Annual Monitoring Report

Monitoring Year 6 of 7

FINAL

Pee Dee Stream Restoration Project
NCDMS Contract No.: 004644
NCDMS Project No.: 95350
USACE Action ID: SAW-2012-01077
DWR #: 13-1140

Montgomery County, NC
Data Collected: November 2020
Date Submitted: January 2021

Submitted to:

North Carolina Division of Mitigation Services

NCDEQ-DMS, 1652 Mail Service Center Raleigh NC 27699-1652

Prepared by:

3600 Glenwood Avenue, Suite 100
Raleigh, North Carolina 27612

Mitigation Project Name	**Pee Dee Stream Restoration Site**	**USACE Action ID**	**2012-01077**
DMS ID	**95350**	**DWR Permit**	**2013-1140**
River Basin	**Yadkin**	**Date Project Instituted**	**8/1/2012**
Cataloging Unit	**03040104**	**Date Prepared**	**7/14/2020**
County	**Montgomery**	**Stream/Wet. Service Area**	**Yadkin 03040104**

Signature & Date of Official Approving Credit Release

1 - For NCDMS, no credits are released during the first milestone
2 - For NCDMS projects, the initial credit release milestone occurs automatically when the as-built report (baseline monitoring report) has been made available to the IRT by posting it to the DMS portal, provided the following have been met:
1) Approved of Final Mitigation Plan
2) Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property.
3) Completion of all physical and biological improvements to the mitigation site pursuant to the mitigation plan.
4) Receipt of necessary DA permit authorization or written DA approval for projects where DA permit issuance is not required.
3 - A 10% reserve of credits is to be held back until the bankfull event performance standard has been met.

Credit Release Milestone	**Warm Stream Credits**						
Project Credits	**Scheduled Releases %**	**Scheduled Release Amount**	**Proposed Released #**	**Not Approved # Releases**	**Approved Credits**	**Anticipated Release Year**	**Actual Release Date**
1 - Site Establishment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2 - Year 0 / As-Built	30.00%	1,951.200	1,951.200	0.000	1,951.200	2015	10/5/2015
3 - Year 1 Monitoring	10.00%	650.400	650.400	0.000	650.400	2016	4/25/2016
4 - Year 2 Monitoring	10.00%	610.827	610.827	158.293	452.534	2017	10/20/2017
5 - Year 3 Monitoring	10.00%	610.827	610.827	610.827	0.000	2018	8/27/2018
6 - Year 4 Monitoring	5.00%	305.413	916.240	916.240	0.000	2019	7/12/2019
7 - Year 5 Monitoring	10.00%	610.827	1,527.067	0.000	1,527.067	2020	6/2/2020
8 - Year 6 Monitoring	5.00%					2021	
9 - Year 7 Monitoring	10.00%					2022	
Stream Bankfull Standard	10.00%	610.827	610.827	0.000	610.827	2017	10/20/2017
			Totals		3,664.961		

Total Gross Credits	6,108.267
Total Unrealized Credits to Date	0.000
Total Released Credits to Date	5,342.028
Total Percentage Released	87.46%
Remaining Unreleased Credits	766.239

Notes

10/20/2017: Adjustment required due to IRT concerns on how the as-built credits were calculcated.
8/27/5018: Due to IRT concerns, no credits were released this year.
6/13/2019: USACE approved modification of the mitigation plan and adaptive management plan for the site.
7/12/2019: Due to IRT concerns no credits were released this year.
2/25/2020: DMS proposing the release of all withheld stream credits from 2018 and 2019 as well as stream credits scheduled for release.

Contingencies (if any)

Project Quantities

Mitigation Type	**Restoration Type**	**Physical Quantity**
Warm Stream	Restoration	5,691.600
Warm Stream	Enhancement I	625.000

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Cataloging Unit	**03040104**	**Date Prepared**	**7/14/2020**
County	**Montgomery**	**Stream/Wet. Service Area**	**Yadkin 03040104**

Debits

							Stream Restoration Credits
Beginning Balance (mitigation credits)							**6,108.267**
Released Credits							**5,342.028**
Unrealized Credits							**0.000**
Owning Program	**Req. Id**	**TIP #**	**Project Name**	**USACE Permit #**	**DWR Permit #**	**DCM Permit #**	
NCDOT Stream & Wetland ILF Program	REQ-006626		SR 1320 - Bridge 228 - Division 8	2016-02283			82.000
NCDOT Stream & Wetland ILF Program	REQ-007228	R-2536	US 64 - Asheboro Bypass	2002-01260	2016-0299		2,535.980
Total Credits Debited							**2,617.980**
Remaining Available balance (Released credits)							**2,724.048**
Remaining balance (Unreleased credits)							**766.239**

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January 13, 2021

Harry Tsomides
NC DEQ Division of Mitigation Services
5 Ravenscroft Drive, Suite 102
Asheville, NC 28801

RE: Pee Dee Stream Restoration Site: MY6 Monitoring Report (NCDMS ID 95350)

Listed below are comments provided by DMS on December 18, 2020 regarding the Pee Dee Stream Restoration Site: Year 6 Monitoring Report and RES' responses.

Asset Table – Assets cannot change on a project until a mitigation plan addendum is reviewed and approved by the IRT. Please revert credits to prior (MY5) version. If a mitigation plan addendum is planned, please describe briefly.
Credits have been reverted to the prior version. No mitigation plan addendum is planned at this time.

Please use text callouts to show the days of consecutive flow sections on the three continuous flow graphs
Done.

Please list the USACE Action ID and DWR number on the report cover (as was done for the MY5 report)
Done.

Please arrange the Appendix F various communications in reverse chronological order, starting with the 6/2/2020 DMS-DWR-RES site visit memo.
Digital support file comments
Done.

Please spatially depict the aggradation that was documented in the stream visual assessment table in the CCPV and submit these spatial features.
The aggradation is symbolized on the CCPV as the "No Credit" reach of Thompson 1.

Please submit monitoring photos as JPEGS.
Done.

The as-built shapefile submitted in MY5 is not continuous. For example in the Pee_Dee_Streams_CLIP shapefile, the two Thompson 1 segments do not connect. The same can be seen at Dale 1 and Dale 2. Please ensure that all features are continuous and segmented where appropriate, update the CCPV, and resubmit these features.
These features have been repaired and resubmitted with the support files.

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1.0 PROJECT SUMMARY

1.1. Goals and Objectives

The project goals address stressors identified in the TLW and include the following:

- Improve water quality within the restored channel reaches and downstream watercourses by reducing sediment and nutrient inputs and increasing dissolved oxygen levels
- Improve local aquatic and terrestrial ecological function via stream shading, habitat complexities, and organic/woody material introduction
- Improve aquatic and benthic macroinvertebrate habitat and associated stream bed form
- Improve site hydrology and attenuate flood flows on-site and downstream
- Provide approximately 18.6 acres of riparian area restoration with a native plant community
- Protect stream and riparian improvements with livestock best management practices
- Protect the site in perpetuity with a permanent conservation easement

The project goals will be addressed through the following project objectives:

- Implement Priority I or II restoration of 5,992 feet of stream and enhancement of 625 feet of stream
- Implement appropriate changes in dimension, pattern and/or profile to create geomorphologically stable conditions along project area reaches
- Modify degraded stream channels to enable proper sediment transport capacity and improved stream bed character
- Construct a floodplain bench that is accessible at the proposed bankfull channel elevation.
- Remove a major impoundment
- Integrate in-stream structures and native bank vegetation
- Plant native woody and herbaceous riparian vegetation with a minimum width of 50 feet from the edge of the restored channels
- Eradicate invasive, exotic or undesirable plant species
- Install cattle exclusion fencing, two new wells, two new cattle drinking stations, and upgrade eight existing cattle drinking stations

1.2. Success Criteria

The success criteria for the Pee Dee Stream Restoration Site follows accepted and approved success criteria presented in the USACE Stream Mitigation Guidelines and subsequent NCDMS and agency guidance. Specific success criteria components are presented below.

1.2.1. Stream Restoration

Dimension – Cross-section measurements should indicate little change from the as-built cross-sections. If changes do occur, they will be evaluated to determine whether the adjustments are associated with increased stability or whether they indicate movement towards an unstable condition.

Pattern and Profile − Measurements and calculated values should indicate stability with little deviation from as-built conditions and established morphological ranges for the restored stream type. Pool depths may vary from year to year, but the majority should maintain depths sufficient to be observed as distinct features in the profile. The pools should maintain their depth with flatter water surface slopes, while the riffles should remain shallower and steeper. Pattern measurements will not be collected unless conditions seem to indicate that a detectable change appears to have occurred based on profile and/or dimension measurements.

Substrate − Calculated D_{50} and D_{84} values should indicate coarser size class distributions of bed materials in riffles and finer size class distributions in pools. The majority of riffle pebble counts should indicate maintenance or coarsening of substrate distributions. Generally, it is anticipated that the bed material will coarsen over time.

Sediment Transport – Depositional features should be consistent with a stable stream that is effectively managing its sediment load. Point bar and inner berm features, if present, should develop without excessive encroachment of the channel. Isolated development of robust (i.e. comprised of coarse material and/or vegetation actively diverting flow) mid-channel or lateral bars will be acceptable. Likewise, development of a higher number of mid-channel or lateral bars that are minor in terms of their permanency such that profile measurements do not indicate systemic aggradation will be acceptable, but trends in the development of robust mid-channel or alternating bar features will be considered a destabilizing condition and may require intervention or have success implications.

1.2.2. Surface Water Hydrology

Monitoring of stream surface water stages should indicate recurrence of bankfull flows on average every 1 to 2 years. At a minimum, throughout the monitoring period, the surface water stage should achieve bankfull or greater elevations at least twice. The bankfull events must occur during separate monitoring years.

1.2.3. Vegetation

Riparian vegetation monitoring shall be conducted for a minimum of seven years to ensure that success criteria are met per USACE guidelines. Accordingly, success criteria will consist of a minimum survival of 320 stems per acre by the end of the Year 3 monitoring period, a minimum of 260 stems per acre at the end of Year 5, and a minimum of 210 stems per acre in Year 7. If monitoring indicates either that the specified survival rate is not being met or the development of detrimental conditions (i.e., invasive species, diseased vegetation), appropriate corrective actions will be developed and implemented.

1.3. Project Setting and Background

The Pee Dee Stream Restoration Site (Site) encompasses approximately 21.0 acres of predominately agricultural land and includes three tributaries to Clarks Creek − Thompson Creek, Dale Branch, and Jerry Branch. The Site is located in the Yadkin River Watershed (NCDWR sub-basin 03-07-10 and HUC 03040104020020) approximately 1 mile south of the town of Pee Dee, NC in Montgomery County (**Figure 1**). Clarks Creek is listed as Class C water (NCDWR) and flows into the Pee Dee River. The Site is located within a NCDMS targeted local watershed.

Following 2016 monitoring the NCIRT requested a review of the differential between the Approved Mitigation Plan and Baseline Monitoring Report. The table below details the discrepancies by reach. The primary cause of increased baseline SMUs is survey methodology (thalweg vs. centerline). The Mitigation Plan lengths were based on centerline. Other causes of increased SMUs include field adjustments during construction and the design assumption of the channel pattern after pond removal. Additionally, credits for the pond removal on Thompson 1 were forfeited and the IRT recommended credits on Dale 1 be changed to valley length. This is discussed further in Section 1.4.4.

Reach	Mitigation Type	Proposed Length (LF)*	Mitigation Ratio	Proposed SMUs	Baseline SMUs
Thompson Creek 1	Enhancement I	401	1.5:1	166.7	162
Thompson Creek 1-2	P1 Restoration	504	1:1	1,314	1349
Dale Branch 1	Enhancement I	1,369	1.5:1	250	250
Dale Branch 2-5	P1 Restoration	3,440	1:1	2,955	2,993
Jerry Branch	P1 Restoration	1,852	1:1	1,670	1,691
Hudson Branch	P1 Restoration	707	1:1	52.6	59
	Total	**8,273**		**6,408.3**	**6,504.0**

*The contracted amount of credits for this Site is 6,138 SMUs

1.4. Project Performance

Monitoring Year 6 (MY6) data was collected from January 2020 to November 2020. Year 6 Monitoring activities included visual assessment of all reaches and the surrounding easement and 16 permanent photo stations. Per the approved Mitigation Plan, cross section and vegetation monitoring was not collected in MY6, however, MY5 data is presented below and in the appendices for reference.

Summary information/data related to the occurrence of items such as beaver or easement encroachment and statistics related to performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the Baseline Monitoring Report (formerly Mitigation Plan) and in the Mitigation Plan (formerly Restoration Plan) documents available on the NCDMS website (http://portal.ncdenr.org/web/eep). All raw data supporting the tables and figures in the appendices is available from NCDMS upon request.

1.4.1. Vegetation

Monitoring of permanent vegetation plots was not performed in MY6 per the approved Mitigation Plan. Due to a few areas of low stem densities in MY5, RES planted container trees in the affected areas in March 2020. Three random vegetation monitoring plots were completed in the supplemental planting areas in November 2020. Stem densities ranged from 364 to 688 stems per acre with a mean of 526 stems per acre across all plots. A total of nine woody plant species were documented within the random monitoring plots. The average stem height was 9.9 feet. MY5 vegetation data is also included for reference.

Visual assessment of the easement (**Appendix B - Table 6, Figure 2**) indicates that herbaceous vegetation is well established throughout the project. Invasive exotic vegetation has been identified throughout the Site as Chinese privet (*Lingustrum sinense*). Invasive species treatments were administered in December 2019 and multiple times in 2020. MY6 treatments included cutting and stump spraying stems and subsequently removing cut stems from the stream channel. The overall treatment of Chinese privet was very effective. After additional treatment of resprouts in November 2020, RES no longer is reporting any

invasive species areas on site. Invasive species treatments will continue as needed throughout the monitoring period.

1.4.2. Stream Geomorphology

Geomorphic data collection was not performed in MY6 per the approved Mitigation Plan. Geomorphic data from MY5 is included for reference. The data below is from MY5 collected during the annual monitoring survey performed during July 2019. Summary tables and cross-section plots related to stream morphology are located in **Appendix D**. MY5 stream morphology data indicate that, in general, the stream is stable and lacking in any significant change.

Substrate monitoring was performed during MY5. Riffle D_{50} ranged from medium gravel to coarse gravel on Jerry Branch, coarse gravel on Dale Branch, and coarse gravel on Thompson Branch. Substrate will be monitored in future years for shifts in particle size composition. Substrate composition data is presented in **Appendix D.**

Visual assessment of the stream was performed to document signs of channel instability, such as eroding banks, structural instability, or excessive sedimentation. There was no indication of instability was observed during the visual assessment (**Table 5 and Figure 2**). Structures are intact and performing as designed.

1.4.3. Stream Hydrology

In January 2019, RES installed flow monitoring gauges on Dale 1, Dale 2, and Thompson 1 per the request of the IRT. Each gauge is located in a pool and the elevation of the nearest downstream riffle is used to detect flow events. In MY6, Dale 1 recorded 106 consecutive days of flow, Dale 2 recorded 75 consecutive days of flow, and Thompson 1 recorded 81 consecutive days of flow. Due to manual gauge failure, RES also recorded bankfull events at the flow gauges. In MY6, Dale 1 documented seven bankfull events, Dale 2 documented two bankfull events, and Thompson 1 documented 14 bankfull events. Bankfull and flow data is located in **Appendix E**.

1.4.4. Adaptive Management

During a site visit with NCIRT and NCDMS at the Pee Dee Site in July 2018, several problem areas were identified regarding the drained pond on Thompson 1 and the drained pond/wetland on Dale 1. RES submitted an Adaptive Management Plan to NCIRT in March 2019. The plan outlines the installation of the aforementioned flow monitoring gauges and the excavation of a baseflow channel through the old pond/wetland on Dale 1. The plan also discusses the decision to forgo the credits for the portion of Thompson 1 that is located in the old pond bottom. RES excavated the baseflow channel on Dale 1 in early January 2020. Additionally, Chinese privet treatment was administered on Thompson 1, Thompson 2, Dale 1, and Dale 2. On June 2, 2020, NCIRT, NCDMS, and RES met at the Pee Dee Site. The purpose of the visit was to see the invasive species treatment areas, channel hand work, and supplemental plantings that were completed in the winter and spring of 2020. Details of this site visit along with the Adaptive Management Work Completed Memo are located in **Appendix F**. Overall, NCIRT was impressed with the invasive species treatment and RES agreed to continue treating invasives throughout the remainder of the monitoring period. NCIRT recommended using valley length for Dale 1 due to the braided nature of the channel through the old pond bottom. And flow, bed and bank, and riffle/pool sequences were observed above the pond area on Thompson 1. Additionally, random vegetation plots were performed in the supplemental planting areas, all of which documented greater than 210 stems per acre.

2.0 METHODS

Visual assessments of the project were performed at the beginning and end of the monitoring year. Permanent photo station photos were collected during vegetation monitoring. Additional vegetation or stream problem areas within the project area were photo-documented. Geomorphic measurements were taken using a Topcon GTS-312 Total Station. Three-dimensional coordinates associated with cross-section and profile data were collected in the field and geo-referenced (NAD83 State Plane feet FIPS 3200). Morphological data was limited to 22 cross-sections.

Survey data (MY0, MY1, MY2, MY3, MY5, MY7) was imported into CAD, ArcGIS, and Excel for data processing and analysis. Channel substrate was characterized using a Wolman Pebble Count as outlined in Harrelson et al. (1994) and processed using Microsoft Excel.

Vegetation success (MY0, MY1, MY2, MY3, MY5, MY7) is being monitored using 14 permanent monitoring plots. Vegetation monitoring followed CVS-EEP Level 1 Protocol for MY1 and is following Level 2 Protocol Version 4.2 for monitoring years 2-7 (Lee et al. 2008). Level 2 Protocol includes analysis of species composition and density of planted species. Data is processed using the CVS data entry tool. In the field, the four corners of each plot were permanently marked with rebar and photos of each plot taken from the origin each monitoring year.

Precipitation data is reported from the NCCRONOS station Uwharrie (Troy). Three crest gauges were installed to document bankfull events, one each on Jerry, Dale, and Thompson branches. During quarterly visits to the site, the height of the corkline was recorded and cross-referenced with known bankfull elevations at each crest gauge. Three flow monitoring gauges were installed in January 2019 to document consecutive days of flow on Dale 1, Dale 2, and Thompson 1. These gauges are made up of pressure transducers located in PVC piping and placed in pools. The pressure transducers record water levels at an hourly interval and the elevation of the downstream riffle is used to detect stream flow from the pool water levels.

3.0 REFERENCES

Harrelson, Cheryl, C. Rawlins and J. Potyondy. 1994. Stream Channel Reference Sites: An Illustrated Guide to Field Technique. Gen. Tech. Rep. RM-245. Rocky Mountain Forest and Range Experiment Station. USDA Forest Service. Fort Collins, Colorado

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation. Version 4.2. http://cvs.bio.unc.edu/methods.htm; accessed November 2008.

Appendix A
General Tables and Figures

Table 1. Project Components and Mitigation Credits

Pee Dee Stream Restoration Site

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	**6,108.267**						-	-	-

Project Components

Project Component -or- Reach ID	Stationing/Location	Existing Footage/Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage or Acreage[1]	Creditable Footage	Mitigation Ratio	Credits[3]	Notes[4]
Thompson Creek 1	100+0 - 102 + 50	250	PI	EI	250	250	1.5	166.667	Flow being monitored
Thompson Creek 1 - 2	102+50 - 115+64	1,346	PI	R	1,314	1,014	1	1,014	Credit removal in old pond
Dale Branch 1	200+00 - 203+75	375	PI	EI	375	375	1.5	250	Repaired January 2020
Dale Branch 2 - 5	203+75 - 234+50	2,407	PI	R	2,955	2,955	1	2,955	
Jerry Branch	300+00 - 317+30	1,832	PI	R	1,670	1,670	1	1,670	
Hudson Branch	403+05 - 403+58	53	PI	R	52.6	52.6	1	52.600	

Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetland (acres)		Non-riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration	5,691.6	-	-	-	-	-
Enhancement	-	-	-	-	-	-
Enhancement I	625	-	-	-	-	-
Enhancement II	-	-	-	-	-	-
Creation	-	-	-	-	-	-
Preservation	-	-	-	-	-	-
High Quality Preservation	-	-	-	-	-	-

BMP Elements

Element[2]	Location	Purpose/Function	Notes
FB	Entire Site	Protect Stream	

[1]Restoration footage accounts for crossings and exclusions.

[2]BR = Bioretention Cell; SF = Sand Filter; SW = Stormwater Wetland; WDP = Wet Detention Pond; DDP = Dry Detention Pond; FS = Filter Strip; S = Grassed Swale; LS = Level Spreader; NI = Natural Infiltration Area; FB = Forested Buffer

[3]Credit calculations were originally calculated along the as-built thalweg and updated to be calculated along stream centerlines for MY3 after discussions with NC IRT stemming from the April 3, 2017 Credit Release Meeting.

[4]An Adaptive Mangement Plan has been created to address the adjustments in Thompson Creek and Dale Branch. A breif description is included in Section 1.4.4 of the MY5 Report.

Table 2. Project Activity and Reporting History Pee Dee Stream Restoration Site		
Activity or Report	**Data Collection Complete**	**Completion or Delivery**
Mitigation Plan	Dec - 2013	Dec - 2013
Final Design - Construction Plans	N/A	Jan - 2014
Construction	N/A	April - 2015
Temporary S&E Mix Applied to Entire Project Area	N/A	April - 2015
Live Stakes and Bare Root Plantings for Entire Project Area	N/A	April - 2015
Baseline Monitoring Document (Year 0 Monitoring - Baseline)	April - 2015	July 2015
Year 1 Monitoring	Oct - 2015	Dec - 2015
Year 2 Monitoring	Jan - 2016	Oct - 2016
Year 3 Monitoring	Stream: June - 2017 Vegetation: Sept - 2017	Nov - 2017
Year 3 Invasive Species Treatment	---	June - 2017
Year 4 Invasive Species Treatment	---	Feb - 2018
Year 4 Invasive Species Treatment	---	June - 2018
Year 4 Monitoring	Nov -2018	Nov - 2018
Year 5 Invasive Species Treatment	---	July - 2019
Year 5 Monitoring	XS: July - 2019 VP: Aug - 2019	Nov - 2019
Year 5 Invasive Species Treatment	---	Dec - 2019
Dale 1 Flow Path Excavation	---	Dec - 2019
Year 6 Invasive Species Treatment	---	Jan - 2020
Year 6 Supplemental Planting	---	Mar - 2020
Dale 1 Flow Path Excavation	---	Mar - 2020
Year 6 Invasive Species Treatment	---	Nov - 2020
Year 6 Monitoring	Nov - 2020	Dec - 2020
Year 7 Monitoring		

Table 3. Project Contacts	
Pee Dee Stream Restoration Site	
Prime Contractor	Resource Environmental Solutions, LLC 3600 Glenwood Ave, Suite 100 Raleigh, North Carolina 27612 David Godley (919) 209-1053
Designer	Wolf Creek Engineering 12-1/2 Wall St., Suite C Asheville, North Carolina 28801 Grant Ginn (828) 449-1930 ext 102
Construction Contractor	Northstate Environmental 2889 Lowery Street Winston Salem, North Carolina 27101 Darrell Westmoreland (336) 725-2010
Seeding Contractor	Northstate Environmental 2889 Lowery Street Winston Salem, North Carolina 27101 Darrell Westmoreland (336) 725-2010
Planting Contractor	Resource Environmental Solutions, LLC 3600 Glenwood Ave, Suite 100 Raleigh, North Carolina 27612 David Godley (919) 209-1053
As-built Surveys	Kee Mapping and Surveying PO Box 2566 Asheville, North Carolina 28802 Phillip B. Key (828) 575-9021
Seeding Mix Source	Green Resource 5204 Highgreen Court Colfax, NC 27235 (336) 855-6363
Bare Root Seedlings	ArborGen Inc. 2011 Broadbank Court Ridgeville, SC 29472 (888) 888-7158
	North Carolina Forest Service 762 Claridge Nursery Road Goldsboro, NC 27350 (888) 628-7337
Live Stakes	Bear Duck Farms, LLC 105 Dobbs Place Goldsboro, NC 27350
Monitoring Performers (Y0-Y2) 2015 - 2016	Equinox Environmental 37 Haywood St. Asheville, North Carolina 28802 Drew Alderman (828) 253-6856
Monitoring Performers (Y3+) 2017+	Resource Environmental Solutions, LLC 3600 Glenwood Ave, Suite 100 Raleigh, North Carolina 27612 Ryan Medric (919) 741-6268

Table 4. Project Baseline Information and Attributes

Project Information

Project Name	Pee Dee Stream Restoration
County	Montgomery County
Project Area (acres)	21
Project Coordinates (latitude and longitude)	35°15'26.95" N, 80°01'47.83" W

Project Watershed Summary Information

Physiographic Province		Piedmont	
River Basin		Yadkin	
USGS Hydrologic Unit 8-digit	03040104	USGS Hydrologic Unit 14-Digit	03040104020020
DWQ Sub-basin		03-07-10	
Project Drainage Area (acres)		286	
Project Drainage Area Percentage of Impervious Area		<10%	
CGIA Land Use Classification		2.01.03 Hay and Pasture Land	

Reach Summary Information

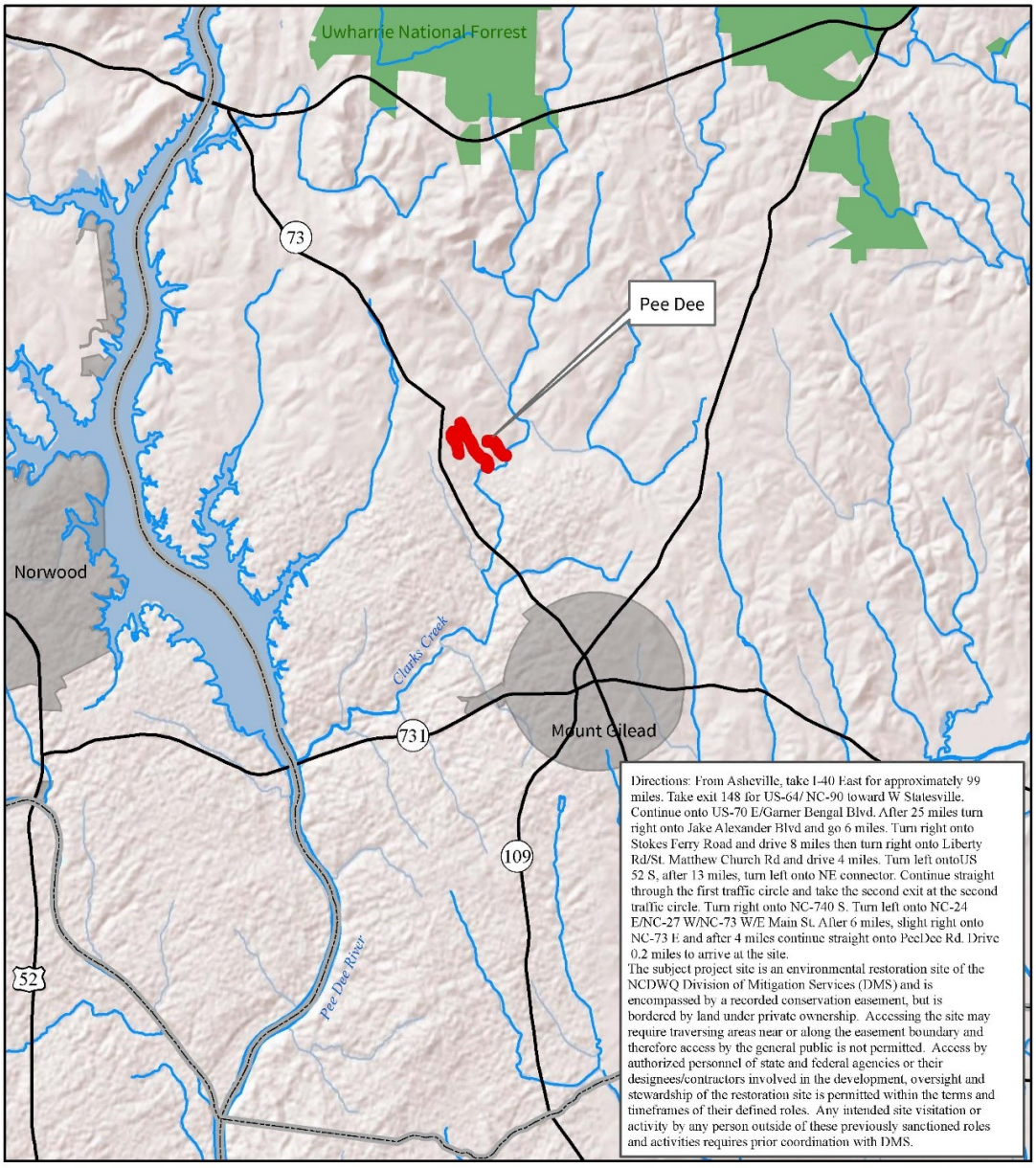
Parameters	Thompson Creek	Dale Branch	Jerry Branch	Hudson Branch
Length of reach (linear feet)	1,596	2,782	1,832	56
Valley classification (Rosgen)	II	II	II	II
Drainage area (acres)	102	58	83	19
NCDWQ stream identification score	30.5	34	30.5	21.5
NCDWQ Water Quality Classification	C	C	C	C
Morphological Description (stream type) (Rosgen)	B4	B4	B4	B4
Evolutionary trend (Rosgen)	IV	IV	IV	IV
Underlying mapped soils	GoE, BeC2, BaC2	GoE, CnA	GoE, BaC2, BaB2	BaC2
Drainage class	Well-drained	Well-drained	Well-drained	Well-drained
Soil Hydric status	Non-Hydric	Non-Hydric	Non-Hydric	Non-Hydric
Slope	2%	2%	2%	2%
FEMA classification	N/A	N/A	N/A	N/A
Native vegetation community	Agricultural	Agricultural	Agricultural	Agricultural
Percent composition of exotic invasive vegetation	5%	5%	5%	5%

Wetland Summary Information

Parameters	-	-	-
Size of Wetland (acres)	-	-	
Wetland Type (non-riparian, riparian riverine or riparian non-riverine)	-	-	-
Mapped Soil Series	-	-	-
Drainage class	-	-	-
Soil Hydric Status	-	-	-
Source of Hydrology	-	-	-
Hydrologic Impairment	-	-	-
Native vegetation community	-	-	-
Percent composition of exotic invasive vegetation	-	-	-

Regulatory Considerations

Regulation	Applicable?	Resolved?	Supporting Documentation
Waters of the United States – Section 404	Yes	Yes	NWP
Waters of the United States – Section 401	Yes	Yes	401 Certification
Endangered Species Act	N/A		ERTR
Historic Preservation Act	N/A		ERTR
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	N/A		
FEMA Floodplain Compliance	N/A		
Essential Fisheries Habitat	N/A		ERTR



res

Figure 1: Vicinity Map

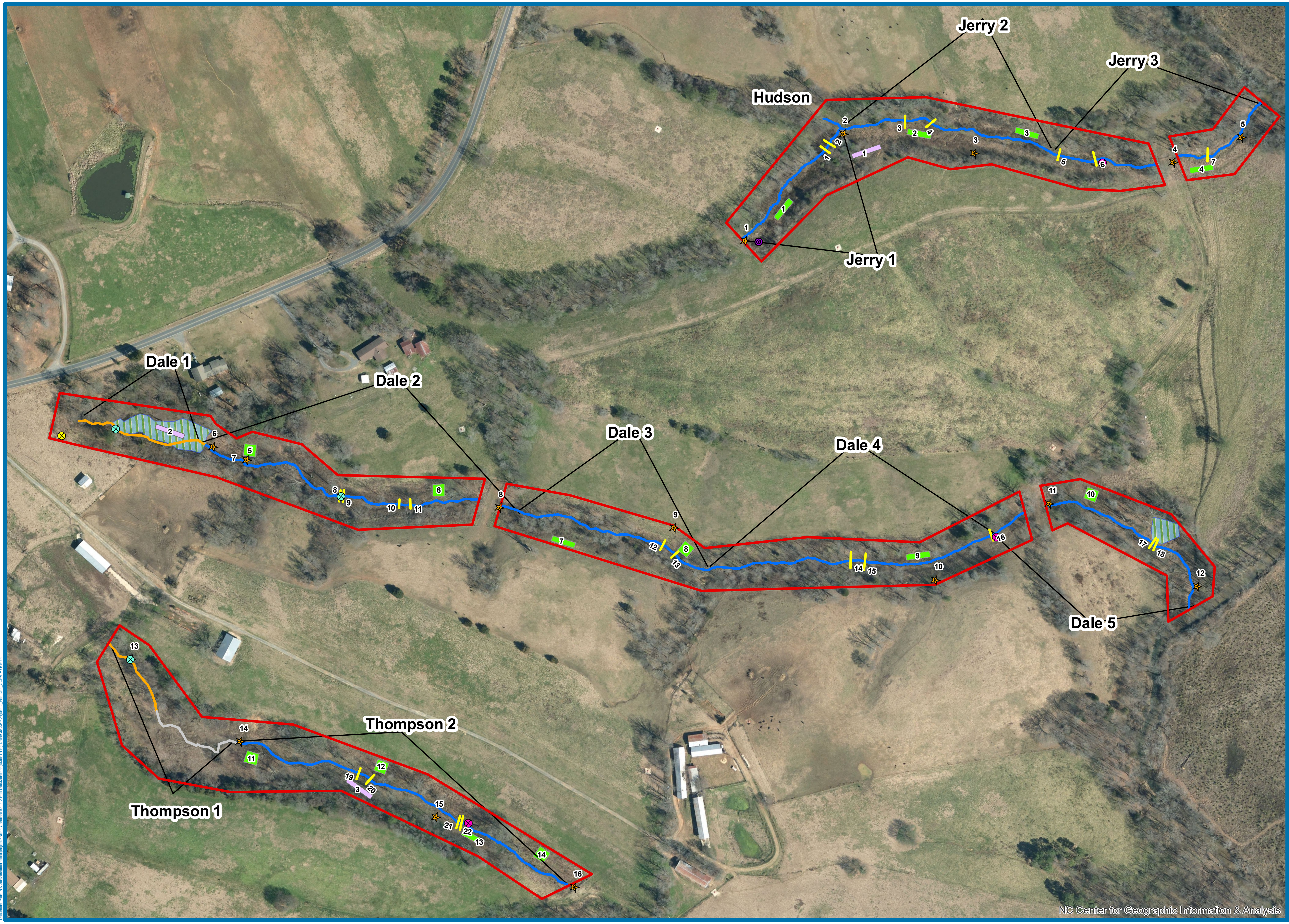
Pee Dee Stream Restoration Site

Project No. 95350

Montgomery County, North Carolina

Notes: Conservation Easement from Key Mapping & Survey, P.A.

