Monitoring Report MY02

Stony Fork Restoration Site
Upper Neuse River Basin - 03020201
Monitoring Year 02
DMS Contract 6830

DMS Project Number 97085
DWR #: 2016-0372
USACE Action ID: 2016-00875
Johnston County, North Carolina

Prepared for:
NCDMS, 1652 Mail Service Center, Raleigh, NC 27699-1652

Monitoring Data Collected: 2020
Date Submitted: January 2021

Mitigation Project Name	**Stony Fork Restoration Site**	**USACE Action ID**	**2016-00875**
DMS ID	**97085**	**DWR Permit**	**2016-0372**
River Basin	**Neuse**	**Date Project Instituted**	**3/22/2016**
Cataloging Unit	**03020201**	**Date Prepared**	**4/21/2020**
County	**Johnston**	**Stream/Wet. Service Area**	**Neuse 03020201**

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 when the as-built report (baseline monitoring report) has been approved by the IRT and posted 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 %**	**Proposed Releases %**	**Proposed Released #**	**Not Approved # Releases**	**Approved Credits**	**Anticipated Release**	**Actual Release**
1 - Site Establishment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2 - Year 0 / As-Built	30.00%	30.00%	1,975.780	0.000	1,975.780	2019	8/20/2019
3 - Year 1 Monitoring	10.00%	10.00%	658.593	0.000	658.593	2020	4/21/2020
4 - Year 2 Monitoring	10.00%					2021	
5 - Year 3 Monitoring	10.00%					2022	
6 - Year 4 Monitoring	5.00%					2023	
7 - Year 5 Monitoring	10.00%					2024	
8 - Year 6 Monitoring	5.00%					2025	
9 - Year 7 Monitoring	10.00%					2026	
Stream Bankfull Standard	10.00%						
			Totals	0.000	2,634.373		

Total Gross Credits	6,585.933
Total Unrealized Credits to Date	0.000
Total Released Credits to Date	2,634.373
Total Percentage Released	40.00%
Remaining Unreleased Credits	3,951.560

Notes

Contingencies (if any)

Project Quantities

Mitigation Type	**Restoration Type**	**Physical Quantity**
Warm Stream	Restoration	6,405.000
Warm Stream	Enhancement I	71.000
Warm Stream	Enhancement II	334.000

Mitigation Project Name	**Stony Fork Restoration Site**	**USACE Action ID**	**2016-00875**
DMS ID	**97085**	**DWR Permit**	**2016-0372**
River Basin	**Neuse**	**Date Project Instituted**	**3/22/2016**
Cataloging Unit	**03020201**	**Date Prepared**	**4/21/2020**
County	**Johnston**	**Stream/Wet. Service Area**	**Neuse 03020201**

Debits

							Stream Restoration Credits
Beginning Balance (mitigation credits)							**6,585.933**
Released Credits							**2,634.373**
Unrealized Credits							**0.000**
Owning Program	**Req. Id**	**TIP #**	**Project Name**	**USACE Permit #**	**DWR Permit #**	**DCM Permit #**	
NCDOT Stream & Wetland ILF Program	REQ-008290	R-2721A	R-2721A - NC 540 - West of NC 55 to East of SR 1389	2009-02240	2018-1249		1,975.780
Total Credits Debited							**1,975.780**
Remaining Available balance (Released credits)							**658.593**
Remaining balance (Unreleased credits)							**3,951.560**

Monitoring and Design Firm

Prepared by:

KCI Associates of North Carolina
4505 Falls of Neuse Road
Suite 400
Raleigh, NC 27609
(919) 783-9214

Project Contact: Tim Morris
Email: tim.morris@kci.com

KCI ASSOCIATES OF NORTH CAROLINA, PA

ENGINEERS • SCIENTISTS • SURVEYORS • CONSTRUCTION MANAGERS

4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 (919) 783-9214 (919) 783-9266 Fax

MEMORANDUM

Date: February 24, 2021
To: Lindsay Crocker, DMS Project Manager
From: Tim Morris, Project Manager
KCI Associates of North Carolina, PA
Subject: MY-02 Monitoring Report Comments
Stony Fork DMS #6830, Contract 006830
Neuse River Basin CU 030202018
Johnston County, North Carolina

Please find below our responses in italics to the MY-02 Monitoring Report comments from NCDMS received on February 2, 2021 for the Stony Fork Restoration Site.

1. There was ATV encroachment and evidence of trails throughout portions of the easement, along with visual evidence of ATV activity during the DMS site visit. This encroachment should be eliminated by working with the landowner. Please reach out to DMS Property and/or Stewardship if you need assistance with this effort, including suggestions for additional signage, etc. There should be a formal letter or memo documenting notification to the landowner to ensure this is handled in the future. Please provide that documentation to DMS.
   KCI Response: KCI first noted the evidence of ATV encroachment on June 5, 2020. At this time, the landowner was alerted of the issue. KCI monitored this area for continued trespass at each site visit after it was first noted and as of December 8, 2020 no evidence of further trespass was noted. At a site visit on February 9, 2021, fresh ATV tracks were noted entering the easement from the end of Sherrill Farm Dr. The landowner has been informed of this encroachment and the letter that was sent to him has been included at the end of the report.

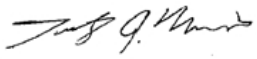
2. Please also document the extent of the encroachment on the CCPV map and measure the area to be reported on the visual assessment table 6 (#5 Easement Encroachment Areas).
   KCI Response: The extent of the ATV encroachment was surveyed with a handheld GPS on February 9, 2021 and the CCPV and visual assessment table have been updated to show the encroachment.

3. Resubmit the buffer features, ensuring that they are organized as they are presented in the asset table. Previous digital submissions of these features do not appear to match the square footage reported in the asset table.
   KCI Response: The correct buffer features have been submitted with the digital deliverables.

4. Digital review of SF3 does not match the asset table (691 ft vs. 624 ft) from the Mitigation Plan. This possibly an issue with the crossing not being removed (as footnoted on the asset table). Please segment this feature or provide the correct geometry for the SF3 that is equal to the creditable stream length (624).

KCI Response: The submitted shapefile contained the section of stream that a restoration level of work was performed on, but which did not generate any credit due to the limited buffer width. These segments of the stream have been marked as "No Credit."

Sincerely,



Tim Morris
Project Manager

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PROJECT SUMMARY

The Stony Fork Restoration Site (SFRS) was completed in May 2019 and restored a total of 6,810 linear feet of stream and 949,747 square feet of riparian buffer under the Neuse Buffer Rule (NCAC Rule 15A 02B.029). The SFRS is a riparian system in the Upper Neuse River Basin (03020201 8-digit cataloging unit) in Johnston County, North Carolina. The site's natural hydrologic regime had been substantially modified through the relocation and straightening of the existing stream channels, impacted by land clearing, and cleared of any riparian buffer. This completed project will restore impacted agricultural and timber lands to a stable stream ecosystem with a functional riparian buffer and floodplain access.

The SFRS is protected by a 24.4 acre permanent conservation easement, held by the State of North Carolina. The site is located approximately 5.5 miles north of Benson, NC. Specifically, the site is 0.2 mile west on Elevation Road from its intersection with Federal Road (SR-1331).

The North Carolina Ecosystem Enhancement Program (NCEEP) published the Neuse River Basin Priorities in 2010. These were updated in for the Neuse 01 cataloging unit (CU) in 2015 due to extensive mitigation needs and changes in watershed conditions since 2010. The project 14 digit CU (03020201150010) was identified as a Targeted Local Watershed (TLW) in the updated priorities. The goals and priorities for the SFRS are based on the information presented in the Neuse River Basin Restoration Priorities: maintaining and enhancing water quality, restoring hydrology, and improving fish and wildlife habitat (NCEEP, 2009). The project will support the following basin priorities:

- Managing stormwater runoff
- Improving/restoring riparian buffers
- Reducing sediment loading
- Improving stream stability

The goals for the project are to:

- Restore channelized and agriculture impacted streams to stable C/Cb channels.
- Restore a forested riparian buffer to provide bank stability, filtration, and shading.

The project goals will be addressed through the following objectives:

- Relocate a channelized stream to its historic landscape position.
- Install cross-sections sized to the bankfull discharge.
- Create bedform diversity with pools, riffles, and habitat structures
- Plant the site with native trees and shrubs and an herbaceous seed mix.

Project planting and construction were completed in May 2019. The SFRS involved restoration and establishment of a functioning stream ecosystem with 6,810 linear feet of stream restored by re-meandering the stream and by tying the bankfull elevation to the historic floodplain where feasible. The entire site was planted to establish a forested riparian buffer. The site was constructed as designed with no major modifications from the design plan. The monitoring components were installed in May 2019. Four automatica recording pressure transducer stream gauges that take a reading every 10 minutes were installed in the upper third of T1, T1-A, T2 and T3 to document flow within those reaches. Cameras were installed in the vicinity of each of these gauges and set to record a short video once a day to provide additional verification of flow. An additional automatic recording pressure transducer stream gauge was installed near the bottom of the main stem (SF3) to record the occurrence of bankfull events. To determine the success of the planted mitigation areas, seven 10 m x 10 m permanent vegetation monitoring plots were established. An additional five 10 m x 10 m random vegetation monitoring plots were sampled as well. The locations of the planted stems relative to the origin were recorded within the permanent plots and the species and height of each planted stem were recorded for all plots. Any volunteers found within the plots were also grouped into size categories by species, but separate from the planted stems. Twelve permanent photo reference points were established and will be taken annually. Sixteen permanent cross-sections (eight riffle

cross-sections and eight pool cross-sections) were also established and a detailed longitudinal profile of the stream was taken. Wolman pebble counts were performed at all of the riffle cross-sections. The cross-section measurements will be repeated in future monitoring years, but the longitudinal profile will only be repeated if there are concerns about bed elevation adjustments. Reports will be submitted to DMS each year.

Vegetative success criteria for the stream mitigation is 260 woody stems/acre after five years, and 210 woody stems/acre after seven years. Trees in each plot must average seven feet in height at Year 5 and ten feet in height at Year 7. Volunteer species must be present for a minimum of two growing seasons and must be a species from the approved planting list to count toward vegetative success. A single species may not account for more than 50% of the required number of stems within any plot. A minimum of four bankfull events must also be recorded during the monitoring period. All project streams must show a minimum of 30 continuous days of flow within a calendar year for three out of the first four years of monitoring. Bank height ratios (BHR) should not exceed 1.2 and the entrenchment ratios (ER) should be 2.2 or greater. BHR and ER at any measured riffle cross-section should not change more than 10% from the baseline condition during any given monitoring interval (e.g. no more than 10% between years 1 and 2, 2 and 3, 3 and 5, or 5 and 7). Visual assessments will also be used to identify problem areas.

Vegetative success criteria for the areas proposed for riparian buffer credit is 260 woody stems/acre at the end of five years of monitoring. Trees in each plot must average seven feet in height at Year 5. There should be a minimum of four native hardwood tree species, with no species accounting for greater than 50% of the stems. Volunteer species must be from the approved planting list to count toward vegetative success.

MONITORING RESULTS

The second-year vegetation monitoring was conducted between September 2 and September 4, 2020. The site averaged 573 planted stems/acre across all 12 plots. Eleven of the twelve plots had greater than 260 planted stems/acre. Including volunteers, the site averaged 782 total stems/acre. The plot that did not meet the success criteria (Plot #5) is located near the bottom of Reach T2-1. Since this reach is an Enhancement II reach, the work that was done here was much less extensive than other areas of the site and the majority of the mature trees in this area were left intact. This area has canopy coverage and there are many mature trees both in and around this plot. In general the site is well vegetated, with widespread herbaceous coverage and healthy planted stems.

The stream gauge near the bottom of SF3 recorded eight bankfull events in 2020. All four stream flow gauges recorded at least 30 consecutive days of flow. All four of the gauges recorded flow for the entirety of the period that they recorded. This consisted of a period of 96 consecutive days from January 1 to April 5, and a period of 152 consecutive days from June 3 to November 1. The gap between April 5 and June 3 was caused by a gauge malfunction but based on the rainfall pattern and previous year's data it is likely that the streams were all flowing during this period as well. The cameras on T1 and T3 either were obscured or malfunctioned throughout the majority of the year, but the camera on T1A recorded a maximum of 183 consecutive days of flow before being obscured by vegetation growth. The camera on T2 recorded a maximum of 53 days before malfunctioning. Camera malfunctions have been repaired for MY03.

The second-year cross-section survey was completed between June 18 and 28, 2020 and found that the dimensions of the stream are as designed, with some small variation as is typical for stream restoration projects. Cross-section 9, located on T3, showed about six inches of aggradation. This reach received a large amount of sediment input during 2020 from portions of the stream located upstream of the project reaches. This section of the project will be monitored to ensure that this sediment washes through the system in the coming monitoring years. The monitored cross-section data have been calculated by adjusting the bankfull elevation to maintain the baseline bankfull area for each cross-section.

During a site visit on June 5, 2020, ATV tracks entering the easement were noted. These tracks entered the easement from the end of Sherrill Farm Dr., turned northeast for approximately 500 feet before turning around and traveling along the northern edge of the easement until exiting the site along the relic farm road that runs parallel to Sherrill Farm Dr. At this time, the landowner was alerted of the issue and KCI monitored this area for continued trespass. As of December 8, 2020 no evidence of further trespass was noted but at a site visit on February 9, 2021, fresh ATV tracks were noted. These tracks ran from the end of Sherrill Farm Rd. to the relic farm road and did not turn northeast, as the original ones had. The landowner has been issued a formal notice of violation, which is included in Appendix F – Additional Information. Please see Appendix B – Visual Assessment Data for further information.

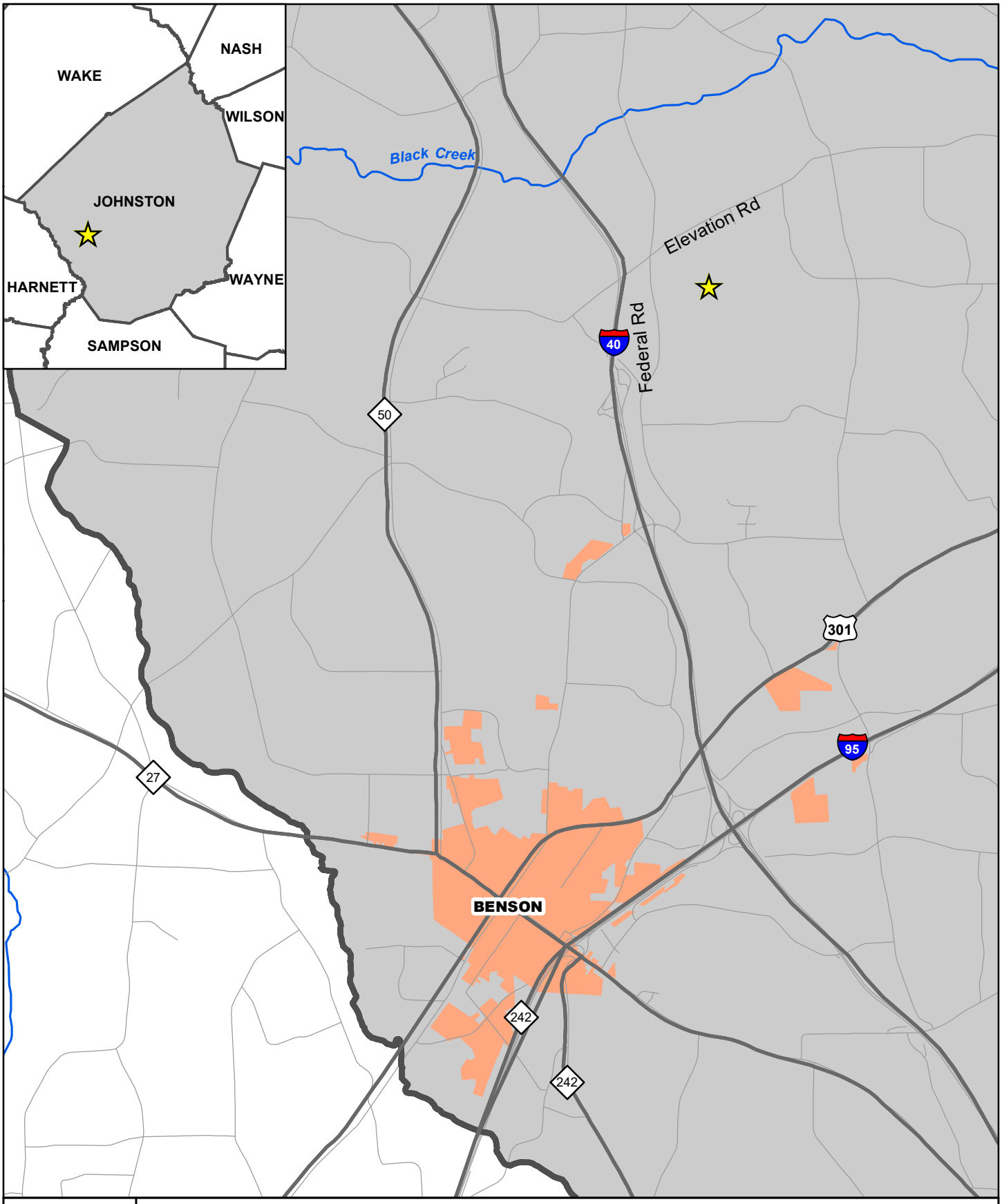

FIGURE 1. VICINITY MAP, STONY FORK RESTORATION SITE, JOHNSTON COUNTY, NC

KCI ASSOCIATES OF NC

Project Site Location
County Boundary
Major Roads
Minor Roads
Airports (none within a 5-mi radius)
Major Rivers and Streams
Cities and Towns

N

0 0.5 1 Miles

REFERENCES

NCDEQ, Division of Mitigation Services. March 2015. 2015 Neuse 03020201 Priorities. Last accessed at: http://portal.ncdenr.org/c/document_library/get_file?uuid=340a3f58-336b-42bf-bab2-fb663cbfd78d&groupId=60329

NCDENR, Ecosystem Enhancement Program. 2014. NCDENR, Ecosystem Enhancement Program. 2014. Stream and Wetland Mitigation Monitoring Guidelines. Last accessed1/2016 at: http://portal.ncdenr.org/c/document_library/get_file?p_l_id=60409&folderId=18877169&name=DLFE-86604.pdf

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NC Wetland Functional Assessment Team. 2010. NC Wetland Assessment Method (NC WAM) User Manual, version 4.1. Last accessed 11/2012 at: http://portal.ncdenr.org/c/document_library/get_file?uuid=76f3c58b-dab8-4960-ba43-45b7faf06f4c&groupId=38364

Schafale, M.P. and A.S. Weakley. 2012. Guide to the Natural Communities of North Carolina: Fourth Approximation. Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment and Natural Resources. Raleigh, NC.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. *Soil Survey of Johnston County, North Carolina*. 1994

APPENDIX A

Background Tables

Table 1. Project Components and Mitigation Credits
Stony Fork Restoration Site, DMS Project #97085

