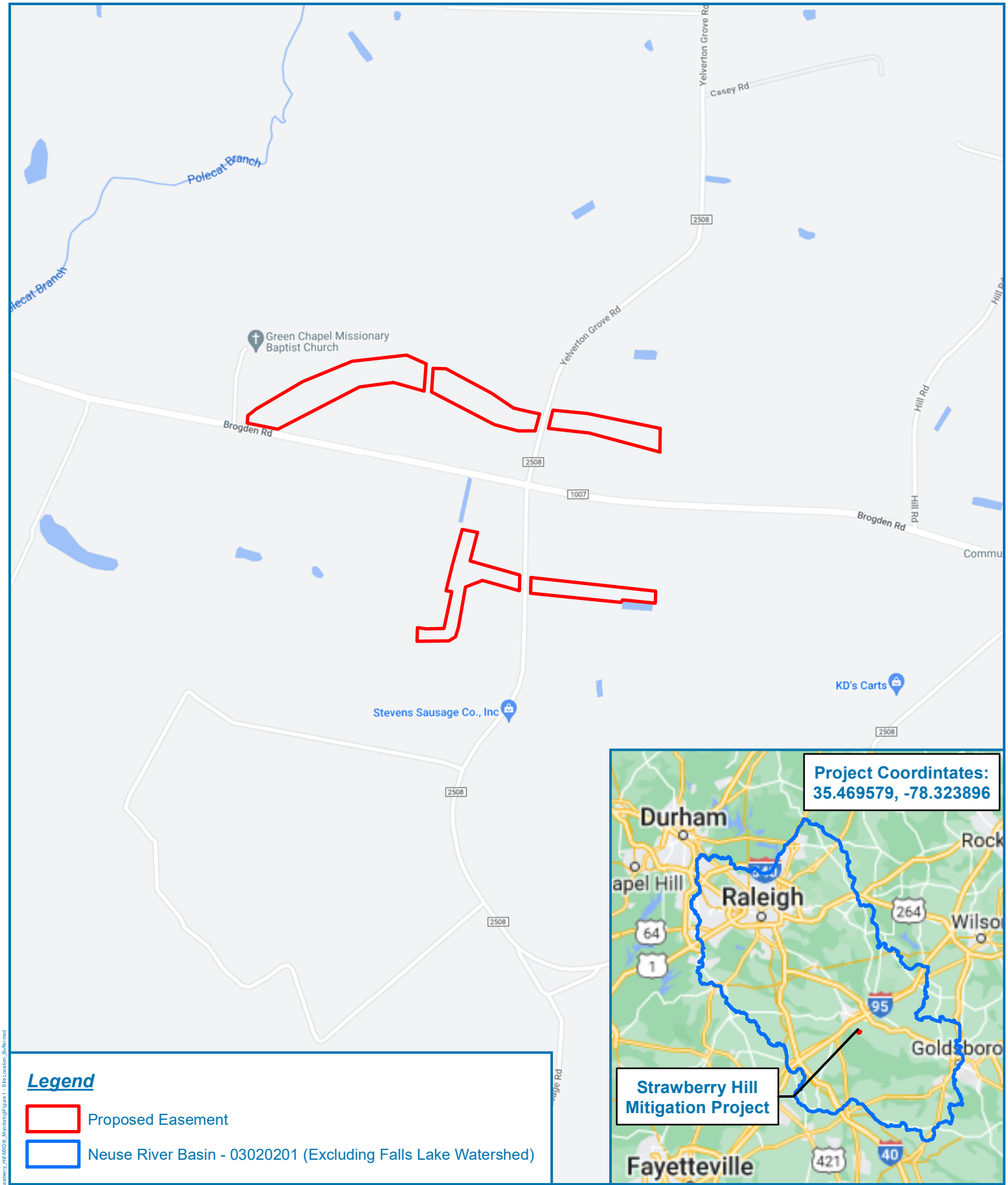

Figure 1 - Site Location

Strawberry Hill Mitigation Project

Johnston County, North Carolina

Date:	3/24/2022
Drawn by:	MDD
Checked by:	JRM
	1 inch = 1,000 feet

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Document Path: R:\Resilience\projects\101038_Strawberry_Hill\MXD\6_Monitoring\Figure 1 - Site Location_Buffer.mxd