0 0.5 1 2 3 Miles



res

0 125 250
Feet

1 inch = 250 feet

Figure 2

Pee Dee Stream Restoration Project MY6 2020

Current Conditions Plan View

Date: 1/13/2021	Drawn by: RTM

LEGEND

- Conservation Easement
- Vegetation Plot
- MY6 Random Veg Plot
- Existing Wetland
- Cross Section

Mitigation Type

- Restoration
- Enhancement I
- No Credit
- Crest Gauge
- Flow Gauge
- Rain Gauge
- Ambient Gauge
- Photo Station

Vegetation Condition Assessment

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

Appendix B
Visual Assessment Data

Table 5. Visual Stream Morphology Stability Assessment
Pee Dee Stream Restoration Site - Jerry Branch
Assessed Length 1,832 feet

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	**1. Vertical Stability** (Riffle and Run Units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	90	90			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth≥ 1.6).	90	90			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	90	90			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander bend (Glide).	90	90			100%			
2. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	91	91			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	91	91			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	91	91			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence doesNOT exceed 15%.	91	91			100%			
	4. Habitat	Pool forming structures maintaining~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	91	91			100%			

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Pee Dee Stream Restoration Site - Dale Branch
Assessed Length 2,782 feet

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	**1. Vertical Stability** (Riffle and Run Units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	120	120			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth≥ 1.6).	119	119			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	119	119			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander bend (Glide).	119	119			100%			
2. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	122	122			N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	122	122			N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	122	122			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence doesNOT exceed 15%.	122	122			N/A			
	4. Habitat	Pool forming structures maintaining~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	122	122			N/A			

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Pee Dee Stream Restoration Site - Thompson Branch
Assessed Length 1,596 feet

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	**1. Vertical Stability** (Riffle and Run Units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			1	300	81%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	50	50			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth≥ 1.6).	50	50			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	50	50			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander bend (Glide).	50	50			100%			
2. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	51	51			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	51	51			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	51	51			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence doesNOT exceed 15%.	51	51			100%			
	4. Habitat	Pool forming structures maintaining~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	51	51			100%			

Table 6. Vegetation Condition Assessment Pee Dee Stream Restoration Site Planted Acreage 21.0					
Vegetation Category	**Definitions**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Planted Acreage**
1. Bare Areas	Very limited cover of both woody and herbaceous material.	N/A	0	0.00	0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	N/A	0	0.00	0%
		Totals	0	0.00	0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	N/A	0	0.00	0%
		Cumulative Totals	0	0.00	0%
Easement Acreage 21.0 acres					
Vegetation Category	**Definitions**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Easement Acreage**
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	Yellow Crosshatch	0	0.00	0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	N/A	0	0.00	0%

MY6 – 2020 Pee Dee Photo Station Photos – November 17, 2020

Jerry Branch – Permanent Photo Station 1
Station 300+25 - Downstream

Jerry Branch – Permanent Photo Station 2
Station 305+04 – Upstream

Jerry Branch – Permanent Photo Station 2
Station 305+04 - Downstream

Hudson Branch – Permanent Photo Station 2
Station 305+04 – Looking Upstream from Confluence with Jerry Branch
November 17, 2020

Jerry Branch – Permanent Photo Station 3
Looking North Northwest/Upstream Jerry Branch

Jerry Branch – Permanent Photo Station 4
Station 304+80 – Upstream

Jerry Branch – Permanent Photo Station 4
Station 304+80 – Downstream

Jerry Branch – Permanent Photo Station 5
Station 316+95 – Upstream

Dale Branch – Permanent Photo Station 6
Station 204+15 – Upstream

Dale Branch – Permanent Photo Station 7
Station 205+15 – Upstream

Dale Branch – Permanent Photo Station 8
Station 212+95 – Upstream

Dale Branch – Permanent Photo Station 8
Station 212+95 – Downstream

Dale Branch – Permanent Photo Station 9
Looking North-Northwest – Upstream Dale

Dale Branch – Permanent Photo Station 9
Looking South-Southeast- Downstream

Dale Branch – Permanent Photo Station 10
Looking North-Northeast – Upstream

Dale Branch – Permanent Photo Station 10
Looking South-Southwest – Downstream

Dale Branch – Permanent Photo Station 11
Station 229+20 – Upstream

Dale Branch – Permanent Photo Station 11
Station 229+20 – Downstream

Dale Branch – Permanent Photo Station 12
Station 234+25 – Upstream

Dale Branch – Permanent Photo Station 12
Station 234+25 – Downstream

Thompson Branch – Permanent Photo Station 13
Station 101+15 – Downstream

Thompson Branch – Permanent Photo Station 14
Station 105+25 – Upstream

Thompson Branch – Permanent Photo Station 14
Station 105+25 – Downstream

Thompson Branch – Permanent Photo Station 15
Station 115+50 – Upstream

Thompson Branch – Permanent Photo Station 15
Station 111+50 – Downstream

Thompson Branch – Permanent Photo Station 16
Station 115+85 – Upstream

Appendix C
Vegetation Plot Data

Table 7. MY5 Vegetation Plot Criteria Attainment

Plot #	Planted Stems/Acre	Volunteer Stems/Acre	Total Stems/Acre	Success Criteria Met?	Average Planted Stem Height (ft)
1	971	486	1457	Yes	17.9
2	567	202	769	Yes	21.6
3	364	121	486	Yes	12.0
4	445	688	1133	Yes	8.1
5	162	0	162	No	10.2
6	324	567	890	Yes	7.7
7	364	162	526	Yes	6.1
8	324	486	809	Yes	11.4
9	809	405	1214	Yes	13.2
10	364	607	971	Yes	21.9
11	769	1497	2266	Yes	27.8
12	607	890	1497	Yes	21.0
13	445	81	526	Yes	28.8
14	688	324	1012	Yes	29.1
Project Avg	**515**	**465**	**980**	**Yes**	18.5

Table 8. CVS Vegetation Plot Metadata Pee Dee Stream Restoration Site	
Report Prepared By	Ryan Medric
Date Prepared	9/25/2019 0:00
database name	Pee Dee MY5 2019 CVS.mdb
database location	
computer name	FIELD-PC
file size	61739008
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY----------	
Project Code	95350
project Name	Pee Dee
Description	
River Basin	
length(ft)	
stream-to-edge width (ft)	
area (sq m)	
Required Plots (calculated)	
Sampled Plots	14

Table 9. Total Planted Stem Counts

Pee Dee			Current Plot Data (MY5 2019)																																				
			95350-01-0001			95350-01-0002			95350-01-0003			95350-01-0004			95350-01-0005			95350-01-0006			95350-01-0007			95350-01-0008			95350-01-0009			95350-01-0010			95350-01-0011			95350-01-0012			95350-01-0013			95350-01-0014		
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	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo	boxelder	Tree																															1			1								
Acer rubrum	red maple	Tree																									1																
Betula nigra	river birch	Tree	9	9	9	2	2	2													3	3	3				4	4	4							1	1	1						
Broussonetia papyrifera	paper mulberry	Exotic																																									
Carya	hickory	Tree																																									
Carya alba	mockernut hickory	Tree																																									
Celtis laevigata	sugarberry	Tree																		2																6							
Celtis occidentalis	common hackberry	Tree																																									
Cephalanthus occidentali	common buttonbush	Shrub																																									
Diospyros virginiana	common persimmon	Tree																																									
Fraxinus pennsylvanica	green ash	Tree	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4							5	5	5	2	2	2				1	1	1				1	1	1
Ilex opaca	American holly	Tree																																									
Juglans nigra	black walnut	Tree																																						1			2	
Liquidambar styraciflua	sweetgum	Tree			8			3																		1			6			5			3								2
Liriodendron tulipifera va	Tulip-tree, Yellow Po	Tree	3	3	3																1	1	5				1	1	2														
Pinus taeda	loblolly pine	Tree																																									
Platanus occidentalis	American sycamore	Tree																																									
Platanus occidentalis var.	Sycamore, Plane-tre	Tree	4	4	4	9	9	11	1	1	1	2	2	4							3	3	3				3	3	5	7	7	8	18	18	19	8	8	8	9	9	10	11	11	15
Quercus	oak	Tree																																									
Quercus michauxii	swamp chestnut oak	Tree				1	1	1	2	2	2	1	1	1				1	1	1				3	3	3	1	1	1				1	1	1				2	2	2	4	4	4
Quercus nigra	water oak	Tree	3	3	3				2	2	2	1	1	1	1	1	1	1	1	1				1	1	1																	
Quercus phellos	willow oak	Tree	3	3	5	1	1	1	3	3	3	6	6	6	2	2	2	3	3	3	2	2	2	4	4	4	6	6	6							5	5	5				1	1	1
Rhus copallinum	flameleaf sumac	shrub			2						3			15						1					1						2											
Rhus copallinum var. cop	flameleaf sumac	shrub																																									
Rhus glabra	smooth sumac	shrub																																									
Salix nigra	black willow	Tree																																									
Ulmus alata	winged elm	Tree																		10												9											
Ulmus americana	American elm	Tree																								10								30			15						
		Stem count	24	24	36	14	14	19	9	9	12	11	11	28	4	4	4	8	8	22	9	9	13	8	8	20	20	20	30	9	9	24	19	19	56	15	15	37	11	11	13	17	17	25
		size (ares)	1			1			1			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			0.02			0.02			0.02		
		Species count	6	6	8	5	5	6	5	5	6	5	5	6	3	3	3	4	4	7	4	4	4	3	3	6	6	6	8	2	2	4	2	2	6	4	4	7	2	2	3	4	4	6
		Stems per ACRE	971	971	1457	567	567	769	364	364	486	445	445	1133	162	162	162	324	324	890	364	364	526	324	324	809	809	809	1214	364	364	971	769	769	2266	607	607	1497	445	445	526	688	688	1012

Pee Dee			Annual Means														
			MY5 (2019)			MY3 (2017)			MY2 (2016)			MY1 (2015)			MY0 (2015)		
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
Acer negundo	boxelder	Tree			2			5									
Acer rubrum	red maple	Tree			1			101									
Betula nigra	river birch	Tree	19	19	19	27	27	29	45	45	47	42	42	42	51	51	51
Broussonetia papyrifera	paper mulberry	Exotic												2			
Carya	hickory	Tree									4			4			
Carya alba	mockernut hickory	Tree						7						2			
Celtis laevigata	sugarberry	Tree			8												
Celtis occidentalis	common hackberry	Tree									1164			333			
Cephalanthus occidentali	common buttonbush	Shrub									221						
Diospyros virginiana	common persimmon	Tree						4			2			2			
Fraxinus pennsylvanica	green ash	Tree	18	18	19	24	24	26	26	26	37	29	29	29	33	33	33
Ilex opaca	American holly	Tree						2									
Juglans nigra	black walnut	Tree			3						15			4			
Liquidambar styraciflua	sweetgum	Tree			28			45			96			51			
Liriodendron tulipifera va	Tulip-tree, Yellow Po	Tree	5	5	10	5	5	19	7	7	7	6	6	6	16	16	16
Pinus taeda	loblolly pine	Tree						2									
Platanus occidentalis	American sycamore	Tree													1	1	1
Platanus occidentalis var.	Sycamore, Plane-tre	Tree	75	75	88	78	78	108	80	80	159	80	80	83	86	86	86
Quercus	oak	Tree							2	2	2	1	1	1	83	83	83
Quercus michauxii	swamp chestnut oak	Tree	16	16	16	22	22	22	26	26	26	27	27	27	14	14	14
Quercus nigra	water oak	Tree	9	9	9	16	16	16	16	16	16	16	16	16	17	17	17
Quercus phellos	willow oak	Tree	36	36	38	50	50	50	55	55	69	55	55	57	18	18	18
Rhus copallinum	flameleaf sumac	shrub			24									4			
Rhus copallinum var. cop	flameleaf sumac	shrub						18			47						
Rhus glabra	smooth sumac	shrub												12			
Salix nigra	black willow	Tree						2									
Ulmus alata	winged elm	Tree			19			84			6						
Ulmus americana	American elm	Tree			55			317									
		Stem count	178	178	339	222	222	857	257	257	1918	256	256	675	319	319	319
		size (ares)	14			14			14			14			14		
		size (ACRES)	0.35			0.35			0.35			0.35			0.35		
		Species count	7	7	15	7	7	18	8	8	16	8	8	17	9	9	9
		Stems per ACRE	515	515	980	642	642	2477	743	743	5544	740	740	1951	922	922	922

Color for Density

- Exceeds requirements by 10%
- Exceeds requirements, but by less than 10%
- Fails to meet requirements, by less than 10%
- Fails to meet requirements by more than 10%
- Recruit Stems

MY5 – 2019 Vegetation Plot Photos

Pee Dee - Vegetation Monitoring Plot 1

Pee Dee - Vegetation Monitoring Plot 2

Pee Dee - Vegetation Monitoring Plot 3

Pee Dee - Vegetation Monitoring Plot 4

Pee Dee - Vegetation Monitoring Plot 5

Pee Dee - Vegetation Monitoring Plot 6

Pee Dee - Vegetation Monitoring Plot 7

Pee Dee - Vegetation Monitoring Plot 8

Pee Dee - Vegetation Monitoring Plot 9

Pee Dee - Vegetation Monitoring Plot 10

Pee Dee - Vegetation Monitoring Plot 11

Pee Dee - Vegetation Monitoring Plot 12

Pee Dee - Vegetation Monitoring Plot 13

Pee Dee - Vegetation Monitoring Plot 14

Pee Dee Random Vegetation Plots November 2020 MY6

Random Plot 1		
#	**Common Name**	**Height (cm)**
1	Willow Oak	75
2	Water Oak	145
3	Cottonwood	230
4	Cottonwood	310
5	Cottonwood	270
6	Willow Oak	290
7	Cottonwood	280
8	Cottonwood	340
9	Willow Oak	330
10	Willow Oak	240
11	Water Oak	400
12	Swamp Chestnut Oak	250
13	Cottonwood	410
14	Swamp Chestnut Oak	290
15	Water Oak	320
16	Willow Oak	210
17	Sugarberry	300
Stems/Acre	688	
Average Height (cm)	276	
Average Height (ft)	9.1	
Plot Size (m)	25 x 4	

Random Plot 2		
#	**Common Name**	**Height (cm)**
1	Green Ash	170
2	River Birch	410
3	Willow Oak	155
4	River Birch	380
5	Green Ash	600
6	Green Ash	260
7	Willow Oak	150
8	River Birch	260
9	Green Ash	230
Stems/Acre	364	
Average Height (cm)	291	
Average Height (ft)	9.5	
Plot Size (m)	25 x 4	

Random Plot 3		
#	**Common Name**	**Height (cm)**
1	Tulip Poplar	225
2	Tulip Poplar	230
3	Tulip Poplar	215
4	Tulip Poplar	250
5	Tulip Poplar	75
6	Tulip Poplar	230
7	Sycamore	235
8	Sycamore	900
9	Tulip Poplar	230
10	Tulip Poplar	450
11	Tulip Poplar	650
12	Tulip Poplar	450
13	Tulip Poplar	310
Stems/Acre	526	
Average Height (cm)	342	
Average Height (ft)	11.2	
Plot Size (m)	25 x 4	

MY6 – 2020 Random Vegetation Plot Photos

Pee Dee – Random Vegetation Plot 1

Pee Dee – Random Vegetation Plot 2

Pee Dee – Random Vegetation Plot 3

Appendix D
Stream Geomorphology Data

Table 10. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Jerry Branch 1 (430 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	3.79	3.5	5.3	5.3	7.0	2.5	2	9.8	11.7	-	13.1	-	-	-	7.9	-	8.1	8.1	8.1	8.1	-	1
Floodprone Width (ft)				3.3	6.2	6.2	9.0	4.0	2	16.0	18.0	-	21	-	-	-	-	-	31.8	31.8	31.8	31.8	-	1
Bankfull Mean Depth (ft)	-	-	0.64	0.6	0.6	0.6	0.6	0.0	2	0.5	0.62	-	0.8	-	-	-	0.42	-	0.5	0.5	0.5	0.5	-	1
Bankfull Max Depth (ft)				0.7	0.8	0.8	0.9	0.1	2	0.8	0.9	-	1.2	-	-	-	0.65	-	1.0	1.0	1.0	1.0	-	1
Bankfull Cross Sectional Area (ft^2)	3.5			2.0	2.9	2.9	3.8	1.3	2	5.4	7.3	-	8	-	-	-	3.3	-	3.7	3.7	3.7	3.7	-	1
Width/Depth Ratio				6.0	9.4	9.4	12.8	4.8	2	12.3	18.8	-	19.6	-	-	-	18.6	-	17.7	17.7	17.7	17.7	-	1
Entrenchment Ratio				0.5	1.6	1.6	2.6	1.5	2	1.4	1.5	-	1.8	-	-	-	2.5	-	3.9	3.9	3.9	3.9	-	1
Bank Height Ratio				2.4	7.7	7.7	12.9	7.4	2	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	-	1
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	2.6	6.2	6.2	16.4	2.8	26
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.003	-	0.001	0.010	0.009	0.026	0.008	26
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	2.3	5.9	5.4	16.0	2.9	26
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	0.97	-	0.7	1.5	1.5	2.3	0.4	26
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	22.5	-	6.1	15.0	14.2	27.8	5.1	25
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	14.0	19.2	19.2	24.4	7.3	2
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	12.0	-	17.0	11.6	13.6	13.1	16.5	2.2	4
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.7	1.6	2.0	0.3	2
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23.8	44.4	47.1	55.0	11.9	6
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	1.7	2.4	2.4	3.0	0.9	2
Substrate, Bed and Transport Parameters																								
Ri% / Ru% / P% / G% / S%				-						-									42% / 0% / 40% / 7% / 11%					
SC% / Sa% / G% / C% / B% / Be%				-						4% / 2% / 49% / 38% / 1% / 6%														
d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)				--/5/6/13/22						14 / 36 / 52 / 110 / 170 / - / -														
Reach Shear Stress (Competency) lb/ft^2				-						0.562						-			-					
Max Part Size (mm) Mobilized at Bankfull				-						947						32			-					
Stream Power (Transport Capacity) W/m^2				-						-						-								
Additional Reach Parameters																								
Drainage Area (mi^2)				0.07						0.42														
Impervious Cover Estimate (%)				-						-														
Rosgen Classification				-						B4c						B4			B4					
Bankfull Velocity (fps)	-			-						3.8						-								
Bankfull Discharge (cfs)	13.12			G						28.0						13								
Valley Length (ft)				-						260.0						406								
Channel Thalweg Length (ft)				-						-						435			430					
Sinuosity				-						1.50						1.0			1.06					
Water Surface Slope (ft/ft)				-						-						0.037			0.0265					
Bankfull Slope (ft/ft)				-						-						-			0.0267					
Bankfull Floodplain Area (acres)				-						-						-								
Proportion Over Wide (%)				-						-														
Entrenchment Class (ER Range)				-						-														
Incision Class (BHR Range)				-						-														
BEHI				24.03						-														
Channel Stability or Habitat Metric				-						-														
Biological or Other				-						-														

- Information unavailable.
N/A - Item does not apply.
Non-Applicable.

Table 10 cont'd. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Jerry Branch 2 (625 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	4.78	3.5	6.0	6.6	8.0	2.3	3	9.8	11.7	-	13.1	-	-	-	7.1	-	7.1	7.1	7.1	7.1	-	1
Floodprone Width (ft)				2.5	10.8	15.0	15.0	7.2	2	16.0	18.0	-	21	-	-	-	-	-	16.0	16.0	16.0	16.0	-	1
Bankfull Mean Depth (ft)	-	-	0.76	0.4	0.6	0.7	0.8	0.2	3	0.5	0.62	-	0.8	-	-	-	0.53	-	0.4	0.4	0.4	0.4	-	1
Bankfull Max Depth (ft)				0.5	0.7	0.8	1.0	0.2	3	0.8	0.9	-	1.2	-	-	-	0.75	-	0.7	0.7	0.7	0.7	-	1
Bankfull Cross Sectional Area (ft^2)	5.1			2.4	2.7	2.7	3.0	0.3	3	5.4	7.3	-	8	-	-	-	3.7	-	3.1	3.1	3.1	3.1	-	1
Width/Depth Ratio				4.6	15.2	14.6	26.3	10.9	3	12.3	18.8	-	19.6	-	-	-	13.4	-	16.4	16.4	16.4	16.4	-	1
Entrenchment Ratio				0.7	1.6	1.9	2.3	0.8	3	1.4	1.5	-	1.8	-	-	-	3.5	-	2.3	2.3	2.3	2.3	-	1
Bank Height Ratio				1.0	3.5	1.5	7.9	3.8	3	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	-	1
d50 (mm)				-	-	-	-	-	-	-	52	-		-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	3.1	9.0	8.7	26.5	4.5	29
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.002	-	0.005	0.019	0.018	0.042	0.010	29
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	2.3	4.8	4.7	7.8	1.5	31
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	1.13	-	0.9	1.5	1.5	2.2	0.3	29
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	21.7	-	12.0	18.0	16.8	36.2	5.1	30
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	13.4	20.3	22.4	25.6	5.1	6
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	11.0	-	17.0	12.1	13.4	12.7	16.5	1.8	5
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	1.9	1.8	2.3	0.2	2
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.5	30.0	30.6	38.1	6.6	6
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	1.9	2.9	3.2	3.6	0.7	6
Substrate, Bed and Transport Parameters																								
Ri% / Ru% / P% / G% / S%						-						-									47% / 0% / 27% / 12% / 14 /%			
SC% / Sa% / G% / C% / B% / Be%						-						4% / 2% / 49% / 38% / 1% / 6%												
d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)						--/5/6/13/22						14 / 36 / 52 / 110 / 170 / - / -												
Reach Shear Stress (Competency) lb/ft^2						-						0.562					-				-			
Max Part Size (mm) Mobilized at Bankfull						-						947					32				-			
Stream Power (Transport Capacity) W/m^2						-						-					-							
Additional Reach Parameters																								
Drainage Area (mi^2)												0.42												
Impervious Cover Estimate (%)						-						-												
Rosgen Classification						-						B4c					B4				B4			
Bankfull Velocity (fps)	-					-						3.8					-							
Bankfull Discharge (cfs)	19.35					G						28.0					19							
Valley Length (ft)						-						260.0					485							
Channel Thalweg Length (ft)						-						-					625				625			
Sinuosity						-						1.50					1.1				1.29			
Water Surface Slope (ft/ft)						-						-					0.024				0.024			
Bankfull Slope (ft/ft)						-						-					-				0.024			
Bankfull Floodplain Area (acres)						-						-					-							
Proportion Over Wide (%)						-						-												
Entrenchment Class (ER Range)						-						-												
Incision Class (BHR Range)						-						-												
BEHI						26.67						-												
Channel Stability or Habitat Metric						-						-												
Biological or Other						-						-												

- Information unavailable.
N/A - Item does not apply.
Non-Applicable.

Table 10 cont'd. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Jerry Branch 3 (636 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	4.95	-	4.0	-	-	-	1	9.8	11.7	-	13.1	-	-	-	7.3	-	7.2	7.3	7.3	7.4	0.141	2
Floodprone Width (ft)				-	6.5	-	-	-	1	16.0	18.0	-	21	-	-	-	-	-	24.7	29.3	29.3	33.8	6.435	2
Bankfull Mean Depth (ft)	-	-	0.78	-	0.9	-	-	-	1	0.5	0.62	-	0.8	-	-	-	0.54	-	0.4	0.4	0.4	0.4	0	2
Bankfull Max Depth (ft)				-	1.1	-	-	-	1	0.8	0.9	-	1.2	-	-	-	0.77	-	0.8	0.9	0.9	0.9	0.071	2
Bankfull Cross Sectional Area (ft^2)	5.4			-	3.3	-	-	-	1	5.4	7.3	-	8	-	-	-	4.0	-	3.0	3.2	3.2	3.3	0.212	2
Width/Depth Ratio				-	4.8	-	-	-	1	12.3	18.8	-	19.6	-	-	-	13.5	-	16.6	17.2	17.2	17.7	0.778	2
Entrenchment Ratio				-	1.6	-	-	-	1	1.4	1.5	-	1.8	-	-	-	3.4	-	3.4	4.0	4.0	4.6	0.849	2
Bank Height Ratio				-	2.9	-	-	-	1	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	0.0	2
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	3.1	9.0	8.7	26.5	4.5	29
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.002	-	0.005	0.019	0.018	0.042	0.010	29
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	2.3	4.8	4.7	7.8	1.5	31
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	1.15	-	0.9	1.5	1.5	2.2	0.3	29
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	23.9	-	12.0	18.0	16.8	36.2	5.1	30
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	20.0	24.2	26.0	26.5	3.6	3
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	12.0	-	17.0	9.2	12.1	10.6	17.0	2.8	7
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	1.7	1.5	2.3	0.4	1
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.1	43.9	44.8	54.4	8.1	6
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	2.7	3.3	3.6	3.6	0.5	3
Substrate, Bed and Transport Parameters																								
Ri% / Ru% / P% / G% / S%						-						-							60% / 0% / 21% / 10% / 9%					
SC% / Sa% / G% / C% / B% / Be%						-						4% / 2% / 49% / 38% / 1% / 6%												
d16 / d35 / d50 / d84 / d95 / di^{p} / di^{ep} (mm)						--/5/6/13/22						14 / 36 / 52 / 110 / 170 / - / -												
Reach Shear Stress (Competency) lb/ft^2						-						0.562					-				-			
Max Part Size (mm) Mobilized at Bankfull						-						947					32				-			
Stream Power (Transport Capacity) W/m^2						-						-					-							
Additional Reach Parameters																								
Drainage Area (mi^2)												0.42												
Impervious Cover Estimate (%)						-						-												
Rosgen Classification						G						B4c					B4				B4			
Bankfull Velocity (fps)	-					-						3.8					-							
Bankfull Discharge (cfs)	20.49					-						28.0					20							
Valley Length (ft)						-						260.0					624							
Channel Thalweg Length (ft)						-						-					670				636			
Sinuosity						-						1.50					1.00				1.02			
Water Surface Slope (ft/ft)						-						-					0.0240				0.0235			
Bankfull Slope (ft/ft)						-						-					-				0.0239			
Bankfull Floodplain Area (acres)						-						-					-							
Proportion Over Wide (%)						-						-												
Entrenchment Class (ER Range)						-						-												
Incision Class (BHR Range)						-						-												
BEHI						21.4						-												
Channel Stability or Habitat Metric						-						-												
Biological or Other						-						-												

- Information unavailable.
N/A - Item does not apply.
Non-Applicable.

Table 10 cont'd. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Hudson Branch (59 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline[1]					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	2.63	-	4.5	-	-	-	1	9.8	11.7	-	13.1	-	-	-	7.3	-						
Floodprone Width (ft)				-	8.0	-	-	-	1	16.0	18.0	-	21	-	-	-	-	-						
Bankfull Mean Depth (ft)	-	-	0.49	-	0.5	-	-	-	1	0.5	0.62	-	0.8	-	-	-	0.34	-						
Bankfull Max Depth (ft)				-	0.7	-	-	-	1	0.8	0.9	-	1.2	-	-	-	0.52	-						
Bankfull Cross Sectional Area (ft^2)	2.0			-	2.1	-	-	-	1	5.4	7.3	-	8	-	-	-	2.1	-						
Width/Depth Ratio				-	9.5	-	-	-	1	12.3	18.8	-	19.6	-	-	-	18.7	-						
Entrenchment Ratio				-	1.8	-	-	-	1	1.4	1.5	-	1.8	-	-	-	4.8	-						
Bank Height Ratio				-	3.6	-	-	-	1	0.9	1	-	1.4	-	-	-	-	-						
d50 (mm)				-	-	-	-	-	-		52	-	-	-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	8.89	10.2	10.2	11.5	1.86	2
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.003	-	0.017	0.017	0.017	0.018	0.001	2
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	5.4	7.33	7.1	9.51	2.07	3
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	0.77	-	1.37	1.77	1.82	2.14	0.39	3
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	15.9	-	11.5	16.6	16.6	21.8	7.26	2
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	10.2	10.2	10.2	10.2	-	1
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	9.0	-	14.0	-	-	-	-	-	-
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
Meander Wavelength (ft)				-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	1.4	1.4	1.4	1.4	-	1
Substrate, Bed and Transport Parameters																								
Ri% / Ru% / P% / G% / S%						-						-									46% / 0% / 50% / 0% / 4%			
SC% / Sa% / G% / C% / B% / Be%						-						4% / 2% / 49% / 38% / 1% / 6%												
d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)						-						14 / 36 / 52 / 110 / 170 / - / -												
Reach Shear Stress (Competency) lb/ft^2						-						0.562					-				-			
Max Part Size (mm) Mobilized at Bankfull						-						947					32				-			
Stream Power (Transport Capacity) W/m^2						-						-					-							
Additional Reach Parameters																								
Drainage Area (mi^2)												0.42												
Impervious Cover Estimate (%)						-						-												
Rosgen Classification						G						B4c					B4				B4			
Bankfull Velocity (fps)		-				-						3.8					-							
Bankfull Discharge (cfs)		7.13				-						28.0					7							
Valley Length (ft)						-						260.0					55							
Channel Thalweg Length (ft)						-						-					102				59			
Sinuosity						-						1.50					1.10				1.08			
Water Surface Slope (ft/ft)						-						-					0.0120				0.030			
Bankfull Slope (ft/ft)						-						-					-				0.043			
Bankfull Floodplain Area (acres)						-						-					-							
Proportion Over Wide (%)						-						-												
Entrenchment Class (ER Range)						-						-												
Incision Class (BHR Range)						-						-												
BEHI						-						-												
Channel Stability or Habitat Metric						-						-												
Biological or Other						-						-												

- Information unavailable.
N/A - Item does not apply.
Non-Applicable.