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer		Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE	R	RE		
Linear Feet/Acres	6,405	405					450,285 sf	499,462 sf		
Credits	6,405	181					425,434	59,904		
TOTAL CREDITS	**6,586**						**480,338**			

Project Components

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Square Footage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	MP Restoration Footage*	As-built Restoration Footage	Mitigation Ratio
SF1	10+00 – 21+55	1,235	PI/PII	R	1,155	1,155	1:1
SF2	21+55 – 49+54	2,453	PI	R	2,707**	2,714**	1:1
SF3	49+54 – 56+08	618	PI	R	624**	624**	1:1
T1	100+00 – 105+10	365	PI/PII	R	510	510	1:1
T1A	150+00 – 151+59	47	PI/PII	R	159	159	1:1
T2-1	200+00 – 203+34	327	N/A	EII	334	334	2.5:1
T2-2	203+34 – 206+71	326	PI/PII	R	337	337	1:1
T2-3	206+71 – 215+26	780	PI/PII	R	855	855	1:1
T3-1	300+00 – 300+71	72	PI/PII	EI	71	71	1.5:1
T3-2	300+71 – 301+29	82	PI/PII	R	58	58	1:1
Buffer Restoration TOB to 100’	N/A	413,194	N/A	R	413,194	413,194	100%
Buffer Restoration 101-200’	N/A	37,091	N/A	R	37,091	37,091	33%
Buffer Enhancement TOB to 100’	N/A	74,802	N/A	E	74,802	74,802	50%
Buffer Preservation TOB to 100’	N/A	424,660	N/A	P	424,660	424,660	10%

*Mitigation Plan footage used for credit calculations. **Crossings have been removed from creditable linear footage for all project streams

Component Summation					
Restoration Level	**Stream (linear feet)**	**Riparian Wetlands (Acres)**		**Non-Riparian Wetlands (Acres)**	**Buffer (square feet)**
		Riverine	Non-Riverine		
Restoration	6,405				450,285
Enhancement					74,802
Enhancement I	71				
Enhancement II	334				
Creation					
Preservation					424,660 (175,029 allowable for credit)
High Quality Preservation					
TOTAL CREDITS	6,586				480,338

Table 2. Project Activity & Reporting History
Stony Fork Restoration Sites, DMS Project #97085

Activity or Report	Data Collection Complete	Actual Completion or Delivery
Mitigation Plan		September 5, 2018
Final Design - Construction Plans		Oct. 15, 2018
Construction Grading Completed		May 3, 2019
Planting Completed		May 6 2019
Baseline Monitoring/Report	May 2019	July 2018
Vegetation Monitoring	*May 9, 2019*	
Stream Survey	*May 15, 2019*	
Year 1 Monitoring	November 2019	January 2020
Vegetation Monitoring	*November 5, 2019*	
Stream Survey	*November 11, 2019*	
Year 2 Monitoring	November 2020	January 2021
Vegetation Monitoring	*September 4, 2020*	
Stream Survey	*June 29, 2020*	

Table 3. Project Contacts **Stony Fork Restoration Site, DMS Project #97085**	
Design Firm	KCI Associates of North Carolina 4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512 Fax: (919) 783-9266
Construction Contractor Stony Fork and T3	Fluvial Solutions, Inc. PO Box 28749 Raleigh, NC 27611 Contact: Mr. Peter Jelenevsky Phone: (919) 605-6134
Construction Contractor T1, T1A, and T2	KCI Environmental Technologies and Construction 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512
Planting Contractor	Bruton Natural Systems, Inc. PO Box 1197 Fremont, NC 27830 Contact: Mr. Charlie Bruton Phone: (919)783-9214
Monitoring Performers	
	KCI Associates of North Carolina 4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 Contact: Mr. Adam Spiller Phone: (919) 278-2514 Fax: (919) 783-9266

Table 4. Project Information Stony Fork Restoration Site, DMS Project #97085				
Project Name	Stony Fork Restoration Site			
County	Johnston County			
Project Area (acres)	24.4 acres			
Project Coordinates (lat. and long.)	35°26'55.0"N, 78°31'18.5"W			
Project Watershed Summary Information				
Physiographic Province	Coastal Plain			
River Basin	Neuse			
USGS Hydrologic Unit 8-digit	03020201	**USGS Hydrologic Unit 14-digit**	03020201150010	
DWQ Sub-basin	03-04-04			
Project Drainage Area (acres)	497 acres			
Project Drainage Area Percentage of Impervious Area	5%			
CGIA Land Use Classification	Managed Herbaceous Cover 53% (262 ac), Mixed Hardwoods/Conifers 31% (150 ac), Low Density Developed 9% (42 ac), Medium Density Residential 5% (24 ac), Transportation/Impervious 3% (13 ac)			
Existing Reach Summary Information				
Parameters	**Stony Fork**	**T1 and T1A**	**T2**	**T3**
Length of reach (linear feet)	3,141	412	1,433	154
Drainage area (acres)	497	12	150	29
Perennial, Intermittent, Ephemeral	Perennial	Intermittent	Perennial	Intermittent
NCDWQ Water Quality Classification	C; NSW	C; NSW	C; NSW	C; NSW
Stream Classification (exisiting)	G4c	G4	G4	G4
Stream Classifcation (proposed)	C4	C4	C4	C4
Evolutionary trend (Simon)	Channelized, Stage III	Channelized, Stage III	Channelized, Stage III	Modified with pond, Stage III
FEMA classification	None	None	None	None
Existing Wetland Summary Information				
Parameters				
Size of Wetland (acres)	0.33 (WA and WE)	0.06 (WB)	0.14 (WC and WF)	
Wetland Type	Headwater Forest	Bottomland Hardwood Forest	Non-Tidal Freshwater Marsh	
Mapped Soil Series	Gilead sandy loam	Bibb sandy loam	Bibb sandy loam	
Drainage class	Moderately Well Drained	Poorly Drained	Poorly Drained	
Soil Hydric Status	Non-hydric	Hydric	Hydric	
Source of Hydrology	Surface Water	Stream Floodplain	Stream Floodplain	
Restoration or Enhancement Method	N/A	N/A	N/A	

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States – Section 404	Yes	Yes	404 permit
Waters of the United States – Section 401	Yes	Yes	401 permit
Endangered Species Act	No	N/A	N/A
Historic Preservation Act	No	N/A	N/A
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	No	Yes	
Essential Fisheries Habitat	No	N/A	N/A

APPENDIX B

Visual Assessment Data

Stream Mitigation

- R *(6,405 lf / 6,405 SMCs)*
- EI *(71 lf / 47 SMCs)*
- EII *(334 lf / 134 SMCs)*

Buffer Mitigation

- R 0-100' *(413,194 sf / 413,194 credits)*
- R 101-200' *(37,091 sf / 12,240 credits)*
- E *(74,802 sf / 37,401 credits)*
- P *(424,660 sf / 17,503 credits)*

- Project Easement
- Easement Encroachment
- Cross-Sections
- Photo Points
- Flow Gauge
- Camera
- Bankfull Gauge

Vegetation Monitoring Plots

- Success Criteria Met
- Success Criteria Not Met

T1
T1A
T2-1
T2-2
T2-3
T3-1
T3-2
SF1
SF2
SF3
Start SF1
Sheet 1
Sheet 2
Sheet 3
Sheet 4

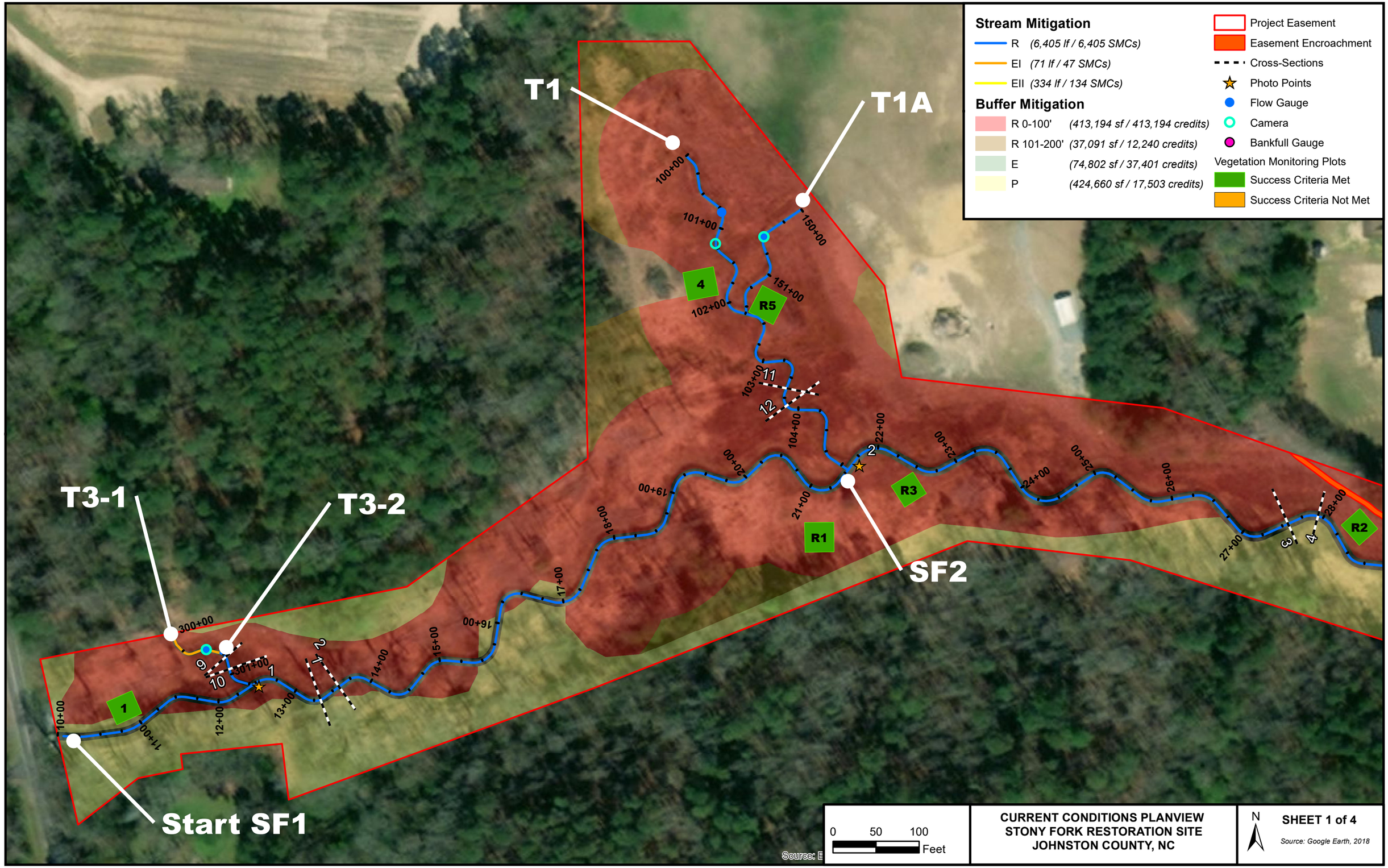
0 150 300 Feet

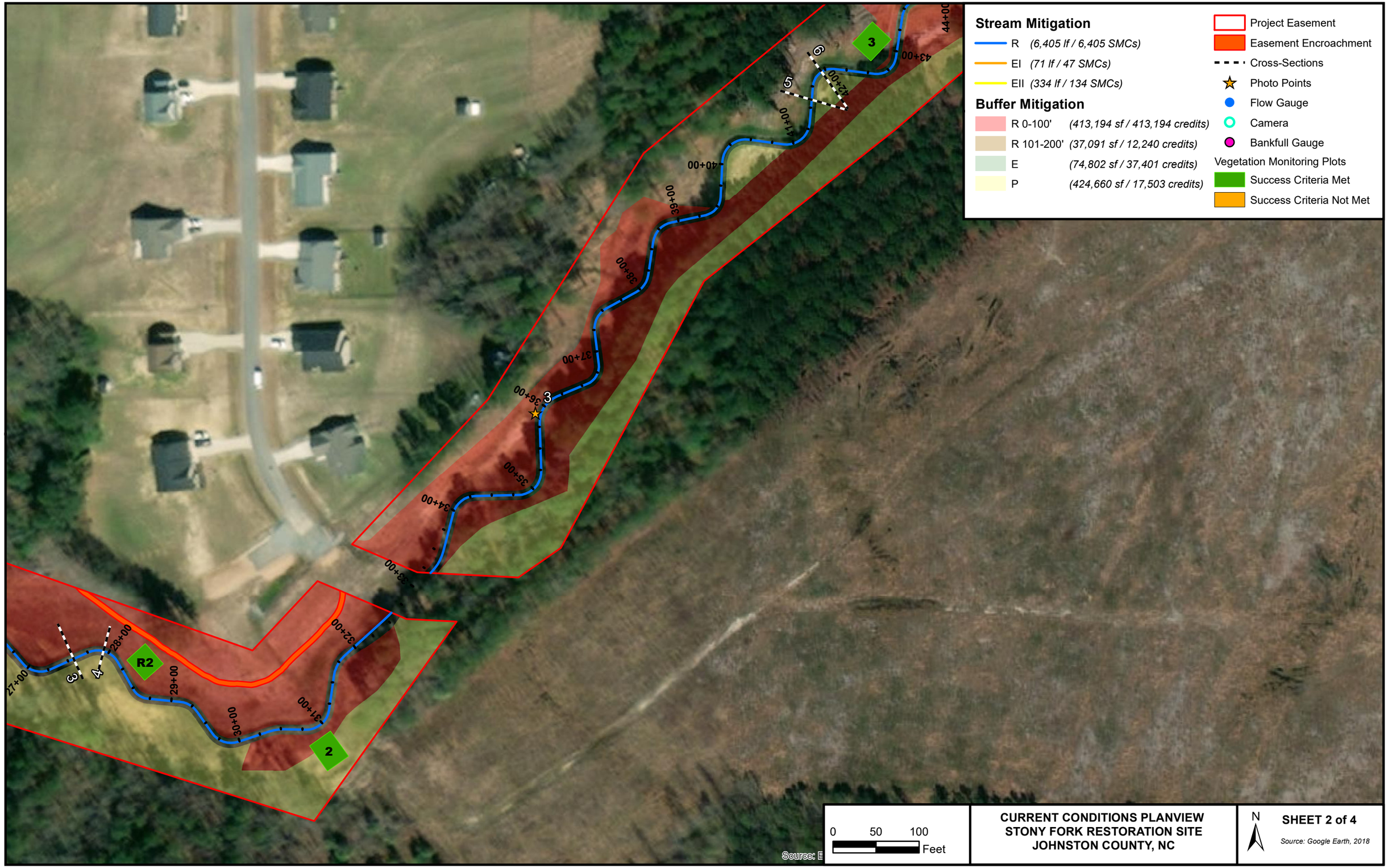
CURRENT CONDITIONS PLANVIEW
STONY FORK RESTORATION SITE
JOHNSTON COUNTY, NC

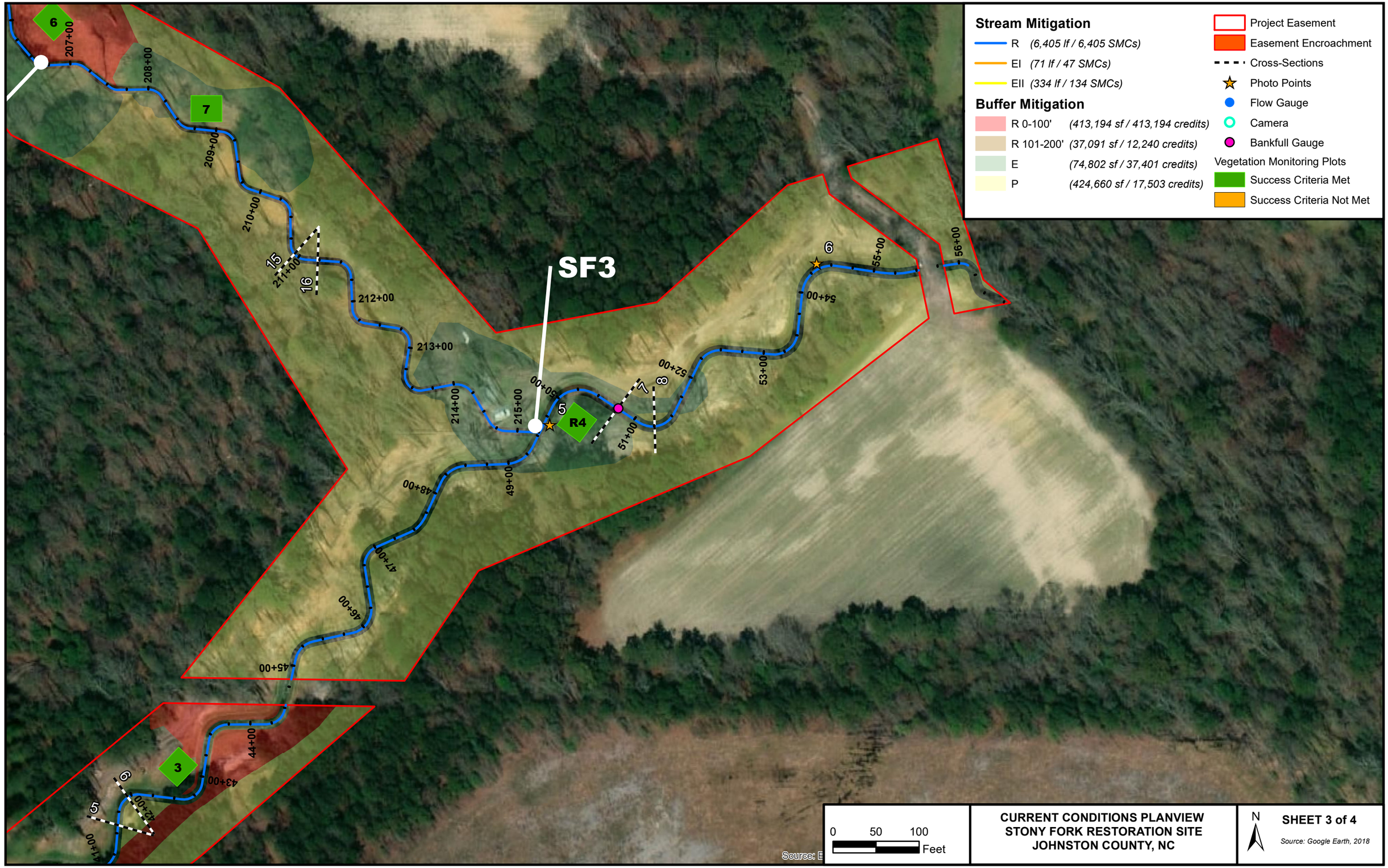
N

Overview

Source: Google Earth, 2018


T1
T1A
T3-1
T3-2
SF2
Start SF1
100+00
101+00
102+00
103+00
104+00
150+00
151+00
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
27+00
28+00
300+00
301+00
4
R5
R3
R1
R2
1
2
3
4
9
10
11
12
Stream Mitigation
R (6,405 lf / 6,405 SMCs)
EI (71 lf / 47 SMCs)
EII (334 lf / 134 SMCs)
Buffer Mitigation
R 0-100' (413,194 sf / 413,194 credits)
R 101-200' (37,091 sf / 12,240 credits)
E (74,802 sf / 37,401 credits)
P (424,660 sf / 17,503 credits)
Project Easement
Easement Encroachment
Cross-Sections
Photo Points
Flow Gauge
Camera
Bankfull Gauge
Vegetation Monitoring Plots
Success Criteria Met
Success Criteria Not Met
0 50 100
Feet
CURRENT CONDITIONS PLANVIEW
STONY FORK RESTORATION SITE
JOHNSTON COUNTY, NC
N
SHEET 1 of 4
Source: Google Earth, 2018