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Figure 2 - CCPV MY1

Strawberry Hill Mitigation Project

Johnston County, North Carolina

Date: 1/17/2023	Drawn by: MDD
1 in = 300 feet	Checked by: JRM

Legend

- Recorded Easement (22.12 ac)

Vegetation Plot

- >320 stems/acre

Riparian Buffer Mitigation Approach

- Riparian Restoration, 0-100'
- Riparian Restoration, 101-200'
- Riparian Restoration (Ditch), 0-50'
- Riparian Preservation, 0-100'
- Riparian Preservation, 101-200'
- Non-diffuse Flow Deduction Area
- Area Not Viable for Credit
- Surveyed Top of Bank

Vegetation Condition Assessment

Invasive Species	Target Community: Present	Target Community: Marginal	Target Community: Absent
Absent	No Fill		
Present			

Area 20-29 ft.

Encroachment- Driving path

Encroachment- Tractor through corners

Brogden Rd

Yelverton Grove Rd

Sausage Rd

Esri, HERE, Garmin, (c) OpenStreetMap contributors

Table 1. Strawberry Hill, DMS# 100094, Project Credits

Neuse 03020201 - Outside Falls Lake	**Project Area**
19.16394	**N Credit Conversion Ratio (ft^2/pound)**
N/A	**P Credit Conversion Ratio (ft^2/pound)**

Credit Type	Location	Subject? (enter NO if ephemeral or ditch [1])	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (ft^2)	Total (Creditable) Area of Buffer Mitigation (ft^2)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Convertible to Riparian Buffer?	Riparian Buffer Credits	Convertible to Nutrient Offset?	Delivered Nutrient Offset: N (lbs)	Delivered Nutrient Offset: P (lbs)
Buffer	Rural	Yes	I / P	Restoration	0-100	Cropland (JH1, JH5)	370,703	370,703	1	100%	1.00000	Yes	370,703.000	Yes	19,343.778	—
Buffer	Rural	Yes	I / P	Restoration	0-100	Timberland (JH1)	122,409	122,409	1	100%	1.00000	Yes	122,409.000	No	—	—
Buffer	Rural	Yes	I / P	Restoration	101-200	Cropland (JH1, JH5)	9,149	9,149	1	33%	3.03030	Yes	3,019.173	Yes	477.407	—
Buffer	Rural	Yes	I / P	Restoration	101-200	Timberland (JH1)	6,810	6,810	1	33%	3.03030	Yes	2,247.302	No	—	—
Buffer	Rural	No	Ditch	Restoration	0-50	JH2, JH3, JH4	136,211	136,211	1	100%	1.00000	Yes	136,211.000	Yes	7,107.672	—
Buffer	Rural	No	Ditch	Restoration	0-50	Segment Less than 50' (JH2)	6,799	6,799	1	100%	1.00000	Yes	6,799.000	No	—	—
Buffer	Rural	No	Ditch	Restoration	0-100	Non-diffused Flow Deductions (JH1, JH2, JH4)	16,303	0	1	100%		No	—	No	—	—
Buffer	Rural	Yes	I / P	Restoration	20-29	Segment Less than 30' (JH1)	910	910	1	75%	1.33333	Yes	682.502	No	—	—
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						Totals (ft2):	**669,294**	**652,991**					**642,070.977**		**26,928.857**	**0.000**
						Total Buffer (ft2):	**669,294**	**652,991**								
						Total Nutrient Offset (ft2):	**0**	**N/A**								

Total Ephemeral Area (ft^2) for Credit:	**0**	**0**	
Total Eligible Ephemeral Area (ft^2):	**187,681**	**0.0%**	**Ephemeral Reaches as % TABM**
Total Eligible for Preservation (ft^2):	**223,098**	**9.1%**	**Preservation as % TABM**

Enter Preservation Credits Below

Credit Type	Location	Subject?	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Total (Creditable) Area for Buffer Mitigation (ft^2)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits
	Rural	Yes	I / P		0-100	JH1, JH5	80,658	80,658	10	100%	10.00000	8,065.800
	Rural	Yes	I / P		101-200	JH1, JH5	773	773	10	33%	30.30303	25.509
												—
												—
												—
						Preservation Area Subtotals (ft^2):	**81,431**	**81,431**				