[1]This reach limited to visual assessment since it is less than 500 feet

Table 10 cont'd. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Dale Branch 1 (250 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline[1]					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	2.63	4.8	7.1	8.0	8.5	2.0	3	9.8	11.7	-	13.1	-	-	-	6.3	-						
Floodprone Width (ft)				7.0	15.0	18.0	20.0	7.0	2	16.0	18.0	-	21	-	-	-	-	-						
Bankfull Mean Depth (ft)	-	-	0.49	0.4	0.5	0.5	0.6	0.1	3	0.5	0.62	-	0.8	-	-	-	0.34	-						
Bankfull Max Depth (ft)				0.5	0.6	0.6	0.7	0.1	3	0.8	0.9	-	1.2	-	-	-	0.52	-						
Bankfull Cross Sectional Area (ft^2)	2.0			2.5	2.9	2.9	3.4	0.5	3	5.4	7.3	-	8	-	-	-	2.1	-						
Width/Depth Ratio				8.0	18.4	21.4	25.7	9.2	3	12.3	18.8	-	19.6	-	-	-	18.7	-						
Entrenchment Ratio				1.5	2.0	2.1	2.5	0.5	3	1.4	1.5	-	1.8	-	-	-	5.6	-						
Bank Height Ratio				1.0	1.8	1.2	3.1	1.2	3	0.9	1	-	1.4	-	-	-	-	-						
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-						
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	-	-						
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-						
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	0.77	-						
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	20.5	-						
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-							
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	9.0	-	14.0						
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	4	-						
Substrate, Bed and Transport Parameters																								
Ri% / Ru% / P% / G% / S%				-						-														
SC% / Sa% / G% / C% / B% / Be%				-						4% / 2% / 49% / 38% / 1% / 6%														
d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)				--/5/6/11/15						14 / 36 / 52 / 110 / 170 / - / -														
Reach Shear Stress (Competency) lb/ft^2				-						0.562						-								
Max Part Size (mm) Mobilized at Bankfull				-						947						32								
Stream Power (Transport Capacity) W/m^2				-						-						-								
Additional Reach Parameters																								
Drainage Area (mi^2)				-						0.42														
Impervious Cover Estimate (%)				-						-														
Rosgen Classification				C						B4c						B4								
Bankfull Velocity (fps)	-			-						3.8						-								
Bankfull Discharge (cfs)	7.13			-						28.0						7								
Valley Length (ft)				-						260.0						-								
Channel Thalweg Length (ft)				-						-						375								
Sinuosity				-						1.50						1.20								
Water Surface Slope (ft/ft)				-						-						0.0390								
Bankfull Slope (ft/ft)				-						-						-								
Bankfull Floodplain Area (acres)				-						-						-								
Proportion Over Wide (%)				-						-														
Entrenchment Class (ER Range)				-						-														
Incision Class (BHR Range)				-						-														
BEHI				25.64						-														
Channel Stability or Habitat Metric				-						-														
Biological or Other				-						-														

- Information unavailable.
N/A - Item does not apply.
Non-Applicable.

[1]This reach received minor bank work with no adjustments to profile. No cross-sections set in this reach.

Table 10 cont'd. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Dale Branch 2 (920 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design[1]			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	2.98	-	5.0	-	-	-	1	9.8	11.7	-	13.1	-	-	-	5.4	-	6.4	6.7	6.7	7.0	0.42	2
Floodprone Width (ft)				-	7.0	-	-	-	1	16.0	18.0	-	21	-	-	-	-	-	15.1	19.5	19.5	23.9	6.22	2
Bankfull Mean Depth (ft)	-	-	0.54	-	0.6	-	-	-	1	0.5	0.62	-	0.8	-	-	-	0.37	-	0.3	0.3	0.3	0.3	0	2
Bankfull Max Depth (ft)				-	0.7	-	-	-	1	0.8	0.9	-	1.2	-	-	-	0.56	-	0.5	0.6	0.6	0.7	0.14	2
Bankfull Cross Sectional Area (ft^2)		2.4		-	2.8	-	-	-	1	5.4	7.3	-	8	-	-	-	2.0	-	1.8	1.9	1.9	2.0	0.14	2
Width/Depth Ratio				-	9.0	-	-	-	1	12.3	18.8	-	19.6	-	-	-	14.6	-	22.6	23.6	23.6	24.6	1.41	2
Entrenchment Ratio				-	1.4	-	-	-	1	1.4	1.5	-	1.8	-	-	-	8.2	-	2.4	2.9	2.9	3.4	0.71	2
Bank Height Ratio				-	7.9	-	-	-	1	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	0.0	2
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	3.2	10.1	9.0	21.3	4.8	28
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.003	-	0.007	0.027	0.027	0.046	0.011	28
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	1.5	3.2	2.9	9.6	1.6	29
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	0.84	-	1.1	1.6	1.4	2.8	0.5	28
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	20.7	-	9.4	19.7	19.3	31.4	4.9	28
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	18.0	20.6	19.0	24.4	3.1	5
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	10.0	-	15.0	8.2	13.8	14.7	16.7	3.4	5
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-		-	-	-	-	-	-	-	1.2	2.1	2.2	2.5	0.5	5
Meander Wavelength (ft)				-	-	-	-	-	-	-		-	-	-	-	-	-	-	33.1	38.9	39.6	41.5	3.1	6
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	4	-	2.7	3.1	2.8	3.6	0.9	6

Substrate, Bed and Transport Parameters					
Ri% / Ru% / P% / G% / S%		-	-		50%/ 7%/ 16%/ 10%/ 17%
SC% / Sa% / G% / C% / B% / Be%		-	4% / 2% / 49% / 38% / 1% / 6%		
d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)		--/5/6/11/15	14 / 36 / 52 / 110 / 170 / - / -		
Reach Shear Stress (Competency) lb/ft^2		-	0.562	-	-
Max Part Size (mm) Mobilized at Bankfull		-	947	32	-
Stream Power (Transport Capacity) W/m^2		-	-	-	
Additional Reach Parameters					
Drainage Area (mi^2)		0.04	0.42		
Impervious Cover Estimate (%)		-	-		
Rosgen Classification		G	B4c	B4	B4
Bankfull Velocity (fps)	-	-	3.8	-	
Bankfull Discharge (cfs)	8.77	-	28.0	9	
Valley Length (ft)		-	260.0	896	
Channel Thalweg Length (ft)		-	-	975	920
Sinuosity		-	1.50	1.00	1.03
Water Surface Slope (ft/ft)		-	-	0.0420	0.029
Bankfull Slope (ft/ft)		-	-	-	0.028
Bankfull Floodplain Area (acres)		-	-	-	
Proportion Over Wide (%)		-	-		
Entrenchment Class (ER Range)		-	-		
Incision Class (BHR Range)		-	-		
BEHI		25.2	-		
Channel Stability or Habitat Metric		-	-		
Biological or Other		-	-		

[1]Based on average design values for Subreaches 2b-2e

- Information unavailable.
N/A - Item does not apply.
Non-Applicable.

Table 10 cont'd. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Dale Branch 3 (559 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	3.28	3.0	3.3	3.3	3.6	0.4	2	9.8	11.7	-	13.1	-	-	-	7.2	-	7.3	7.3	7.3	7.3	-	1
Floodprone Width (ft)				9.0	12.0	12.0	15.0	4.2	2	16.0	18.0	-	21	-	-	-	-	-	18.5	18.5	18.5	18.5	-	1
Bankfull Mean Depth (ft)	-	-	0.58	0.6	0.7	0.7	0.7	0.1	2	0.5	0.62	-	0.8	-	-	-	0.39	-	0.3	0.3	0.3	0.3	-	1
Bankfull Max Depth (ft)				0.7	0.8	0.8	0.9	0.1	2	0.8	0.9	-	1.2	-	-	-	0.59	-	0.7	0.7	0.7	0.7	-	1
Bankfull Cross Sectional Area (ft^2)	2.8			3.0	3.6	3.6	4.1	0.8	2	5.4	7.3	-	8	-	-	-	2.8	-	2.5	2.5	2.5	2.5	-	1
Width/Depth Ratio				8.8	10.4	10.4	11.9	2.2	2	12.3	18.8	-	19.6	-	-	-	18.7	-	21.1	21.1	21.1	21.1	-	1
Entrenchment Ratio				1.5	2.0	2.0	2.5	0.7	2	1.4	1.5	-	1.8	-	-	-	4.2	-	2.5	2.5	2.5	2.5	-	1
Bank Height Ratio				1.6	1.9	1.9	2.2	0.4	2	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	-	1
d50 (mm)				-	-	-	-	-	-	-	52	-		-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	0.5	12.6	10.7	60.6	10.9	24
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.008	-	0.005	0.026	0.025	0.061	0.014	24
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	1.3	3.3	2.9	9.0	1.5	23
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	0.89	-	0.8	1.3	1.3	1.7	0.2	23
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	21.9	-	13.3	21.0	18.5	63.1	10.1	23
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	17.8	26.7	27.9	33.4	7.4	4
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	11.0	-	16.0	8.7	10.2	9.8	12.1	1.4	6
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.4	1.3	1.7	0.2	1
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29.6	39.9	37.4	55.7	10.0	6
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	2.4	3.7	3.8	4.6	1.0	4
Substrate, Bed and Transport Parameters																								
Ri% / Ru% / P% / G% / S%				-						-									62% / 0% / 16% /11% /11%					
SC% / Sa% / G% / C% / B% / Be%				-						4% / 2% / 49% / 38% / 1% / 6%														
d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)				--/5/6/11/15						14 / 36 / 52 / 110 / 170 / - / -														
Reach Shear Stress (Competency) lb/ft^2				-						0.562						-			-					
Max Part Size (mm) Mobilized at Bankfull				-						947						32			-					
Stream Power (Transport Capacity) W/m^2				-						-						-								
Additional Reach Parameters																								
Drainage Area (mi^2)				0.05						0.42														
Impervious Cover Estimate (%)				-						-														
Rosgen Classification				G						B4c						B4			B4					
Bankfull Velocity (fps)	-			-						3.8						-								
Bankfull Discharge (cfs)	10.3			-						28.0						10								
Valley Length (ft)				-						260.0						531								
Channel Thalweg Length (ft)				-						-						550			559					
Sinuosity				-						1.50						1.0			1.05					
Water Surface Slope (ft/ft)				-						-						0.027			0.024					
Bankfull Slope (ft/ft)				-						-						-			0.026					
Bankfull Floodplain Area (acres)				-						-						-								
Proportion Over Wide (%)				-						-														
Entrenchment Class (ER Range)				-						-														
Incision Class (BHR Range)				-						-														
BEHI				20.47						-														
Channel Stability or Habitat Metric				-						-														
Biological or Other				-						-														

- Information unavailable.
Non-Applicable.

Table 10 cont'd. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Dale Branch 4 (835 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	4.01	5.5	6.0	6.0	6.5	0.7	2	9.8	11.7	-	13.1	-	-	-	6.1	-	6.3	6.4	6.4	6.5	0.14	2
Floodprone Width (ft)				6.5	7.8	7.8	9.0	1.8	2	16.0	18.0	-	21	-	-	-	-	-	22.0	33.1	33.1	44.2	15.7	2
Bankfull Mean Depth (ft)	-	-	0.67	0.8	0.8	0.8	0.8	0.0	2	0.5	0.62	-	0.8	-	-	-	0.47	-	0.3	0.4	0.4	0.5	0.14	2
Bankfull Max Depth (ft)				1.0	1.0	1.0	1.0	0.0	2	0.8	0.9	-	1.2	-	-	-	0.67	-	0.7	0.8	0.8	0.9	0.14	2
Bankfull Cross Sectional Area (ft^2)	3.9			4.1	4.6	4.6	5.0	0.6	2	5.4	7.3	-	8	-	-	-	2.9	-	1.9	2.5	2.5	3.1	0.85	2
Width/Depth Ratio				7.3	7.9	7.9	8.4	0.8	2	12.3	18.8	-	19.6	-	-	-	13.0	-	13.8	17.4	17.4	21.0	5.09	2
Entrenchment Ratio				1.2	1.3	1.3	1.4	0.1	2	1.4	1.5	-	1.8	-	-	-	4.1	-	3.5	5.2	5.2	6.8	2.33	2
Bank Height Ratio				3.3	3.5	3.5	3.7	0.3	2	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	0.0	2
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	7.8	17.8	14.5	68.7	12.3	31
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.002	-	0.003	0.018	0.016	0.048	0.009	31
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	1.5	3.2	2.9	12.5	2.1	30
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	1.01	-	0.1	1.4	1.4	2.1	0.3	33
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	19.6	-	14.4	26.0	22.2	77.4	13.7	31
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	16.7	18.7	18.0	22.2	2.5	4
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	9.0	-	14.0	9.3	13.1	13.6	16.4	2.9	6
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-		-	-	-	-	-	-	-	1.4	2.1	2.1	2.6	0.5	2
Meander Wavelength (ft)				-	-	-	-	-	-	-		-	-	-	-	-	-	-	34.4	45.9	39.9	62.7	12.5	6
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	2.6	2.9	2.8	3.5	0.4	4
Substrate, Bed and Transport Parameters																								
Ri% / Ru% / P% / G% / S%				-						-									68%/ 0%/ 12%/ 8%/ 11%					
SC% / Sa% / G% / C% / B% / Be%				-						4% / 2% / 49% / 38% / 1% / 6%														
d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)				--/5/6/11/15						14 / 36 / 52 / 110 / 170 / - / -														
Reach Shear Stress (Competency) lb/ft^2				-						0.562						-			-					
Max Part Size (mm) Mobilized at Bankfull				-						947						32			-					
Stream Power (Transport Capacity) W/m^2				-						-						-								
Additional Reach Parameters																								
Drainage Area (mi^2)				0.08						0.42														
Impervious Cover Estimate (%)				-						-														
Rosgen Classification				G						B4c						B4			B4					
Bankfull Velocity (fps)	-			-						3.8						-								
Bankfull Discharge (cfs)	14.45			-						28.0						14								
Valley Length (ft)				-						260.0						810								
Channel Thalweg Length (ft)				-						-						825			835					
Sinuosity				-						1.50						1.00			1.03					
Water Surface Slope (ft/ft)				-						-						0.028			0.024					
Bankfull Slope (ft/ft)				-						-						-			0.020					
Bankfull Floodplain Area (acres)				-						-						-								
Proportion Over Wide (%)				-						-														
Entrenchment Class (ER Range)				-						-														
Incision Class (BHR Range)				-						-														
BEHI				24.25						-														
Channel Stability or Habitat Metric				-						-														
Biological or Other				-						-														

- Information unavailable.
N/A - Item does not apply.
Non-Applicable.

Table 10 cont'd. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Dale Branch 5 (679 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design[1]			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	4.2	-	8.0	-	-	-	1	9.8	11.7	-	13.1	-	-	-	6.4	-	7.1	7.1	7.1	7.1	-	1
Floodprone Width (ft)				-	9.0	-	-	-	1	16.0	18.0	-	21	-	-	-	-	-	23.9	23.9	23.9	23.9	-	1
Bankfull Mean Depth (ft)	-	-	0.7	-	0.8	-	-	-	1	0.5	0.62	-	0.8	-	-	-	0.49	-	0.5	0.5	0.5	0.5	-	1
Bankfull Max Depth (ft)				-	1.0	-	-	-	1	0.8	0.9	-	1.2	-	-	-	0.69	-	0.7	0.7	0.7	0.7	-	1
Bankfull Cross Sectional Area (ft^2)	4.2			-	5.0	-	-	-	1	5.4	7.3	-	8	-	-	-	3.1	-	3.3	3.3	3.3	3.3	-	1
Width/Depth Ratio				-	12.9	-	-	-	1	12.3	18.8	-	19.6	-	-	-	13.1	-	15.2	15.2	15.2	15.2	-	1
Entrenchment Ratio				-	1.1	-	-	-	1	1.4	1.5	-	1.8	-	-	-	3.1	-	3.4	3.4	3.4	3.4	-	1
Bank Height Ratio				-	2.6	-	-	-	1	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	-	1
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	7.2	18.3	20.3	25.1	6.0	11
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.002	-	0.005	0.022	0.024	0.044	0.011	11
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	1.8	3.0	3.1	4.0	0.7	12
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	1.04	-	1.1	1.5	1.4	2.2	0.4	11
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	29.9	-	12.1	26.4	28.4	35.2	6.8	11
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	13.2	15.3	15.6	17.1	1.9	3
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	7.0	-	12.0	8.7	14.1	15.6	16.7	3.6	4
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	2.0	2.2	2.4	0.5	2
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47.9	56.4	54.8	67.7	7.2	6
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	1.9	2.2	2.2	2.4	0.3	3
Substrate, Bed and Transport Parameters																								
Ri% / Ru% / P% / G% / S%						-						-									68% / 0%/ 12%/ 13%/ 7%			
SC% / Sa% / G% / C% / B% / Be%						-						4% / 2% / 49% / 38% / 1% / 6%												
d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)						--/5/6/11/15						14 / 36 / 52 / 110 / 170 / - / -												
Reach Shear Stress (Competency) lb/ft^2						-						0.562					-				-			
Max Part Size (mm) Mobilized at Bankfull						-						947					32				-			
Stream Power (Transport Capacity) W/m^2						-						-					-							
Additional Reach Parameters																								
Drainage Area (mi^2)						0.09						0.42												
Impervious Cover Estimate (%)						-						-												
Rosgen Classification						F						B4c					B4				B4			
Bankfull Velocity (fps)		-				-						3.8					-							
Bankfull Discharge (cfs)		15.73				-						28.0					16							
Valley Length (ft)						-						260.0					695							
Channel Thalweg Length (ft)						-						-					725				679			
Sinuosity						-						1.50					1.0				0.977			
Water Surface Slope (ft/ft)						-						-					0.023				0.024			
Bankfull Slope (ft/ft)						-						-					-				0.024			
Bankfull Floodplain Area (acres)						-						-					-							
Proportion Over Wide (%)						-						-												
Entrenchment Class (ER Range)						-						-												
Incision Class (BHR Range)						-						-												
BEHI						23.1						-												
Channel Stability or Habitat Metric						-						-												
Biological or Other						-						-												

[1]Values taken from Subreach 5b

- Information unavailable.

Non-Applicable.

Table 10 con't. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Thompson Branch 1 (530 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	4.6	-	5.0	-	-	-	1	9.8	11.7	-	13.1	-	-	-	8.8	-	-	-	-	-	-	-
Floodprone Width (ft)				-	20.0	-	-	-	1	16.0	18.0	-	21.0	-	-	-	-	-	-	-	-	-	-	-	-
Bankfull Mean Depth (ft)	-	-	0.7	-	1.0	-	-	-	1	0.5	0.6	-	0.8	-	-	-	0.48	-	-	-	-	-	-	-
Bankfull Max Depth (ft)				-	1.3	-	-	-	1	0.8	0.9	-	1.2	-	-	-	0.73	-	-	-	-	-	-	-
Bankfull Cross Sectional Area (ft^2)	4.8			-	4.6	-	-	-	1	5.4	7.3	-	8.0	-	-	-	4.2	-	-	-	-	-	-	-
Width/Depth Ratio				-	5.5	-	-	-	1	12.3	18.8	-	19.6	-	-	-	18.6	-	-	-	-	-	-	-
Entrenchment Ratio				-	4.0	-	-	-	1	1.4	1.5	-	1.8	-	-	-	3.4	-	-	-	-	-	-	-
Bank Height Ratio				-	1.2	-	-	-	1	0.9	1.0	-	1.4	-	-	-	-	-	-	-	-	-	-	-
d50 (mm)				-	-	-	-	-	-	-	52	-		-	-	-	-	-	-	-	-	-	-	-
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	44.7	44.7	44.7	44.7	-	1
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	-	-	0.006	0.006	0.006	0.006	-	1
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	9.6	20.6	17.0	35.0	11.6	6
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	1.1	-	1.6	2.0	1.9	2.3	0.3	7
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	28.6	-	11.0	22.3	18.3	36.5	11.2	6
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	19.0	26.1	22.9	36.4	9.1	3
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	13.0	-	19.0	12.3	13.1	13.2	13.7	0.7	3
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.5	1.5	1.6	0.1	1
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60.7	94.7	81.4	155.2	44.0	4
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	3	-	2.2	3.0	2.6	4.1	1.0	3
Substrate, Bed and Transport Parameters																								
Ri% / Ru% / P% / G% / S%						-						-									25% / 0% / 69% / 0% / 6%			
SC% / Sa% / G% / C% / B% / Be%						-						4% / 2% / 49% / 38% / 1% / 6%												
d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)						4 / 6 /8 /15 / 24						14 / 36 / 52 / 110 / 170 / - / -												
Reach Shear Stress (Competency) lb/ft^2						-						0.562					-				-			
Max Part Size (mm) Mobilized at Bankfull						-						947					37				-			
Stream Power (Transport Capacity) W/m^2						-						-					-							
Additional Reach Parameters																								
Drainage Area (mi^2)						0.11						0.42												
Impervious Cover Estimate (%)						-						-												
Rosgen Classification						G						B4c					B4				B4			
Bankfull Velocity (fps)		-				-						3.8					-							
Bankfull Discharge (cfs)		18.2				-						28.0					18							
Valley Length (ft)						-						260.0					294							
Channel Thalweg Length (ft)						-						-					511				530			
Sinuosity						-						1.50					1.0				1.06			
Water Surface Slope (ft/ft)						-						-					0.030				0.031			
Bankfull Slope (ft/ft)						-						-					-				0.030			
Bankfull Floodplain Area (acres)						-						-					-							
Proportion Over Wide (%)						-						-												
Entrenchment Class (ER Range)						-						-												
Incision Class (BHR Range)						-						-												
BEHI						30.9						-												
Channel Stability or Habitat Metric						-						-												
Biological or Other						-						-												

- Information unavailable.
Non-Applicable.

Table 10 cont'd. Baseline Stream Data Summary
Pee Dee Stream Restoration Site - Thompson Branch 2 (1,061 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	5.11	7.0	7.7	7.0	9.0	1.2	3	9.8	11.7	-	13.1	-	-	-	7.5	-	7.5	7.6	7.6	7.6	0.07	2
Floodprone Width (ft)				9.0	14.7	15.0	20.0	5.5	2	16.0	18.0	-	21.0	-	-	-	-	-	31.1	32.7	32.7	34.3	2.26	2
Bankfull Mean Depth (ft)	-	-	0.8	0.9	0.9	0.9	1.0	0.1	3	0.5	0.6	-	0.8	-	-	-	0.6	-	0.6	0.6	0.6	0.6	0	2
Bankfull Max Depth (ft)				1.1	1.1	1.1	1.2	0.1	3	0.8	0.9	-	1.2	-	-	-	0.78	-	1.1	1.2	1.2	1.2	0.07	2
Bankfull Cross Sectional Area (ft^2)	5.6			5.7	6.7	6.0	8.4	1.5	3	5.4	7.3	-	8.0	-	-	-	4.2	-	4.2	4.3	4.3	4.3	0.07	2
Width/Depth Ratio				8.1	8.8	8.5	9.7	0.8	3	12.3	18.8	-	19.6	-	-	-	13.5	-	13.3	13.4	13.4	13.4	0.07	2
Entrenchment Ratio				1.3	2.0	1.7	2.9	0.8	3	1.4	1.5	-	1.8	-	-	-	4.0	-	4.1	4.3	4.3	4.5	0.28	2
Bank Height Ratio				1.4	2.2	2.4	2.9	0.8	3	0.9	1.0	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	0.0	2
d50 (mm)				-	-	-	-	-	-		52	-		-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	10.0	15.8	15.2	25.4	3.9	32
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.008	-	0.005	0.014	0.013	0.023	0.005	32
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	1.8	5.0	4.6	18.3	3.0	32
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	1.17	-	1.4	2.1	2.0	2.6	0.3	32
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	26.2	-	19.5	27.5	25.9	54.0	7.4	32
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	14.4	22.4	19.5	37.8	8.2	6
Radius of Curvature (ft)				-	-	-	-	-	-	-	18.0	-	-	-	-	12.0	-	18.0	10.5	18.3	18.5	25.9	6.7	4
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-		-	-	-	-	-	-	-	1.4	2.4	2.5	3.5	0.9	2
Meander Wavelength (ft)				-	-	-	-	-	-	-		-	-	-	-	-	-	-	34.3	48.7	50.5	60.9	9.8	6
Meander Width Ratio				-	-	-	-	-	-	-	1.8	-	-	-	-	-	3	-	2.2	3.0	2.6	4.1	1.0	3
Substrate, Bed and Transport Parameters																								
Ri% / Ru% / P% / G% / S%				-						-									57% / 0% / 18% / 11% / 14%					
SC% / Sa% / G% / C% / B% / Be%				-						4% / 2% / 49% / 38% / 1% / 6%														
d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)				4 / 6 / 8 / 15 /24						14 / 36 / 52 / 110 / 170 / - / -														
Reach Shear Stress (Competency) lb/ft^2				-						0.562						-			-					
Max Part Size (mm) Mobilized at Bankfull				-						947						37			-					
Stream Power (Transport Capacity) W/m^2				-						-						-								
Additional Reach Parameters																								
Drainage Area (mi^2)				0.14						0.42														
Impervious Cover Estimate (%)				-						-														
Rosgen Classification				G						B4c						B4			B4					
Bankfull Velocity (fps)	-			-						3.8						-								
Bankfull Discharge (cfs)	21.6			-						28.0						22								
Valley Length (ft)				-						260.0						1,010								
Channel Thalweg Length (ft)				-						-						1,150			1,061					
Sinuosity				-						1.50						1.1			1.05					
Water Surface Slope (ft/ft)				-						-						0.020			0.020					
Bankfull Slope (ft/ft)				-						-						0.022			0.022					
Bankfull Floodplain Area (acres)				-						-						-								
Proportion Over Wide (%)				-						-														
Entrenchment Class (ER Range)				-						-														
Incision Class (BHR Range)				-						-														
BEHI				29.8						-														
Channel Stability or Habitat Metric				-						-														
Biological or Other				-						-														

- Information unavailable.
Non-Applicable.

Appendix D. Table 11a. - Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross Sections)
Pee Dee Stream Restoration Site - Jerry Branch

	Reach 1 Cross-Section 1 Pool								Reach 1 Cross-Section 2 Riffle								Reach 2 Cross-Section 3 Pool								Reach 2 Cross-Section 4 Riffle							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record elevation (datum) used[1]	320.1	320.1	320.1	320.1	---	N/A	---		319.6	319.6	319.6	319.6	---	319.71	---		312.9	312.9	312.9	312.9	---	N/A	---		310.6	310.6	310.6	310.6	---	310.67	---	
Bankfull Width (ft)[1]	9.1	8.3	8.3	8.2	---	N/A	---		8.1	7.0	6.7	6.9	---	8.6	---		7.8	8.1	8.1	9.8	---	N/A	---		7.1	7.2	7.2	7.7	---	7.3	---	
Floodprone Width (ft)[1]	>25	>25	>25	>25	---	N/A	---		>30	>30	>30	>30	---	>29.9	---		>30	>30	>30	>30	---	N/A	---		>25	>25	>25	>25	---	21.6	---	
Bankfull Mean Depth (ft)	0.9	0.8	0.8	0.8	---	---	---		0.5	0.3	0.4	0.4	---	---	---		1.1	1.0	1.1	1.0	---	---	---		0.4	0.4	0.4	0.3	---	---	---	
Bankfull Max Depth (ft)[2]	1.7	1.3	1.2	1.2	---	1.7	---		1.0	0.5	0.6	0.6	---	0.8	---		2.3	2	2.2	2.1	---	2.1	---		0.7	0.6	0.6	0.6	---	0.7	---	
Low Bank Elevation	-	-	-	-	---	320.33	---		-	-	-	-	---	319.68	---		-	-	-	-	---	312.68	---		-	-	-	-	---	310.63	---	
Bankfull Cross Sectional Area (ft^2)[2]	8.5	6.8	6.9	6.6	---	10.2	---		3.7	2.4	2.6	2.7	---	3.5	---		8.3	7.7	8.7	9.4	---	10.1	---		3.1	3.0	2.7	2.6	---	2.8	---	
Bankfull Width/Depth Ratio	9.8	10.1	9.9	10.1	---	---	---		17.7	20.3	17.5	17.6	---	---	---		7.4	8.4	7.6	10.2	---	---	---		16.4	17	19.4	22.6	---	---	---	
Bankfull Entrenchment Ratio[1]	>2.7	>3.0	>3.0	N/A	---	N/A	---		>3.7	>4.3	>4.5	4.0	---	>3.5	---		>3.8	>3.7	>3.7	N/A	---	N/A	---		>3.5	>3.5	>3.5	3.2	---	3	---	
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	N/A	---	N/A	---		1.0	1.0	1.0	1.0	---	1	---		1.0	1.0	1.0	N/A	---	N/A	---		1.0	1.0	1.0	0.9	---	<1	---	
d50 (mm)	N/A	N/A	N/A	N/A	---	N/A	---		N/A	0.2	0.062	12.0	---	12	---		N/A	N/A	N/A	N/A	---	N/A	---		N/A	22	5.2	12.0	---	22	---	

	Reach 3 Cross-Section 5 Pool								Reach 3 Cross-Section 6 Riffle								Reach 3 Cross-Section 7 Riffle							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record elevation (datum) used[1]	301.7	301.7	301.7	301.7	---	N/A	---		298.8	298.8	298.8	298.8	---	299.26	---		290.2	290.2	290.2	290.2	---	290.45	---	
Bankfull Width (ft)[1]	8.1	9.2	9.7	9.4	---	N/A	---		7.4	7.5	7.3	6.9	---	12	---		7.2	6.7	6.4	6.2	---	7.4	---	
Floodprone Width (ft)[1]	>25	>25	>25	>25	---	N/A	---		>30	>30	>30	>30	---	>33.8	---		>25	>25	>25	>25	---	23.7	---	
Bankfull Mean Depth (ft)	1.0	0.7	0.7	0.7	---	---	---		0.4	0.4	0.4	0.4	---	---	---		0.4	0.3	0.4	0.4	---	---	---	
Bankfull Max Depth (ft)[2]	1.8	1.3	1.3	1.4	---	0.9	---		0.9	0.6	0.6	0.6	---	0.5	---		0.8	0.5	0.5	0.5	---	0.5	---	
Low Bank Elevation	-	-	-	-	---	301.09	---		-	-	-	-	---	299.19	---		-	-	-	-	---	290.29	---	
Bankfull Cross Sectional Area (ft^2)[2]	7.9	6.3	6.8	6.9	---	3.2	---		3.3	3.3	2.9	2.4	---	2.5	---		3.0	2.3	2.4	2.2	---	2	---	
Bankfull Width/Depth Ratio	8.3	13.3	13.7	13.0	---	---	---		16.6	16.7	18.7	19.4	---	---	---		17.7	19.4	17.0	17.4	---	---	---	
Bankfull Entrenchment Ratio[1]	>3.1	>2.7	>2.6	N/A	---	N/A	---		>4.1	>4.0	>4.1	4.4	---	>2.8	---		>3.4	>3.7	>3.9	4.0	---	3.2	---	
Bankfull Bank Height Ratio[1]	N/A	N/A	N/A	N/A	---	N/A	---		1.0	1.0	1.0	1.0	---	<1	---		1.0	1.0	1.0	0.9	---	<1	---	
d50 (mm)	N/A	N/A	N/A	N/A	---	N/A	---		N/A	5.5	14.0	52.0	---	17	---		N/A	34.0	15.0	27.0	---	16	---	