Stream Mitigation
R (6,405 lf / 6,405 SMCs)
EI (71 lf / 47 SMCs)
EII (334 lf / 134 SMCs)
Buffer Mitigation
R 0-100' (413,194 sf / 413,194 credits)
R 101-200' (37,091 sf / 12,240 credits)
E (74,802 sf / 37,401 credits)
P (424,660 sf / 17,503 credits)
Project Easement
Easement Encroachment
Cross-Sections
Photo Points
Flow Gauge
Camera
Bankfull Gauge
Vegetation Monitoring Plots
Success Criteria Met
Success Criteria Not Met
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00
38+00
39+00
40+00
41+00
42+00
43+00
44+00
R2
2
3
4
5
6
0 50 100 Feet
CURRENT CONDITIONS PLANVIEW
STONY FORK RESTORATION SITE
JOHNSTON COUNTY, NC
N
SHEET 2 of 4
Source: Google Earth, 2018


Stream Mitigation
R (6,405 lf / 6,405 SMCs)
EI (71 lf / 47 SMCs)
EII (334 lf / 134 SMCs)
Buffer Mitigation
R 0-100' (413,194 sf / 413,194 credits)
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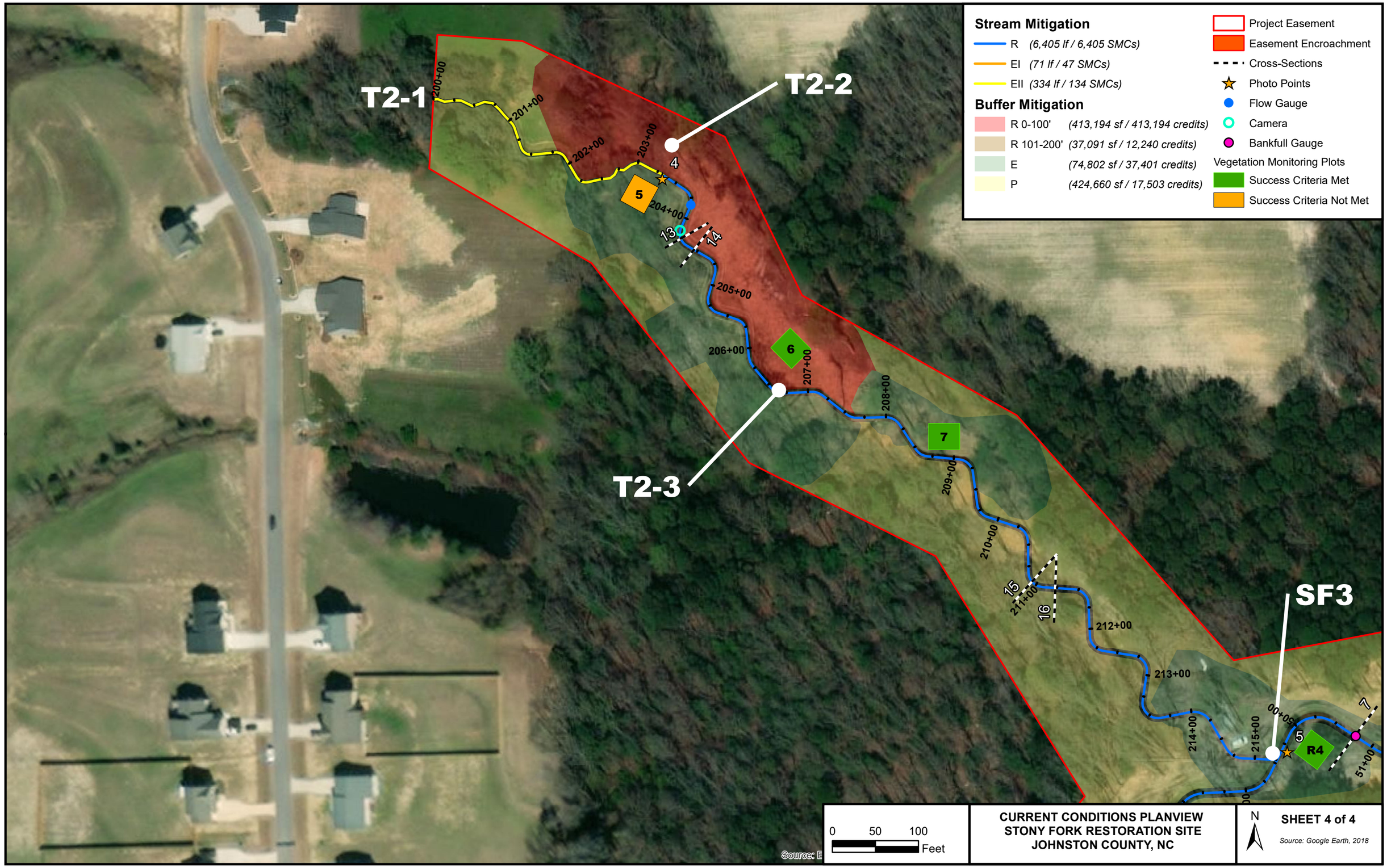
E (74,802 sf / 37,401 credits)
P (424,660 sf / 17,503 credits)
Project Easement
Easement Encroachment
Cross-Sections
Photo Points
Flow Gauge
Camera
Bankfull Gauge
Vegetation Monitoring Plots
Success Criteria Met
Success Criteria Not Met
SF3
R4
6
7
3
207+00
208+00
209+00
210+00
211+00
212+00
213+00
214+00
215+00
50+00
51+00
52+00
53+00
54+00
55+00
56+00
49+00
48+00
47+00
46+00
45+00
44+00
43+00
42+00
41+00
15
16
5
8
9
Source: E
0 50 100 Feet
CURRENT CONDITIONS PLANVIEW
STONY FORK RESTORATION SITE
JOHNSTON COUNTY, NC
N
SHEET 3 of 4
Source: Google Earth, 2018


T2-1
T2-2
T2-3
SF3
200+00
201+00
202+00
203+00
204+00
205+00
206+00
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208+00
209+00
210+00
211+00
212+00
213+00
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242+00
243+00
244+00
245+00
246+00
247+00
248+00
249+00
250+00
251+00
4
5
6
7
R4
13
14
15
16
Stream Mitigation
R (6,405 lf / 6,405 SMCs)
EI (71 lf / 47 SMCs)
EII (334 lf / 134 SMCs)
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Project Easement
Easement Encroachment
Cross-Sections
Photo Points
Flow Gauge
Camera
Bankfull Gauge
Vegetation Monitoring Plots
Success Criteria Met
Success Criteria Not Met
0 50 100
Feet
CURRENT CONDITIONS PLANVIEW
STONY FORK RESTORATION SITE
JOHNSTON COUNTY, NC
N
SHEET 4 of 4
Source: Google Earth, 2018

Table 5 **Visual Stream Morphology Stability Assessment**

Stony Fork Stream Restoration Site, DMS Project#97085

Reach ID **SF1**

Assessed Length **1,155**

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
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	18	18			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	17	17			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	17	17			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	17	17			100%
		2. Thalweg centering at downstream of meander (Glide)	17	17			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	5	5			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	5	5			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	5	5			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	5	5			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	5	5			100%

Table 5	Visual Stream Morphology Stability Assessment						
Stony Fork Stream Restoration Site, DMS Project#97085							
Reach ID	SF2						
Assessed Length	2,802						
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**
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	36	36			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	35	35			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	35	35			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	35	35			100%
		2. Thalweg centering at downstream of meander (Glide)	35	35			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	8	8			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	8	8			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	8	8			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	8	8			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	8	8			100%

Table 5	Visual Stream Morphology Stability Assessment						
Stony Fork Stream Restoration Site, DMS Project#97085							
Reach ID	SF3						
Assessed Length	618						
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**
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	9	9			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	8	8			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	8	8			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	8	8			100%
		2. Thalweg centering at downstream of meander (Glide)	8	8			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	1	1			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	1	1			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	1	1			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	1	1			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	1	1			100%

Table 5	Visual Stream Morphology Stability Assessment						
Stony Fork Stream Restoration Site, DMS Project#97085							
Reach ID	T1						
Assessed Length	365						
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**
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	13	13			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	12	12			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	12	12			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	12	12			100%
		2. Thalweg centering at downstream of meander (Glide)	12	12			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	4	4			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	4	4			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	4	4			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	4	4			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	4	4			100%

Table 5	Visual Stream Morphology Stability Assessment						
Stony Fork Stream Restoration Site, DMS Project#97085							
Reach ID	T2						
Assessed Length	1,433						
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**
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	27	27			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	26	26			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	26	26			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	26	26			100%
		2. Thalweg centering at downstream of meander (Glide)	26	26			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	7	7			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	7	7			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	7	7			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	7	7			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	7	7			100%

Table 5	Visual Stream Morphology Stability Assessment						
Stony Fork Stream Restoration Site, DMS Project#97085							
Reach ID		T3					
Assessed Length		154					
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**
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	3	3			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	2	2			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	2	2			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	2	2			100%
		2. Thalweg centering at downstream of meander (Glide)	2	2			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	N/A	N/A			N/A
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	N/A	N/A			N/A
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	N/A	N/A			N/A
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	N/A	N/A			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.	N/A	N/A			N/A

Table 6 **Vegetation Condition Assessment**

Stony Fork Stream Restoration Site, DMS Project# 97085

Planted Acreage **24.4**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	Pattern and Color	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	Pattern and Color	0	0.00	0.0%
			Total	0	0.00	0.0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	Pattern and Color	0	0.00	0.0%
			Cumulative Total	0	0.00	0.0%
Easement Acreage	**9.5**					
Vegetation Category	**Definitions**	**Mapping Threshold**	**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).	1000 SF	Pattern and Color	0	0.00	0.0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	Pattern and Color	1	0.05	0.5%

Photo Reference Photos

PP1U – MY-00 – 5/15/19

PP1U – MY-02 – 12/8/20

PP1D – MY-00 – 5/15/19

PP1D – MY-02 – 12/8/20

PP2U – MY-00 – 5/15/19

PP2U – MY-02 – 12/8/20

PP2D – MY-00 – 5/15/19

PP2D – MY-02 – 12/8/20

PP3U – MY-00 – 5/15/19

PP3U – MY-02 – 12/8/20

PP3D – MY-00 – 5/15/19

PP3D – MY-02 – 12/8/20

PP4U – MY-00 – 5/15/19

PP4U – MY-02 – 12/8/20

PP4D – MY-00 – 5/15/19

PP4D – MY-02 – 12/8/20

PP5U – MY-00 – 5/15/19

PP5U – MY-02 – 12/8/20

PP5D – MY-00 – 5/15/19

PP5D – MY-02 – 12/8/20

PP6U – MY-00 – 5/15/19

PP6U – MY-02 – 12/8/20

PP6D – MY-00 – 5/15/19

PP6D – MY-02 – 12/8/20

Permanent Vegetation Monitoring Plot Photos

Vegetation Plot 1 – MY-00 – 5/15/19

Vegetation Plot 1 – MY-02 – 9/2/20

Vegetation Plot 2 – MY-00 – 5/15/19

Vegetation Plot 2 – MY-02 – 9/2/20

Vegetation Plot 3 – MY-00 – 5/15/19

Vegetation Plot 3 – MY-02 – 9/2/20

Vegetation Plot 4 – MY-00 – 5/15/19

Vegetation Plot 4 – MY-02 – 9/2/20

Vegetation Plot 5 – MY-00 – 5/15/19

Vegetation Plot 5 – MY-02 – 9/2/20

Vegetation Plot 6 – MY-00 – 5/15/19

Vegetation Plot 6 – MY-02 – 9/2/20

Vegetation Plot 7 – MY-00 – 5/15/19

Vegetation Plot 7 – MY-02 – 9/2/20

Random Vegetation Monitoring Plot Photos

Vegetation Plot R1 – MY-02 – 9/4/20

Vegetation Plot R2 – MY-02 – 9/4/20

Vegetation Plot R3 – MY-02 – 9/4/20

Vegetation Plot R4 – MY-02 – 9/4/20

Vegetation Plot R5 – MY-02 – 9/4/20

APPENDIX C

Vegetation Plot Data

Table 7. Stem Count by Plot and Species
Stony Fork Restoration Site, DMS Project #97085

	Current Plot Data (MY02 2020)													
	Plot 01		Plot 02		Plot 03		Plot 04		Plot 05		Plot 06		Plot 7	
Species	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**
American Elm (*Ulmus americana*)								2						
American Persimmon (*Diospyros virginiana*)														
American Sycamore (*Platanus occidentalis*)	5	5	7	8	1	1	2	2	1	1	3	3	2	2
Bald Cypress (*Taxodium distichum*)							1	1					4	4
Black Willow (*Salix nigra*)		1										3		
Elderberry (*Sambucus canadensis*)										3				
Green Ash (*Fraxinus pennsylvanica*)	2	2	4	4	4	4					1	1		
Loblolly Pine (*Pinus taeda*)		12		3				8						
Oak (Quercus sp.)														
Pin Oak (*Quercus palustris*)	2	2	2	2			1	1	1	1	1	1	2	2
Red Maple (*Acer rubrum*)				1				1		2				
Red Oak (*Quercus rubra*)														
River Birch (*Betula nigra*)			1	1	1	1	1	1	1	1	2	2	2	2
Silky Dogwood (*Cornus amomum*)							5	5			1	1	1	1
Sugar Berry (*Celtis laevigata*)														
Swamp Chestnut Oak (*Quercus michauxii*)	2	2							1	1	1	1	1	1
Sweet Bay (*Magnolia virginiana*)										1				
Sweet Gum (*Liquidambar styraciflua*)				1										
Tulip Poplar (*Liriodendron tulipifera*)	1	2			1	1		1			1	1		
Water Oak (*Quercus nigra*)														
Wax Myrtle (*Myrica cerifera*)		1												
White Oak (*Quercus alba*)	1	1			1	1				1				
Willow Oak (*Quercus phellos*)	1	1	1	1	3	3	6	6			3	3	2	2
Unknown														
Stem count	14	29	15	21	11	11	16	28	4	11	13	16	14	14
size (ares)	1		1		1		1		1		1		1	
size (ACRES)	0.025		0.025		0.025		0.025		0.025		0.025		0.025	
Species count	7	10	5	8	6	6	6	10	4	8	0	0	0	0
Stems per ACRE	567	1,174	607	850	445	445	647	1,133	162	445	526	647	567	567

Table 7. Stem Count by Plot and Species
Stony Fork Restoration Site, DMS Project #97085

	Current Plot Data (MY02 2020)									
	Plot R1		Plot R2		Plot R3		Plot R4		Plot R5	
Species	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**
American Elm (*Ulmus americana*)								1		
American Persimmon (*Diospyros virginiana*)	2	2								
American Sycamore (*Platanus occidentalis*)	2	2	5	5	6	6	8	8	1	1
Bald Cypress (*Taxodium distichum*)										
Black Willow (*Salix nigra*)									2	2
Elderberry (*Sambucus canadensis*)										
Green Ash (*Fraxinus pennsylvanica*)	2	2	6	6	7	7	5	5		
Loblolly Pine (*Pinus taeda*)						7				
Oak (Quercus sp.)										
Pin Oak (*Quercus palustris*)	2	2								
Red Maple (*Acer rubrum*)										1
Red Oak (*Quercus rubra*)										
River Birch (*Betula nigra*)			6	6	2	2	7	7	4	4
Silky Dogwood (*Cornus amomum*)									3	3
Sugar Berry (*Celtis laevigata*)										
Swamp Chestnut Oak (*Quercus michauxii*)										
Sweet Bay (*Magnolia virginiana*)										
Sweet Gum (*Liquidambar styraciflua*)		1		3		6				
Tulip Poplar (*Liriodendron tulipifera*)	3	3								
Water Oak (*Quercus nigra*)										
Wax Myrtle (*Myrica cerifera*)										
White Oak (*Quercus alba*)	1	1	2	2						
Willow Oak (*Quercus phellos*)			3	3	2	2	2	2		
Unknown										
Stem count	12	13	22	25	17	30	22	23	10	11
size (ares)	1		1		1		1		1	
size (ACRES)	0.025		0.025		0.025		0.025		0.025	
Species count	6	7	5	6	4	6	4	5	4	5
Stems per ACRE	486	526	890	1,012	688	1,214	890	931	405	445

Table 7. Stem Count by Plot and Species
Stony Fork Restoration Site, DMS Project #97085

	Annual Means					
	MY02 (2020)		MY01 (2019)		MY00 (2019)	
Species	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**
American Elm (*Ulmus americana*)		3				
American Persimmon (*Diospyros virginiana*)	2	2	4	4		
American Sycamore (*Platanus occidentalis*)	43	44	40	40	9	9
Bald Cypress (*Taxodium distichum*)	5	5	7	7	1	1
Black Willow (*Salix nigra*)	2	6		2		
Elderberry (*Sambucus canadensis*)		3	1	1	2	2
Green Ash (*Fraxinus pennsylvanica*)	31	31	25	25	29	29
Loblolly Pine (*Pinus taeda*)		30	2	2		
Oak (Quercus sp.)			1	1	18	18
Pin Oak (*Quercus palustris*)	11	11	7	7	3	3
Red Maple (*Acer rubrum*)		5	4	11		2
Red Oak (*Quercus rubra*)			2	2		
River Birch (*Betula nigra*)	27	27	17	17	2	2
Silky Dogwood (*Cornus amomum*)	10	10	8	8	10	10
Sugar Berry (*Celtis laevigata*)					2	2
Swamp Chestnut Oak (*Quercus michauxii*)	5	5	7	7	7	7
Sweet Bay (*Magnolia virginiana*)		1		1		1
Sweet Gum (*Liquidambar styraciflua*)		11	2	8		
Tulip Poplar (*Liriodendron tulipifera*)	6	8	14	20	14	14
Water Oak (*Quercus nigra*)					1	1
Wax Myrtle (*Myrica cerifera*)		1				
White Oak (*Quercus alba*)	5	6	12	15	1	4
Willow Oak (*Quercus phellos*)	23	23	30	30	3	3
Unknown			4	4	199	199
Stem count	170	232	187	212	301	307
size (ares)	12		12		12	
size (ACRES)	0.300		0.300		0.300	
Species count	12	19	18	20	15	17
Stems per ACRE	567	773	623	707	1,003	1,023