TOTAL AREA OF BUFFER MITIGATION (TABM)		
Mitigation Totals	**Square Feet**	**Credits**
Restoration:	652,991	642,070.977
Enhancement:	0	0.000
Preservation:	81,431	8,091.309
Total Riparian Buffer:	734,422	650,162.286
TOTAL NUTRIENT OFFSET MITIGATION		
Mitigation Totals	**Square Feet**	**Credits**
Nutrient Offset: Nitrogen:	0	0.000
Nutrient Offset: Phosphorus:		0.000

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Credit conversions must be calculated using the guidance provided in the Clarified Procedures for Calculating Buffer Mitigation Credits and Nutrient Offset Credits letter issued by the DWR in November 2019.

1. The Randleman Lake buffer rules allow some ditches to be classified as subject according to 15A NCAC 02B .0250 (5)(a).

last updated 08/03/2020

Table 2: Summary: Goals, Performance and Results

Goal	Objective/Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Restore and preserve native floodplain and streambank vegetation.	Established and increased forested riparian buffers to 50 feet and greater along both sides of the channel along the project reaches with a hardwood riparian plant community;	Reduction in floodplain sediment inputs from runoff, increased bank stability, increased LWD and organic material in streams, increased	Survival of at least four native hardwood tree species, where no one species is greater than 50 percent of stems, at a density of at least 260 stems per acre at the end of Year 5.	13 fixed vegetation plots	13/13 passed - MY1

Table 3. Project Attributes			
Project Name		Strawberry Hill Mitigation Project	
County		Johnston	
Project Area (acres)		22.12	
Project Coordinates (latitude and longitude)		35.469579, -78.323896	
Planted Acreage (Acres of Woody Stems Planted)		19.73	
Project Watershed Summary Information			
Physiographic Province		65m - Rolling Coastal Plain	
River Basin		Neuse	
USGS Hydrologic Unit 8-digit	03020201	USGS Hydrologic Unit 14-digit	03020201140010
DWR Sub-basin		03-04-02	
Project Drainage Area (Acres and Square Miles)		383 ac (0.60 mi^2)	
Project Drainage Area Percentage of Impervious Area		2%	
CGIA Land Use Classification		Bottomland Forest, Cultivated, Evergreen Shrubland, Southern Yellow Pine, Unconsolidated Sediment	

Table 4. Project Timeline and Contacts

Activity or Deliverable	Data Collection Complete	Task Completion or Deliverable Submission
Project Instituted	NA	Dec-20
Mitigation Plan Approved	NA	Nov-20
Construction (Grading) Completed	NA	20-Jan-22
Planting Completed	NA	07-Mar-22
As-built Survey Completed	NA	May-22
MY-0 Baseline Report	Mar-22	May-22
Encroachment	Areas noted in Nov-22. Hunting driving path continued use and farm equipment cutting corners.RES is actively resolving.	
MY1+ Monitoring Reports	Nov-22	Jan-23
Remediation Items (e.g. beaver removal, supplements, repairs etc.)		

Strawberry Hill #100094	
Provider	RES / 3600 Glenwood Ave., Suite 100, Raleigh, NC 27612
Mitigation Provider POC	Jamey Mceachran (919) 623-9889
Designer	RES / 3600 Glenwood Ave., Suite 100, Raleigh, NC 27612
Primary project design POC	Ben Carroll, PE (336) 514-0927
Construction Contractor	RES / 3600 Glenwood Ave., Suite 100, Raleigh, NC 27612
Construction contractor POC	Jacy Kirkpatrick

Appendix B

Vegetation Assessment Data

Table 5. Strawberry Hill Riparian Buffer Planted Species Summary

Common Name	Species	% Zone 1	% Zone 2	Total Planted Amount
River birch	*Betula nigra*	10	10	1,600
Buttonbush	*Cephalanthus occidentalis*	5	5	800
Yellow poplar	*Liriodendron tulipifera*	10	10	1,600
Wax Myrtle	*Morella cerifera*	5	10	1,000
Swamp tupelo	*Nyssa biflora*	5	5	800
American sycamore	*Platanus occidentalis*	10	10	1,600
Laurel oak	*Quercus laurifolia*	5	10	1,000
Overcup oak	*Quercus lyrata*	10	10	1,600
Swamp chestnut oak	*Quercus michauxii*	10	10	1,600
Water oak	*Quercus nigra*	10	10	1,600
Willow oak	*Quercus phellos*	10	10	1,600
Bald cypress	*Taxodium distichum*	10	0	1,000
			TOTAL	15,800