N/A - Information Not Available

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Appendix D. Table 11a. cont'd - Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross Sections)
Pee Dee Stream Restoration Site - Dale Branch

	Reach 2 Cross-Section 8 Riffle								Reach 2 Cross-Section 9 Pool								Reach 2 Cross-Section 10 Riffle								Reach 2 Cross-Section 11 Pool							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record elevation (datum) used[1]	354.94	354.94	354.94	354.94	---	354.96	---		354.7	354.7	354.7	354.7	---	N/A	---		348.1	348.1	348.1	348.1	---	348.06	---		347.4	347.4	347.4	347.4	---	N/A	---	
Bankfull Width (ft)[1]	7.0	7.3	7.2	6.5	---	7.7	---		7.7	8.0	8.1	7.7	---	N/A	---		6.4	6.2	6.2	6.5	---	5.9	---		7.6	8	8.3	9.4	---	N/A	---	
Floodprone Width (ft)[1]	>25	>25	>25	>25	---	>24.5	---		>25	>25	>25	>25	---	N/A	---		>25	>25	>25	>25	---	15.2	---		>20	>20	>20	>20	---	N/A	---	
Bankfull Mean Depth (ft)	0.3	0.2	0.3	0.2	---	---	---		0.6	0.6	0.6	0.6	---	---	---		0.3	0.3	0.3	0.3	---	---	---		0.8	0.7	0.7	0.7	---	---	---	
Bankfull Max Depth (ft)[2]	0.7	0.5	0.5	0.5	---	0.6	---		1.7	1.5	1.7	1.5	---	1.5	---		0.5	0.5	0.5	0.6	---	0.5	---		1.6	1.2	1.3	1.3	---	1	---	
Low Bank Elevation	-	-	-	-	---	354.85	---		-	-	-	-	---	354.59	---		-	-	-	-	---	347.99	---		-	-	-	-	---	347.3	---	
Bankfull Cross Sectional Area (ft^2)[2]	2.0	1.7	2.0	1.6	---	1.3	---		4.8	4.8	5.0	5	---	4.2	---		1.8	1.6	1.7	1.8	---	1.4	---		6.1	5.9	6.0	6.7	---	4.6	---	
Bankfull Width/Depth Ratio	24.6	30.6	26.0	26.9	---	---	---		12.3	13.5	13.3	11.8	---	---	---		22.6	23.7	21.7	23.4	---	---	---		9.5	10.9	11.5	13.3	---	---	---	
Bankfull Entrenchment Ratio[1]	>3.6	>3.4	>3.5	3.9	---	>3.2	---		>3.1	>3.1	>3.1	N/A	---	N/A	---		>3.9	>4.0	>4.1	3.9	---	2.6	---		>2.6	>2.5	>2.4	N/A	---	N/A	---	
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	0.9	---	<1	---		1.0	1.0	1.0	N/A	---	N/A	---		1.0	1.0	1.0	0.9	---	<1	---		1.0	1.0	1.0	N/A	---	N/A	---	
d50 (mm)	N/A	8.0	8.3	7.1	---	16	---		N/A	N/A	N/A	N/A	---	N/A	---		N/A	19	4.3	25.0	---	41	---		N/A	N/A	N/A	N/A	---	N/A	---	

	Reach 3 Cross-Section 12 Riffle								Reach 3 Cross-Section 13 Pool								Reach 4 Cross-Section 14 Pool								Reach 4 Cross-Section 15 Riffle							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record elevation (datum) used[1]	327.8	327.8	327.8	327.8	---	327.77	---		326.1	326.1	326.1	326.1	---	N/A	---		315.3	315.3	315.3	315.3	---	N/A	---		314.1	314.1	314.1	314.1	---	313.88	---	
Bankfull Width (ft)[1]	7.3	7.1	7.1	7.8	---	5.4	---		7.8	7.6	7.7	8.3	---	N/A	---		6.7	7.2	7.0	5.8	---	N/A	---		6.5	6.2	6.5	6.8	---	5.4	---	
Floodprone Width (ft)[1]	>20	>20	>20	>20	---	17.7	---		>20	>20	>20	>20	---	N/A	---		>30	>30	>30	>30	---	N/A	---		>40	>40	>40	>40	---	>43.2	---	
Bankfull Mean Depth (ft)	0.3	0.3	0.4	0.4	---	---	---		0.5	0.5	0.4	0.4	---	---	---		0.9	0.6	0.7	0.8	---	---	---		0.5	0.5	0.5	0.5	---	---	---	
Bankfull Max Depth (ft)[2]	0.7	0.6	0.8	0.8	---	0.8	---		1.3	1.1	1.0	0.9	---	0.8	---		2.0	1.0	1.3	1.3	---	1.2	---		0.9	0.8	0.8	0.8	---	1.3	---	
Low Bank Elevation	-	-	-	-	---	327.84	---		-	-	-	-	---	325.82	---		-	-	-	-	---	315.2	---		-	-	-	-	---	314.19	---	
Bankfull Cross Sectional Area (ft^2)[2]	2.5	2.2	2.7	3.1	---	2.9	---		3.9	3.5	3.0	3.7	---	2.5	---		6.2	4.3	5.2	4.9	---	4.7	---		3.1	2.9	3.0	3.2	---	5	---	
Bankfull Width/Depth Ratio	21.1	23.1	18.7	19.3	---	---	---		15.7	16.7	19.7	18.5	---	---	---		7.1	12.1	9.5	7.0	---	---	---		13.8	13.2	14.2	14.7	---	---	---	
Bankfull Entrenchment Ratio[1]	>2.8	>2.8	>2.8	2.6	---	3.3	---		>2.6	>2.6	>2.6	N/A	---	N/A	---		>4.5	>4.2	>4.3	N/A	---	N/A	---		>6.1	>6.5	>6.2	5.9	---	>8	---	
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	0.5	---	1.1	---		1.0	1.0	1.0	N/A	---	N/A	---		1.0	1.0	1.0	N/A	---	N/A	---		1.0	1.0	1.0	1.0	---	1.3	---	
d50 (mm)	N/A	2.1	4.4	8.0	---	22	---		N/A	N/A	N/A	N/A	---	N/A	---		N/A	N/A	N/A	N/A	---	N/A	---		N/A	16.0	5.8	12.0	---	11	---	

	Reach 4 Cross-Section 16 Riffle								Reach 5 Cross-Section 17 Riffle								Reach 5 Cross-Section 18 Pool							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record elevation (datum) used[1]	303.5	303.5	303.5	303.5	---	303.57	---		286.8	286.8	286.8	286.8	---	286.8	---		286.6	286.6	286.6	286.6	---	N/A	---	
Bankfull Width (ft)[1]	6.3	7.2	7.6	6.7	---	6.4	---		7.1	7.9	7.9	9.1	---	7	---		7.2	8.0	7.7	7.4	---	N/A	---	
Floodprone Width (ft)[1]	>25	>25	>25	>25	---	17.5	---		>25	>25	>25	>25	---	>23.7	---		>25	>25	>25	>25	---	N/A	---	
Bankfull Mean Depth (ft)	0.3	0.3	0.4	0.3	---	---	---		0.5	0.5	0.5	0.4	---	---	---		0.8	0.7	0.7	0.7	---	---	---	
Bankfull Max Depth (ft)[2]	0.7	0.6	0.7	0.7	---	0.5	---		0.7	0.8	0.8	0.8	---	0.8	---		1.7	1.5	1.4	1.4	---	1.2	---	
Low Bank Elevation	-	-	-	-	---	303.55	---		-	-	-	-	---	286.9	---		-	-	-	-	---	286.59	---	
Bankfull Cross Sectional Area (ft^2)[2]	1.9	2.3	2.7	2.2	---	1.7	---		3.3	3.8	3.9	4.1	---	4	---		5.9	5.8	5.6	5.3	---	5.2	---	
Bankfull Width/Depth Ratio	21.0	23.0	20.9	19.9	---	---	---		15.2	16.2	16.3	20.6	---	---	---		8.7	11.0	10.7	10.4	---	---	---	
Bankfull Entrenchment Ratio[1]	>4.0	>3.5	>3.3	3.8	---	2.7	---		>3.5	>3.2	>3.2	2.7	---	>3.4	---		>3.5	>3.1	>3.2	N/A	---	N/A	---	
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	0.9	---	1	---		1.0	1.0	1.0	1.2	---	1.1	---		1.0	1.0	1.0	N/A	---	N/A	---	
d50 (mm)	N/A	26.0	4.7	16.0	---	25	---		N/A	33.0	16.0	32.0	---	24	---		N/A	N/A	N/A	N/A	---	N/A	---	

N/A - Information Not Available

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Appendix D. Table 11a. cont'd - Monitoring Data - Dimensional Morphology Summary
(Dimensional Parameters - Cross Sections)
Pee Dee Stream Restoration Site -Thompson Branch

	Reach 2 Cross-Section 19 Pool								Reach 2 Cross-Section 20 Riffle								Reach 2 Cross-Section 21 Pool								Reach 2 Cross-Section 22 Riffle							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record elevation (datum) used[1]	364.1	364.1	364.1	364.1	---	N/A	---		363.2	363.2	363.2	363.2	---	363.17	---		356.0	356.0	356.0	356.0	---	N/A	---		356.0	356.0	356.0	356.0	---	356	---	
Bankfull Width (ft)[1]	8.4	9.2	9.2	7.8	---	N/A	---		7.5	7.7	7.6	8.4	---	8.4	---		8.6	9.1	9.2	10.2	---	N/A	---		7.6	7.7	7.7	7.8	---	8.9	---	
Floodprone Width (ft)[1]	>30	>30	>30	>30	---	N/A	---		>30	>30	>30	>30	---	25	---		>30	>30	>30	>30	---	N/A	---		>30	>30	>30	>30	---	33.3	---	
Bankfull Mean Depth (ft)	1.0	0.9	0.8	1.0	---	---	---		0.6	0.6	0.6	0.6	---	---	---		1.0	0.8	0.8	0.8	---	---	---		0.6	0.6	0.6	0.6	---	---	---	
Bankfull Max Depth (ft)[2]	2.1	1.7	1.5	1.5	---	1.3	---		1.2	0.9	0.9	0.9	---	0.8	---		2.3	1.7	1.7	1.6	---	1.2	---		1.1	1.0	1.1	1.1	---	0.8	---	
Low Bank Elevation	-	-	-	-	---	364.01	---		-	-	-	-	---	363.16	---		-	-	-	-	---	355.64	---		-	-	-	-	---	355.8	---	
Bankfull Cross Sectional Area (ft^2)[2]	8.8	8.1	7.0	7.7	---	7.3	---		4.2	4.4	4.4	4.8	---	4.1	---		8.5	7.5	7.8	8	---	4.9	---		4.3	4.4	4.4	4.4	---	2.8	---	
Bankfull Width/Depth Ratio	8.0	10.4	12.1	8.0	---	---	---		13.3	13.5	13.0	14.5	---	---	---		8.7	10.9	10.9	12.9	---	---	---		13.4	13.5	13.5	13.8	---	---	---	
Bankfull Entrenchment Ratio[1]	>3.6	>3.3	>3.3	N/A	---	N/A	---		>4.0	>3.9	>3.9	3.6	---	3	---		>3.5	>3.3	>3.2	N/A	---	N/A	---		>3.9	>3.9	>3.9	3.9	---	3.7	---	
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	N/A	---	N/A	---		1.0	1.0	1.0	1.0	---	1	---		1.0	1.0	1.0	N/A	---	N/A	---		1.0	1.0	1.0	1.0	---	<1	---	
d50 (mm)	N/A	N/A	N/A	N/A	---	N/A	---		N/A	0.2	9.9	47.0	---	28	---		N/A	N/A	N/A	N/A	---	N/A	---		N/A	29.0	30.0	53.0	---	23	---	

N/A - Information Not Available

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Table 11b. Monitoring Data - Stream Reach Data Summary
Pee Dee Stream Restoration - Jerry Branch 1 (430 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)[1]	8.1	8.1	8.1	8.1	N/A	1	7.0	7.0	7.0	7.0	N/A	1	6.7	6.7	6.7	6.7	N/A	1	6.9	6.9	6.9	6.9	N/A	1							8.60	8.60	8.60	8.60	N/A	1.00												
Floodprone Width (ft)[1]	31.8	31.8	31.8	31.8	N/A	1	30.0	30.0	30.0	30.0	N/A	1	30.0	30.0	30.0	30.0	N/A	1	30.0	30.0	30.0	30.0	N/A	1							>29.9	>29.9	>29.9	>29.9	N/A	1.00												
Bankfull Mean Depth (ft)	0.5	0.5	0.5	0.5	N/A	1	0.3	0.3	0.3	0.3	N/A	1	0.4	0.4	0.4	0.4	N/A	1	0.4	0.4	0.4	0.4	N/A	1							---	---	---	---	---	---												
Bankfull Max Depth (ft)[2]	1.0	1.0	1.0	1.0	N/A	1	0.5	0.5	0.5	0.5	N/A	1	0.6	0.6	0.6	0.6	N/A	1	0.6	0.6	0.6	0.6	N/A	1							0.80	0.80	0.80	0.80	N/A	1.00												
Bankfull Cross Sectional Area (ft^2)[2]	3.7	3.7	3.7	3.7	N/A	1	2.4	2.4	2.4	2.4	N/A	1	2.6	2.6	2.6	2.6	N/A	1	2.7	2.7	2.7	2.7	N/A	1							3.50	3.50	3.50	3.50	N/A	1.00												
Bankfull Width/Depth Ratio	17.7	17.7	17.7	17.7	N/A	1	20.3	20.3	20.3	20.3	N/A	1	17.5	17.5	17.5	17.5	N/A	1	17.6	17.6	17.6	17.6	N/A	1							---	---	---	---	---	---												
Bankfull Entrenchment Ratio[1]	3.9	3.9	3.9	3.9	N/A	1	4.3	4.3	4.3	4.3	N/A	1	4.5	4.5	4.5	4.5	N/A	1	4.0	4.0	4.0	4.0	N/A	1							>3.5	>3.5	>3.5	>3.5	N/A	1.00												
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1							1.00	1.00	1.00	1.00	N/A	1.00												
Profile																																															
Riffle Length (ft)	2.6	6.2	6.2	16.4	2.8	26																																									
Riffle Slope (ft/ft)	0.001	0.010	0.009	0.026	0.0	26																																									
Pool Length (ft)	2.3	5.9	5.4	16.0	2.9	26																																									
Pool Max Depth (ft)	0.7	1.5	1.5	2.3	0.4	26																																									
Pool Spacing (ft)	6.1	15.0	14.2	27.8	5.1	25																																									
Pattern																																															
Channel Belt Width (ft)	14.0	19.2	19.2	24.4	7.3	2																																									
Radius of Curvature (ft)	11.6	13.6	13.1	16.5	2.2	4																																									
Rc: Bankfull Width (ft/ft)	1.4	1.7	1.6	2.0	0.3	2																																									
Meander Wavelength (ft)	23.8	44.4	47.1	55.0	11.9	6																																									
Meander Width Ratio	1.7	2.4	2.4	3.0	0.9	2																																									
Additional Reach Parameters																																															
Rosgen Classification	B4																																														
Channel Thalweg Length (ft)	430																																														
Sinuosity (ft)	1.06																																														
Water Surface Slope (Channel) (ft/ft)	0.0265																																														
Bankfull Slope (ft/ft)	0.0267																																														
Ri% / Ru% / P% / G% / S%	42%	0%	40%	7%	11%																																									

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Table 11b cont'd. Monitoring Data - Stream Reach Data Summary
Pee Dee Stream Restoration Site - Jerry Branch 2 (625 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)[1]	7.1	7.1	7.1	7.1	N/A	1	7.2	7.2	7.2	7.2	N/A	1	7.2	7.2	7.2	7.2	N/A	1	7.7	7.7	7.7	7.7	N/A	1							7.3	7.3	7.3	7.3	N/A	1.00												
Floodprone Width (ft)[1]	16.0	16.0	16.0	16.0	N/A	1	25.0	25.0	25.0	25.0	N/A	1	25.0	25.0	25.0	25.0	N/A	1	25.0	25.0	25.0	25.0	N/A	1							21.6	21.6	21.6	21.6	N/A	1.00												
Bankfull Mean Depth (ft)	0.4	0.4	0.4	0.4	N/A	1	0.4	0.4	0.4	0.4	N/A	1	0.4	0.4	0.4	0.4	N/A	1	0.3	0.3	0.3	0.3	N/A	1							---	---	---	---	N/A	1.00												
Bankfull Max Depth (ft)[2]	0.7	0.7	0.7	0.7	N/A	1	0.6	0.6	0.6	0.6	N/A	1	0.6	0.6	0.6	0.6	N/A	1	0.6	0.6	0.6	0.6	N/A	1							0.7	0.7	0.7	0.7	N/A	1.00												
Bankfull Cross Sectional Area (ft^2)[2]	3.1	3.1	3.1	3.1	N/A	1	3.0	3.0	3.0	3.0	N/A	1	2.7	2.7	2.7	2.7	N/A	1	2.6	2.6	2.6	2.6	N/A	1							2.8	2.8	2.8	2.8	N/A	1.00												
Bankfull Width/Depth Ratio	16.4	16.4	16.4	16.4	N/A	1	17.0	17.0	17.0	17.0	N/A	1	19.4	19.4	19.4	19.4	N/A	1	22.6	22.6	22.6	22.6	N/A	1							---	---	---	---	N/A	1.00												
Bankfull Entrenchment Ratio[1]	2.3	2.3	2.3	2.3	N/A	1	3.5	3.5	3.5	3.5	N/A	1	3.5	3.5	3.5	3.5	N/A	1	3.2	3.2	3.2	3.2	N/A	1							3.0	3.0	3.0	3.0	N/A	1.00												
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1	0.9	0.9	0.9	0.9	N/A	1							<1	<1	<1	<1	N/A	1.00												
Profile																																															
Riffle Length (ft)	3.1	9.0	8.7	26.5	4.5	29																																									
Riffle Slope (ft/ft)	0.005	0.019	0.018	0.042	0.010	29																																									
Pool Length (ft)	2.3	4.8	4.7	7.8	1.5	31																																									
Pool Max Depth (ft)	0.9	1.5	1.5	2.2	0.3	29																																									
Pool Spacing (ft)	12.0	18.0	16.8	36.2	5.1	30																																									
Pattern																																															
Channel Belt Width (ft)	13.4	20.3	22.4	25.6	5.1	6																																									
Radius of Curvature (ft)	12.1	13.4	12.7	16.5	1.8	5																																									
Rc: Bankfull Width (ft/ft)	1.70	1.9	1.8	2.3	0.2	2																																									
Meander Wavelength (ft)	18.5	30.0	30.6	38.1	6.6	6																																									
Meander Width Ratio	1.9	2.9	3.2	3.6	0.7	6																																									
Additional Reach Parameters																																															
Rosgen Classification	B4																																														
Channel Thalweg Length (ft)	625																																														
Sinuosity (ft)	1.29																																														
Water Surface Slope (Channel) (ft/ft)	0.024																																														
Bankfull Slope (ft/ft)	0.024																																														
Ri% / Ru% / P% / G% / S%	47%	0%	27%	12%	14%																																									

N/A - Information does not apply.

Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Table 11b cont'd. Monitoring Data - Stream Reach Data Summary
Pee Dee Stream Restoration Site - Jerry Branch 3 (636 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)[1]	7.2	7.3	7.3	7.4	0.1	2	6.7	7.1	7.1	7.5	0.6	2	6.4	6.9	6.9	7.3	0.6	2	6.2	6.6	6.6	6.9	0.5	2							7.4	9.7	9.7	12.0	3.3	2.0												
Floodprone Width (ft)[1]	24.7	29.3	29.3	33.8	6.4	2	25.0	27.5	27.5	30.0	3.5	2	25.0	27.5	27.5	30.0	3.5	2	25.0	27.5	27.5	30.0	3.5	2							23.7	28.8	28.8	33.8	7.1	2.0												
Bankfull Mean Depth (ft)	0.4	0.4	0.4	0.4	0.0	2	0.3	0.4	0.4	0.4	0.1	2	0.4	0.4	0.4	0.4	0.0	2	0.4	0.4	0.4	0.4	0.0	2							---	---	---	---	---	---												
Bankfull Max Depth (ft)[2]	0.8	0.9	0.9	0.9	0.1	2	0.5	0.6	0.6	0.6	0.1	2	0.5	0.6	0.6	0.6	0.0	2	0.5	0.6	0.6	0.6	0.1	2							0.5	0.5	0.5	0.5	0.0	2.0												
Bankfull Cross Sectional Area (ft^2)[2]	3.0	3.2	3.2	3.3	0.2	2	2.3	2.8	2.8	3.3	0.7	2	2.4	2.6	2.6	2.9	0.3	2	2.2	2.3	2.3	2.4	0.1	2							2.0	2.3	2.3	2.5	0.4	2.0												
Bankfull Width/Depth Ratio	16.6	17.2	17.2	17.7	0.8	2	16.7	18.1	18.1	19.4	1.9	2	17.0	17.9	17.9	18.7	1.2	2	17.4	18.4	18.4	19.4	1.4	2							---	---	---	---	---	---												
Bankfull Entrenchment Ratio[1]	3.4	4.0	4.0	4.6	0.8	2	3.7	3.9	3.9	4.0	0.2	2	3.9	4.0	4.0	4.1	0.1	2	4.0	4.2	4.2	4.4	0.3	2							2.8	3.0	3.0	3.2	0.3	2.0												
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2							1.0	1.0	1.0	1.0	0.0	2.0												
Profile																																																
Riffle Length (ft)	3.1	9.0	8.7	26.5	4.5	29																																									
Riffle Slope (ft/ft)	0.00	0.019	0.018	0.042	0.010	29																																									
Pool Length (ft)	2.3	4.8	4.7	7.8	1.5	31																																									
Pool Max Depth (ft)	0.9	1.5	1.5	2.2	0.3	29																																									
Pool Spacing (ft)	12.0	18.0	16.8	36.2	5.1	30																																									
Pattern																																															
Channel Belt Width (ft)	20.0	24.2	26.0	26.5	3.6	3																																									
Radius of Curvature (ft)	9.2	12.1	10.6	17.0	2.8	7																																									
Rc: Bankfull Width (ft/ft)	1.3	1.7	1.5	2.3	0.4	2																																									
Meander Wavelength (ft)	34.1	43.9	44.8	54.4	8.1	6																																									
Meander Width Ratio	2.7	3.3	3.6	3.6	0.5	3																																									
Additional Reach Parameters																																															
Rosgen Classification	B4																																														
Channel Thalweg Length (ft)	636																																														
Sinuosity (ft)	1.02																																														
Water Surface Slope (Channel) (ft/ft)	0.0235																																														
Bankfull Slope (ft/ft)	0.0239																																														
Ri% / Ru% / P% / G% / S%	60%	0%	21%	10%	9%																																									

N/A - Information does not apply.

Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Table 11b cont'd. Monitoring Data - Stream Reach Data Summary
Pee Dee Stream Restoration Site - Dale Branch 2 (920 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)[1]	6.4	6.7	6.7	7.0	0.4	2	6.2	6.8	6.8	7.3	0.8	2	6.2	6.7	6.7	7.2	0.7	2	6.5	6.5	6.5	6.5	0.0	2							5.9	6.8	6.8	7.7	1.3	2.0												
Floodprone Width (ft)[1]	15.1	19.5	19.5	23.9	6.2	2	25.0	25.0	25.0	25.0	0.0	2	25.0	25.0	25.0	25.0	0.0	2	25.0	25.0	25.0	25.0	0.0	2							15.2	19.9	19.9	24.5	6.6	2.0												
Bankfull Mean Depth (ft)	0.3	0.3	0.3	0.3	0.0	2	0.2	0.3	0.3	0.3	0.1	2	0.3	0.3	0.3	0.3	0.0	2	0.2	0.3	0.3	0.3	0.1	2							---	---	---	---	---	---												
Bankfull Max Depth (ft)[2]	0.5	0.6	0.6	0.7	0.1	2	0.5	0.5	0.5	0.5	0.0	2	0.5	0.5	0.5	0.5	0.0	2	0.5	0.6	0.6	0.6	0.1	2							0.5	0.6	0.6	0.6	0.1	2.0												
Bankfull Cross Sectional Area (ft^2)[2]	1.8	1.9	1.9	2.0	0.1	2	1.6	1.7	1.7	1.7	0.1	2	1.7	1.9	1.9	2.0	0.2	2	1.6	1.7	1.7	1.8	0.1	2							1.3	1.4	1.4	1.4	0.1	2.0												
Bankfull Width/Depth Ratio	22.6	23.6	23.6	24.6	1.4	2	23.7	27.2	27.2	30.6	4.9	2	21.7	23.9	23.9	26.0	3.0	2	23.4	25.2	25.2	26.9	2.5	2							---	---	---	---	---	---												
Bankfull Entrenchment Ratio[1]	2.4	2.9	2.9	3.4	0.7	2	3.3	3.7	3.7	4.0	0.5	2	3.5	3.8	3.8	4.1	0.4	2	3.9	3.9	3.9	3.9	0.0	2							2.6	2.9	2.9	3.2	0.4	2.0												
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2	0.9	0.9	0.9	0.9	0.0	2							1.0	1.0	1.0	1.0	0.0	2.0												
Profile																																															
Riffle Length (ft)	3.2	10.1	9.0	21.3	4.8	28																																									
Riffle Slope (ft/ft)	0.007	0.027	0.027	0.046	0.011	28																																									
Pool Length (ft)	1.5	3.2	2.9	9.6	1.6	29																																									
Pool Max Depth (ft)	1.1	1.6	1.4	2.8	0.5	28																																									
Pool Spacing (ft)	9.4	19.7	19.3	31.4	4.9	28																																									
Pattern																																															
Channel Belt Width (ft)	18.0	20.6	19.0	24.4	3.1	5																																									
Radius of Curvature (ft)	8.2	13.8	14.7	16.7	3.4	5																																									
Rc: Bankfull Width (ft/ft)	1.2	2.1	2.2	2.5	0.5	5																																									
Meander Wavelength (ft)	33.1	38.9	39.6	41.5	3.1	6																																									
Meander Width Ratio	2.7	3.1	2.8	3.6	0.9	6																																									
Additional Reach Parameters																																															
Rosgen Classification	B4																																														
Channel Thalweg Length (ft)	920																																														
Sinuosity (ft)	1.03																																														
Water Surface Slope (Channel) (ft/ft)	0.029																																														
Bankfull Slope (ft/ft)	0.028																																														
Ri% / Ru% / P% / G% / S%	50%	7%	16%	10%	17%																																									

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Table 11b cont'd. Monitoring Data - Stream Reach Data Summary
Pee Dee Stream Restoration Site - Dale Branch 3 (559 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)[1]	7.3	7.3	7.3	7.3	N/A	1	7.1	7.1	7.1	7.1	N/A	1	7.1	7.1	7.1	7.1	N/A	1	7.8	7.8	7.8	7.8	N/A	1							5.40	5.40	5.40	5.40	N/A	1.00												
Floodprone Width (ft)[1]	18.5	18.5	18.5	18.5	N/A	1	20.0	20.0	20.0	20.0	N/A	1	20.0	20.0	20.0	20.0	N/A	1	20.0	20.0	20.0	20.0	N/A	1							17.70	17.70	17.70	17.70	N/A	1.00												
Bankfull Mean Depth (ft)	0.3	0.3	0.3	0.3	N/A	1	0.3	0.3	0.3	0.3	N/A	1	0.4	0.4	0.4	0.4	N/A	1	0.4	0.4	0.4	0.4	N/A	1							---	---	---	---	---	---												
Bankfull Max Depth (ft)[2]	0.7	0.7	0.7	0.7	N/A	1	0.6	0.6	0.6	0.6	N/A	1	0.8	0.8	0.8	0.8	N/A	1	0.8	0.8	0.8	0.8	N/A	1							0.80	0.80	0.80	0.80	N/A	1.00												
Bankfull Cross Sectional Area (ft^2)[2]	2.5	2.5	2.5	2.5	N/A	1	2.2	2.2	2.2	2.2	N/A	1	2.7	2.7	2.7	2.7	N/A	1	3.1	3.1	3.1	3.1	N/A	1							2.90	2.90	2.90	2.90	N/A	1.00												
Bankfull Width/Depth Ratio	21.1	21.1	21.1	21.1	N/A	1	23.1	23.1	23.1	23.1	N/A	1	18.7	18.7	18.7	18.7	N/A	1	19.3	19.3	19.3	19.3	N/A	1							---	---	---	---	---	---												
Bankfull Entrenchment Ratio[1]	2.5	2.5	2.5	2.5	N/A	1	2.8	2.8	2.8	2.8	N/A	1	2.8	2.8	2.8	2.8	N/A	1	2.6	2.6	2.6	2.6	N/A	1							3.30	3.30	3.30	3.30	N/A	1.00												
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1	0.5	0.5	0.5	0.5	N/A	1							1.10	1.10	1.10	1.10	N/A	1.00												
Profile																																															
Riffle Length (ft)	0.5	12.6	10.7	60.6	10.9	24																																									
Riffle Slope (ft/ft)	0.005	0.026	0.025	0.061	0.014	24																																									
Pool Length (ft)	1.3	3.3	2.9	9.0	1.5	23																																									
Pool Max Depth (ft)	0.8	1.3	1.3	1.7	0.2	23																																									
Pool Spacing (ft)	13.3	21.0	18.5	63.1	10.1	23																																									
Pattern																																															
Channel Belt Width (ft)	17.8	26.7	27.9	33.4	7.4	4																																									
Radius of Curvature (ft)	8.7	10.2	9.8	12.1	1.4	6																																									
Rc: Bankfull Width (ft/ft)	1.2	1.4	1.3	1.7	0.2	1																																									
Meander Wavelength (ft)	29.6	39.9	37.4	55.7	10.0	6																																									
Meander Width Ratio	2.4	3.7	3.8	4.6	1.0	4																																									
Additional Reach Parameters																																															
Rosgen Classification	B4																																														
Channel Thalweg Length (ft)	559																																														
Sinuosity (ft)	1.05																																														
Water Surface Slope (Channel) (ft/ft)	0.024																																														
Bankfull Slope (ft/ft)	0.026																																														
Ri% / Ru% / P% / G% / S%	62%	0%	16%	11%	11%																																									