APPENDIX D

Stream Measurement and Geomorphology Data

Table 8a. SF1 Data Summary Stony Fork Restoration Site, DMS Project #97085							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	7.2	14.8-18.8	9.7		9.3		1
Floodprone Width (ft)	8.7	>50	100		>80		1
Bankfull Mean Depth (ft)	0.9	1.3-1.8	0.7		0.8		1
Bankfull Max Depth (ft)	1.2	1.9-2.4	1.1		1.2		1
Bankfull Cross-Sectional Area (ft^2)	6.4	25	7.0		7.0		1
Width/Depth Ratio	8.1	9.0-14.0	13.5		12.2		1
Entrenchment Ratio	1.2	>2.5	10.3		8.7		1
Bank Height Ratio	2.9	1.0-1.2	1.0		1.0		1
Pattern							
Channel Beltwidth (ft)	*	60	30-55		30-55		
Radius of Curvature (ft)	*	16—87	20-29		20-29		
Rc:Bankfull width (ft/ft)	*	3.5—12.9	9.6-13.6		9.6-13.6		
Meander Wavelength (ft)	*	66—191	93-132		93-132		
Meander Width Ratio	*	4.1	3.1-5.7		3.1-5.7		
Profile							
Riffle Length (ft)				23.40	31.55	40.95	17
Riffle Slope (ft/ft)	0.009	0.013—0.035	0.009-0.015	0.0031	0.0141	0.0137	17
Pool Length (ft)	*	14—33	21-46	12.47	28.73	41.34	17
Pool Spacing (ft)	*	2.7—7.1	5.6-7.3	44.28	68.72	142.01	17
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	3/40/57/0/0/0			0/4/90/7/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.15/1.2/2.2/7.5/11/-0.4/7.1	Gravel	Gravel	9.4/16/22/33/53/70			
Channel length (ft)	1235		1155	1155			
Drainage Area (SM)	0.27	1.49	0.27	0.27			
Rosgen Classification	G4c	C4	C4	C4			
Sinuosity	1.3	1.3	1.2	1.2			
Water Surface Slope (ft/ft)	0.009	0.005	0.009	0.01			

* : no data shown for pools, radius of curvature or meanders in existing stream do to channelization / lack of bed diversity

Table 8b. SF2 Baseline Stream Data Summary **Stony Fork Restoration Site, DMS Project #97085**							
Parameter	Pre-Existing Condition	Reference Reach(es) Data (SF)	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	5.0-10.0	14.8-18.8	11.3	12.2	12.4	12.6	2
Floodprone Width (ft)	7.4-14.5	>50	100	53.3	67.0	80.7	2
Bankfull Mean Depth (ft)	1.0-1.4	1.3-1.8	0.8	0.9	0.95	1.0	2
Bankfull Max Depth (ft)	1.3-2.2	1.9-2.4	1.2	1.4	1.5	1.6	2
Bankfull Cross-Sectional Area (ft^2)	6.9-8.9	25	9.4	10.6	11.6	12.5	2
Width/Depth Ratio	3.7-11.2	9.0-14.0	13.5	12.8	13.5	14.1	2
Entrenchment Ratio	1.4-1.5	>2.5	8.8	4.2	5.4	6.6	2
Bank Height Ratio	1.6-2.1	1.0-1.2	1.0	1	1	1	2
Pattern							
Channel Beltwidth (ft)	*	60	37-65	37-65			
Radius of Curvature (ft)	*	16—87	22-33	22-33			
Rc:Bankfull width (ft/ft)	*	3.5—12.9	9.3-13.1	9.3-13.1			
Meander Wavelength (ft)	*	66—191	105-148	105-148			
Meander Width Ratio	*	4.1	3.3-5.8	3.3-5.8			
Profile							
Riffle Length (ft)				17.58	39.07	86.38	36
Riffle Slope (ft/ft)	0.003-0.008	0.013—0.035	0.009 - 0.015	0.0021	0.0118	0.0256	36
Pool Length (ft)	*	14—33	24-52	12.51	28.83	52.39	34
Pool Spacing (ft)	*	2.7—7.1	5.2-7.4	43.01	81.44	178.86	34
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	20.3/30/49.8/0/0/0			5/8/54/33/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.33/0.61/1.2/6.2/9.8/0.3/5.5	Gravel	Gravel	5.9/31/45/61/98.5/140			
Channel length (ft)	2453		2802	2802			
Drainage Area (SM)	0.41	1.49	0.41	0.41			
Rosgen Classification	G4c—G5c	C4	C4	C4			
Sinuosity	1.1	1.3	1.2	1.2			
Water Surface Slope (ft/ft)	0.008	0.005	0.008	0.008			

* : no data shown for pools, radius of curvature or meanders in existing stream do to channelization / lack of bed diversity

Table 8c. SF3 Baseline Stream Data Summary Stony Fork Restoration Site, DMS Project #97085							
Parameter	Pre-Existing Condition	Reference Reach(es) Data (SF)	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	10.5	14.8-18.8	12.6		11.6		1
Floodprone Width (ft)	14.4	>50	100		92.4		1
Bankfull Mean Depth (ft)	1.2	1.3-1.8	0.9		1.1		1
Bankfull Max Depth (ft)	1.3	1.9-2.4	1.4		1.7		1
Bankfull Cross-Sectional Area (ft^2)	12.5	25	11.8		12.9		1
Width/Depth Ratio	8.9	9.0-14.0	13.5		10.4		1
Entrenchment Ratio	1.4	>2.5	7.9		8.0		1
Bank Height Ratio	2.0	1.0-1.2	1.0		1.0		1
Pattern							
Channel Beltwidth (ft)	*	60	46-77		46-77		
Radius of Curvature (ft)	*	16—87	28-35		28-35		
Rc:Bankfull width (ft/ft)	*	3.5—12.9	11.7-14		11.7-14		
Meander Wavelength (ft)	*	66—191	148-176		148-176		
Meander Width Ratio	*	4.1	3.7-6.1		3.7-6.1		
Profile							
Riffle Length (ft)				7.4	35.2	52.4	7
Riffle Slope (ft/ft)	0.006	0.013—0.035	0.01	0.0032	0.0075	0.0175	7
Pool Length (ft)	*	14—33	35-62	12.4	33.9	39.7	7
Pool Spacing (ft)	*	2.7—7.1	6.7-8.0	92.0	103.1	114.4	7
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	10/0/0/0/0/0			21/21/40/18/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	1.1/6.0/8.3/12/15/-0.7/3.3	Gravel	Gravel	0.06/0.77/16/29/70/120			
Channel length (ft)	618		654	654			
Drainage Area (SM)	0.84	1.49	0.84	0.84			
Rosgen Classification	G4c	C4	C4	C4			
Sinuosity	1.1	1.3	1.2	1.2			
Water Surface Slope (ft/ft)	0.006	0.005	0.008	0.006			

* : no data shown for pools, radius of curvature or meanders in existing stream do to channelization / lack of bed diversity

Table 8d. T1 Baseline Stream Data Summary
Stony Fork Restoration Site, DMS Project #97085

Parameter	Pre-Existing Condition	Reference Reach(es) Data (SF)	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	3.4	14.8-18.8	5.0		4.2		1
Floodprone Width (ft)	4.5	>50	50		45.0		1
Bankfull Mean Depth (ft)	0.3	1.3-1.8	0.4		0.2		1
Bankfull Max Depth (ft)	0.4	1.9-2.4	0.6		0.5		1
Bankfull Cross-Sectional Area (ft^2)	0.9	25	1.9		0.9		1
Width/Depth Ratio	12.7	9.0-14.0	13.5		18.6		1
Entrenchment Ratio	1.3	>2.5	10		10.8		1
Bank Height Ratio	4.5	1.0-1.2	1.0		1.0		1
Pattern							
Channel Beltwidth (ft)	*	60	23-37		23-37		
Radius of Curvature (ft)	*	16—87	11-17		11-17		
Rc:Bankfull width (ft/ft)	*	3.5—12.9	11.6-14.4		11.6-14.4		
Meander Wavelength (ft)	*	66—191	58-72		58-72		
Meander Width Ratio	*	4.1	4.6-7.4		4.6-7.4		
Profile							
Riffle Length (ft)				4.53	18.2	29.1	11
Riffle Slope (ft/ft)	0.035	0.013—0.035	0.014-0.04	0.00	0.024	0.045	11
Pool Length (ft)	*	14—33	11-29	7.29	40.2	65.6	11
Pool Spacing (ft)	*	2.7—7.1	6.2-8.8	35.7	45.7	60.3	11
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%				10/3/21/66/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	Silt-Clay	Gravel	Gravel	37/65/78/94/130/170			
Channel length (ft)	365		510	510			
Drainage Area (SM)	0.02	1.49	0.02	0.02			
Rosgen Classification	G5	C4	C4	C4			
Sinuosity	1.0	1.3	1.2	1.2			
Water Surface Slope (ft/ft)	0.035	0.005	0.020	0.019			

* : no data shown for pools, radius of curvature or meanders in existing stream do to channelization / lack of bed diversity

Table 8e. T2-1 Baseline Stream Data Summary Stony Fork Restoration Site, DMS Project #97085				
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built
Dimension - Riffle				
Bankfull Width (ft)	4.5-5.7	14.8-18.8	5.0	
Floodprone Width (ft)	5.7-30.7	>50	50	
Bankfull Mean Depth (ft)	0.8-1.7	1.3-1.8	0.4	
Bankfull Max Depth (ft)	1.2-2.1	1.9-2.4	0.6	
Bankfull Cross-Sectional Area (ft^2)	3.6-9.4	25	1.9	
Width/Depth Ratio	3.4-5.4	9.0-14.0	13.5	
Entrenchment Ratio	1.3-5.4	>2.5	10	
Bank Height Ratio	1.5-4.1	1.0-1.2	1.0	
Pattern				
Channel Beltwidth (ft)	*	60	25-40	25-40
Radius of Curvature (ft)	*	16—87	12-15	12-15
Rc:Bankfull width (ft/ft)	*	3.5—12.9	14	14
Meander Wavelength (ft)	*	66—191	70	70
Meander Width Ratio	*	4.1	5.0-8.0	5.0-8.0
Profile				
Riffle Length (ft)				
Riffle Slope (ft/ft)	0.009-0.020	0.013—0.035	0.016	
Pool Length (ft)	*	14—33	6-16	
Pool Spacing (ft)	*	2.7—7.1	6.4-8.0	
Substrate and Transport Parameters				
SC% / Sa% / G% / C% / B% /Be%				
d16 / d35 / d50 / d84 / d95 (mm)	Silt-Clay	Gravel	Gravel	
Channel length (ft)	327		334	334
Drainage Area (SM)	0.23	1.49	0.04	0.04
Rosgen Classification	G5c	C4	C4	C4
Sinuosity	1.1	1.3	1.2	1.2
Water Surface Slope (ft/ft)	0.014	0.005	0.012	

* : no data shown for pools, radius of curvature or meanders in existing stream do to channelization / lack of bed diversity

Table 8f. T2-2 Baseline Stream Data Summary **Stony Fork Restoration Site, DMS Project #97085**							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
				Min	Mean	Max	n
Bankfull Width (ft)	4.5-5.7	14.8-18.8	7.6	9.7			1
Floodprone Width (ft)	5.7-30.7	>50	50	43.4			1
Bankfull Mean Depth (ft)	0.8-1.7	1.3-1.8	0.6	0.6			1
Bankfull Max Depth (ft)	1.2-2.1	1.9-2.4	0.8	1.0			1
Bankfull Cross-Sectional Area (ft^2)	3.6-9.4	25	4.3	5.8			1
Width/Depth Ratio	3.4-5.4	9.0-14.0	13.4	16.4			1
Entrenchment Ratio	1.3-5.4	>2.5	6.6	4.5			1
Bank Height Ratio	1.5-4.1	1.0-1.2	1.0	1.0			1
Pattern							
Channel Beltwidth (ft)	*	60	28-45	28-45			
Radius of Curvature (ft)	*	16—87	16-23	16-23			
Rc:Bankfull width (ft/ft)	*	3.5—12.9	11.2-11.8	11.2-11.8			
Meander Wavelength (ft)	*	66—191	85-90	85-90			
Meander Width Ratio	*	4.1	3.7-5.9	3.7-5.9			
Profile							
Riffle Length (ft)				20.0	29.0	56.7	6
Riffle Slope (ft/ft)	0.009-0.020	0.013—0.035	0.014	0.01	0.018	0.028	6
Pool Length (ft)	*	14—33	14-24	10.8	17.6	22.8	6
Pool Spacing (ft)	*	2.7—7.1	5.7-6.6	47.0	48.8	51.2	6
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%				6/45/15/33/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	Silt-Clay	Gravel	Gravel	26/35/42/51/74/110			
Channel length (ft)	326		337	337			
Drainage Area (SM)	0.23	1.49	0.15	0.15			
Rosgen Classification	G5c	C4	C4	C4			
Sinuosity	1.1	1.3	1.2	1.2			
Water Surface Slope (ft/ft)	0.014	0.005	0.012	0.011			

* : no data shown for pools, radius of curvature or meanders in existing stream do to channelization / lack of bed diversity

Table 8g. T2-3 Baseline Stream Data Summary **Stony Fork Restoration Site, DMS Project #97085**							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	4.5-5.7	14.8-18.8	9.0		8.6		1
Floodprone Width (ft)	5.7-30.7	>50	50		80.9		1
Bankfull Mean Depth (ft)	0.8-1.7	1.3-1.8	0.6		0.7		1
Bankfull Max Depth (ft)	1.2-2.1	1.9-2.4	1.0		1.2		1
Bankfull Cross-Sectional Area (ft^2)	3.6-9.4	25	5.8		6.0		1
Width/Depth Ratio	3.4-5.4	9.0-14.0	13.9		12.3		1
Entrenchment Ratio	1.3-5.4	>2.5	5.6		9.4		1
Bank Height Ratio	1.5-4.1	1.0-1.2	1.0		1.0		1
Pattern							
Channel Beltwidth (ft)	*	60	32-45		32-45		
Radius of Curvature (ft)	*	16—87	18-23		18-23		
Rc:Bankfull width (ft/ft)	*	3.5—12.9	10.2-11.1		10.2-11.1		
Meander Wavelength (ft)	*	66—191	92-100		92-100		
Meander Width Ratio	*	4.1	3.6-6.0		3.6-6.0		
Profile							
Riffle Length (ft)				25.8	33.6	38.9	15
Riffle Slope (ft/ft)	0.009-0.020	0.013—0.035	0.012-0.015	0.002	0.014	0.024	15
Pool Length (ft)	*	14—33	12-34	8.48	35.6	91.4	14
Pool Spacing (ft)	*	2.7—7.1	5.1-7.0	45.7	57.3	77.4	14
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%				4/7/65/24/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.031/0.13/0.21/2.0/6.1/0.1/8	Gravel	Gravel	18/35/45/77/120			
Channel length (ft)	780		855	855			
Drainage Area (SM)	0.23	1.49	0.23	0.23			
Rosgen Classification	G5c	C4	C4	C4			
Sinuosity	1.1	1.3	1.2	1.2			
Water Surface Slope (ft/ft)	0.014	0.005	0.011	0.011			

* : no data shown for pools, radius of curvature or meanders in existing stream do to channelization / lack of bed diversity

Table 8h. T3 Baseline Stream Data Summary **Stony Fork Restoration Site, DMS Project #97085**							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	4.2-4.8	14.8	5.0		5.2		1
Floodprone Width (ft)	5.0-5.9	>50	50		38.0		1
Bankfull Mean Depth (ft)	0.4-0.6	1.3-1.8	0.4		0.4		1
Bankfull Max Depth (ft)	0.6-0.7	1.9-2.4	0.6		0.7		1
Bankfull Cross-Sectional Area (ft^2)	1.9-2.6	25	1.9		2.1		1
Width/Depth Ratio	6.9-12.6	9.0-14.0	13.5		13.0		1
Entrenchment Ratio	1.2	>2.5	10		7.2		1
Bank Height Ratio	3.2-3.4	1.0-1.2	1.0		1.0		1
Pattern							
Channel Beltwidth (ft)	**	60	16-26		16-26		
Radius of Curvature (ft)	**	16—87	11-14		11-14		
Rc:Bankfull width (ft/ft)	**	3.5—12.9	8.6-9.4		8.6-9.4		
Meander Wavelength (ft)	**	66—191	43-47		43-47		
Meander Width Ratio	**	4.1	3.2-5.2		3.2-5.2		
Profile							
Riffle Length (ft)				34.3	36.9	39.5	2
Riffle Slope (ft/ft)	**	0.013—0.035	0.0025	0.006	0.0098	0.014	2
Pool Length (ft)	**	14—33	7-15	38.43			1
Pool Spacing (ft)	**	2.7—7.1	4.2-5.4				
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	8/67/25/0/0/0			9/15/58/19/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	N/A	Gravel	Gravel	0.3/8.2/18/35/72/140			
Channel length (ft)	154		129	129			
Drainage Area (SM)	0.05	1.49	0.02	0.02			
Rosgen Classification	G4	C4	C4	C4			
Sinuosity	1.0	1.3	1.2	1.2			
Water Surface Slope (ft/ft)	0.007	0.005	0.0016	0.005			

** :channel affected by former pond

Table 9. Cross Section Dimensional Morphology Summary
Stony Fork Stream Restoration Site, DMS Project #97085

Dimension and Substrate	Cross-Section 1 (Pool) Station 13+58, SF							Cross-Section 2 (Riffle) Station 13+85, SF							Cross-Section 3 (Riffle) Station 22+44, SF						
	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Bankfull Elevation (ft) based on AB BKF area	206.8	206.7	206.7					206.6	206.6	206.6					192.5	192.5	192.4				
Bankfull Width (ft)	12.6	11.7	11.6					9.3	11.0	10.2					12.6	11.9	12.5				
Floodprone Width (ft)	-	-	-					>80	>80	>80					53.3	53.2	50.1				
Bankfull Mean Depth (ft)	0.9	1.0	1.0					0.8	0.6	0.7					1.0	1.0	1.0				
Bankfull Max Depth (ft)	1.9	2.0	2.1					1.2	1.1	1.3					1.6	1.7	1.5				
Cross-Sectional Area (ft^2) based on AB BKF area	11.5	11.5	11.5					7.0	7.0	7.0					12.5	12.5	12.5				
Cross-Sectional Area (ft^2) based on AB BKF elevation	11.5	11.9	12.1					7.0	7.1	6.8					12.5	13.2	13.8				
Bankfull Width/Depth Ratio	-	-	-					12.2	17.3	14.8					12.8	11.4	12.6				
Bankfull Entrenchment Ratio	-	-	-					8.7	7.2	8.0					4.2	4.5	4.0				
Bankfull Bank Height Ratio	-	-	-					1.0	0.9	1.0					1.0	1.0	1.0				
d50 (mm)	-	-	-					22	32	24					38	46	20				
	Cross-Section 4 (Pool) Station 26+17, SF							Cross-Section 5 (Riffle) Station 35+12, SF							Cross-Section 6 (Pool) Station 41+94, SF						
	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Bankfull Elevation (ft) based on AB BKF area	192.0	191.9	191.9					182.1	182.2	182.2					181.7	181.8	181.7				
Bankfull Width (ft)	12.5	13.0	12.4					12.2	13.6	13.2					12.0	13.1	11.5				
Floodprone Width (ft)	-	-	-					>80	>80	>80					-	-	-				
Bankfull Mean Depth (ft)	1.1	1.1	1.1					0.9	0.8	0.8					1.2	1.1	1.3				
Bankfull Max Depth (ft)	1.9	2.1	2.1					1.4	1.3	1.3					2.4	2.4	2.5				
Cross-Sectional Area (ft^2) based on AB BKF area	13.6	13.6	13.6					10.6	10.6	10.6					14.5	14.5	14.5				
Cross-Sectional Area (ft^2) based on AB BKF elevation	13.6	14.5	15.2					10.6	10.1	9.3					14.5	14.3	15.2				
Bankfull Width/Depth Ratio	-	-	-					14.1	17.4	16.4					-	-	-				
Bankfull Entrenchment Ratio	-	-	-					6.6	5.9	6.1					-	-	-				
Bankfull Bank Height Ratio	-	-	-					1.0	1.0	1.0					-	-	-				
d50 (mm)	-	-	-					52	44	25					-	-	-				