Table 6. Strawberry Hill Riparian Buffer Vegetation Plot Mitigation Success Summary

Plot #	Planted Stems/Acre	Volunteer Stems/Acre	Total Stems/Acre	Success Criteria Met?	Average Planted Stem Height
1	607	0	607	Yes	1.3
2	567	81	647	Yes	1.7
3	607	0	607	Yes	1.4
4	647	0	647	Yes	1.5
5	809	0	809	Yes	1.3
6	567	0	567	Yes	1.4
7	526	0	526	Yes	1.3
8	445	0	445	Yes	1.2
9	728	0	728	Yes	1.6
10	647	0	647	Yes	1.6
11	324	0	324	Yes	1.5
12	486	0	486	Yes	1.6
13	364	0	364	Yes	2.0
Project Avg	**563**	**6**	**570**	**Yes**	**1.5**

Table 7. Strawberry Hill Riparian Buffer Stem Count Total and Planted by Plot Species

Strawberry Hill			Current Plot Data (MY1 2022)																														
			101038-01-0001			101038-01-0002			101038-01-0003			101038-01-0004			101038-01-0005			101038-01-0006			101038-01-0007			101038-01-0008			101038-01-0009			101038-01-0010			101038-01-0011		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	river birch	Tree	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	2	2	2							1	1	1						
Cephalanthus occidentalis	common buttonbush	Shrub				1	1	1	1	1	1																3	3	3	1	1	1			
Liriodendron tulipifera	tuliptree	Tree				1	1	1	1	1	1	1	1	1				1	1	1				2	2	2	3	3	3	4	4	4	2	2	2
Morella cerifera	wax myrtle	shrub	2	2	2										2	2	2	2	2	2	3	3	3												
Nyssa biflora	swamp tupelo	Tree							1	1	1																			2	2	2			
Platanus occidentalis	American sycamore	Tree							2	2	2				3	3	3				2	2	2	1	1	1				2	2	2			
Quercus laurifolia	laurel oak	Tree	2	2	2				3	3	3	1	1	1							1	1	1				1	1	1	1	1	1	2	2	2
Quercus lyrata	overcup oak	Tree	3	3	3	2	2	2				2	2	2	1	1	1							2	2	2				3	3	3	2	2	2
Quercus michauxii	swamp chestnut oak	Tree				2	2	2	2	2	2	1	1	1				6	6	6							2	2	2	1	1	1			
Quercus nigra	water oak	Tree	2	2	2							1	1	1	8	8	8	2	2	2	3	3	3	4	4	4	8	8	8				1	1	1
Quercus phellos	willow oak	Tree	2	2	2	1	1	1	3	3	3	4	4	4	3	3	3				1	1	1	2	2	2				2	2	2	1	1	1
Sambucus	elderberry	Shrub						2																											
Taxodium distichum	bald cypress	Tree	2	2	2	5	5	5				4	4	4				1	1	1	3	3	3												
		Stem count	15	15	15	14	14	16	15	15	15	16	16	16	20	20	20	14	14	14	13	13	13	11	11	11	18	18	18	16	16	16	8	8	8
		size (ares)	1			1			1			1			1			1			1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
		Species count	7	7	7	7	7	8	8	8	8	8	8	8	6	6	6	6	6	6	6	6	6	5	5	5	6	6	6	8	8	8	5	5	5
		Stems per ACRE	607	607	607	567	567	647	607	607	607	647	647	647	809	809	809	567	567	567	526	526	526	445	445	445	728	728	728	647	647	647	324	324	324