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Table 11b cont'd. Monitoring Data - Stream Reach Data Summary
Pee Dee Stream Restoration Site - Dale Branch 4 (835 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)[1]	6.3	6.4	6.4	6.5	0.1	2	6.2	6.7	6.7	7.2	0.7	2	6.5	7.0	7.0	7.6	0.7	2	6.7	6.8	6.8	6.8	0.1	2							5.40	5.90	5.90	6.40	0.71	2.00												
Floodprone Width (ft)[1]	22.0	33.1	33.1	44.2	15.7	2	25.0	32.5	32.5	40.0	10.6	2	25.0	32.5	32.5	40.0	10.6	2	25.0	32.5	32.5	40.0	10.6	2							17.50	30.35	30.35	43.20	18.17	2.00												
Bankfull Mean Depth (ft)	0.3	0.4	0.4	0.5	0.1	2	0.3	0.4	0.4	0.5	0.1	2	0.4	0.4	0.4	0.5	0.1	2	0.3	0.4	0.4	0.5	0.1	2							---	---	---	---	---	---												
Bankfull Max Depth (ft)[2]	0.7	0.8	0.8	0.9	0.1	2	0.6	0.7	0.7	0.8	0.1	2	0.7	0.8	0.8	0.8	0.0	2	0.7	0.8	0.8	0.8	0.1	2							0.50	0.90	0.90	1.30	0.57	2.00												
Bankfull Cross Sectional Area (ft^2)[2]	1.9	2.5	2.5	3.1	0.8	2	2.3	2.6	2.6	2.9	0.4	2	2.7	2.9	2.9	3.0	0.2	2	2.2	2.7	2.7	3.2	0.7	2							1.70	3.35	3.35	5.00	2.33	2.00												
Bankfull Width/Depth Ratio	13.8	17.4	17.4	21.0	5.1	2	13.2	18.1	18.1	23.0	6.9	2	14.2	17.5	17.5	20.9	4.7	2	14.7	17.3	17.3	19.9	3.7	2							---	---	---	---	---	---												
Bankfull Entrenchment Ratio[1]	3.5	5.2	5.2	6.8	2.3	2	3.5	4.9	4.9	6.2	1.9	2	3.3	4.7	4.7	6.2	2.0	2	3.8	4.9	4.9	5.9	1.5	2							2.70	5.35	5.35	8.00	3.75	2.00												
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2	0.9	1.0	1.0	1.0	0.1	2							1.00	1.15	1.15	1.30	0.21	2.00												
Profile																																															
Riffle Length (ft)	7.8	17.8	14.5	68.7	12.3	31																																									
Riffle Slope (ft/ft)	0.003	0.018	0.016	0.048	0.009	31																																									
Pool Length (ft)	1.5	3.2	2.9	12.5	2.1	30																																									
Pool Max Depth (ft)	0.1	1.4	1.4	2.1	0.3	33																																									
Pool Spacing (ft)	14.4	26.0	22.2	77.4	13.7	31																																									
Pattern																																															
Channel Belt Width (ft)	16.7	18.7	18.0	22.2	2.5	4																																									
Radius of Curvature (ft)	9.3	13.1	13.6	16.4	2.9	6																																									
Rc: Bankfull Width (ft/ft)	1.4	2.1	2.1	2.6	0.5	2																																									
Meander Wavelength (ft)	34.4	45.9	39.9	62.7	12.5	6																																									
Meander Width Ratio	2.6	2.9	2.8	3.5	0.4	4																																									
Additional Reach Parameters																																															
Rosgen Classification	B4																																														
Channel Thalweg Length (ft)	835																																														
Sinuosity (ft)	1.03																																														
Water Surface Slope (Channel) (ft/ft)	0.024																																														
Bankfull Slope (ft/ft)	0.020																																														
Ri% / Ru% / P% / G% / S%	68%	0%	12.0%	8%	11%																																									

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Table 11b cont'd. Monitoring Data - Stream Reach Data Summary
Pee Dee Stream Restoration Site - Dale Branch 5 (679 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)[1]	7.1	7.1	7.1	7.1	N/A	1	7.9	7.9	7.9	7.9	N/A	1	7.9	7.9	7.9	7.9	N/A	1	9.1	9.1	9.1	9.1	N/A	1							7.0	7.0	7.0	7.0	N/A	1.0												
Floodprone Width (ft)[1]	23.9	23.9	23.9	23.9	N/A	1	25.0	25.0	25.0	25.0	N/A	1	25.0	25.0	25.0	25.0	N/A	1	25.0	25.0	25.0	25.0	N/A	1							>23.7	>23.7	>23.7	>23.7	N/A	1.0												
Bankfull Mean Depth (ft)	0.5	0.5	0.5	0.5	N/A	1	0.5	0.5	0.5	0.5	N/A	1	0.5	0.5	0.5	0.5	N/A	1	0.4	0.4	0.4	0.4	N/A	1							---	---	---	---	N/A	1.0												
Bankfull Max Depth (ft)[2]	0.7	0.7	0.7	0.7	N/A	1	0.8	0.8	0.8	0.8	N/A	1	0.8	0.8	0.8	0.8	N/A	1	0.8	0.8	0.8	0.8	N/A	1							0.8	0.8	0.8	0.8	N/A	1.0												
Bankfull Cross Sectional Area (ft^2)[2]	3.3	3.3	3.3	3.3	N/A	1	3.8	3.8	3.8	3.8	N/A	1	3.9	3.9	3.9	3.9	N/A	1	4.1	4.1	4.1	4.1	N/A	1							4.0	4.0	4.0	4.0	N/A	1.0												
Bankfull Width/Depth Ratio	15.2	15.2	15.2	15.2	N/A	1	16.2	16.2	16.2	16.2	N/A	1	16.3	16.3	16.3	16.3	N/A	1	20.6	20.6	20.6	20.6	N/A	1							---	---	---	---	N/A	1.0												
Bankfull Entrenchment Ratio[1]	3.4	3.4	3.4	3.4	N/A	1	3.2	3.2	3.2	3.2	N/A	1	3.2	3.2	3.2	3.2	N/A	1	2.7	2.7	2.7	2.7	N/A	1							>3.4	>3.4	>3.4	>3.4	N/A	1.0												
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1	1.0	1.0	1.0	1.0	N/A	1	1.2	1.2	1.2	1.2	N/A	1							1.1	1.1	1.1	1.1	N/A	1.0												
Profile																																															
Riffle Length (ft)	7.2	18.3	20.3	25.1	6.0	11																																									
Riffle Slope (ft/ft)	0.005	0.022	0.024	0.044	0.011	11																																									
Pool Length (ft)	1.8	3.0	3.1	4.0	0.7	12																																									
Pool Max Depth (ft)	1.1	1.5	1.4	2.2	0.4	11																																									
Pool Spacing (ft)	12.1	26.4	28.4	35.2	6.8	11																																									
Pattern																																															
Channel Belt Width (ft)	13.2	15.3	15.6	17.1	1.9	3																																									
Radius of Curvature (ft)	8.7	14.1	15.6	16.7	3.6	4																																									
Rc: Bankfull Width (ft/ft)	1.2	2.0	2.2	2.4	0.5	2																																									
Meander Wavelength (ft)	47.9	56.4	54.8	67.7	7.2	6																																									
Meander Width Ratio	1.9	2.2	2.2	2.4	0.3	3																																									
Additional Reach Parameters																																															
Rosgen Classification	B4																																														
Channel Thalweg Length (ft)	679																																														
Sinuosity (ft)	0.977																																														
Water Surface Slope (Channel) (ft/ft)	0.024																																														
Bankfull Slope (ft/ft)	0.024																																														
Ri% / Ru% / P% / G% / S%	68%	0%	12%	13%	7%																																									

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Table 11b cont'd. Monitoring Data - Stream Reach Data Summary
Pee Dee Stream Restoration Site - Thompson Branch 2 (1,061 feet)

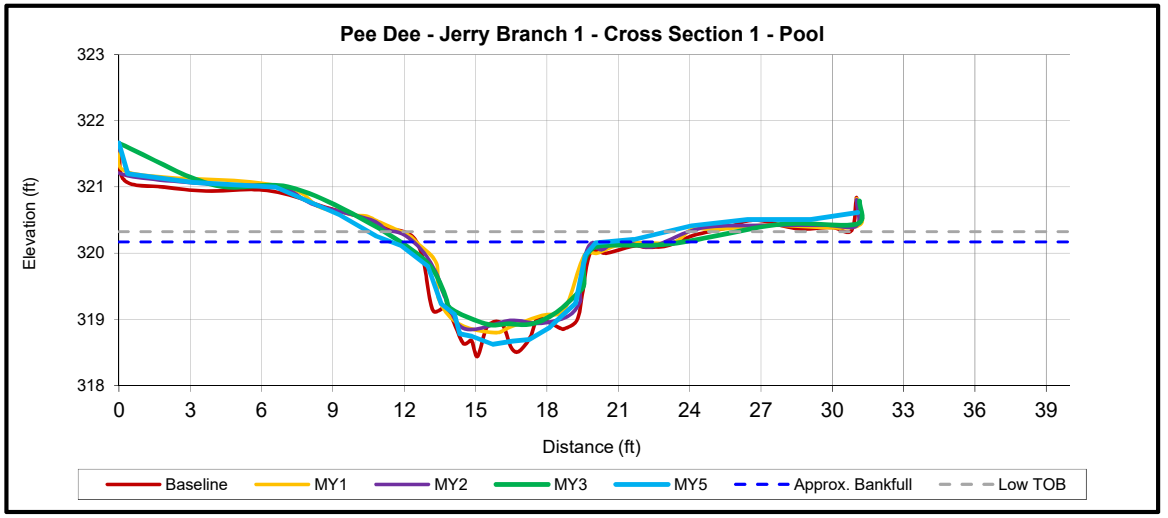
Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)[1]	7.5	7.6	7.6	7.6	0.1	2	7.7	7.7	7.7	7.7	0.0	2	7.6	7.7	7.7	7.7	0.1	2	7.8	8.1	8.1	8.4	0.4	2							8.4	8.7	8.7	8.9	0.4	2.0												
Floodprone Width (ft)[1]	31.1	32.7	32.7	34.3	2.3	2	30.0	30.0	30.0	30.0	0.0	2	30.0	30.0	30.0	30.0	0.0	2	30.0	30.0	30.0	30.0	0.0	2							25.0	29.2	29.2	33.3	5.9	2.0												
Bankfull Mean Depth (ft)	0.6	0.6	0.6	0.6	0.0	2	0.6	0.6	0.6	0.6	0.0	2	0.6	0.6	0.6	0.6	0.0	2	0.6	0.6	0.6	0.6	0.0	2							---	---	---	---	---	---												
Bankfull Max Depth (ft)[2]	1.1	1.2	1.2	1.2	0.1	2	0.9	1.0	1.0	1.0	0.1	2	0.9	1.0	1.0	1.1	0.1	2	0.9	1.0	1.0	1.1	0.1	2							0.8	0.8	0.8	0.8	0.0	2.0												
Bankfull Cross Sectional Area (ft^2)[2]	4.2	4.3	4.3	4.3	0.1	2	4.4	4.4	4.4	4.4	0.0	2	4.4	4.4	4.4	4.4	0.0	2	4.4	4.6	4.6	4.8	0.3	2							2.8	3.5	3.5	4.1	0.9	2.0												
Bankfull Width/Depth Ratio	13.3	13.4	13.4	13.4	0.1	2	13.5	13.5	13.5	13.5	0.0	2	13.0	13.3	13.3	13.5	0.4	2	13.8	14.2	14.2	14.5	0.5	2							---	---	---	---	---	---												
Bankfull Entrenchment Ratio[1]	4.1	4.3	4.3	4.5	0.3	2	3.9	3.9	3.9	3.9	0.0	2	3.9	3.9	3.9	3.9	0.0	2	3.6	3.8	3.8	3.9	0.2	2							3.0	3.4	3.4	3.7	0.5	2.0												
Bankfull Bank Height Ratio[1]	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2							1.0	1.0	1.0	1.0	0.0	2.0												
Profile																																																
Riffle Length (ft)	10.0	15.8	15.2	25.4	3.9	32																																									
Riffle Slope (ft/ft)	0.005	0.014	0.013	0.023	0.005	32																																									
Pool Length (ft)	1.8	5.0	4.6	18.3	3.0	32																																									
Pool Max Depth (ft)	1.4	2.1	2.0	2.6	0.3	32																																									
Pool Spacing (ft)	19.5	27.5	25.9	54.0	7.4	32																																									
Pattern																																															
Channel Belt Width (ft)	14.4	22.4	19.5	37.8	8.2	6																																									
Radius of Curvature (ft)	10.5	18.3	18.5	25.9	6.7	4																																									
Rc: Bankfull Width (ft/ft)	1.4	2.4	2.5	3.5	0.9	3																																									
Meander Wavelength (ft)	34.3	48.7	50.5	60.9	9.8	6																																									
Meander Width Ratio	2.2	3.0	2.6	4.1	1.0	3																																									
Additional Reach Parameters																																															
Rosgen Classification	B4																																														
Channel Thalweg Length (ft)	1,061																																														
Sinuosity (ft)	1.05																																														
Water Surface Slope (Channel) (ft/ft)	0.020																																														
Bankfull Slope (ft/ft)	0.022																																														
Ri% / Ru% / P% / G% / S%	57%	0%	18%	11%	14%																																									

N/A - Information does not apply
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step

Note: Starting in MY5, the parameters denoted with[1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with[2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

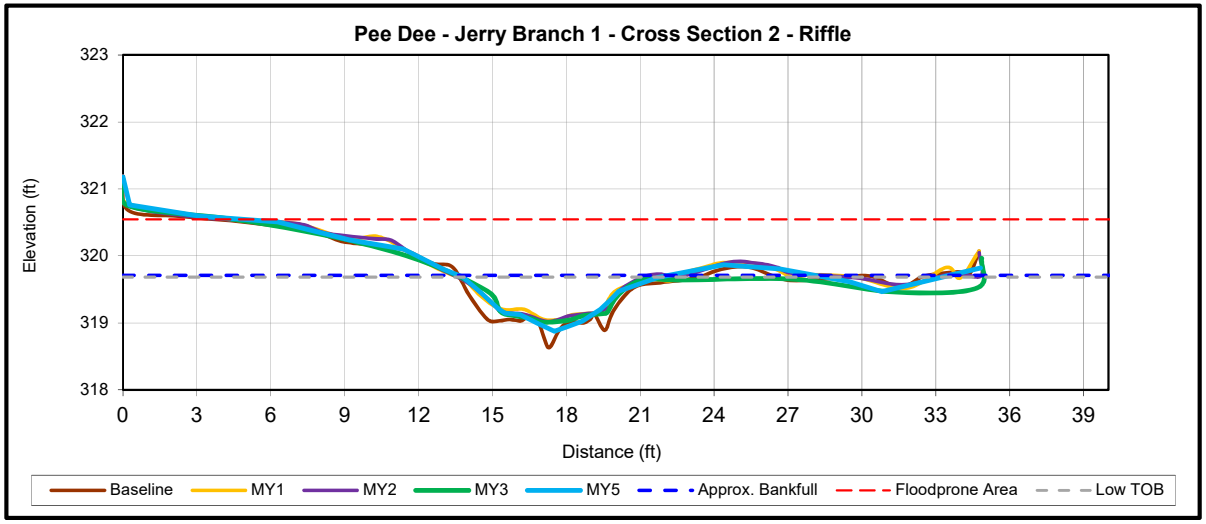


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	9.1	8.3	8.3	8.2	-	N/A	-	-
Floodprone Width (ft)[1]	25.0	25.0	25.0	25.0	-	N/A	-	-
Bankfull Mean Depth (ft)	0.9	0.8	0.8	0.8	-	---	-	-
Bankfull Max Depth (ft)[2]	1.7	1.3	1.2	1.2	-	1.7	-	-
Bankfull Cross-Sectional Area (ft2)[2]	8.5	6.8	6.9	6.6	-	10.2	-	-
Width/Depth Ratio	9.8	10.1	9.9	10.1	-	---	-	-
Entrenchment Ratio[1]	2.7	3.0	3.0	N/A	-	N/A	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	N/A	-	N/A	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

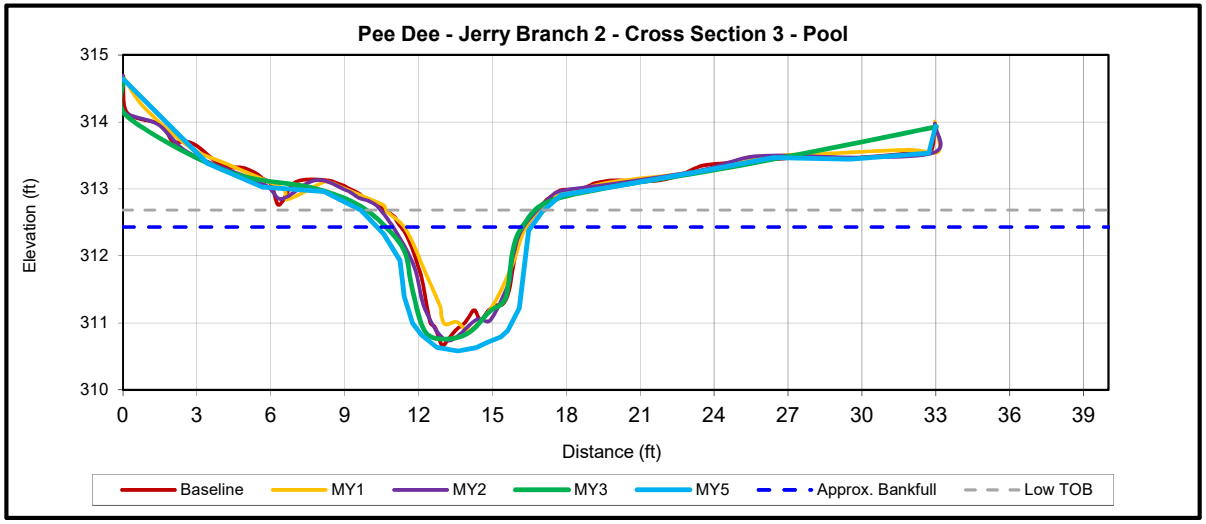


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	8.1	7.0	6.7	6.9	-	8.6	-	-
Floodprone Width (ft)[1]	30.0	30.0	30.0	30.0	-	>29.9	-	-
Bankfull Mean Depth (ft)	0.5	0.3	0.4	0.4	-	---	-	-
Bankfull Max Depth (ft)[2]	1.0	0.5	0.6	0.6	-	0.8	-	-
Bankfull Cross-Sectional Area (ft2)[2]	3.7	2.4	2.6	2.7	-	3.5	-	-
Width/Depth Ratio	17.7	20.3	17.5	17.6	-	---	-	-
Entrenchment Ratio[1]	3.7	4.3	4.5	4.0	-	>3.5	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	1.0	-	1.0	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

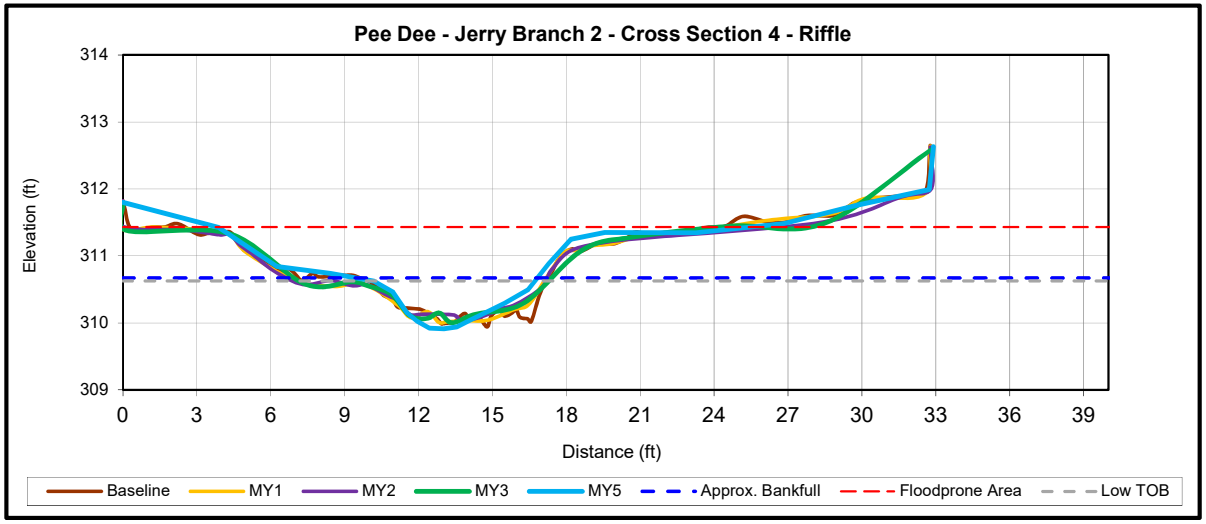


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.8	8.1	8.1	9.8	-	N/A	-	-
Floodprone Width (ft)[1]	30.0	30.0	30.0	30.0	-	N/A	-	-
Bankfull Mean Depth (ft)	1.1	1.0	1.1	1.0	-	---	-	-
Bankfull Max Depth (ft)[2]	2.3	2.0	2.2	2.1	-	2.1	-	-
Bankfull Cross-Sectional Area (ft2)[2]	8.3	7.7	8.7	9.4	-	10.1	-	-
Width/Depth Ratio	7.4	8.4	7.6	10.2	-	---	-	-
Entrenchment Ratio[1]	3.8	3.7	3.7	N/A	-	N/A	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	N/A	-	N/A	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

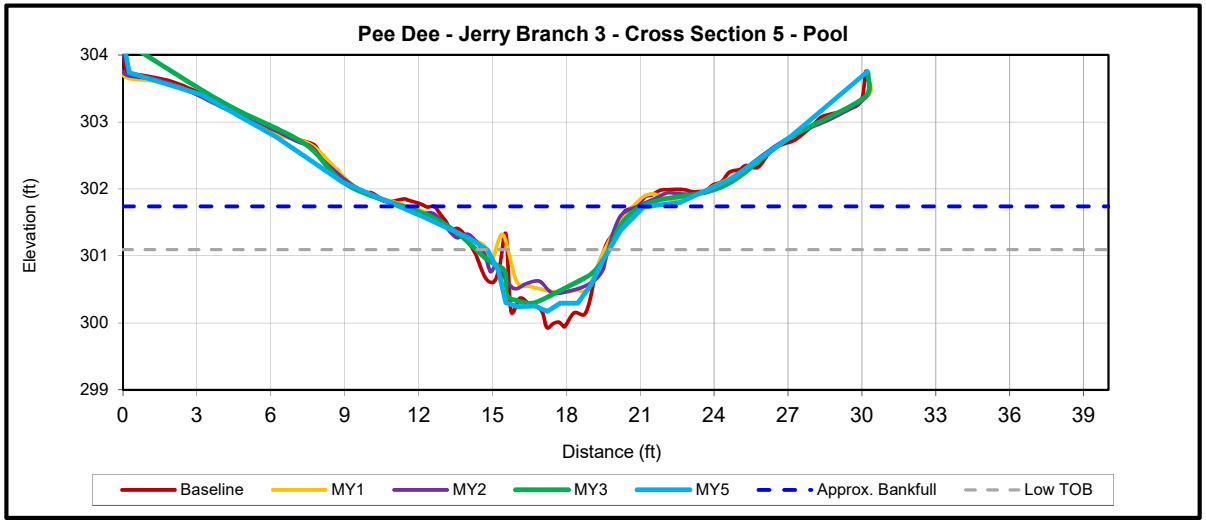


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.1	7.2	7.2	7.7	-	7.3	-	-
Floodprone Width (ft)[1]	25.0	25.0	25.0	25.0	-	21.6	-	-
Bankfull Mean Depth (ft)	0.4	0.4	0.4	0.3	-	---	-	-
Bankfull Max Depth (ft)[2]	0.7	0.6	0.6	0.6	-	0.7	-	-
Bankfull Cross-Sectional Area (ft2)[2]	3.1	3.0	2.7	2.6	-	2.8	-	-
Width/Depth Ratio	16.4	17.0	19.4	22.6	-	---	-	-
Entrenchment Ratio[1]	3.5	3.5	3.5	3.2	-	3.0	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	0.9	-	<1	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

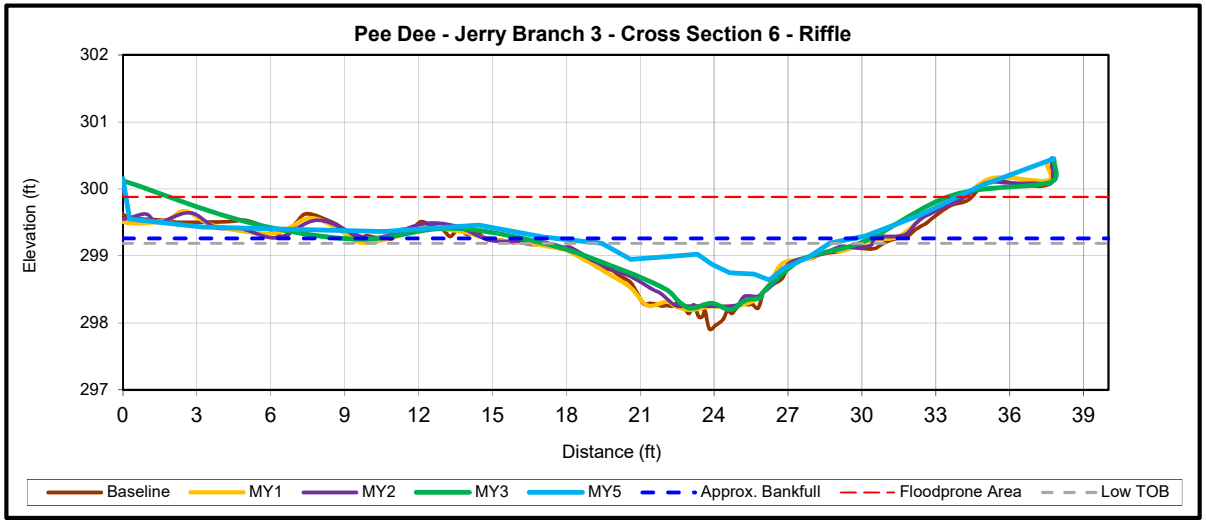


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	8.1	9.2	9.7	9.4	-	N/A	-	-
Floodprone Width (ft)[1]	25.0	25.0	25.0	25.0	-	N/A	-	-
Bankfull Mean Depth (ft)	1.0	0.7	0.7	0.7	-	---	-	-
Bankfull Max Depth (ft)[2]	1.8	1.3	1.3	1.4	-	0.9	-	-
Bankfull Cross-Sectional Area (ft2)[2]	7.9	6.3	6.8	6.9	-	3.2	-	-
Width/Depth Ratio	8.3	13.2	13.7	13.0	-	---	-	-
Entrenchment Ratio[1]	3.1	2.7	2.6	N/A	-	N/A	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	N/A	-	N/A	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

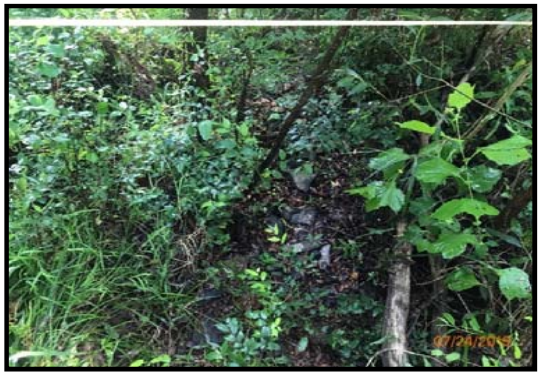
Downstream



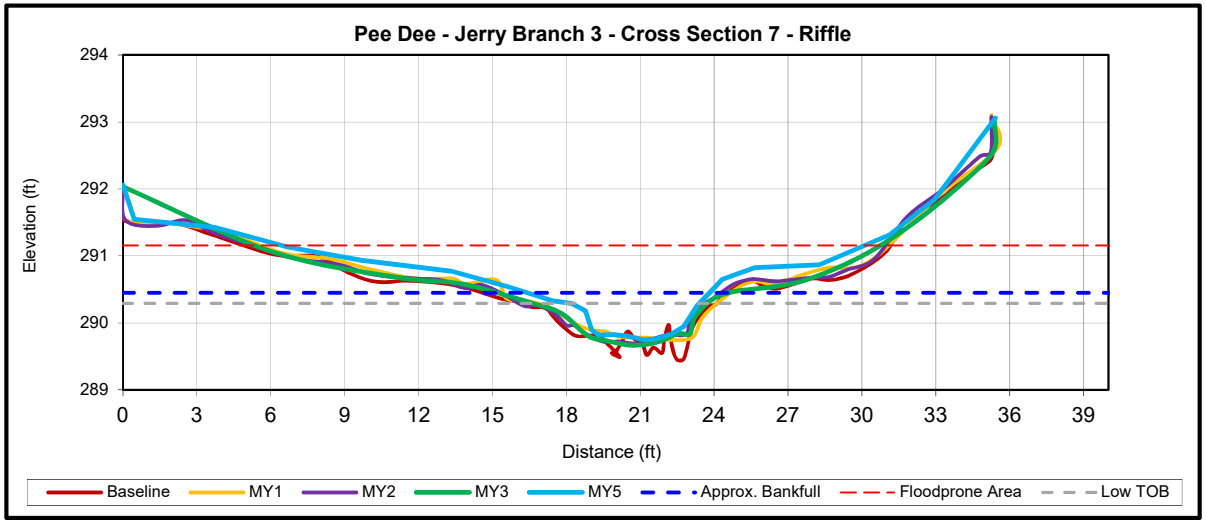
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.4	7.5	7.3	6.9	-	12.0	-	-
Floodprone Width (ft)[1]	30.0	30.0	30.0	30.0	-	>33.8	-	-
Bankfull Mean Depth (ft)	0.4	0.4	0.4	0.4	-	---	-	-
Bankfull Max Depth (ft)[2]	0.9	0.6	0.6	0.6	-	0.5	-	-
Bankfull Cross-Sectional Area (ft2)[2]	3.3	3.3	2.9	2.4	-	2.5	-	-
Width/Depth Ratio	16.6	16.7	18.7	19.4	-	---	-	-
Entrenchment Ratio[1]	4.1	4.0	4.1	4.4	-	>2.8	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	1.0	-	<1	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream



Downstream

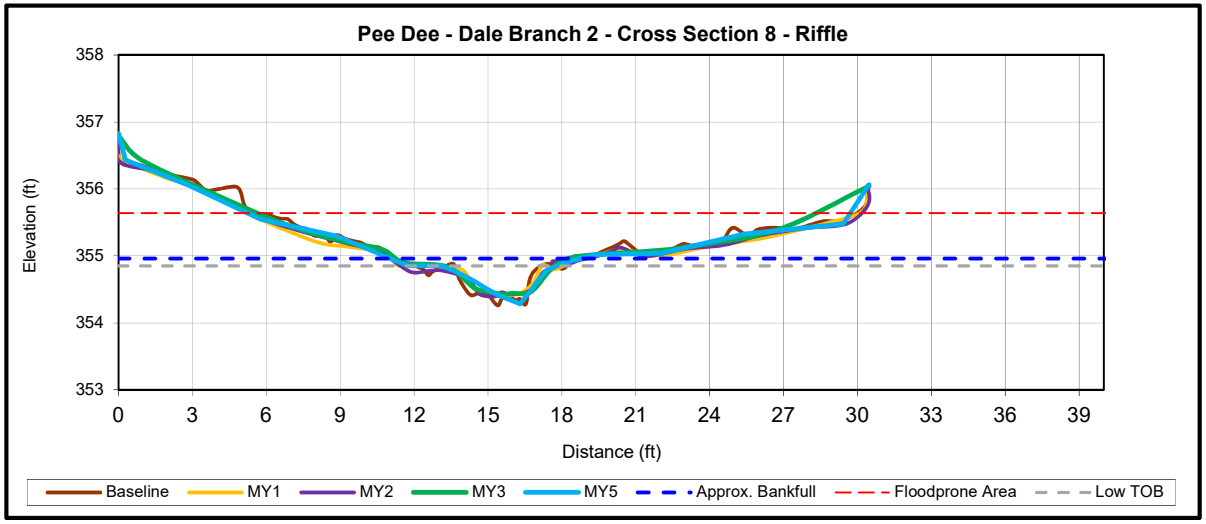


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.2	6.7	6.4	6.2	-	7.4	-	-
Floodprone Width (ft)[1]	25.0	25.0	25.0	25.0	-	23.7	-	-
Bankfull Mean Depth (ft)	0.4	0.3	0.4	0.4	-	---	-	-
Bankfull Max Depth (ft)[2]	0.8	0.5	0.5	0.5	-	0.5	-	-
Bankfull Cross-Sectional Area (ft2)[2]	3.0	2.3	2.4	2.2	-	2.0	-	-
Width/Depth Ratio	17.7	19.4	17.0	17.4	-	---	-	-
Entrenchment Ratio[1]	3.4	3.7	3.9	4.0	-	3.2	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	0.9	-	<1	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