Table 9. Cross Section Dimensional Morphology Summary
Stony Fork Stream Restoration Site, DMS Project #97085

	Cross-Section 7 (Riffle) Station 42+58, SF							Cross-Section 8 (Pool) Station 57+19, SF							Cross-Section 9 (Pool) Station 57+44, T3						
	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Bankfull Elevation (ft) based on AB BKF area	176.0	176.0	176.0					175.3	175.2	175.2					207.0	206.9	207.3				
Bankfull Width (ft)	11.6	13.4	14.2					13.5	14.5	15.7					5.5	5.9	8.2				
Floodprone Width (ft)	>90	>90	>90					-	-	-					-	-	-				
Bankfull Mean Depth (ft)	1.1	1.0	0.9					1.5	1.4	1.3					0.7	0.6	0.4				
Bankfull Max Depth (ft)	1.7	1.6	1.8					2.7	2.7	2.5					1.1	1.1	0.8				
Cross-Sectional Area (ft^2) based on AB BKF area	12.8	12.8	12.8					20.7	20.7	20.7					3.7	3.7	3.7				
Cross-Sectional Area (ft^2) based on AB BKF elevation	12.8	13.2	13.3					20.7	21.4	21.5					3.7	4.0	2.0				
Bankfull Width/Depth Ratio	10.4	14.0	15.7					-	-	-					-	-	-				
Bankfull Entrenchment Ratio	8.0	6.8	6.5					-	-	-					-	-	-				
Bankfull Bank Height Ratio	1.0	1.0	1.0					-	-	-					-	-	-				
d50 (mm)	16	29	41					-	-	-					-	-	-				

	Cross-Section 10 (Riffle) Station 96+69, T3							Cross-Section 11 (Riffle) Station 99+07, T1							Cross-Section 12 (Pool) Station 99+25, T1						
	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Bankfull Elevation (ft) based on AB BKF area	207.1	207.1	207.2					198.4	198.3	198.3					198.4	198.3	198.3				
Bankfull Width (ft)	6.2	5.5	5.4					6.0	5.8	5.7					7.5	7.3	7.4				
Floodprone Width (ft)	38.0	39.4	41.5					>60	>60	>60					-	-	-				
Bankfull Mean Depth (ft)	0.4	0.4	0.4					0.3	0.3	0.4					0.6	0.7	0.7				
Bankfull Max Depth (ft)	0.7	0.7	0.7					0.7	0.7	0.6					1.2	1.2	1.1				
Cross-Sectional Area (ft^2) based on AB BKF area	2.2	2.2	2.2					2.0	2.0	2.0					4.8	4.8	4.8				
Cross-Sectional Area (ft^2) based on AB BKF elevation	2.2	2.1	1.8					2.0	2.6	2.6					4.8	5.5	5.3				
Bankfull Width/Depth Ratio	17.7	13.7	13.4					18.3	17.1	16.0					-	-	-				
Bankfull Entrenchment Ratio	6.1	7.2	7.7					10.9	10.9	11.2					-	-	-				
Bankfull Bank Height Ratio	1.0	0.9	0.8					1.0	1.1	1.2					-	-	-				
d50 (mm)	18	20	3					78	75	57					-	-	-				

Table 9. Cross Section Dimensional Morphology Summary
Stony Fork Stream Restoration Site, DMS Project #97085

	Cross-Section 13 (Pool) Station 252+25, T2							Cross-Section 14 (Riffle) Station 225+97, T2							Cross-Section 15 (Pool) Station 226+04, T2						
	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Bankfull Elevation (ft) based on AB BKF area	188.4	188.4	188.2					187.9	187.9	188.0					180.9	180.8	180.7				
Bankfull Width (ft)	11.3	12.7	9.5					9.7	11.8	11.1					11.8	11.7	10.9				
Floodprone Width (ft)	-	-	-					43.4	46.8	47.2					-	-	-				
Bankfull Mean Depth (ft)	0.8	0.7	1.0					0.6	0.5	0.5					1.0	1.0	1.0				
Bankfull Max Depth (ft)	1.5	1.4	1.7					1.0	1.1	1.1					1.8	1.9	1.8				
Cross-Sectional Area (ft^2) based on AB BKF area	9.3	9.3	9.3					5.8	5.8	5.8					11.2	11.2	11.2				
Cross-Sectional Area (ft^2) based on AB BKF elevation	9.3	8.7	11.0					5.8	5.3	4.4					11.2	11.8	12.8				
Bankfull Width/Depth Ratio	-	-	-					16.4	24.0	21.4					-	-	-				
Bankfull Entrenchment Ratio	-	-	-					4.5	4.0	4.2					-	-	-				
Bankfull Bank Height Ratio	-	-	-					1.0	0.8	0.9					-	-	-				
d50 (mm)	-	-	-					42	16	1.4					-	-	-				

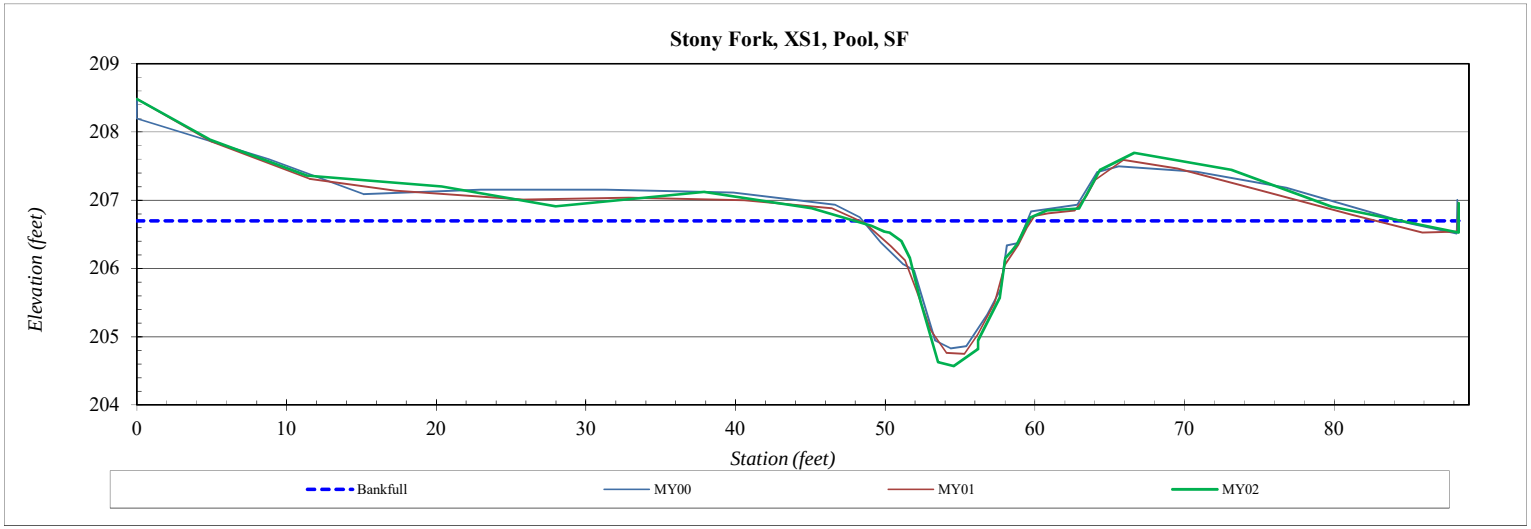
	Cross-Section 16 (Riffle) Station 252+25, T2						
	Base	MY1	MY2	MY3	MY4	MY5	MY+
Bankfull Elevation (ft) based on AB BKF area	180.7	180.7	180.8				
Bankfull Width (ft)	8.6	9.9	10.0				
Floodprone Width (ft)	>80	>80	>80				
Bankfull Mean Depth (ft)	0.7	0.6	0.6				
Bankfull Max Depth (ft)	1.2	1.1	1.0				
Cross-Sectional Area (ft^2) based on AB BKF area	6.0	6.0	6.0				
Cross-Sectional Area (ft^2) based on AB BKF elevation	6.0	5.8	5.2				
Bankfull Width/Depth Ratio	12.3	16.3	16.6				
Bankfull Entrenchment Ratio	9.4	8.3	7.6				
Bankfull Bank Height Ratio	1.0	1.0	0.9				
d50 (mm)	45	44	37				

Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS1
Drainage Area (sq mi):	0.28
Date:	6/18/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	208.48
4.8	207.89
11.4	207.36
20.4	207.20
28.0	206.91
37.9	207.12
45.1	206.89
49.1	206.63
49.9	206.54
50.3	206.53
51.1	206.40
51.6	206.15
52.4	205.51
53.5	204.63
54.6	204.57
56.2	204.82
56.2	204.95
57.7	205.58
58.0	206.15
58.4	206.25
58.8	206.36
59.7	206.75
60.8	206.85
62.9	206.88
64.3	207.44
66.7	207.69
73.1	207.45
79.8	206.91
88.3	206.53
88.3	206.96

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	206.70
Bankfull Cross-Sectional Area:	11.5
Total Cross-Sectional Area:	12.1
Bankfull Width:	11.6
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	2.1
Mean Depth at Bankfull:	1.0
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	204.6

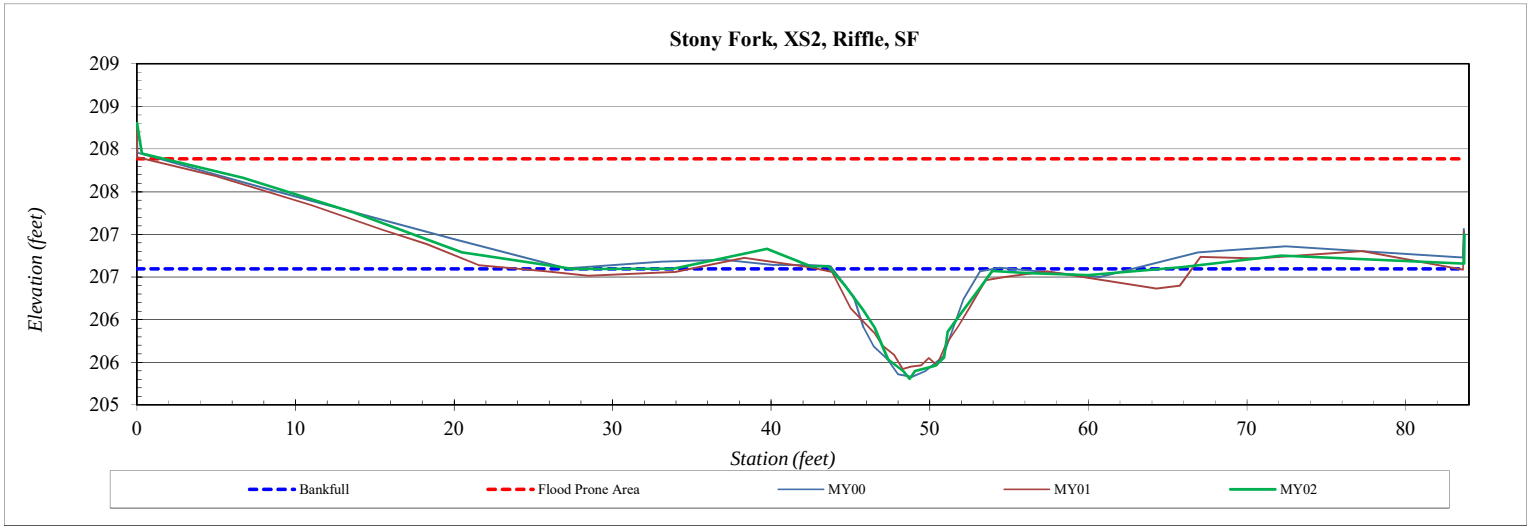


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS2
Drainage Area (sq mi):	0.28
Date:	6/18/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	208.30
0.3	207.95
6.7	207.66
13.7	207.26
20.5	206.79
27.5	206.60
33.8	206.60
39.7	206.83
42.5	206.63
43.6	206.63
44.6	206.41
45.8	206.11
46.5	205.90
47.4	205.53
48.3	205.39
48.7	205.31
49.0	205.40
50.4	205.46
50.9	205.56
51.1	205.86
52.1	206.10
53.2	206.39
53.9	206.57
56.3	206.55
60.0	206.52
65.9	206.62
72.2	206.75
83.7	206.66
83.7	207.00

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	206.60
Bankfull Cross-Sectional Area:	7.0
Total Cross-Sectional Area:	6.8
Bankfull Width:	10.2
Flood Prone Area Elevation:	207.9
Flood Prone Width:	82.0
Max Depth at Bankfull:	1.3
Mean Depth at Bankfull:	0.7
W / D Ratio:	14.8
Entrenchment Ratio:	8.0
Bank Height Ratio:	1.0
Thalweg Elevation:	205.3

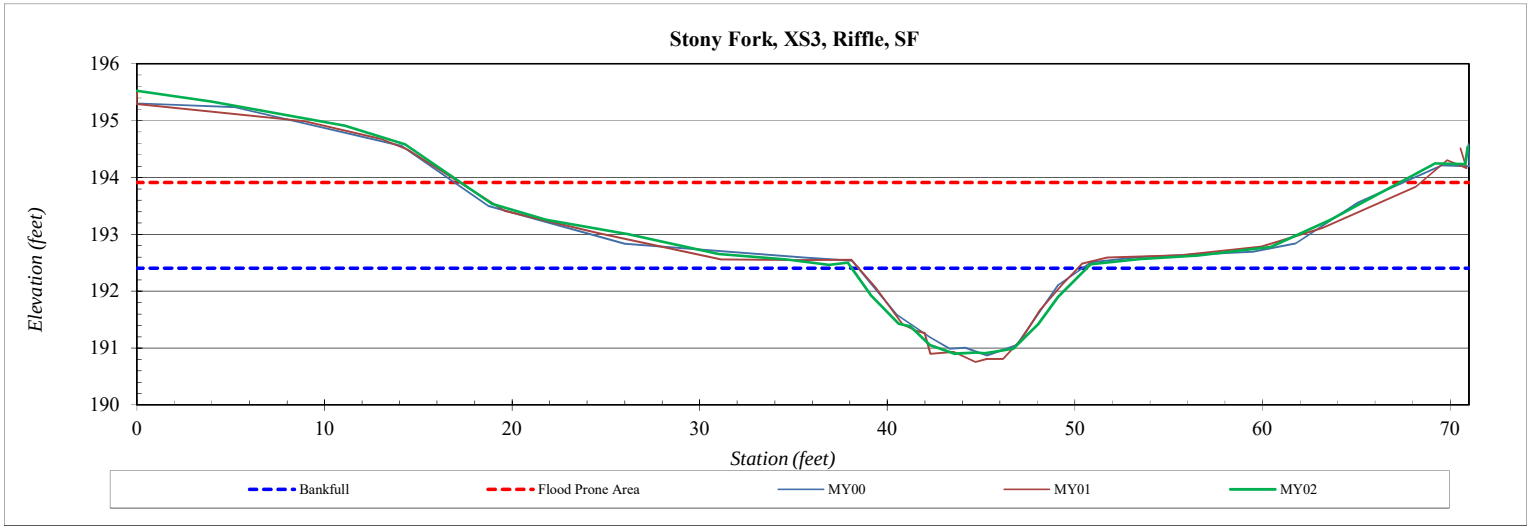


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS3
Drainage Area (sq mi):	0.46
Date:	6/18/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	195.53
4.0	195.33
11.1	194.91
14.3	194.59
18.9	193.54
21.8	193.26
26.2	193.00
31.0	192.66
34.6	192.56
36.9	192.46
37.9	192.51
39.1	191.94
40.6	191.43
41.2	191.39
42.3	191.05
43.6	190.90
44.7	190.92
45.2	190.91
45.6	190.93
46.7	190.99
48.0	191.43
49.1	191.90
50.8	192.48
53.4	192.57
56.5	192.63
60.4	192.78
63.6	193.25
69.2	194.25
70.8	194.24
70.9	194.54

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	192.41
Bankfull Cross-Sectional Area:	12.5
Total Cross-Sectional Area:	13.8
Bankfull Width:	12.5
Flood Prone Area Elevation:	193.9
Flood Prone Width:	50.1
Max Depth at Bankfull:	1.5
Mean Depth at Bankfull:	1.0
W / D Ratio:	12.6
Entrenchment Ratio:	4.0
Bank Height Ratio:	1.0
Thalweg Elevation:	190.9