Strawberry Hill			Current Plot Data (MY1 2022)						Annual Means					
			101038-01-0012			101038-01-0013			MY1 (2022)			MY0 (2022)		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	river birch	Tree	3	3	3				17	17	17	18	18	18
Cephalanthus occidentalis	common buttonbush	Shrub				2	2	2	8	8	8	9	9	9
Liriodendron tulipifera	tuliptree	Tree	1	1	1	1	1	1	17	17	17	33	33	33
Morella cerifera	wax myrtle	shrub				2	2	2	11	11	11	23	23	23
Nyssa biflora	swamp tupelo	Tree				2	2	2	5	5	5	15	15	15
Platanus occidentalis	American sycamore	Tree	1	1	1				11	11	11	18	18	18
Quercus laurifolia	laurel oak	Tree	2	2	2				13	13	13	24	24	24
Quercus lyrata	overcup oak	Tree	2	2	2				17	17	17	16	16	16
Quercus michauxii	swamp chestnut oak	Tree							14	14	14	12	12	12
Quercus nigra	water oak	Tree	1	1	1				30	30	30	20	20	20
Quercus phellos	willow oak	Tree	2	2	2	2	2	2	23	23	23	34	34	34
Sambucus	elderberry	Shrub									2			
Taxodium distichum	bald cypress	Tree							15	15	15	20	20	20
		Stem count	12	12	12	9	9	9	181	181	183	242	242	242
		size (ares)	1			1			13			13		
		size (ACRES)	0.02			0.02			0.32			0.32		
		Species count	7	7	7	5	5	5	12	12	13	12	12	12
		Stems per ACRE	486	486	486	364	364	364	563	563	570	753	753	753

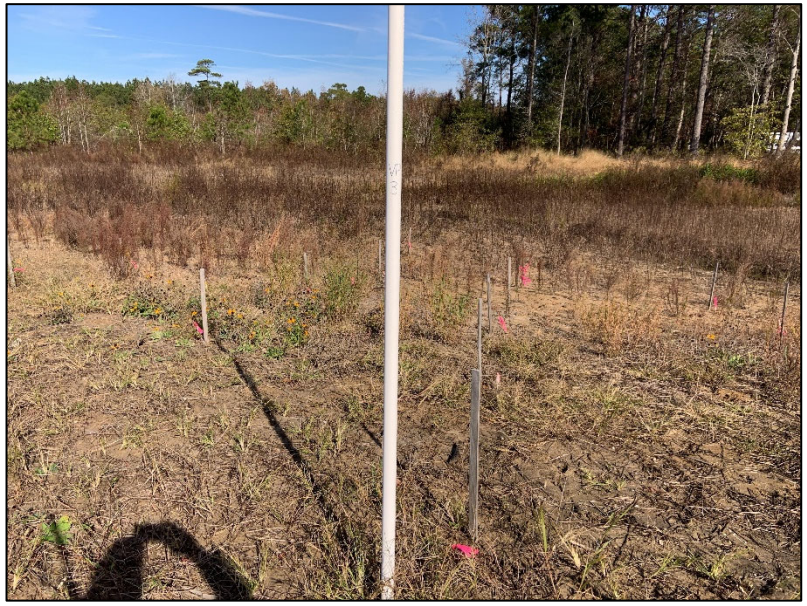
Appendix C

Photos

Strawberry Hill Riparian Buffer Vegetation Monitoring Plot Photos (MY1)

Vegetation Plot 1 (11/16/2022)

Vegetation Plot 2 (11/16/2022)



Vegetation Plot 3 (11/16/2022)

Vegetation Plot 4 (11/16/2022)

Vegetation Plot 5 (11/16/2022)

Vegetation Plot 6 (11/16/2022)

Vegetation Plot 7 (11/16/2022)

Vegetation Plot 8 (11/16/2022)

Vegetation Plot 9 (11/16/2022)

Vegetation Plot 10 (11/16/2022)

Vegetation Plot 11 (11/16/2022)

Vegetation Plot 12 (11/16/2022)

Vegetation Plot 13 (11/16/2022)

Strawberry Hill General Site Buffer Photos (MY1)

JH1-A looking upstream (11/16/2022)

Vegetation along JH1-A (11/16/2022)

JH1-B looking downstream (11/16/2022)

Vegetation along JH1-B (11/16/2022)

Easement boundary along JH1-B (11/16/2022)

JH1-B – Looking DS from road (11/16/2022)

Encroachment – From Stevens Sausage Rd. – Driving path parallel to JH2 and farm equipment path cutting through right corner (11/16/2022)

Encroachment – Driving path parallel to JH2 further “upstream” (11/16/2022)