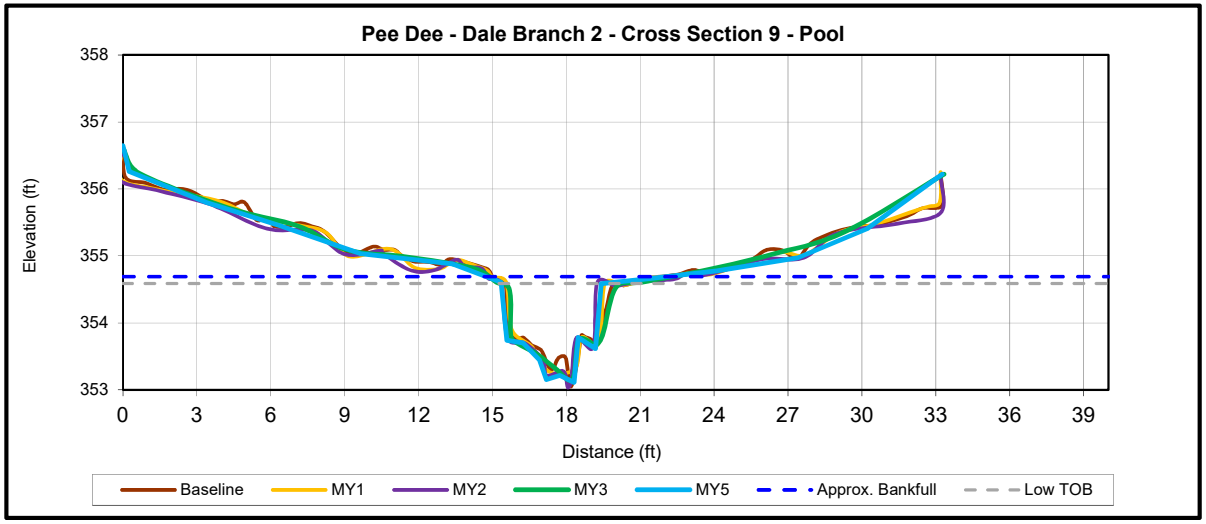


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.0	7.3	7.2	6.5	-	7.7	-	-
Floodprone Width (ft)[1]	25.0	25.0	25.0	25.0	-	>24.5	-	-
Bankfull Mean Depth (ft)	0.3	0.2	0.3	0.2	-	---	-	-
Bankfull Max Depth (ft)[2]	0.7	0.5	0.5	0.5	-	0.6	-	-
Bankfull Cross-Sectional Area (ft2)[2]	2.0	1.7	2.0	1.6	-	1.3	-	-
Width/Depth Ratio	24.6	30.6	26.0	26.9	-	---	-	-
Entrenchment Ratio[1]	3.6	3.4	3.5	3.9	-	>3.2	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	0.9	-	<1	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

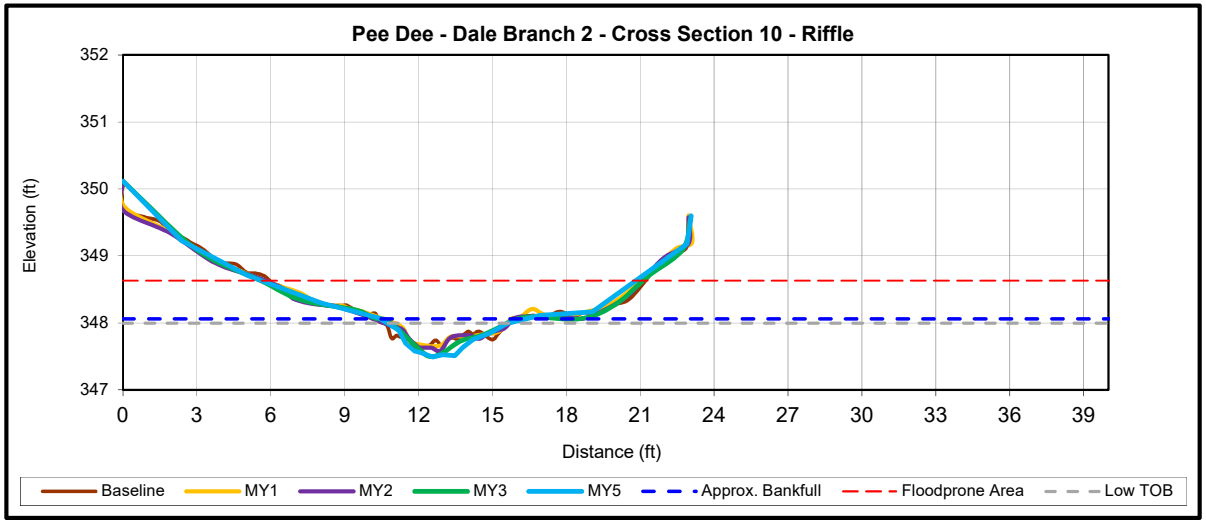


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.7	8.0	8.1	7.7	-	N/A	-	-
Floodprone Width (ft)[1]	25.0	25.0	25.0	25.0	-	N/A	-	-
Bankfull Mean Depth (ft)	0.6	0.6	0.6	0.6	-	---	-	-
Bankfull Max Depth (ft)[2]	1.7	1.5	1.7	1.5	-	1.5	-	-
Bankfull Cross-Sectional Area (ft2)[2]	4.8	4.8	5.0	5.0	-	4.2	-	-
Width/Depth Ratio	12.3	13.5	13.3	11.8	-	---	-	-
Entrenchment Ratio[1]	3.3	3.1	3.1	N/A	-	N/A	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	N/A	-	N/A	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

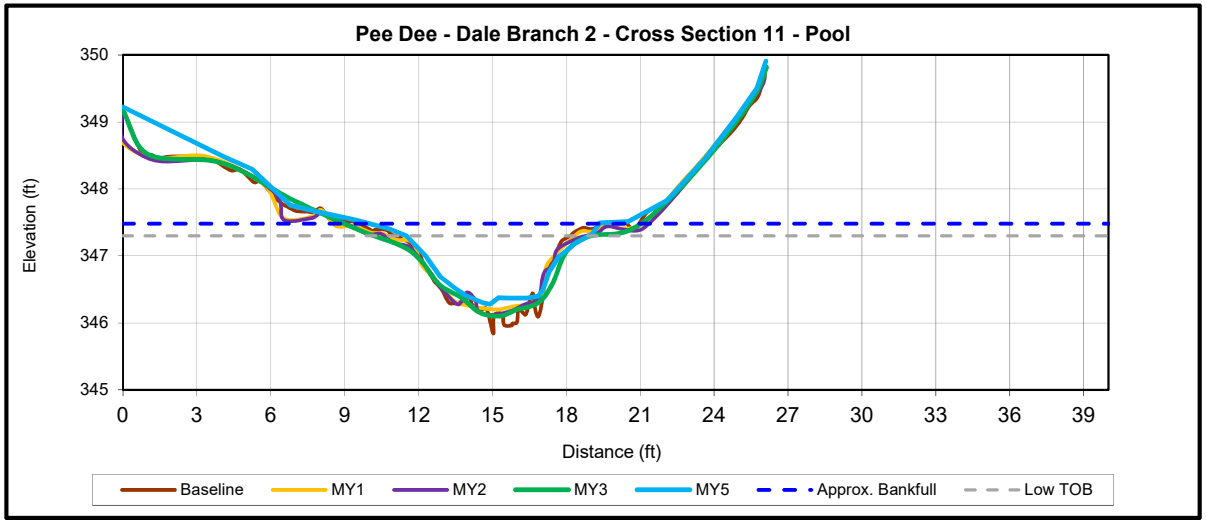


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	6.4	6.2	6.2	6.5	-	5.9	-	-
Floodprone Width (ft)[1]	25.0	25.0	25.0	25.0	-	15.2	-	-
Bankfull Mean Depth (ft)	0.3	0.3	0.3	0.3	-	---	-	-
Bankfull Max Depth (ft)[2]	0.5	0.5	0.5	0.6	-	0.5	-	-
Bankfull Cross-Sectional Area (ft2)[2]	1.8	1.6	1.7	1.8	-	1.4	-	-
Width/Depth Ratio	22.6	23.7	21.7	23.4	-	---	-	-
Entrenchment Ratio[1]	3.9	4.0	4.1	3.9	-	2.6	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	0.9	-	<1	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

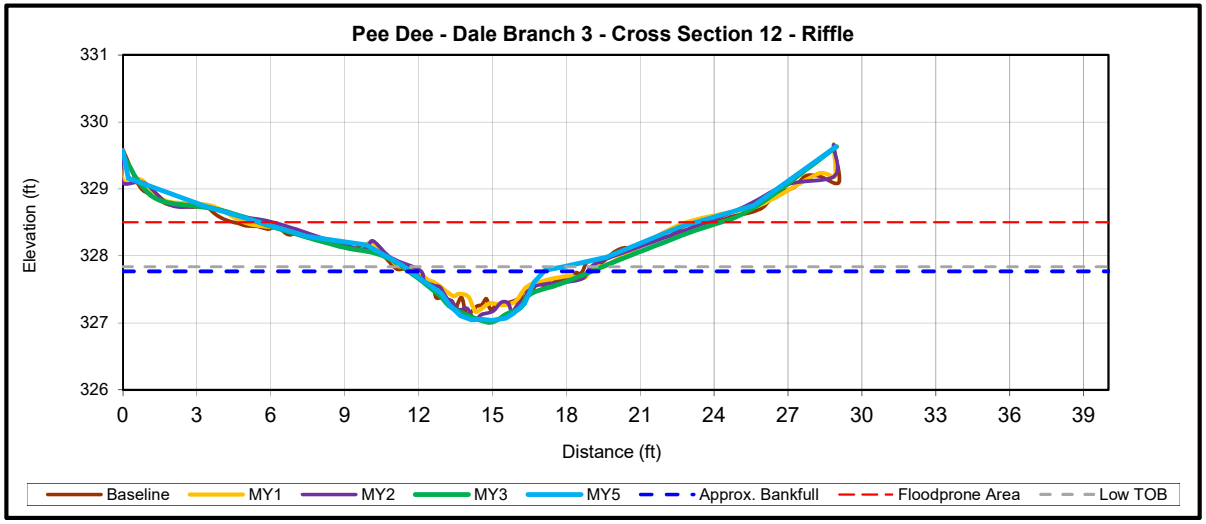


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.6	8.0	8.3	9.4	-	N/A	-	-
Floodprone Width (ft)[1]	20.0	20.0	20.0	20.0	-	N/A	-	-
Bankfull Mean Depth (ft)	0.8	0.7	0.7	0.7	-	---	-	-
Bankfull Max Depth (ft)[2]	1.6	1.2	1.3	1.3	-	1.0	-	-
Bankfull Cross-Sectional Area (ft2)[2]	6.1	5.9	6.0	6.7	-	4.6	-	-
Width/Depth Ratio	9.5	10.9	11.5	13.3	-	---	-	-
Entrenchment Ratio[1]	2.6	2.5	2.4	N/A	-	N/A	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	N/A	-	N/A	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

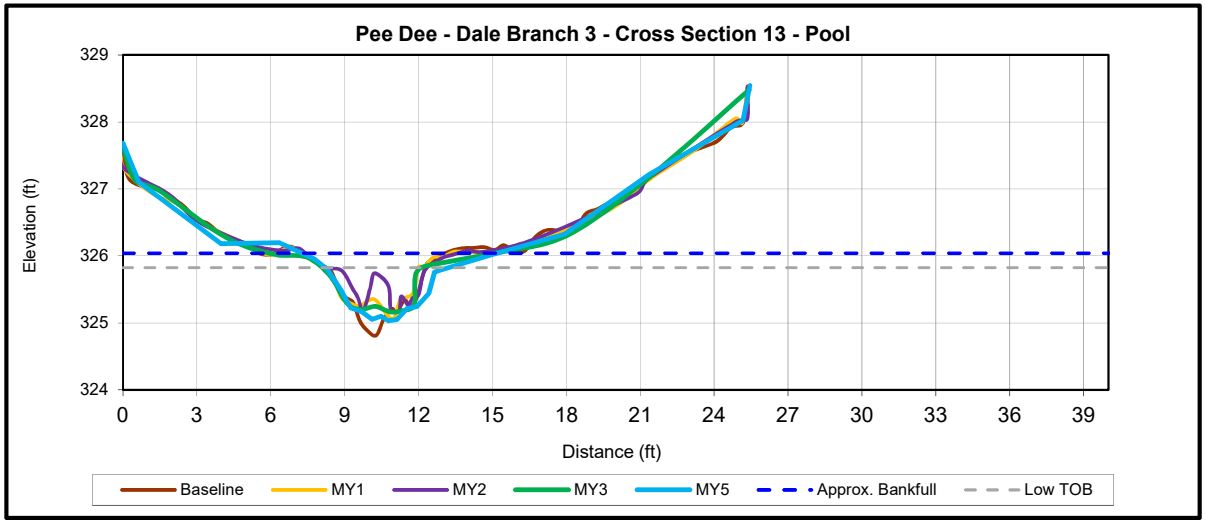


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.3	7.1	7.1	7.8	-	5.4	-	-
Floodprone Width (ft)[1]	20.0	20.0	20.0	20.0	-	17.7	-	-
Bankfull Mean Depth (ft)	0.3	0.3	0.4	0.4	-	---	-	-
Bankfull Max Depth (ft)[2]	0.7	0.6	0.8	0.8	-	0.8	-	-
Bankfull Cross-Sectional Area (ft2)[2]	2.5	2.2	2.7	3.1	-	2.9	-	-
Width/Depth Ratio	21.1	23.1	18.7	19.3	-	---	-	-
Entrenchment Ratio[1]	2.8	2.8	2.8	2.6	-	3.3	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	0.5	-	1.1	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

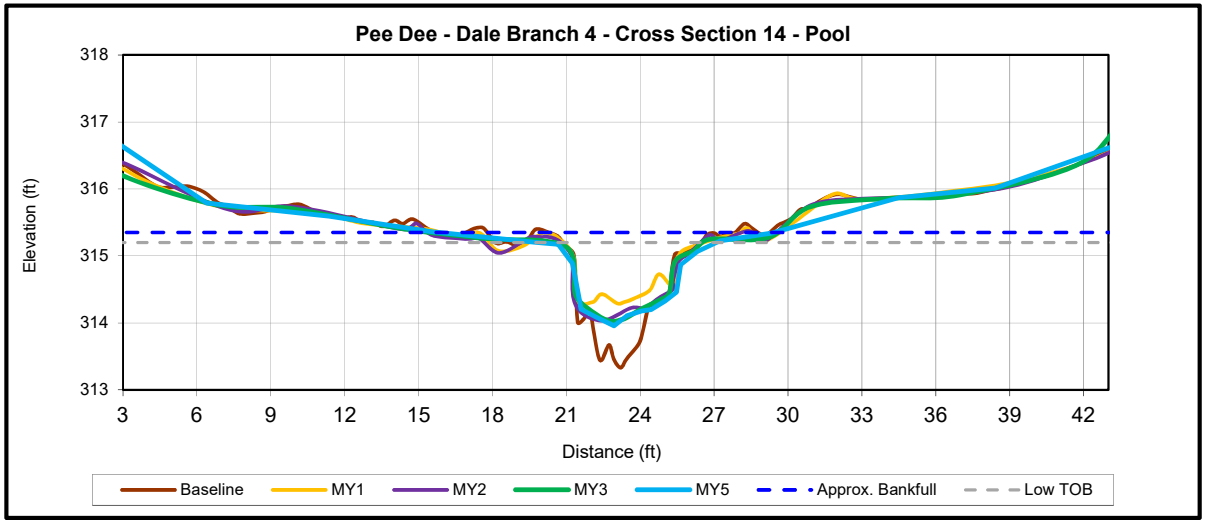


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.8	7.6	7.7	8.3	-	N/A	-	-
Floodprone Width (ft)[1]	20.0	20.0	20.0	20.0	-	N/A	-	-
Bankfull Mean Depth (ft)	0.5	0.5	0.4	0.4	-	---	-	-
Bankfull Max Depth (ft)[2]	1.3	1.1	1.0	0.9	-	0.8	-	-
Bankfull Cross-Sectional Area (ft2)[2]	3.9	3.5	3.0	3.7	-	2.5	-	-
Width/Depth Ratio	15.7	16.7	19.7	18.5	-	---	-	-
Entrenchment Ratio[1]	2.6	2.6	2.6	N/A	-	N/A	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	N/A	-	N/A	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

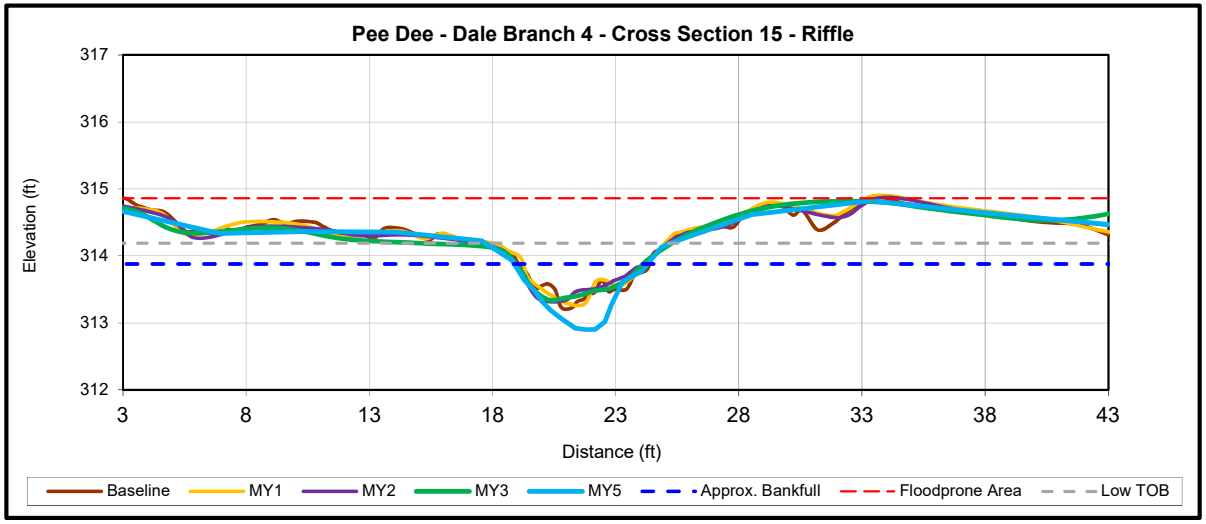


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	6.7	7.2	7.0	5.8	-	N/A	-	-
Floodprone Width (ft)[1]	30.0	30.0	30.0	30.0	-	N/A	-	-
Bankfull Mean Depth (ft)	0.9	0.6	0.7	0.8	-	---	-	-
Bankfull Max Depth (ft)[2]	2.0	1.0	1.3	1.3	-	1.2	-	-
Bankfull Cross-Sectional Area (ft2)[2]	6.2	4.3	5.2	4.9	-	4.7	-	-
Width/Depth Ratio	7.1	12.1	9.5	7.0	-	---	-	-
Entrenchment Ratio[1]	4.5	4.2	4.3	N/A	-	N/A	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	N/A	-	N/A	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

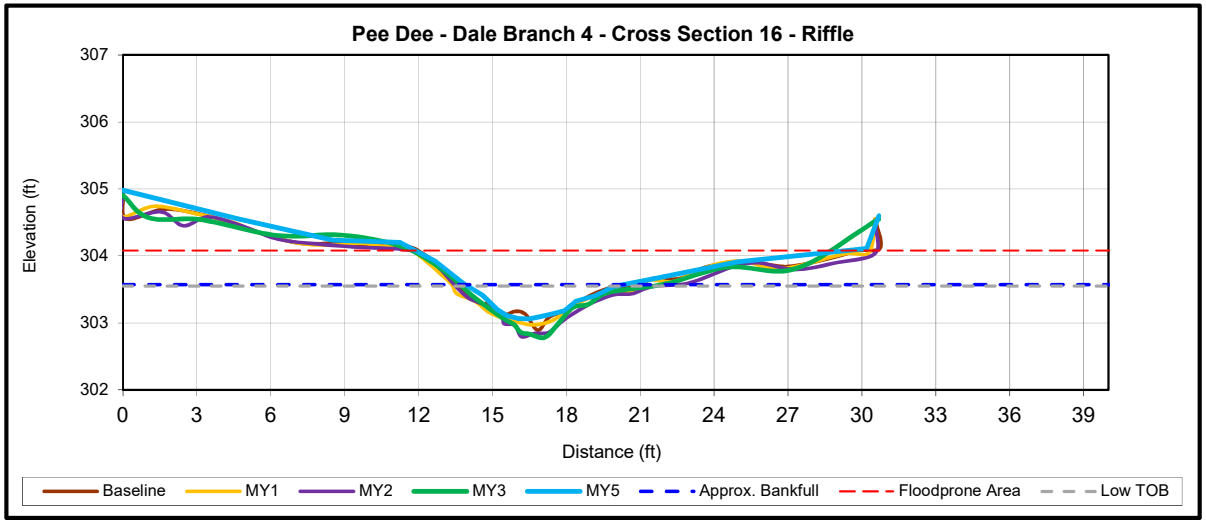


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	6.5	6.2	6.5	6.8	-	5.4	-	-
Floodprone Width (ft)[1]	40.0	40.0	40.0	40.0	-	>43.2	-	-
Bankfull Mean Depth (ft)	0.5	0.5	0.5	0.5	-	---	-	-
Bankfull Max Depth (ft)[2]	0.9	0.8	0.8	0.8	-	1.3	-	-
Bankfull Cross-Sectional Area (ft2)[2]	3.1	2.9	3.0	3.2	-	5.0	-	-
Width/Depth Ratio	13.8	13.2	14.2	14.7	-	---	-	-
Entrenchment Ratio[1]	6.1	6.5	6.2	5.9	-	>8	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	1.0	-	1.3	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

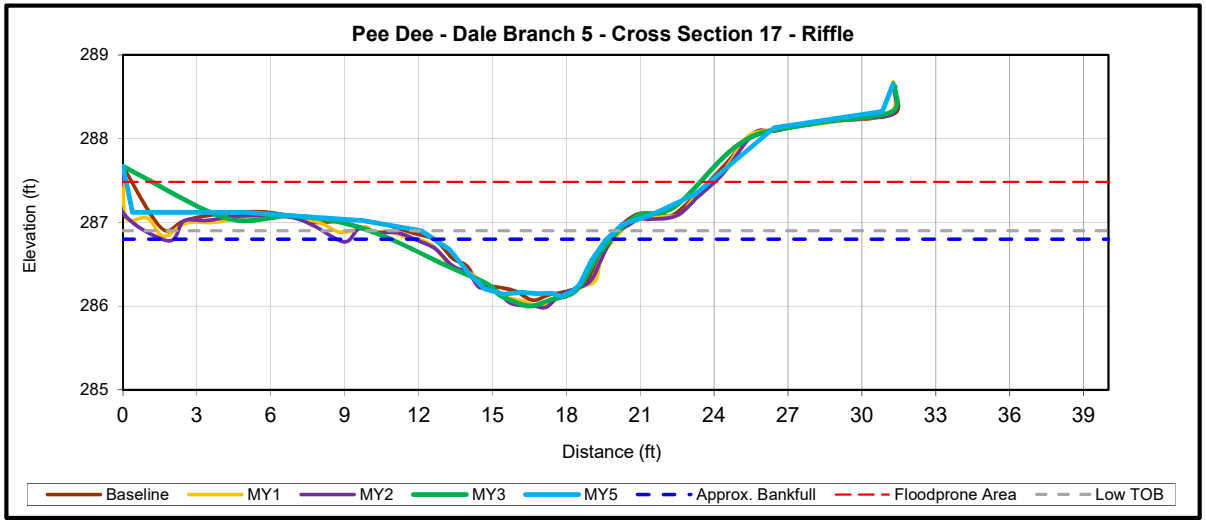


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	6.3	7.2	7.6	6.7	-	6.4	-	-
Floodprone Width (ft)[1]	25.0	25.0	25.0	25.0	-	17.5	-	-
Bankfull Mean Depth (ft)	0.3	0.3	0.4	0.3	-	---	-	-
Bankfull Max Depth (ft)[2]	0.7	0.6	0.7	0.7	-	0.5	-	-
Bankfull Cross-Sectional Area (ft2)[2]	1.9	2.3	2.7	2.2	-	1.7	-	-
Width/Depth Ratio	21.0	23.0	20.9	19.9	-	---	-	-
Entrenchment Ratio[1]	4.0	3.5	3.3	3.8	-	2.7	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	0.9	-	1.0	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

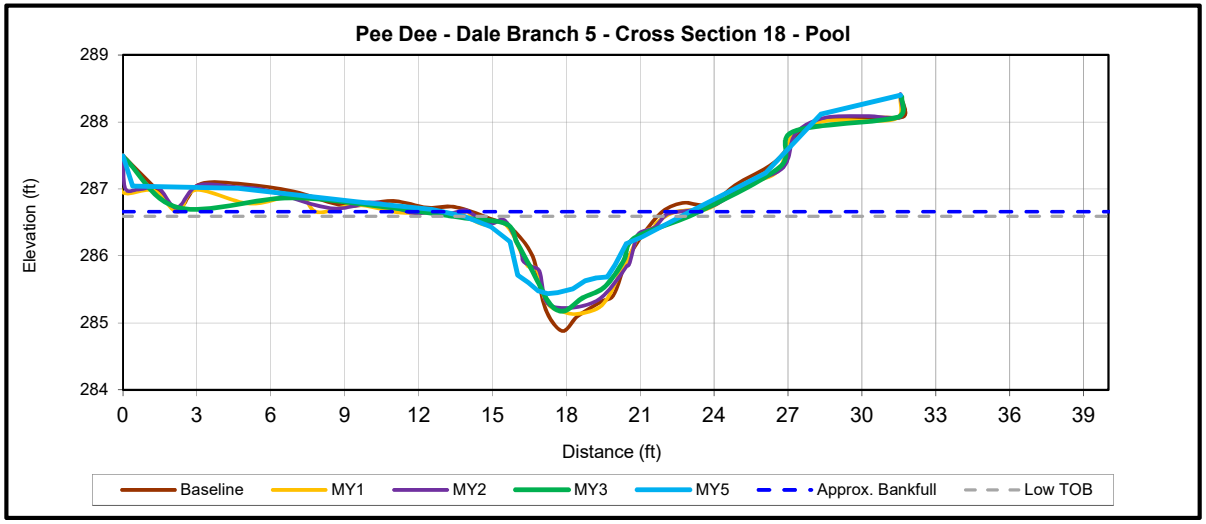


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.1	7.9	7.9	9.1	-	7.0	-	-
Floodprone Width (ft)[1]	25.0	25.0	25.0	25.0	-	>23.7	-	-
Bankfull Mean Depth (ft)	0.5	0.5	0.5	0.4	-	---	-	-
Bankfull Max Depth (ft)[2]	0.7	0.8	0.8	0.8	-	0.8	-	-
Bankfull Cross-Sectional Area (ft2)[2]	3.3	3.8	3.9	4.1	-	4.0	-	-
Width/Depth Ratio	15.2	16.2	16.3	20.6	-	---	-	-
Entrenchment Ratio[1]	3.5	3.2	3.2	2.7	-	>3.4	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	1.2	-	1.1	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

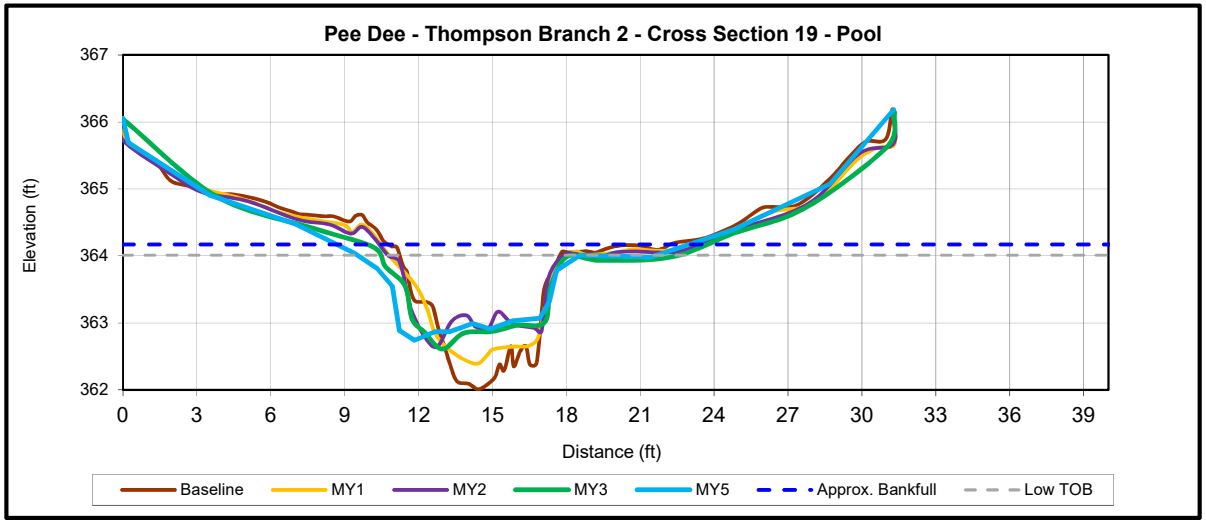


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.2	8.0	7.7	7.4	-	N/A	-	-
Floodprone Width (ft)[1]	25.0	25.0	25.0	25.0	-	N/A	-	-
Bankfull Mean Depth (ft)	0.8	0.7	0.7	0.7	-	---	-	-
Bankfull Max Depth (ft)[2]	1.7	1.5	1.4	1.4	-	1.2	-	-
Bankfull Cross-Sectional Area (ft2)[2]	5.9	5.8	5.6	5.3	-	5.2	-	-
Width/Depth Ratio	8.7	11.0	10.7	10.4	-	---	-	-
Entrenchment Ratio[1]	3.5	3.1	3.2	N/A	-	N/A	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	N/A	-	N/A	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

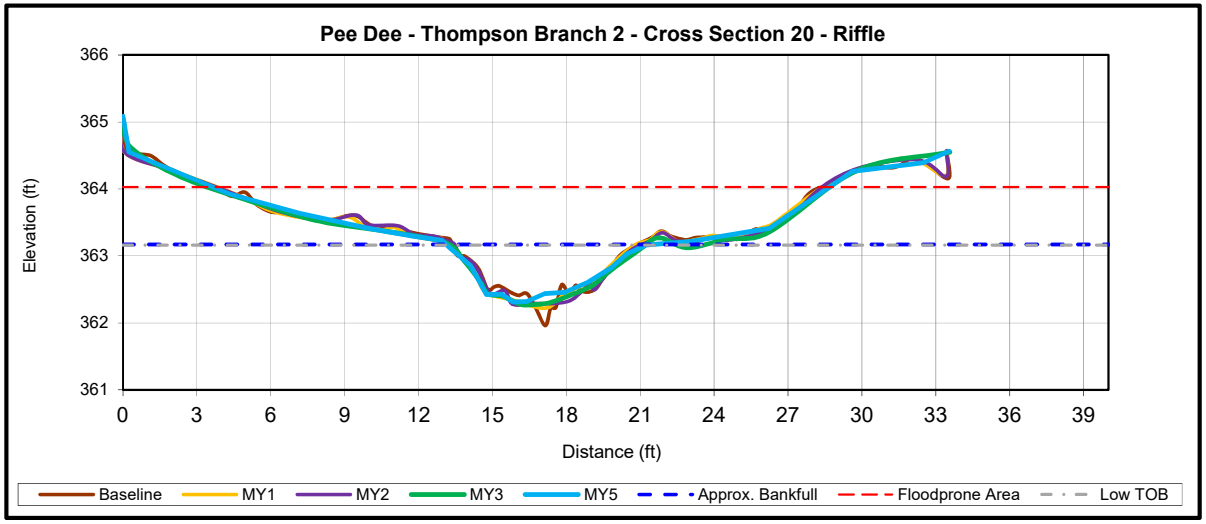


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	8.4	9.2	9.2	7.8	-	N/A	-	-
Floodprone Width (ft)[1]	30.0	30.0	30.0	30.0	-	N/A	-	-
Bankfull Mean Depth (ft)	1.0	0.9	0.8	1.0	-	---	-	-
Bankfull Max Depth (ft)[2]	2.1	1.7	1.5	1.5	-	1.3	-	-
Bankfull Cross-Sectional Area (ft2)[2]	8.8	8.1	7.0	7.7	-	7.3	-	-
Width/Depth Ratio	8.0	10.4	12.1	8.0	-	---	-	-
Entrenchment Ratio[1]	3.6	3.3	3.3	N/A	-	N/A	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	N/A	-	N/A	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