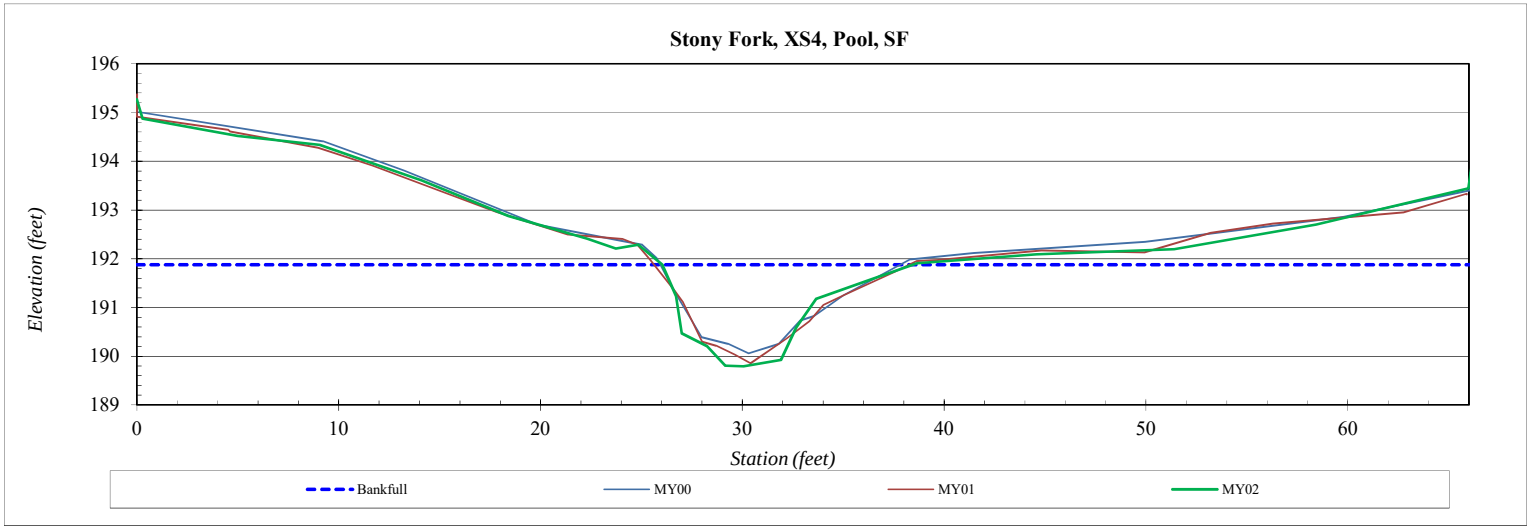


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS4
Drainage Area (sq mi):	0.46
Date:	6/18/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	195.27
0.3	194.88
5.0	194.52
9.1	194.34
14.1	193.61
18.4	192.88
22.3	192.42
23.7	192.21
24.8	192.29
26.0	191.88
26.7	191.24
27.0	190.47
28.3	190.21
29.1	189.81
30.1	189.79
31.9	189.92
32.7	190.59
33.7	191.18
36.2	191.55
38.6	191.91
44.6	192.10
51.4	192.19
58.4	192.70
66.0	193.45
66.1	193.84

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	191.88
Bankfull Cross-Sectional Area:	13.6
Total Cross-Sectional Area:	15.2
Bankfull Width:	12.4
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	2.1
Mean Depth at Bankfull:	1.1
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	189.8

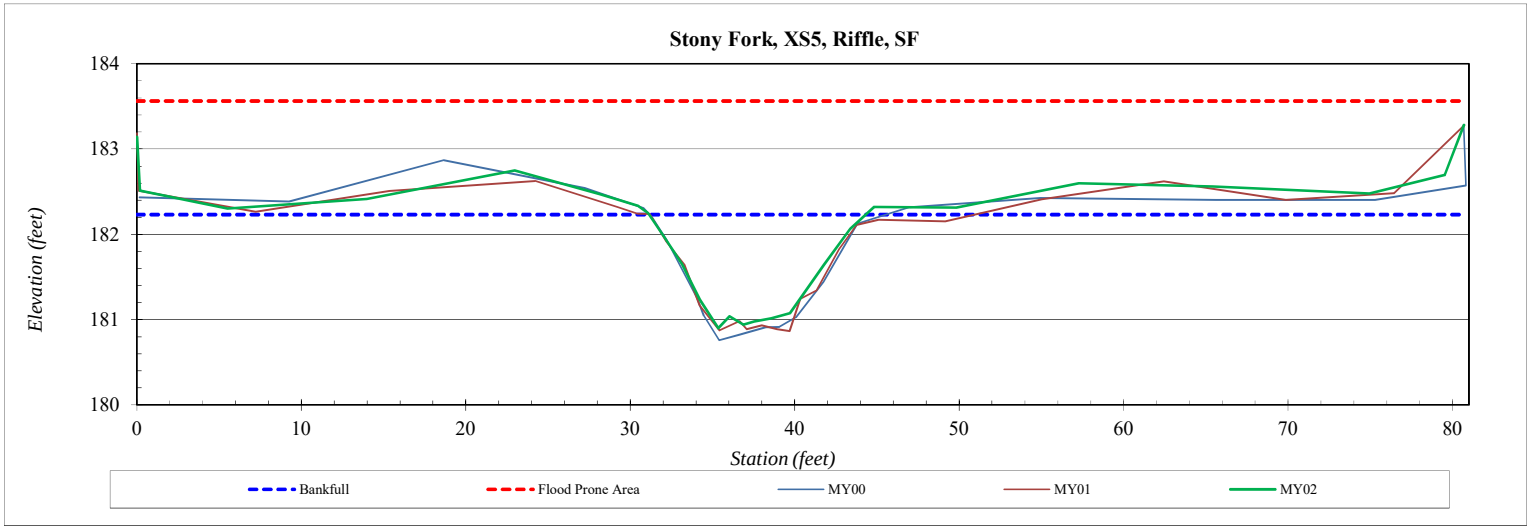


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS5
Drainage Area (sq mi):	0.46
Date:	6/18/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	183.14
0.2	182.51
5.5	182.31
14.0	182.42
23.0	182.75
28.2	182.47
30.4	182.34
31.1	182.25
32.1	181.96
33.1	181.65
34.2	181.24
35.4	180.90
36.0	181.04
36.9	180.94
37.5	180.98
38.6	181.02
39.7	181.08
41.8	181.64
43.4	182.07
44.8	182.32
49.8	182.31
57.3	182.60
65.4	182.56
75.0	182.48
79.5	182.70
80.7	183.28

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	182.23
Bankfull Cross-Sectional Area:	10.6
Total Cross-Sectional Area:	9.3
Bankfull Width:	13.2
Flood Prone Area Elevation:	183.6
Flood Prone Width:	80.7
Max Depth at Bankfull:	1.3
Mean Depth at Bankfull:	0.8
W / D Ratio:	16.4
Entrenchment Ratio:	6.1
Bank Height Ratio:	1.0
Thalweg Elevation:	180.9

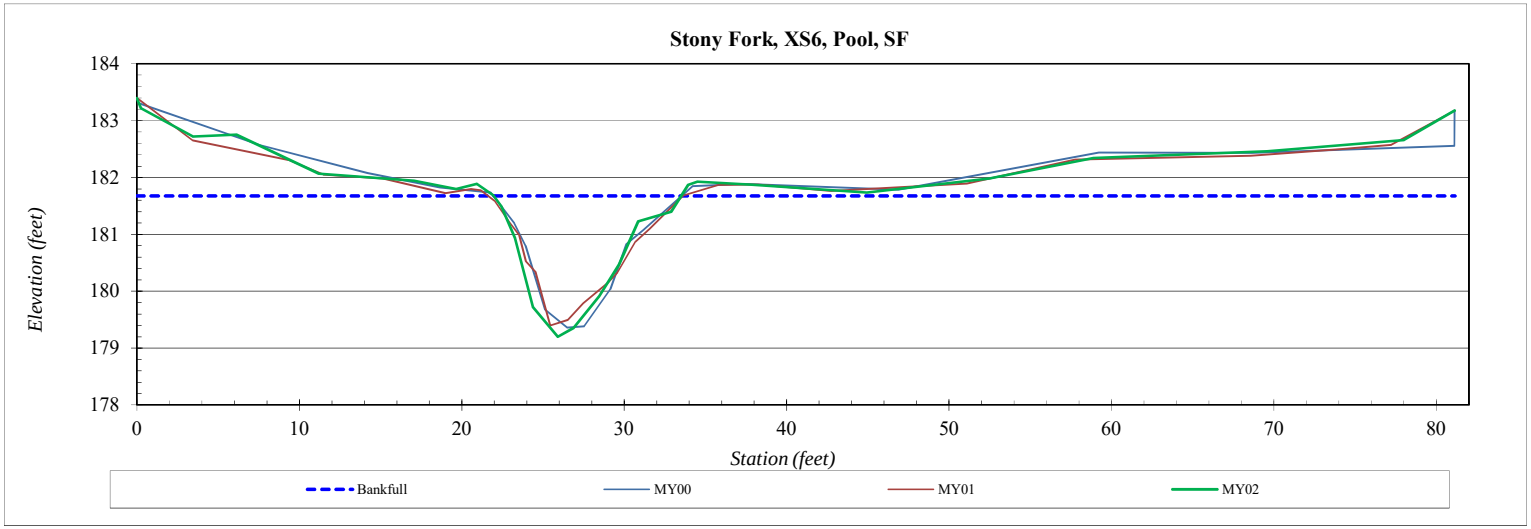


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS6
Drainage Area (sq mi):	0.46
Date:	6/18/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	183.40
0.2	183.22
3.4	182.72
6.1	182.76
11.2	182.07
17.1	181.95
19.6	181.80
20.9	181.89
21.9	181.68
22.4	181.49
23.3	180.93
24.4	179.72
25.9	179.20
26.9	179.35
28.5	179.92
29.7	180.47
30.9	181.23
32.9	181.40
33.9	181.87
34.5	181.93
37.7	181.88
44.9	181.74
52.5	181.99
58.9	182.34
69.6	182.47
78.0	182.66
81.1	183.18

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	181.68
Bankfull Cross-Sectional Area:	14.5
Total Cross-Sectional Area:	15.2
Bankfull Width:	11.5
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	2.5
Mean Depth at Bankfull:	1.3
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	179.2

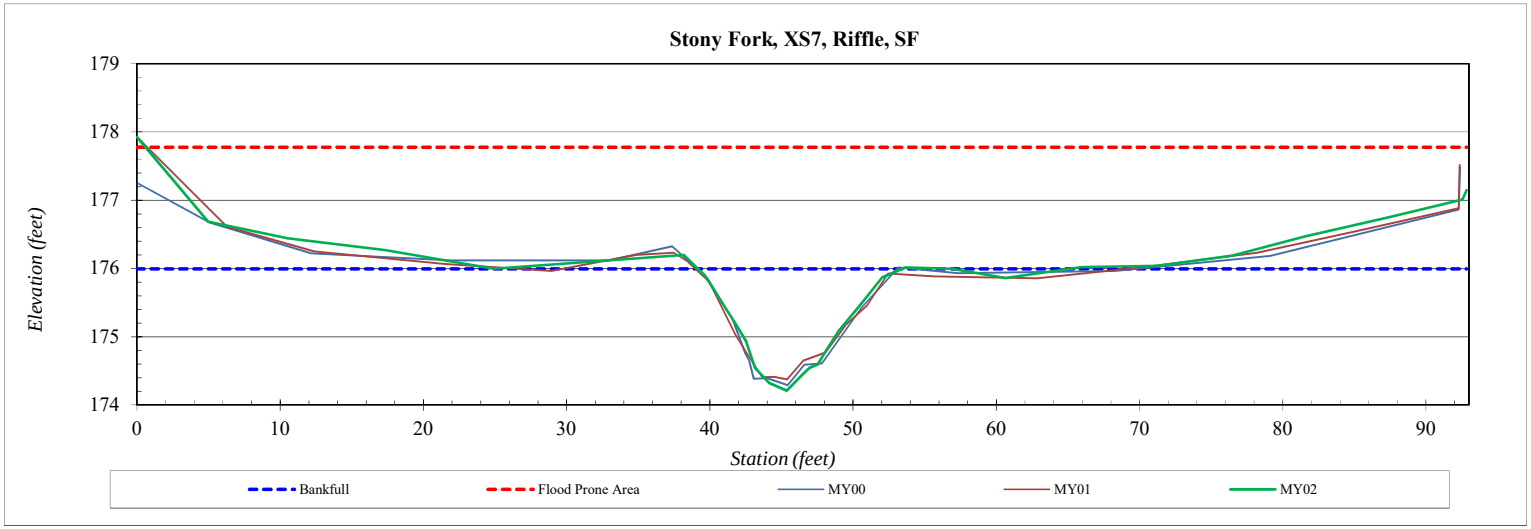


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS7
Drainage Area (sq mi):	0.83
Date:	6/29/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	177.93
5.0	176.69
10.5	176.44
17.4	176.27
24.9	176.00
30.5	176.08
38.2	176.20
39.6	175.90
41.0	175.46
41.8	175.18
42.5	174.93
43.2	174.54
44.1	174.32
45.4	174.21
46.5	174.46
47.0	174.54
47.5	174.60
48.1	174.80
49.0	175.09
50.5	175.47
52.1	175.87
53.7	176.02
56.9	176.00
60.6	175.86
66.0	176.02
71.2	176.04
76.5	176.19
81.6	176.47
87.6	176.76
92.5	177.01
92.8	177.15

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	175.99
Bankfull Cross-Sectional Area:	12.8
Total Cross-Sectional Area:	13.3
Bankfull Width:	14.2
Flood Prone Area Elevation:	177.8
Flood Prone Width:	92.2
Max Depth at Bankfull:	1.8
Mean Depth at Bankfull:	0.9
W / D Ratio:	15.7
Entrenchment Ratio:	6.5
Bank Height Ratio:	1.0
Thalweg Elevation:	174.2

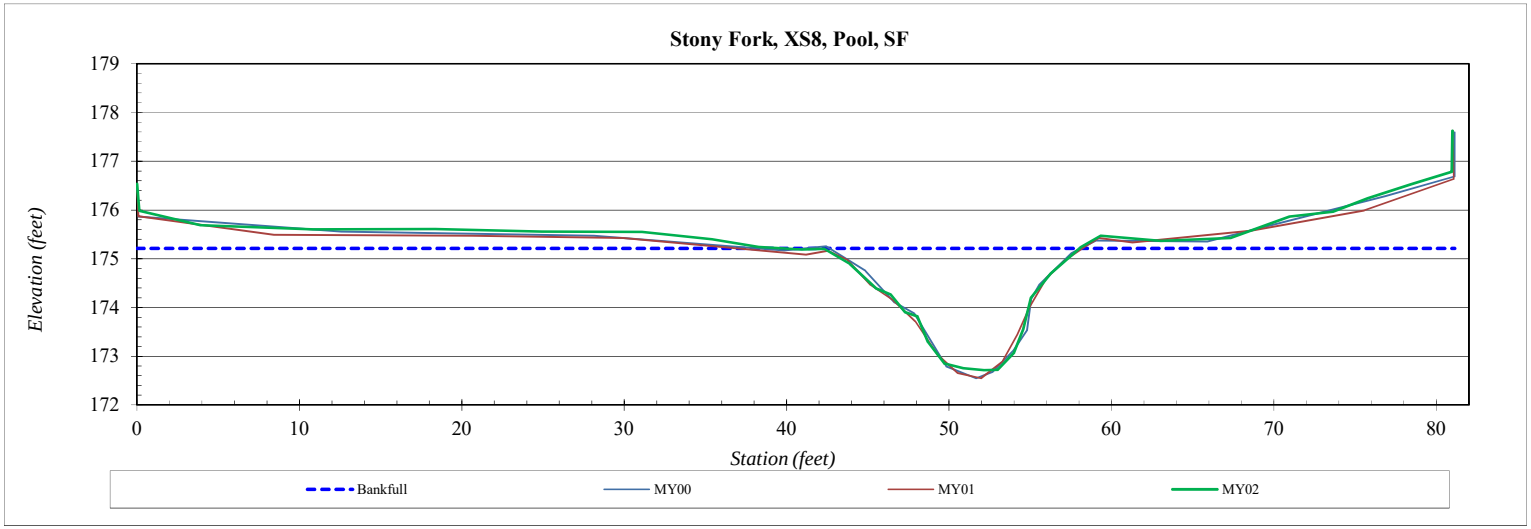


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS8
Drainage Area (sq mi):	0.83
Date:	6/29/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	176.54
0.1	175.98
3.9	175.69
10.8	175.61
18.4	175.61
24.9	175.56
31.1	175.55
35.4	175.40
38.3	175.24
40.9	175.19
42.3	175.20
43.9	174.89
45.5	174.39
46.4	174.26
47.3	173.91
48.0	173.82
48.7	173.29
49.7	172.85
50.9	172.75
52.2	172.71
53.0	172.72
54.0	173.07
54.6	173.55
55.0	174.20
56.3	174.70
58.1	175.24
59.4	175.47
63.0	175.37
67.3	175.43
71.0	175.87
73.6	175.97
75.8	176.24
78.4	176.53
80.9	176.78
81.0	177.63

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	175.21
Bankfull Cross-Sectional Area:	20.7
Total Cross-Sectional Area:	21.5
Bankfull Width:	15.7
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	2.5
Mean Depth at Bankfull:	1.3
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	172.7

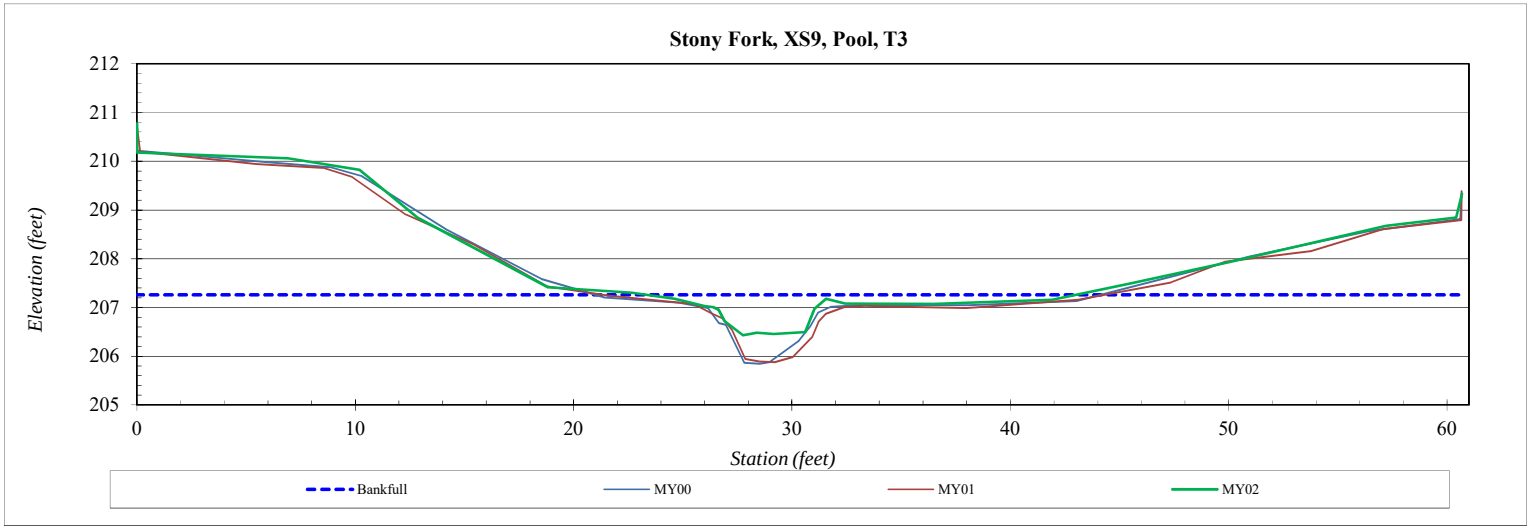


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS9
Drainage Area (sq mi):	0.04
Date:	6/18/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	210.78
0.0	210.18
6.9	210.06
10.2	209.83
12.9	208.84
18.8	207.42
22.7	207.30
24.6	207.18
26.0	207.03
26.4	207.01
26.6	206.95
26.9	206.72
27.7	206.43
28.4	206.48
29.2	206.46
30.6	206.50
31.0	206.98
31.6	207.18
32.4	207.08
36.5	207.08
41.9	207.16
45.6	207.50
50.0	207.93
57.2	208.67
60.4	208.85
60.7	209.33