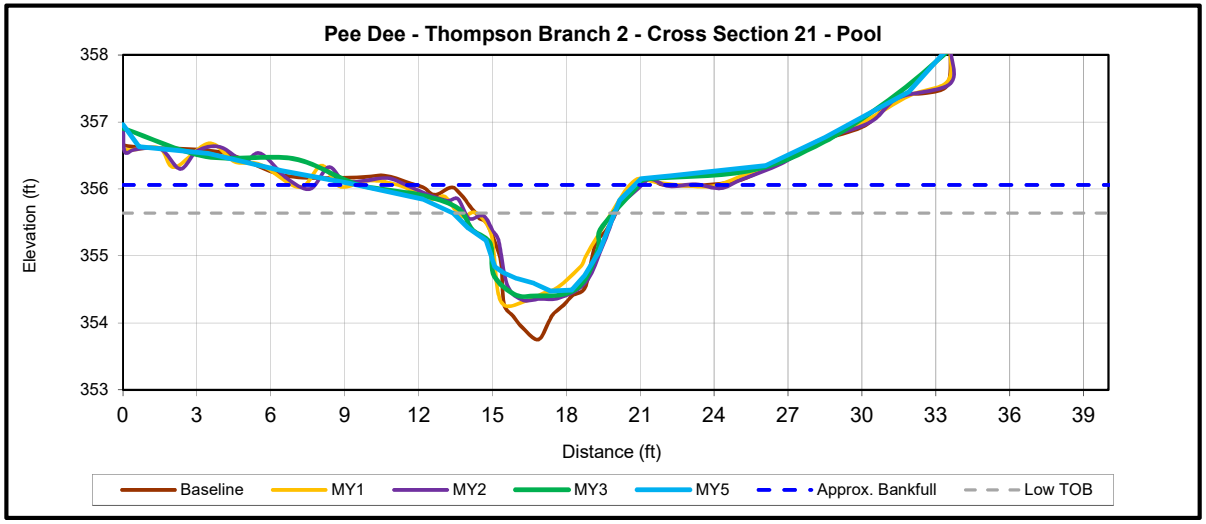


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.5	7.7	7.6	8.4	-	8.4	-	-
Floodprone Width (ft)[1]	30.0	30.0	30.0	30.0	-	25.0	-	-
Bankfull Mean Depth (ft)	0.6	0.6	0.6	0.6	-	---	-	-
Bankfull Max Depth (ft)[2]	1.2	0.9	0.9	0.9	-	0.8	-	-
Bankfull Cross-Sectional Area (ft2)[2]	4.2	4.4	4.4	4.8	-	4.1	-	-
Width/Depth Ratio	13.3	13.5	13.0	14.5	-	---	-	-
Entrenchment Ratio[1]	4.0	3.9	3.9	3.6	-	3.0	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	1.0	-	1.0	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream

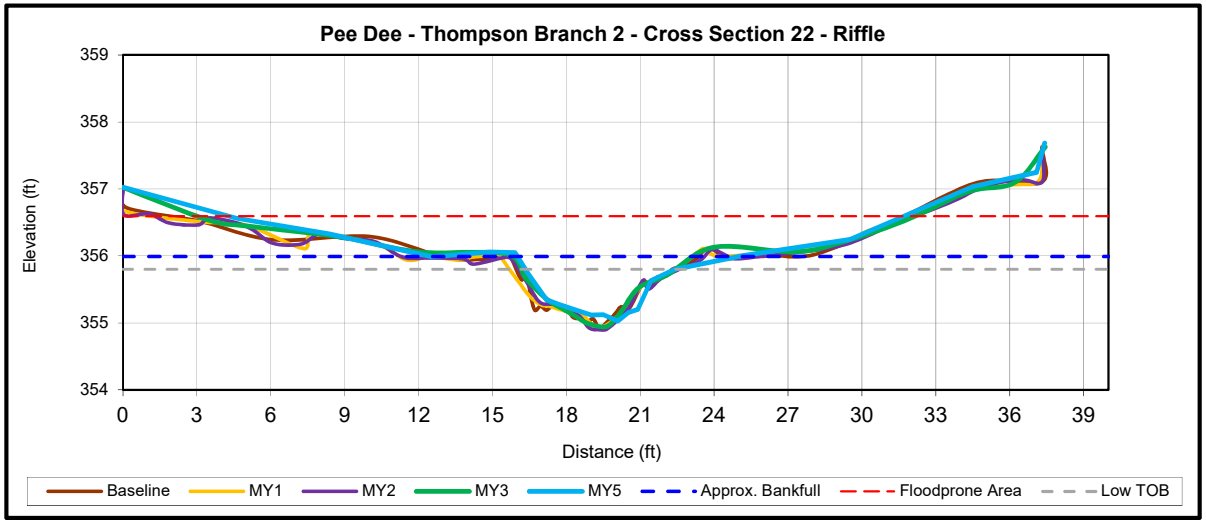


DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	8.6	9.1	9.2	10.2	-	N/A	-	-
Floodprone Width (ft)[1]	30.0	30.0	30.0	30.0	-	N/A	-	-
Bankfull Mean Depth (ft)	1.0	0.8	0.8	0.8	-	---	-	-
Bankfull Max Depth (ft)[2]	2.3	1.7	1.7	1.6	-	1.2	-	-
Bankfull Cross-Sectional Area (ft2)[2]	8.5	7.5	7.8	8.0	-	4.9	-	-
Width/Depth Ratio	8.7	10.9	10.9	12.9	-	---	-	-
Entrenchment Ratio[1]	3.5	3.3	3.2	N/A	-	N/A	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	N/A	-	N/A	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Upstream

Downstream



DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)[1]	7.6	7.7	7.7	7.8	-	8.9	-	-
Floodprone Width (ft)[1]	30.0	30.0	30.0	30.0	-	33.3	-	-
Bankfull Mean Depth (ft)	0.6	0.6	0.6	0.6	-	---	-	-
Bankfull Max Depth (ft)[2]	1.1	1.0	1.1	1.1	-	0.8	-	-
Bankfull Cross-Sectional Area (ft2)[2]	4.3	4.4	4.4	4.4	-	2.8	-	-
Width/Depth Ratio	13.4	13.5	13.5	13.8	-	---	-	-
Entrenchment Ratio[1]	3.9	3.9	3.9	3.9	-	3.7	-	-
Bank Height Ratio[1]	1.0	1.0	1.0	1.0	-	<1	-	-

Note: Starting in MY5, the parameters denoted with [1] were calculated using the as-built cross sectional area as the basis for adjusting the bankfull elevation and the parameters denoted with [2] were calculated using the current years low top of bank as the bankfull elevation. These changes reflect the 2018 guidance that arose from the mitigation technical workgroup consisting of DMS, the IRT, and industry mitigation providers.

Table 12. Pebble Count Data Summary

Stream Reach	MY1 - 2015		MY2 - 2016		MY3 - 2017		MY4 - 2018		MY5 - 2019		MY6 - 2020		MY7 - 2021	
	Pebble Count		Pebble Count		Pebble Count		Pebble Count		Pebble Count		Pebble Count		Pebble Count	
	D_{50} (mm)	D_{84} (mm)	D_{50} (mm)	D_{84} (mm)	D_{50} (mm)	D_{84} (mm)	D_{50} (mm)	D_{84} (mm)	D_{50} (mm)	D_{84} (mm)	D_{50} (mm)	D_{84} (mm)	D_{50} (mm)	D_{84} (mm)
Jerry Branch 1	0.2	34	0.062	5.2	12	58	11	28	12	37				
Jerry Branch 2	22	44	5.2	9.6	12	30	22	78	22	60				
Jerry Branch 3	20	44	15	51	40	76	12.5	45	16.5	47				
Dale Branch 2	14	45	6.3	32	16	51	24	49	28.5	58.5				
Dale Branch 3	2.1	13	4.4	30	8	80	9.4	60	22	52				
Dale Branch 4	21	44	5	37	14	71	14.9	35	18	44.5				
Dale Branch 5	33	60	16	41	32	69	48	96	24	54				
Thompson Branch 2	15	51	20	51	50	95	30	76	25.5	58.5				

Charts 1-9. MY5 Stream Reach Substrate Composition Charts

Chart 1.

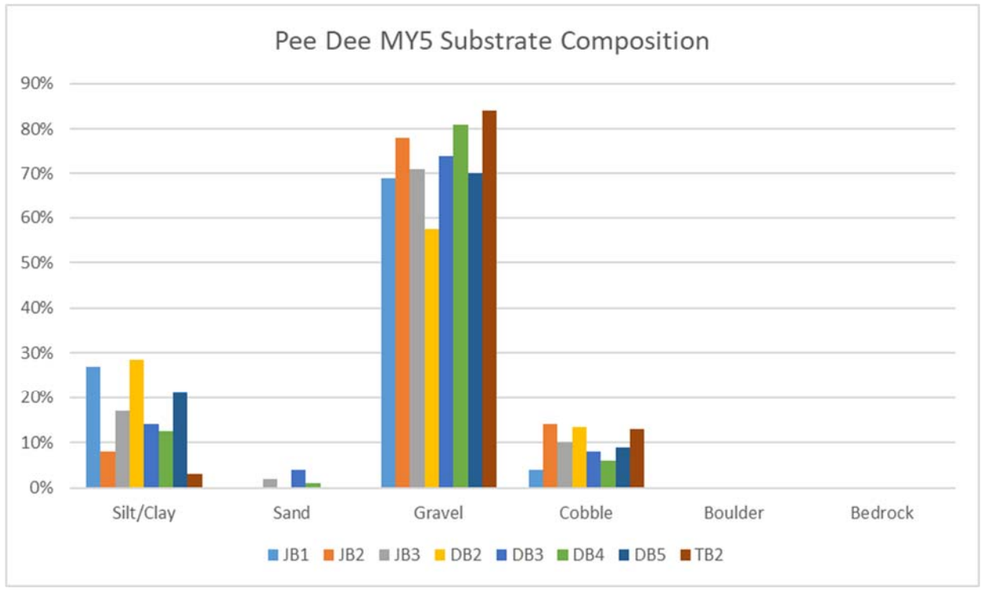


Chart 2.

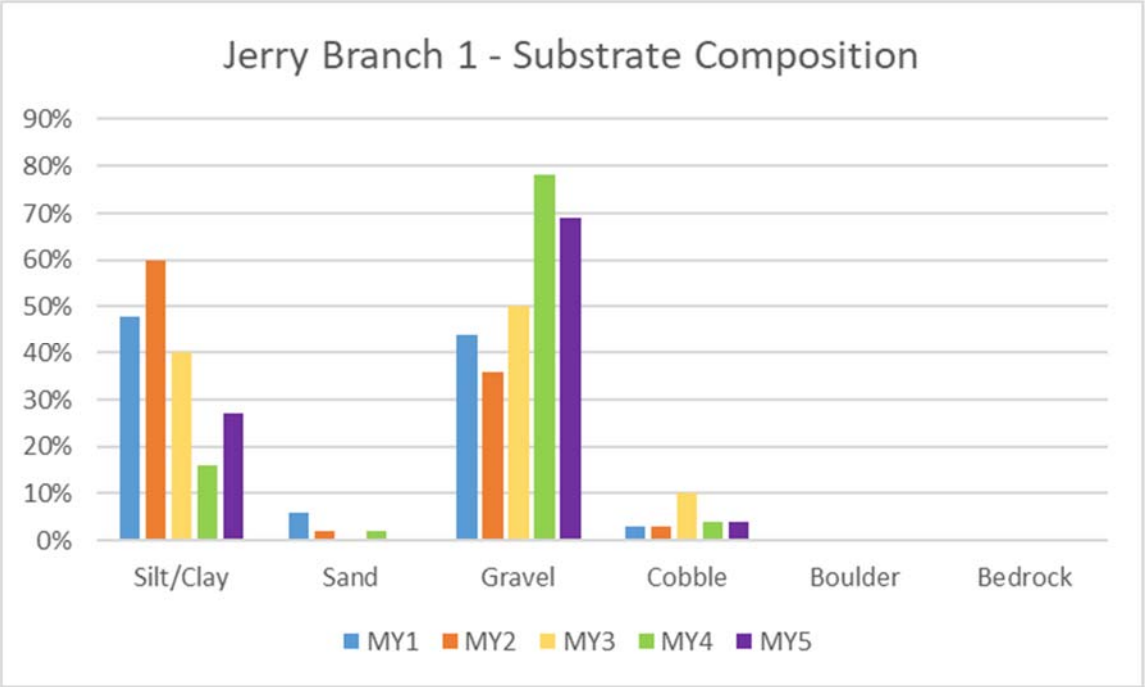


Chart 3.

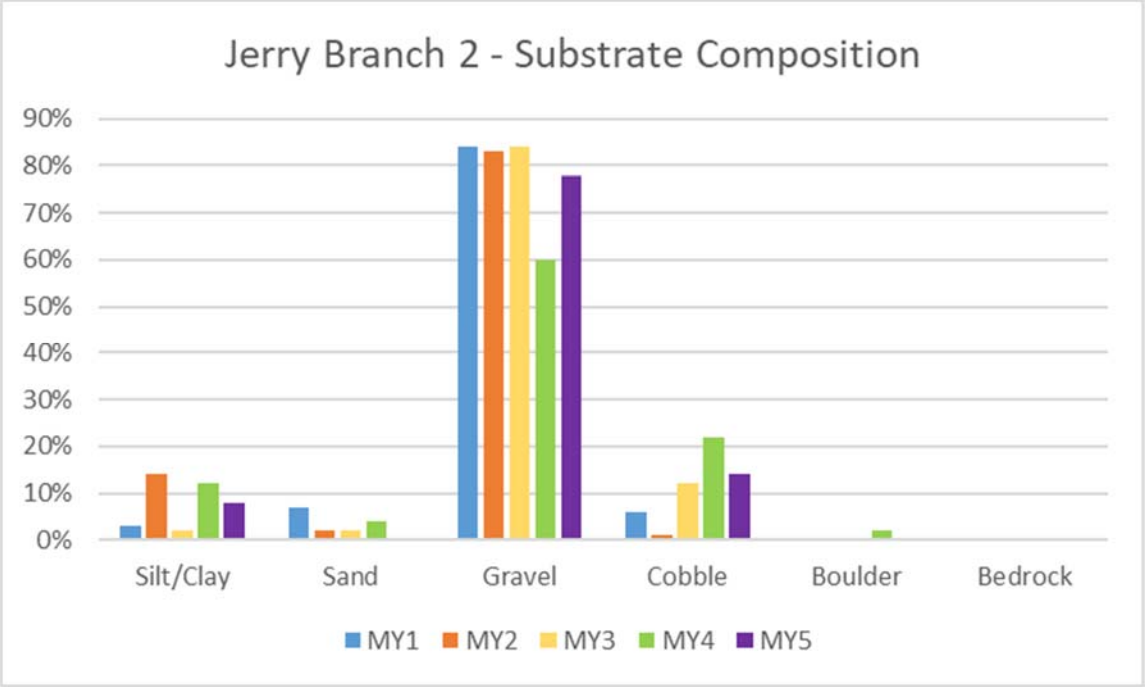


Chart 4.

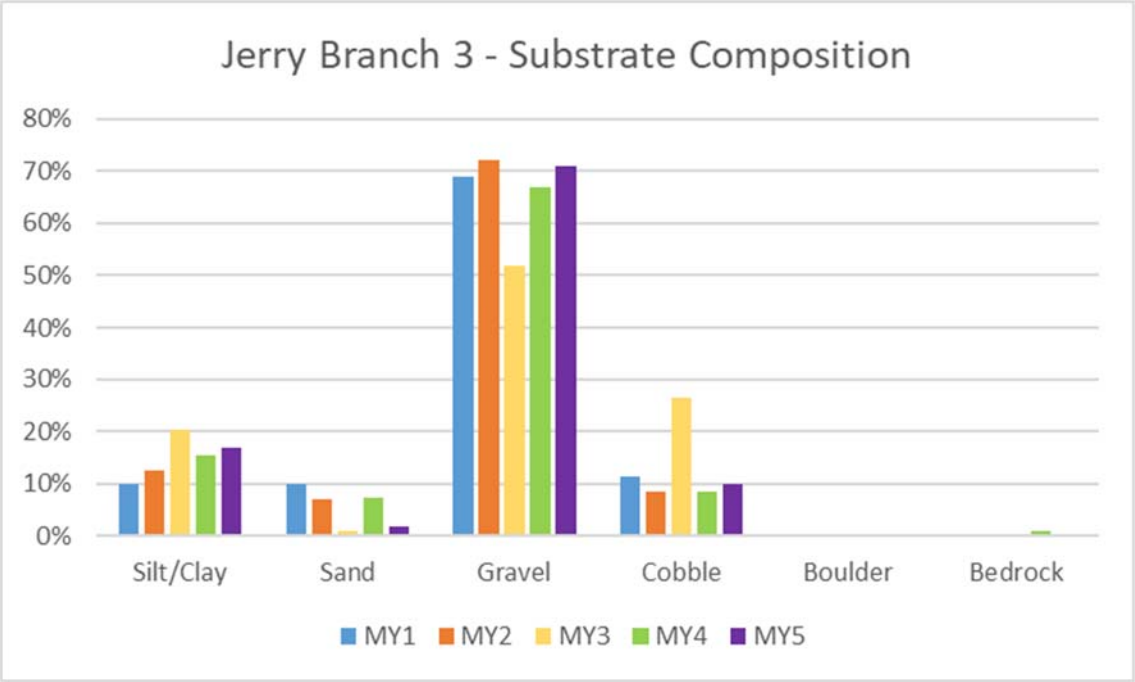


Chart 5.

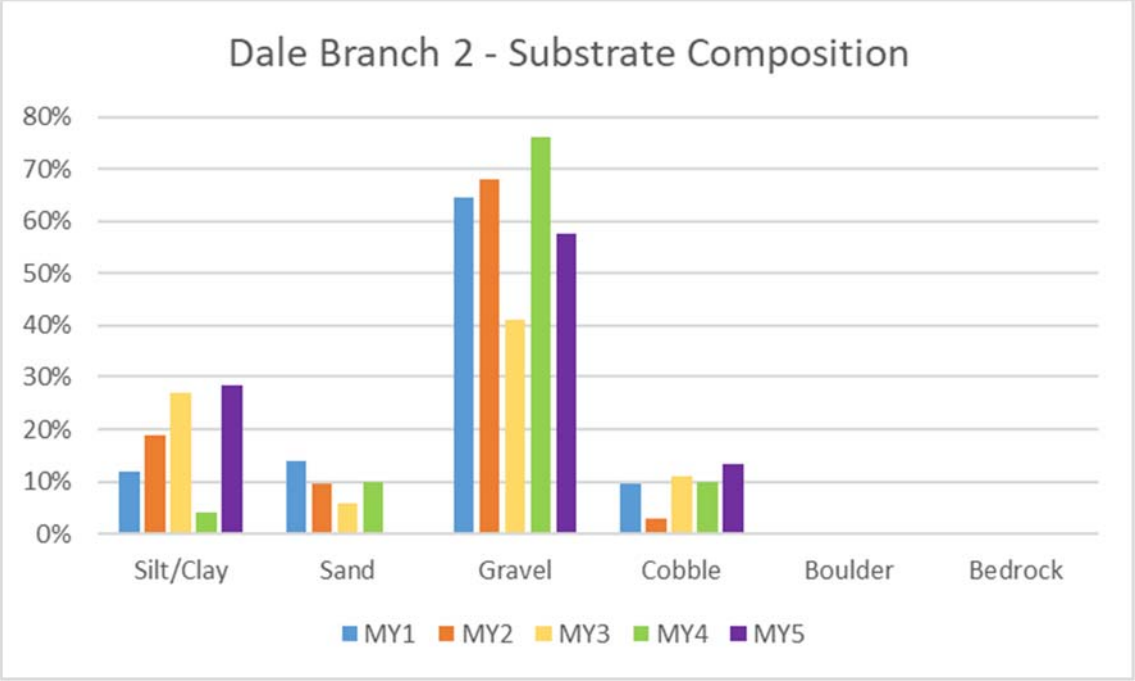


Chart 6.

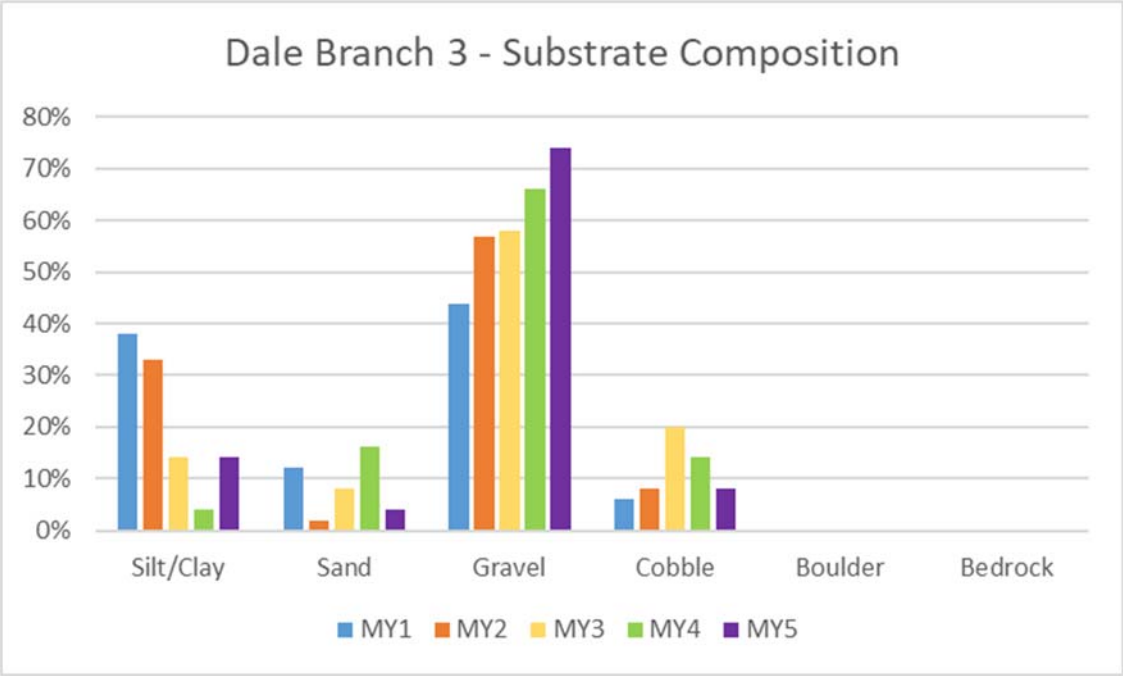


Chart 7.

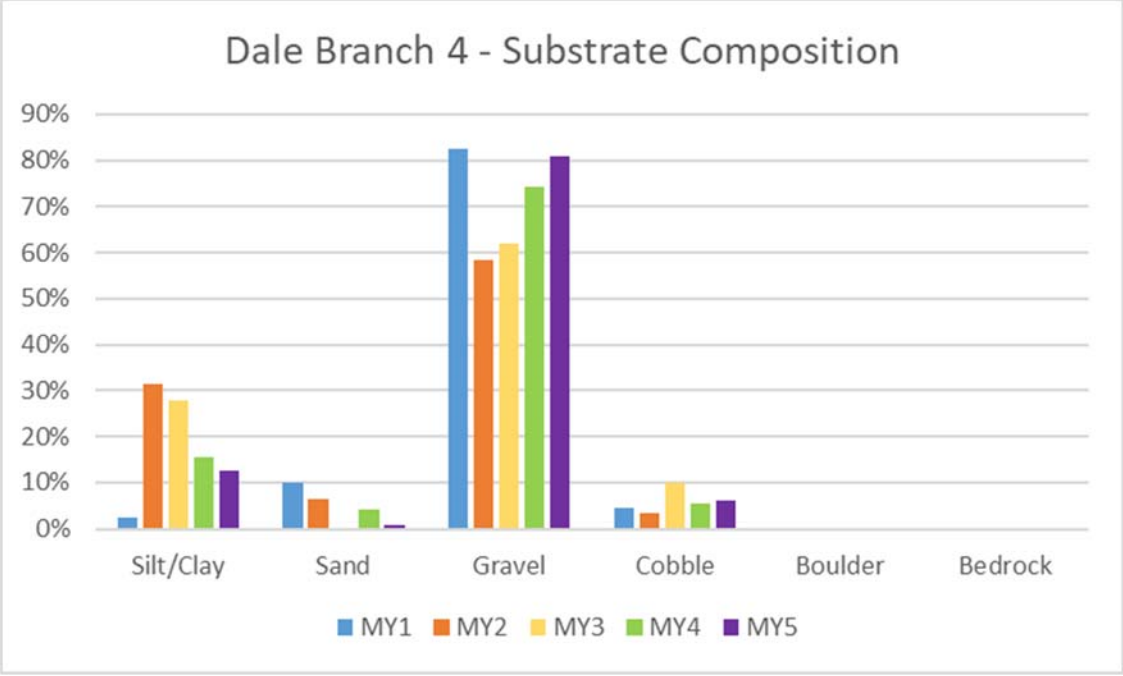


Chart 8.

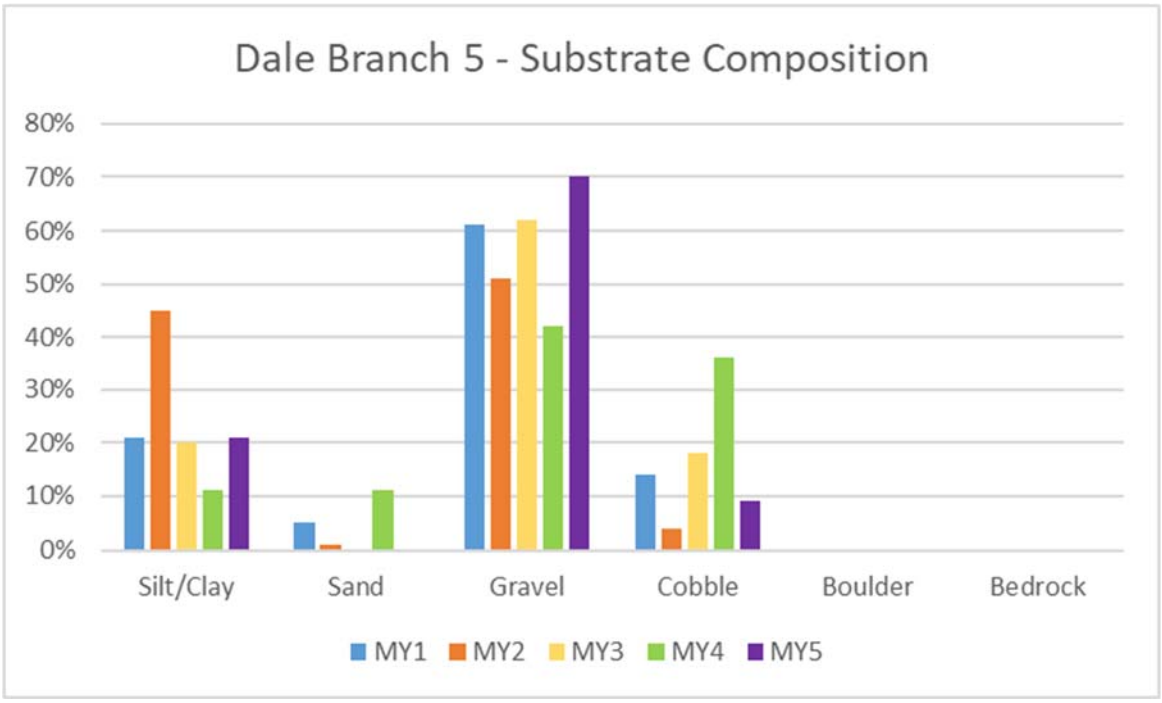


Chart 9.

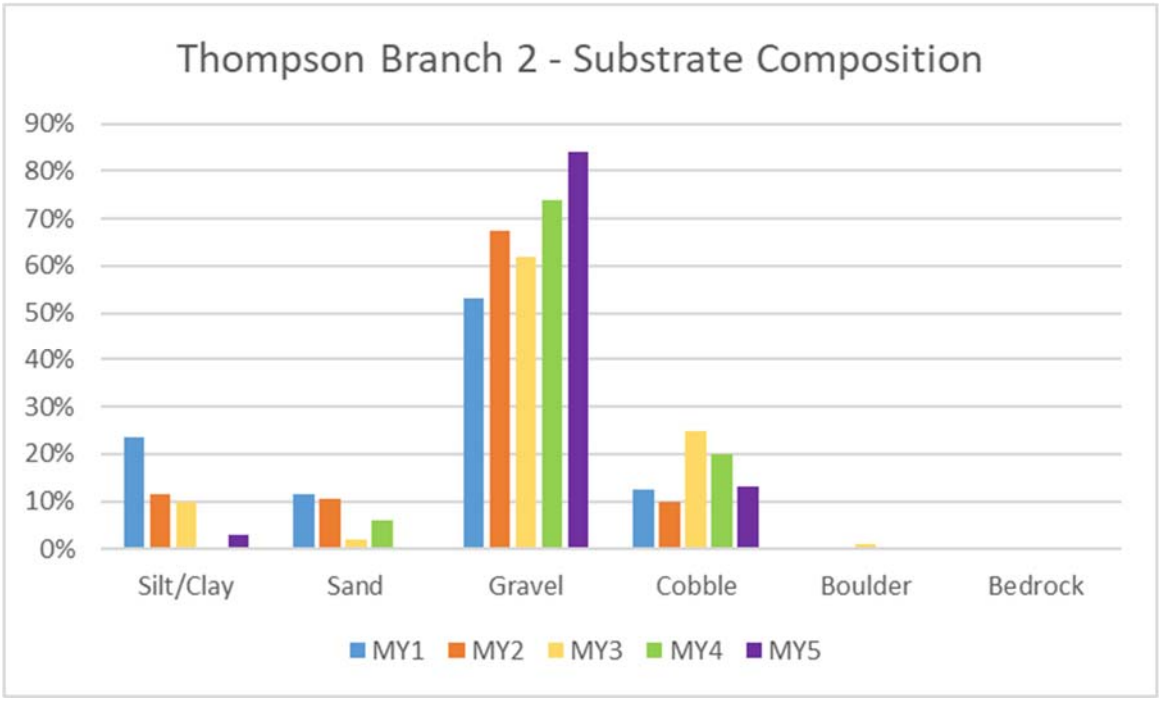


Table 13. Pee Dee Bank Pin Array Summary

Bank Pin Location	Position	Year 1 Reading (mm)	Year 2 Reading (mm)	Year 3 Reading (mm)	Year 5 Reading (mm)
Cross Section 1	Upstream	0.0	0.0	0.0	0.0
	At Cross Section	0.0	0.0	0.0	0.0
	Downstream	0.0	6.35	0.00	0.00
Cross Section 5	Upstream	0.0	0.0	0.0	0.0
	At Cross Section	0.0	0.0	0.0	0.0
	Downstream	0.0	0.0	0.0	0.0
Cross Section 13	Upstream	0.0	0.0	0.0	0.0
	At Cross Section	0.0	0.0	0.0	0.0
	Downstream	0.0	0.0	0.0	0.0
Cross Section 18	Upstream	0.0	0.0	0.0	0.0
	At Cross Section	19.1	0.0	0.0	0.0
	Downstream	0.0	0.0	0.0	0.0
Cross Section 19	Upstream	12.7	0.0	0.0	0.0
	At Cross Section	6.4	19.05	0.0	0.0
	Downstream	0.00	19.05	0.0	0.0
Cross Section 21	Upstream	0.0	0.0	0.0	0.0
	At Cross Section	0.0	0.0	0.0	0.0
	Downstream	0.0	50.8	0.0	0.0

Appendix E
Hydrology Data

Table 14. Verification of Bankfull and Flow Events

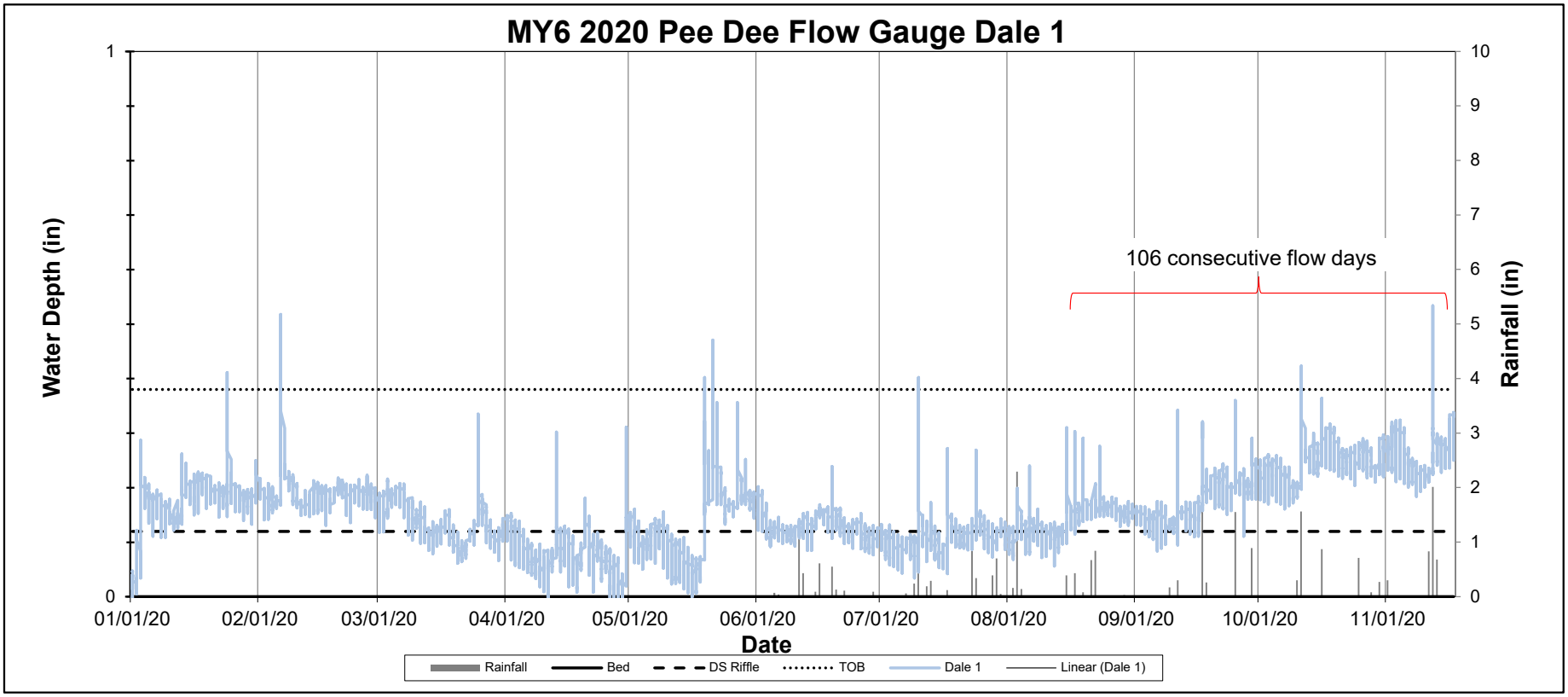
Year	Number of Bankfull Events	Maximum Bankfull Height
Jerry		
MY1 2015	1	1.33
MY2 2016	4	1.50
MY3 2017	0	N/A
MY4 2018	1	0.88
MY5 2019	0	N/A
Dale		
MY1 2015	1	0.95
MY2 2016	3	0.82
MY3 2017	0	N/A
MY4 2018	3	1.08
MY5 2019	0	N/A
Thompson		
MY1 2015	1	0.8
MY2 2016	3	0.88
MY3 2017	1	0.40
MY4 2018	1	0.67
MY5 2019	0	N/A

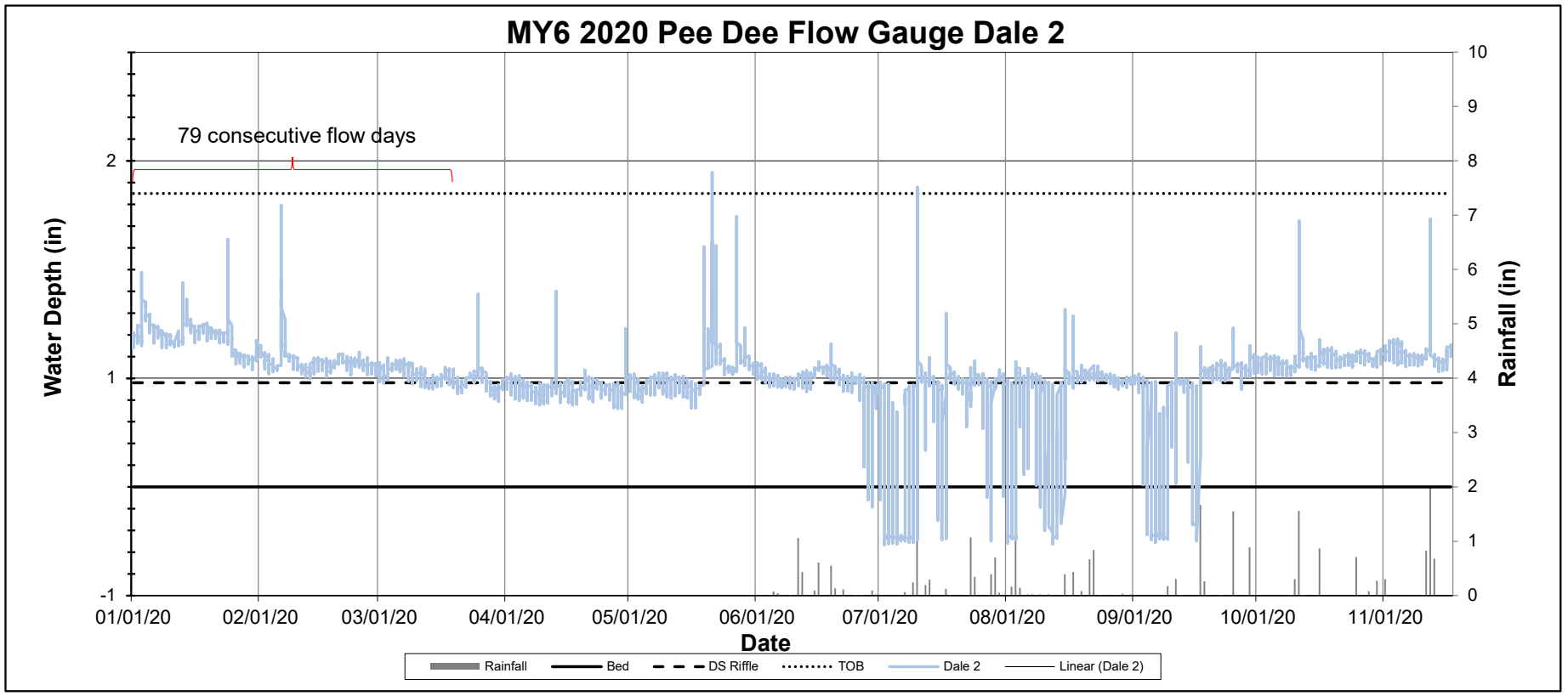
Year	Number of Bankfull Events	Maximum Bankfull Height
Dale 1		
MY6 2020	7	0.15
Dale 2		
MY6 2020	2	0.97
Thompson 1		
MY6 2020	14	1.61

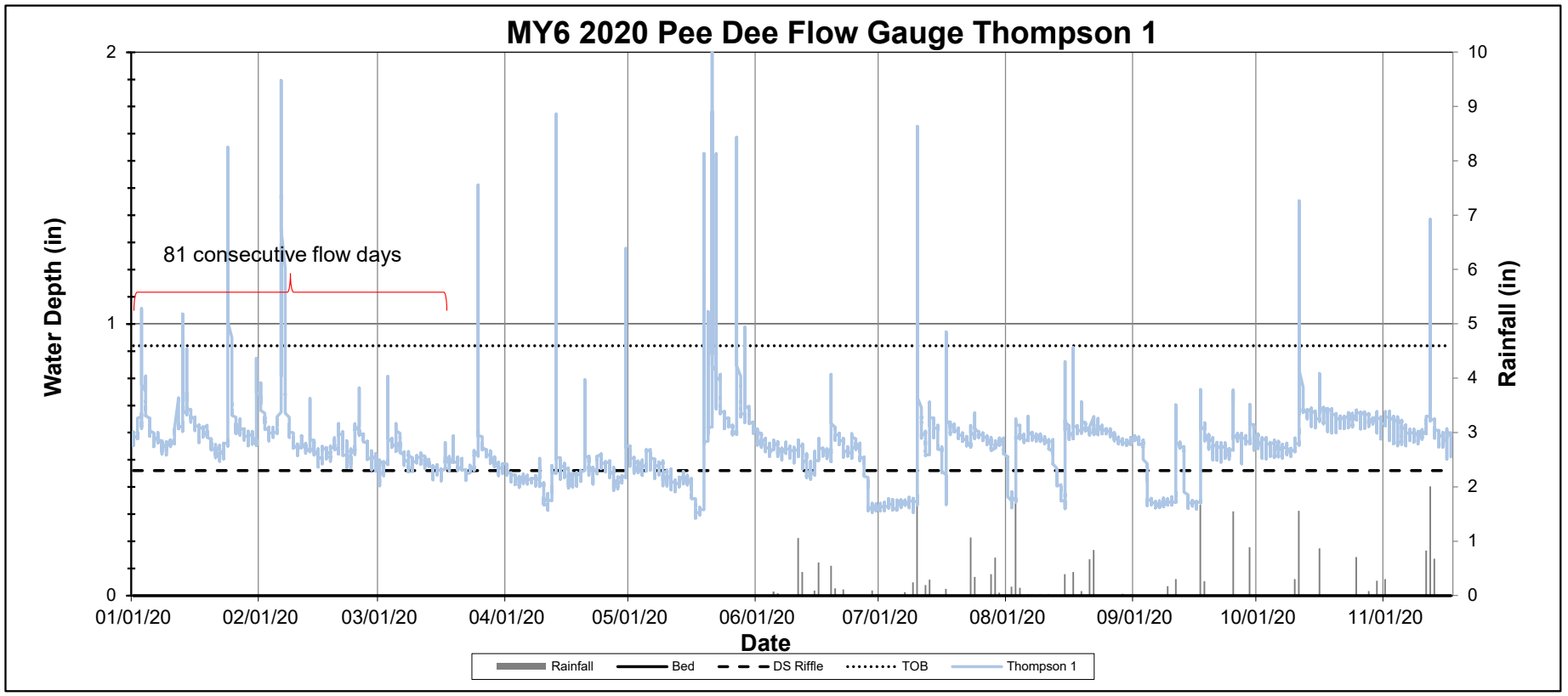
Year	Consecutive Flow Days	Total Flow Days	Number of Flow Events
Dale 1			
MY5 2019	152	152	1
MY6 2020	106	235	4
Dale 2			
MY5 2019	120	120	1
MY6 2020	75	223	9
Thompson 1			
MY5 2019	97	104	2
MY6 2020	81	266	11

Table 15. 2020Rainfall Summary

Month	Average	Normal Limits		Uwharrie Station Precipitation
		30 Percent	70 Percent	
January	4.07	2.74	4.87	5.28
February	3.41	2.47	4.03	6.04
March	4.28	3.05	5.07	3.43
April	3.15	1.86	3.82	4.85
May	3.61	2.54	4.28	7.44
June	4.34	2.56	5.27	3.23
July	4.84	3.08	5.83	5.96
August	4.50	2.89	5.42	5.15
September	4.48	2.26	5.48	4.87
October	3.75	2.19	4.53	3.82
November	3.34	1.98	4.05	5.74
December	3.66	2.52	4.35	---
Total	47.43	30.14	57.00	55.81


MY6 2020 Pee Dee Flow Gauge Dale 1
Water Depth (in)
Rainfall (in)
106 consecutive flow days
1
0
10
9
8
7
6
5
4
3
2
1
0
01/01/20
02/01/20
03/01/20
04/01/20
05/01/20
06/01/20
07/01/20
08/01/20
09/01/20
10/01/20
11/01/20
Date
Rainfall
Bed
DS Riffle
TOB
Dale 1
Linear (Dale 1)


MY6 2020 Pee Dee Flow Gauge Dale 2
79 consecutive flow days
Water Depth (in)
Rainfall (in)
2
1
-1
10
9
8
7
6
5
4
3
2
1
0
01/01/20
02/01/20
03/01/20
04/01/20
05/01/20
06/01/20
07/01/20
08/01/20
09/01/20
10/01/20
11/01/20
Date
Rainfall
Bed
DS Riffle
TOB
Dale 2
Linear (Dale 2)


MY6 2020 Pee Dee Flow Gauge Thompson 1
Water Depth (in)
Rainfall (in)
81 consecutive flow days
2
1
0
10
9
8
7
6
5
4
3
2
1
0
01/01/20
02/01/20
03/01/20
04/01/20
05/01/20
06/01/20
07/01/20
08/01/20
09/01/20
10/01/20
11/01/20
Date
Rainfall
Bed
DS Riffle
TOB
Thompson 1

Appendix F
Adaptive Management

M E M O R A N D U M

3600 Glenwood Avenue, Suite 100 Raleigh, North Carolina 27612 919.209.1052 tel. 919.829.9913 fax

TO: Harry Tsomides - DMS

FROM: Ryan Medric - RES

DATE: 6/11/2020

RE: Pee Dee MY5 (2019) IRT Credit Release Site Visit

Attendees:
IRT: Mac Haupt (NCDWR), Erin Davis (NCDWR)
DMS: Paul Wiesner, Harry Tsomides
RES: Brad Breslow, Ryan Medric

Site Visit Date: June 2, 2020

The IRT, DMS, and RES conducted a site visit at the Pee Dee Stream Restoration Site to discuss the Monitoring Year 5 (2019) credit release. The main topics of discussion were the invasive species treatment, channel hand work, and supplemental plantings that were completed in the winter and spring of 2020. Details are bulleted below:

- Flow, bed and bank, and riffle/pool sequences were observed above the pond area on Thompson 1. A hydrologic connection to Thompson Reach 2 through the pond area was also observed.
- Overall, the privet treatment was extremely successful, and only a limited number of re-sprouts were observed. Some areas had cut privet left in the channel which will be removed, and follow-up privet treatments will be administered throughout the remainder of the monitoring period.
- The supplemental planting areas looked good with a high survival rate thus far. RES agreed to perform three random vegetation transects in these areas, in MY6 and MY7, to document survival and growth.
- Despite the hand work RES performed on the channel through the wetland area on Dale 1, the area resembled more of a braided system. DWR recommended using valley length for all of Dale 1. Valley length for Dale 1 would reduce the credits from 250 SMUs to 240 SMUs.
- At the time of the site visit, flow was observed on all project reaches.
- A general comment was to ensure easement signs were on all the fencing before project closeout.
- The full IRT was not able to attend the meeting; however, DWR staff did not note any issue with releasing the 2019 project credit as proposed by DMS. DWR staff indicated that they would send their site visit notes to the USACE IRT chair for review.

3600 Glenwood Avenue, Suite 100
Raleigh, NC 27612

Corporate Headquarters
6575 West Loop South, Suite 300
Bellaire, TX 77401
Main: 713.520.5400

May 22, 2020

Harry Tsomides
NCDEQ – DMS
5 Ravenscroft Drive
Asheville, NC 28801

RE: Pee Dee Stream Restoration Site – 2020 Monitoring Adaptive Management Work Completed

Mr. Tsomides,

In response to problem areas identified in the Pee Dee Stream Restoration Site Year 5 Monitoring Report, 2019 Adaptive Management Plan, and IRT Comment Memo, RES completed adaptive management work in 2019 and early 2020. The 2019 work included adding flow gauges to Thompson 1, Dale 1, and Dale 2 and removal of 300 SMUs from Thompson 1 in the old pond bottom. All three flow gauges used the height of the downstream riffle to detect flow and documented 97, 152, and 120 consecutive days of flow respectively. And the removal of the 300 SMUs from Thompson 1 adjusted the total credits from 6,405 to 6,105. The 2020 work included: invasive species treatment, flow path excavation, and container tree planting. More information about the 2020 adaptive management work is detailed below:

Invasive Species Treatment

Dates: December 2019, January 2020, March 2020
Method: Cut Stump Herbicide Treatment of Chinese Privet
Treatment Area: >2.51 acres

Flow Path Excavation

Date: January 2020
Method: Hand tools (shovels and rakes)
Treatment Length: +/- 150 feet (Dale 1)

Container Tree Planting

Date: March 2020
Method: Gas augers and shovels
Planting Area: +/- 1.40 acres (in previously mulched privet areas)
Stems/Acre: 357

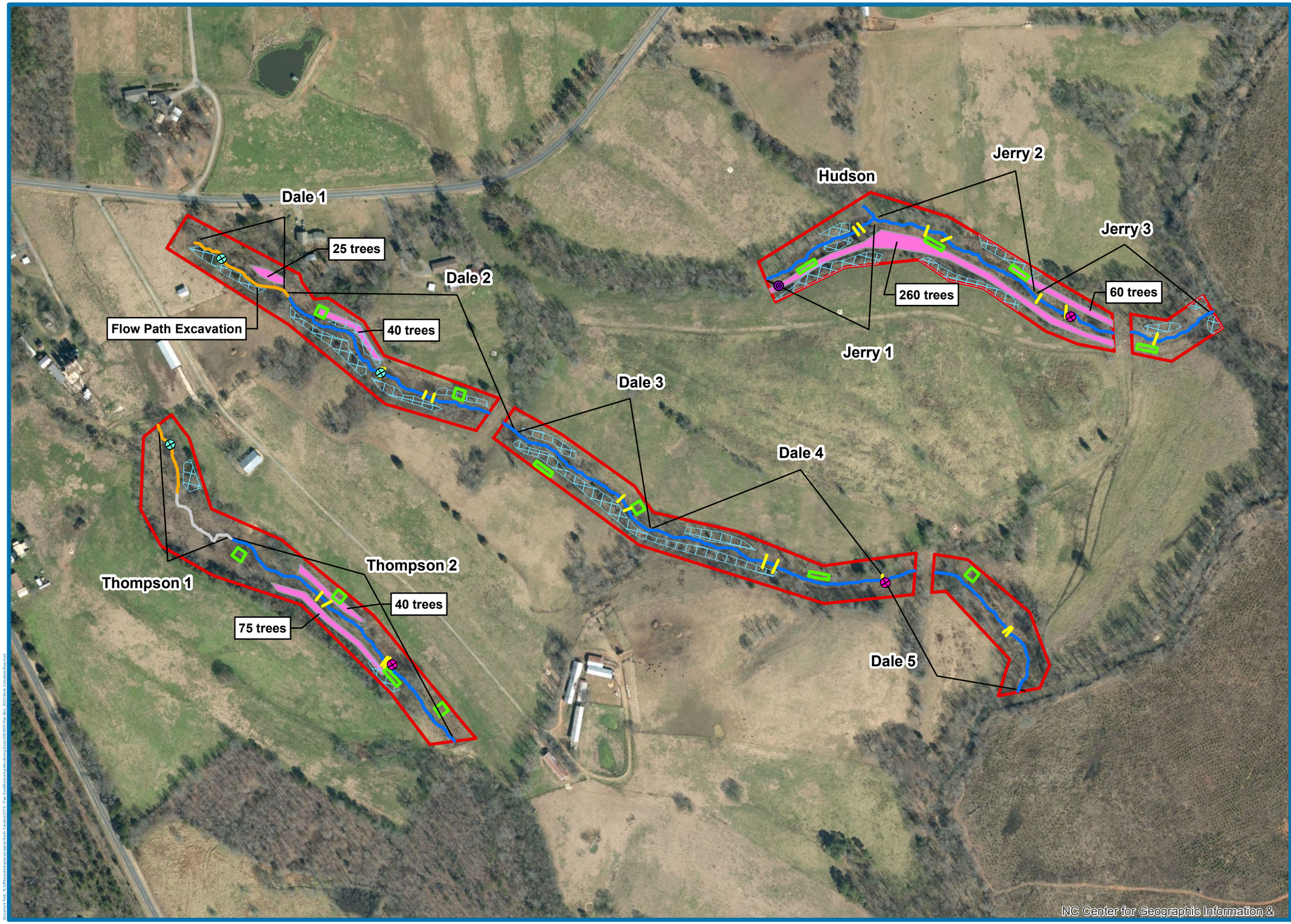
Species	Size	Quantity
Swamp Chesnut Oak	3 gallon	150
Pin Oak	3 gallon	100
Green Ash	3 gallon	95
River Birch	3 gallon	75
Green Ash	3 gallon	60
Tulip Poplar	3 gallon	20
Total		500

A map displaying the locations of the items mentioned above is attached as well as the 2019 Adaptive Management Plan and the IRT Comment Memo.

Thank you,

Ryan Medric

Ryan Medric | Ecologist



res

0 150 300
Feet

1 inch = 300 feet

Pee Dee Stream Restoration Project

Date: 4/10/2020	Drawn by: RTM

LEGEND

- Conservation Easement
- Vegetation Plot

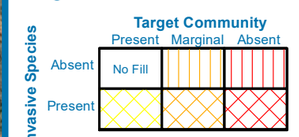
Invasive Species Area

- Cut Stump Treatment
- Replant Area
- Cross Section

Mitigation Type

- Restoration
- Enhancement I
- No Credit
- Crest Gauge
- Flow Gauge (Jan 2019)
- Rain Gauge

Vegetation Condition Assessment



302 Jefferson Street, Suite 110
Raleigh, NC 27605

Corporate Headquarters
5020 Montrose Blvd. Suite 650
Houston, TX 77006
Main: 713.520.5400

March 29, 2019

Harry Tsomides
NCDEQ – DMS
5 Ravenscroft Drive
Asheville, NC 28801

RE: Pee Dee Stream Restoration Site – 2019 Monitoring Adaptive Management Plan

Mr. Tsomides,

During a site visit with the IRT and NCDMS at the Pee Dee Site in July 2018, several problem areas were identified. Per the request of NCIRT, RES is providing this Adaptative Management Plan to address the stream problem areas listed below:

1. **Thompson 1 above the old pond bottom.**
   During the July 2018 site visit, the IRT noted that this reach had a defined flow path but the lack of sorting in the bed material and the uniform bedform was characteristic of a stream with less than intermittent flow. In January 2019, RES installed a flow gauge above the old pond bottom to document at least intermittent flow. RES will report consecutive and cumulative flow days in the annual monitoring reports. To further assess perenniality, RES completed NCDWR Stream Forms above the old pond bed and in the pasture upstream of the easement. The reach above the old pond bottom in the easement scored 27.5 and the reach above the old pond bottom in the pasture scored 25. The completed NCDWR Stream Forms are attached. Additionally, the new crossing (constructed in 2017) directly upstream of the easement was inspected to confirm it was not blocking flow.
2. **Thompson 1 in the old pond bottom.**
   Following dam removal, the pond bottom cracked as it was drained. The cracks in the soil are up to a few feet deep. Any surface water that enters the pond bottom is lost into the cracks and a single-thread flow path is difficult to locate. Due to risk and budgetary constraints, RES does not plan on doing any work in this area.
3. **Dale 1 above the old pond bottom.**
   During the July 2018 site visit, the IRT determined that RES needs to document at least intermittent flow on this reach to receive credit. In January 2019, RES installed a flow gauge on this reach to document at least intermittent flow. RES will report consecutive and cumulative flow days in the annual monitoring reports.
4. **Dale 1 in the old pond bottom**.
   This area is a drained pond turned wetland. The channel had overgrown with vegetation and the targeted bedform and riffle/pool sequence was hard to identify during the July 2018 site visit. In January 2019, RES staff identified the preferred flow path up against the toe of slope on the western side of the wetland. Photos of the preferred flow path through the wetland area attached. RES plans on hand excavating and adding riffle material to the channel to reestablish the proper bedform diversity as well as hand excavating a low flow

path above and below this reach to better connect it to the top of Dale 1 and the start of Dale 2.

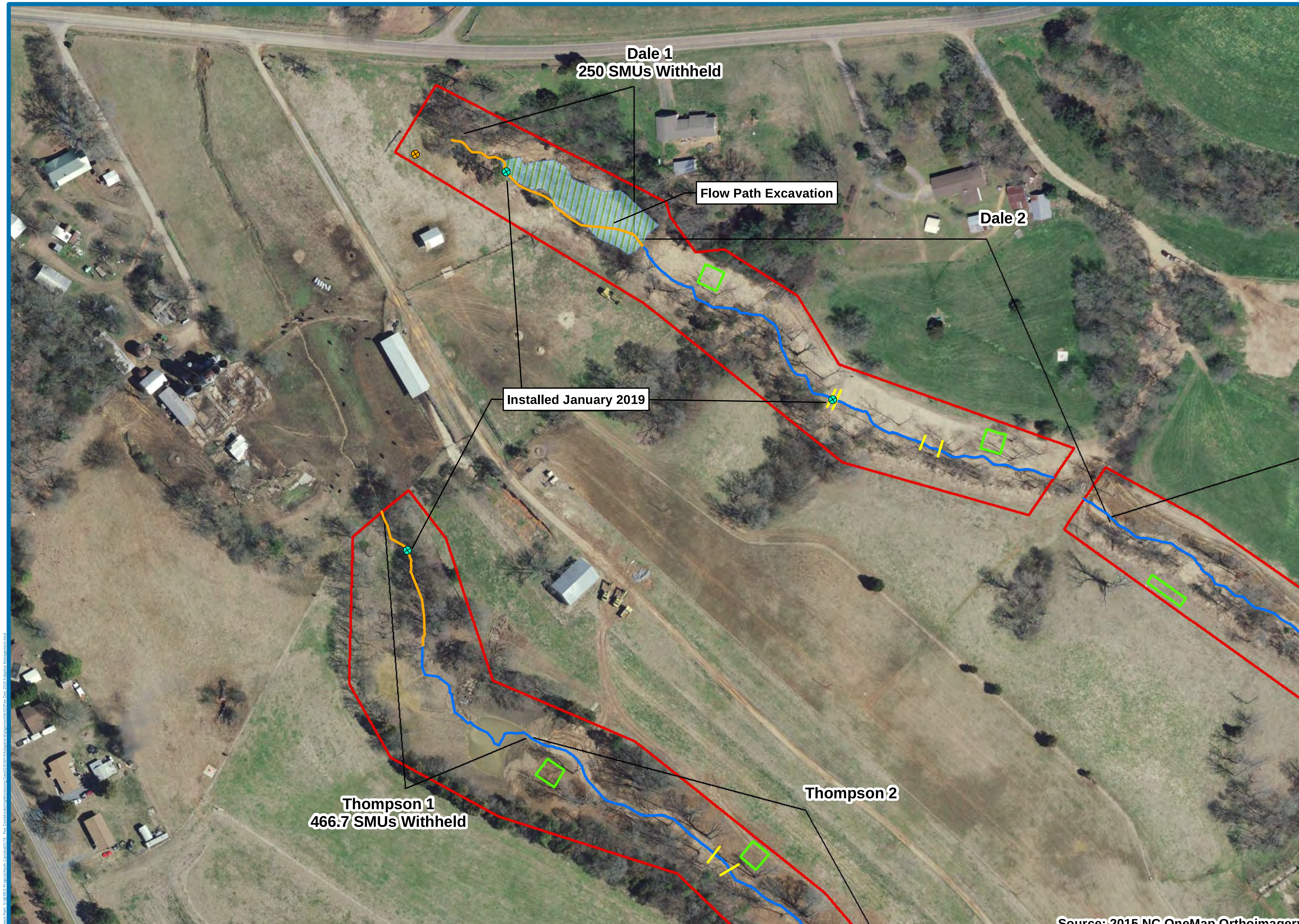
5. **Dale 2.**
   The IRT requested the documentation of at least intermittent flow on this reach to assist with closeout decisions. In January 2019, RES installed a flow gauge at Cross Section 9 to document at least intermittent flow. RES will report consecutive and cumulative flow days in the annual monitoring reports.

RES plans to perform the above-mentioned adaptive management activities on Dale 1 in spring of 2019. Once work is completed, RES will provide written notification to USACE along with photo documentation to inform work has been completed. RES plans on monitoring the adaptive management areas for the remainder of the seven-year monitoring period. Each annual report will include data from the flow gauges and the visual assessments. Also, RES will continue to treat the Chinese privet on site multiple times per year for the rest of the monitoring period.

A map displaying the locations of the items listed above is attached. Photos of the flow gauges and areas of note are also attached.

Thank you,

Ryan Medric | Ecologist



res

0 75 150
Feet

1 inch = 150 feet

Pee Dee Stream Restoration Project

2019 Adaptive Management Map

Date: 3/7/2019	Drawn by: RTM

LEGEND

- Conservation Easement
- Vegetation Plot
- Wetland
- Restoration
- Enhancement I
- Cross Section
- Ambient Gauge
- Crest Gauge
- Flow Gauge
- Rain Gauge

Pee Dee Adaptive Management Plan Photos (01/29/2019)

Thompson 1 above old pond looking upstream

Thompson 1 above old pond looking upstream at new crossing

Thompson 1 above old pond looking upstream

Thompson 1 above old pond looking upstream

Thompson 1 Flow Gauge

Thompson 1 above old pond looking downstream into pond bottom

Thompson 1 in the pasture upstream of the easement

Thompson 1 looking upstream at Pee Dee Road

Dale 2 Flow Gauge

Dale 1 in old pond looking upstream

Dale 1 in old pond looking downstream

Dale 1 Flow Gauge

Thompson 1 above pond (in easement)

NC DWQ Stream Identification Form Version 4.11

Date: 1/29/19	**Project/Site:** Pee Dee	**Latitude:** 35.255157
Evaluator: RTM	**County:**	**Longitude:** -80.030671
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 27.5	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 14.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Thompson 1 above pond (out of easement)

NC DWQ Stream Identification Form Version 4.11

Date: 1/29/19	**Project/Site:** Pee Dee	**Latitude:** 35.255931
Evaluator: RTM	**County:**	**Longitude:** -80.030592
Total Points: 25 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 11.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
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23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch: CRONOS Stanly County Airport

1/29/19 0.05"

1/24/19 0.53"

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

CESAW-RG/Browning June 13, 2019

MEMORANDUM FOR RECORD

SUBJECT: Pee Dee Mitigation Site - NCIRT Comments during 30-day Mitigation Plan Review

PURPOSE: The comments listed below were provided during the 30-day comment period in accordance with Section 332.8(g) of the 2008 Mitigation Rule.

NCDMS Project Name: Pee Dee Mitigation Site, Montgomery County, NC

USACE AID#: SAW-2012-01077

NCDMS #: 95350

30-Day Comment Deadline: May 30, 2019

Todd Bowers, EPA:
In general, I agree with all responses and approaches to adaptive management that RES proposes to correct site deficiencies and resume credit release at the Pee Dee site. My only comment is that RES should clearly state the stream mitigation units that the proposed action will release or those that are no longer being sought such as the Thompson 1 old pond bottom that is not being reworked for credit (due to budgetary constraints).
As an IRT member, I encourage RES to continue to monitor the site and provide the IRT with adaptive management needs as they arise in order to minimize any time between problem identification and correction.

Mac Haupt/Erin Davis, NCDWR:
I am ok with the proposed Modification Plan. However, I would like some clarification as to how they are measuring stream flow given the placement of the flow gauges. I am assuming they are adjusting the elevation to the riffle above or below, since they are all located in pools.

Kim Browning, USACE:
I question the flow, and functional uplift, of including the reach above the cracked pond bottom. I generally agree with the adaptive management plan, especially the need for flow gauges on the reach above the pond and the privet treatment.

Kim Browning
Mitigation Project Manager
Regulatory Division