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	207.26
Bankfull Cross-Sectional Area:	3.7
Total Cross-Sectional Area:	2.0
Bankfull Width:	8.2
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	0.8
Mean Depth at Bankfull:	0.4
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	206.4

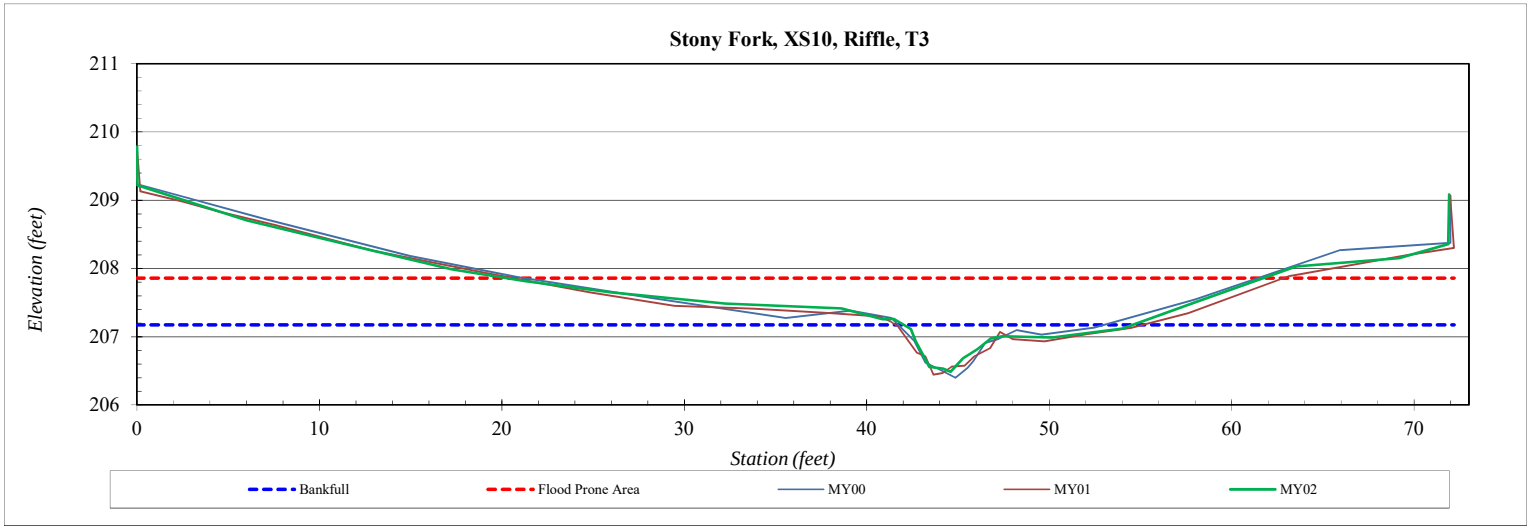


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS10
Drainage Area (sq mi):	0.04
Date:	6/18/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	209.78
0.0	209.22
6.0	208.71
12.4	208.29
17.3	207.99
21.3	207.81
26.0	207.65
32.3	207.49
38.6	207.42
40.9	207.26
41.5	207.26
42.4	207.11
42.7	206.93
43.4	206.56
44.2	206.53
44.6	206.49
45.3	206.68
46.1	206.82
46.8	206.98
47.4	207.01
50.2	206.99
54.0	207.12
57.9	207.50
63.5	208.03
69.2	208.15
71.9	208.36
71.9	209.09

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	207.17
Bankfull Cross-Sectional Area:	2.2
Total Cross-Sectional Area:	1.8
Bankfull Width:	5.4
Flood Prone Area Elevation:	207.9
Flood Prone Width:	41.5
Max Depth at Bankfull:	0.7
Mean Depth at Bankfull:	0.4
W / D Ratio:	13.4
Entrenchment Ratio:	7.7
Bank Height Ratio:	0.8
Thalweg Elevation:	206.5

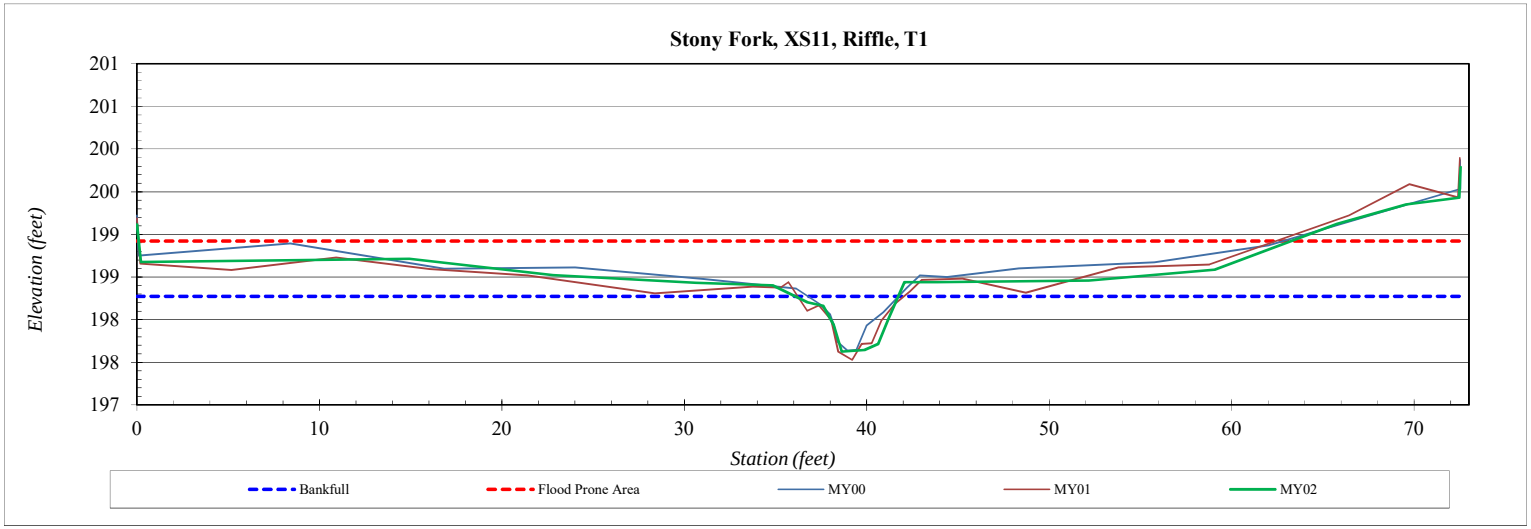


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS11
Drainage Area (sq mi):	0.02
Date:	6/18/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	199.11
0.2	198.68
7.7	198.70
14.9	198.72
22.8	198.52
30.6	198.43
34.8	198.40
36.7	198.21
37.6	198.16
38.2	197.94
38.6	197.63
39.9	197.64
40.6	197.72
41.2	198.01
42.1	198.44
43.9	198.44
47.1	198.45
52.2	198.46
59.1	198.59
65.8	199.12
69.6	199.35
72.5	199.43
72.6	199.79

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	198.27
Bankfull Cross-Sectional Area:	2.0
Total Cross-Sectional Area:	2.6
Bankfull Width:	5.7
Flood Prone Area Elevation:	198.9
Flood Prone Width:	63.2
Max Depth at Bankfull:	0.6
Mean Depth at Bankfull:	0.4
W / D Ratio:	16.0
Entrenchment Ratio:	11.2
Bank Height Ratio:	1.2
Thalweg Elevation:	197.6

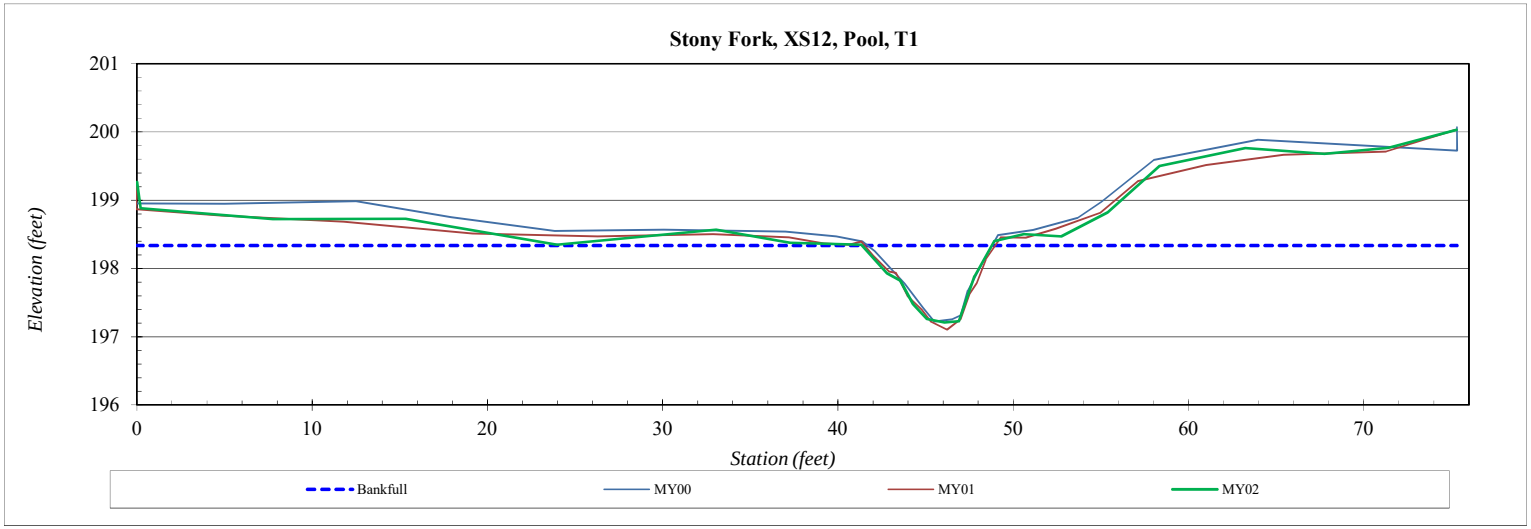


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS12
Drainage Area (sq mi):	0.02
Date:	6/18/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	199.27
0.2	198.88
7.8	198.72
15.3	198.73
24.0	198.35
33.0	198.57
37.3	198.38
41.3	198.35
42.8	197.93
43.6	197.82
44.3	197.48
45.1	197.26
46.1	197.21
46.9	197.23
47.8	197.89
48.9	198.40
50.6	198.50
52.7	198.47
55.4	198.82
58.3	199.50
63.2	199.77
67.8	199.68
71.4	199.77
75.3	200.03

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	198.34
Bankfull Cross-Sectional Area:	4.8
Total Cross-Sectional Area:	5.3
Bankfull Width:	7.4
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.1
Mean Depth at Bankfull:	0.7
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	197.2

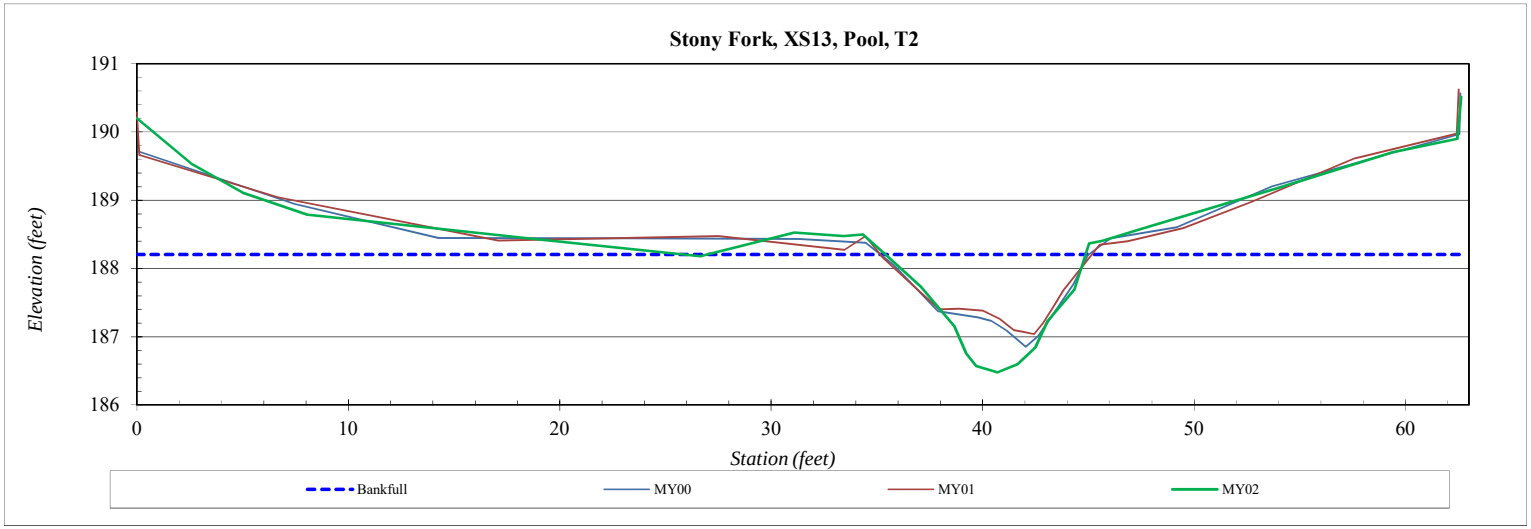


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS13
Drainage Area (sq mi):	0.14
Date:	6/29/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	190.20
2.6	189.52
5.0	189.12
8.1	188.79
19.2	188.42
26.7	188.18
31.1	188.53
33.4	188.48
34.3	188.50
35.4	188.21
37.1	187.73
38.7	187.15
39.2	186.75
39.7	186.57
40.7	186.48
41.7	186.60
42.5	186.84
43.1	187.23
44.3	187.69
45.0	188.37
45.7	188.41
47.5	188.59
54.0	189.18
59.4	189.70
62.5	189.90
62.6	190.51

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	188.20
Bankfull Cross-Sectional Area:	9.3
Total Cross-Sectional Area:	11.0
Bankfull Width:	9.5
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.7
Mean Depth at Bankfull:	1.0
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	186.5

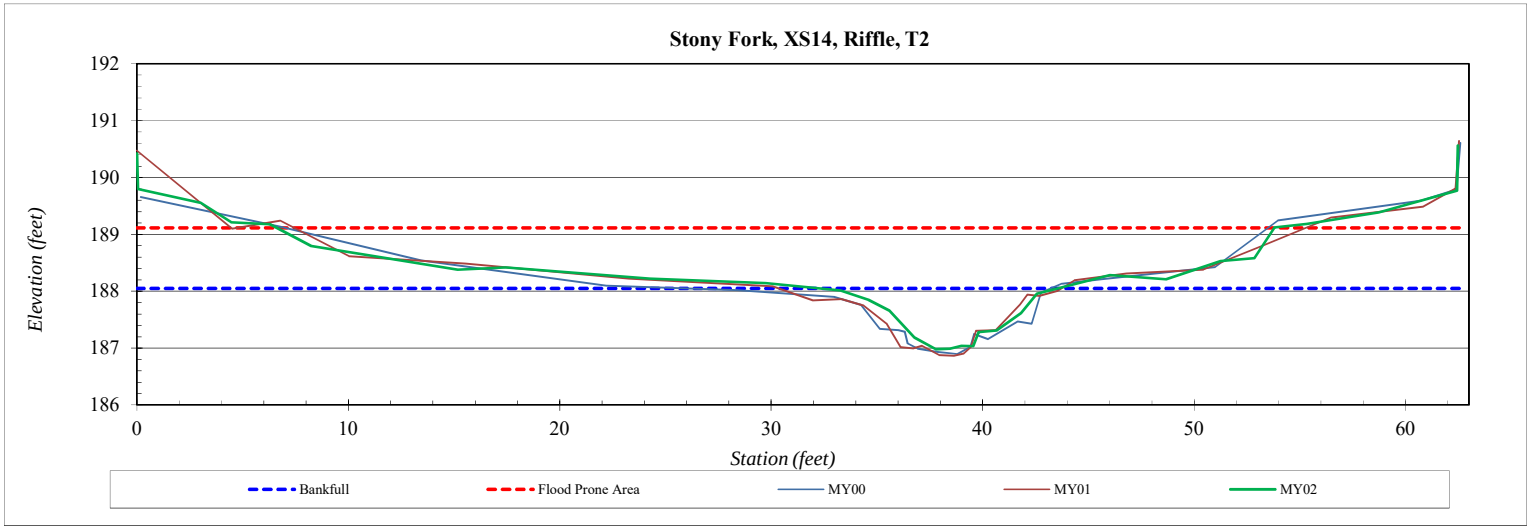


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS14
Drainage Area (sq mi):	0.14
Date:	6/29/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	190.42
0.0	189.80
3.0	189.56
4.5	189.21
6.3	189.18
8.2	188.80
15.2	188.38
17.4	188.42
24.3	188.23
29.7	188.14
33.3	188.02
34.6	187.85
35.6	187.66
36.8	187.19
37.8	186.98
38.4	186.99
39.0	187.04
39.6	187.04
39.8	187.28
40.7	187.31
41.8	187.61
42.6	187.96
42.7	187.97
46.0	188.29
48.7	188.21
51.3	188.53
52.8	188.58
53.8	189.12
55.3	189.19
58.7	189.39
62.4	189.77
62.5	190.56

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	188.05
Bankfull Cross-Sectional Area:	5.8
Total Cross-Sectional Area:	4.4
Bankfull Width:	11.1
Flood Prone Area Elevation:	189.1
Flood Prone Width:	47.2
Max Depth at Bankfull:	1.1
Mean Depth at Bankfull:	0.5
W / D Ratio:	21.4
Entrenchment Ratio:	4.2
Bank Height Ratio:	0.9
Thalweg Elevation:	187.0

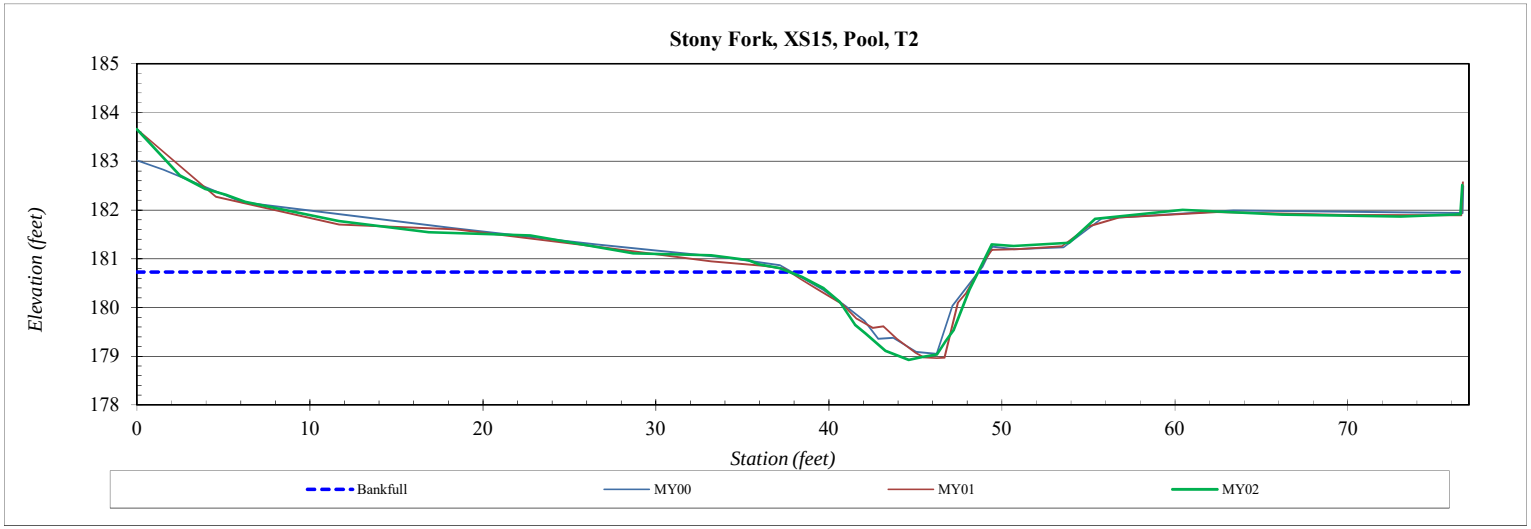


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS15
Drainage Area (sq mi):	0.22
Date:	6/29/2020
Field Crew:	T. Seelinger, A. Gutierrez

Station	Elevation
0.0	183.66
2.5	182.71
4.0	182.43
5.2	182.31
6.3	182.17
11.7	181.78
16.9	181.55
22.7	181.48
28.7	181.11
33.2	181.07
35.3	180.97
35.9	180.89
37.1	180.81
38.5	180.62
39.7	180.39
40.6	180.12
41.5	179.65
42.1	179.46
43.3	179.11
44.6	178.93
45.5	178.99
46.2	179.04
46.8	179.32
47.2	179.54
48.1	180.36
49.4	181.30
50.7	181.26
53.9	181.33
55.4	181.82
60.5	182.01
66.2	181.91
73.1	181.86
76.5	181.91
76.6	182.51

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	180.73
Bankfull Cross-Sectional Area:	11.2
Total Cross-Sectional Area:	12.8
Bankfull Width:	10.9
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.8
Mean Depth at Bankfull:	1.0
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	178.9

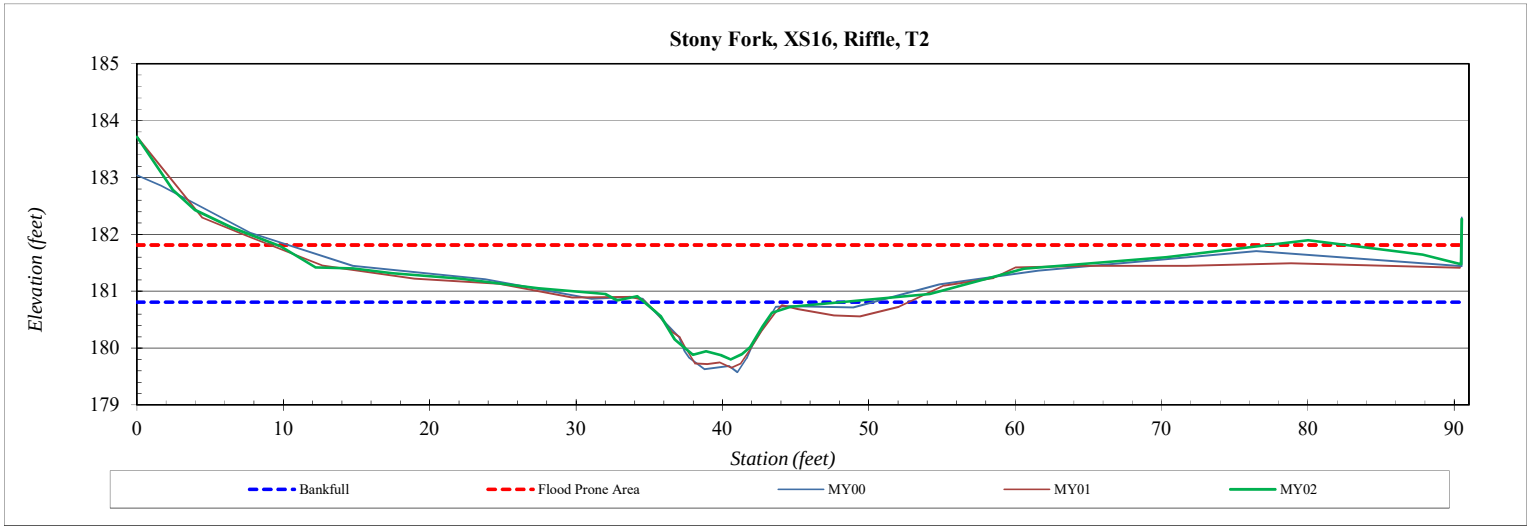


Cross-Section Plots

River Basin:	Neuse River
Site:	Stony Fork
XS ID	XS16
Drainage Area (sq mi):	0.22
Date:	6/29/2020
Field Crew:	T. Seelinger, A. Gutierrez

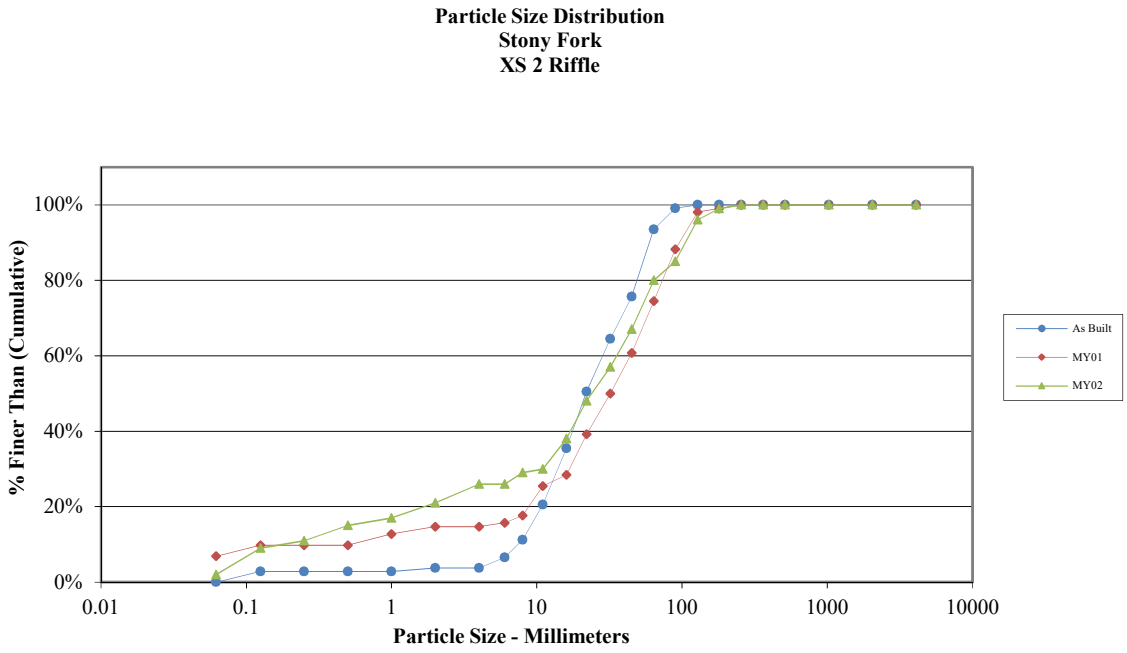
Station	Elevation
0.0	183.72
2.5	182.78
4.0	182.43
6.5	182.12
9.8	181.79
12.2	181.42
14.8	181.41
17.4	181.32
22.1	181.23
27.4	181.05
32.0	180.95
32.8	180.84
34.2	180.92
35.8	180.56
36.8	180.15
37.3	180.02
38.0	179.88
38.9	179.95
39.9	179.88
40.6	179.80
41.3	179.90
41.9	180.02
42.8	180.38
43.4	180.62
44.7	180.73
54.2	180.95
60.6	181.40
70.3	181.60
80.0	181.90
87.9	181.65
90.5	181.48
90.5	182.27

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	180.81
Bankfull Cross-Sectional Area:	6.0
Total Cross-Sectional Area:	5.2
Bankfull Width:	10.0
Flood Prone Area Elevation:	181.8
Flood Prone Width:	75.5
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.6
W / D Ratio:	16.6
Entrenchment Ratio:	7.6
Bank Height Ratio:	0.9
Thalweg Elevation:	179.8



Cross-Section 2 Riffle - MY02			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	2
Very Fine	.062 - .125	S	7
Fine	.125 - .25	A	2
Medium	.25 - .50	N	4
Coarse	.50 - 1	D	2
Very Coarse	1 - 2	S	4
Very Fine	2 - 4		5
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	3
Medium	8 - 11.3	A	1
Medium	11.3 - 16	V	8
Coarse	16 - 22.6	E	10
Coarse	22.6 - 32	L	9
Very Coarse	32 - 45	S	10
Very Coarse	45 - 64		13
Small	64 - 90	C	5
Small	90 - 128	O	11
Large	128 - 180	B	3
Large	180 - 256	L	1
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



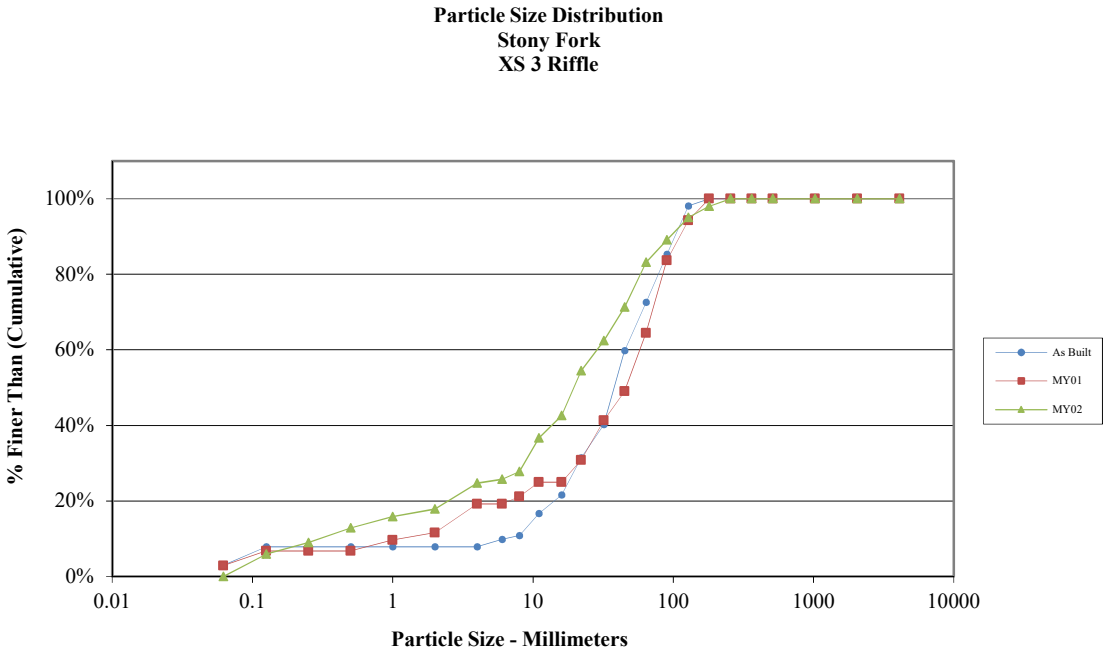
Size (mm)	
D16	0.71
D35	14
D50	24
D65	42
D84	84
D95	120

Size Distribution	
mean	7.7
dispersion	18.7
skewness	-0.34

Type	
silt/clay	2%
sand	19%
gravel	59%
cobble	16%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 3 Riffle - MY02			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	6
Fine	.125 - .25	A	3
Medium	.25 - .50	N	4
Coarse	.50 - 1	D	3
Very Coarse	1 - 2	S	2
Very Fine	2 - 4		7
Fine	4 - 5.7	G	1
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	9
Medium	11.3 - 16	V	6
Coarse	16 - 22.6	E	12
Coarse	22.6 - 32	L	8
Very Coarse	32 - 45	S	9
Very Coarse	45 - 64		12
Small	64 - 90	C	6
Small	90 - 128	O	6
Large	128 - 180	B	3
Large	180 - 256	L	2
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	101

Note:



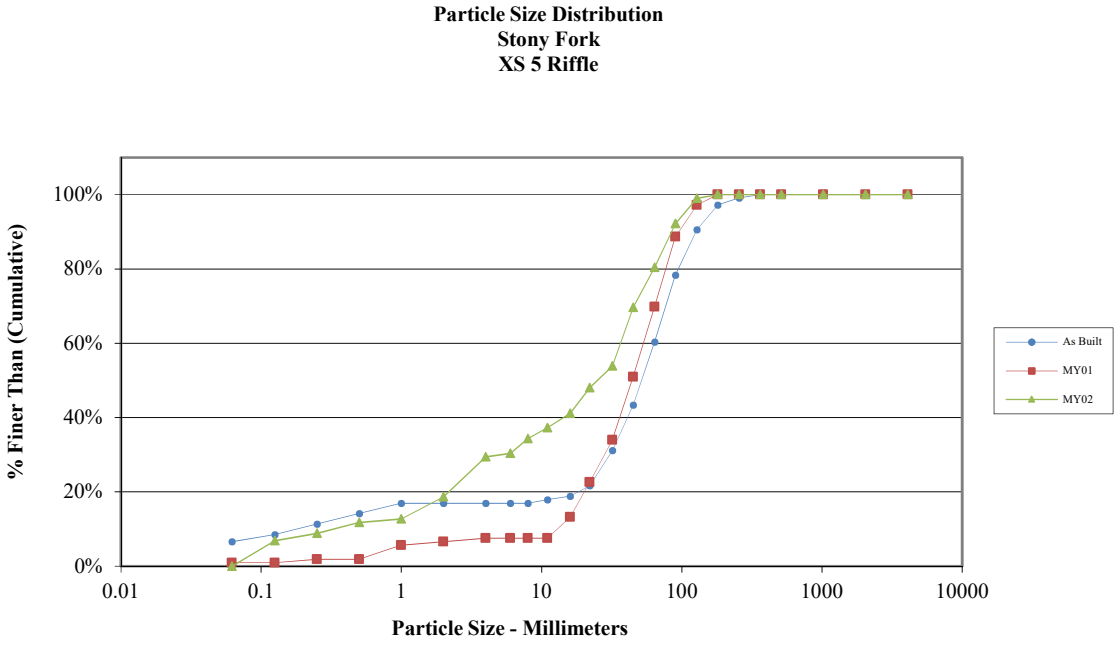
Size (mm)	
D16	1.1
D35	10
D50	20
D65	35
D84	67
D95	130

Size Distribution	
mean	8.6
dispersion	10.8
skewness	-0.27

Type	
silt/clay	0%
sand	18%
gravel	65%
cobble	17%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 5 Riffle - MY02			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	7
Fine	.125 - .25	A	2
Medium	.25 - .50	N	3
Coarse	.50 - 1	D	1
Very Coarse	1 - 2	S	6
Very Fine	2 - 4		11
Fine	4 - 5.7	G	1
Fine	5.7 - 8	R	4
Medium	8 - 11.3	A	3
Medium	11.3 - 16	V	4
Coarse	16 - 22.6	E	7
Coarse	22.6 - 32	L	6
Very Coarse	32 - 45	S	16
Very Coarse	45 - 64		11
Small	64 - 90	C	12
Small	90 - 128	O	7
Large	128 - 180	B	1
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	102

Note:



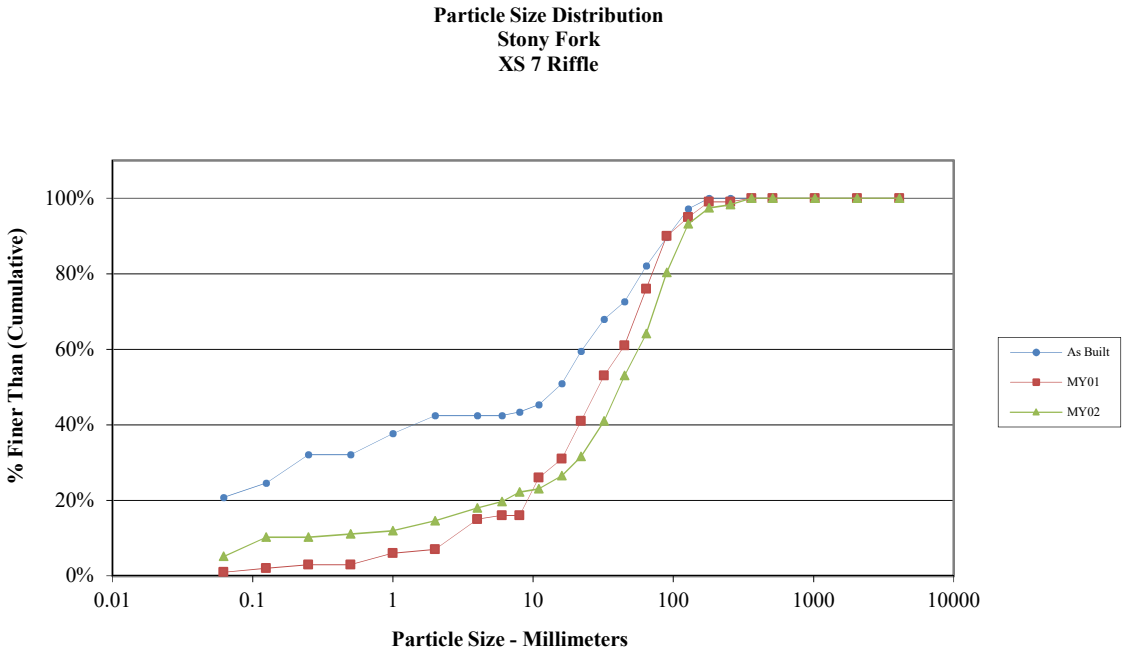
Size (mm)	
D16	1.5
D35	8.6
D50	25
D65	41
D84	71
D95	100

Size Distribution	
mean	10.3
dispersion	9.8
skewness	-0.30

Type	
silt/clay	0%
sand	19%
gravel	62%
cobble	20%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 7 Riffle -MY02			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	6
Very Fine	.062 - .125	S	6
Fine	.125 - .25	A	
Medium	.25 - .50	N	1
Coarse	.50 - 1	D	1
Very Coarse	1 - 2	S	3
Very Fine	2 - 4		4
Fine	4 - 5.7	G	2
Fine	5.7 - 8	R	3
Medium	8 - 11.3	A	1
Medium	11.3 - 16	V	4
Coarse	16 - 22.6	E	6
Coarse	22.6 - 32	L	11
Very Coarse	32 - 45	S	14
Very Coarse	45 - 64		13
Small	64 - 90	C	19
Small	90 - 128	O	15
Large	128 - 180	B	5
Large	180 - 256	L	1
Small	256 - 362	B	2
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	117

Note:



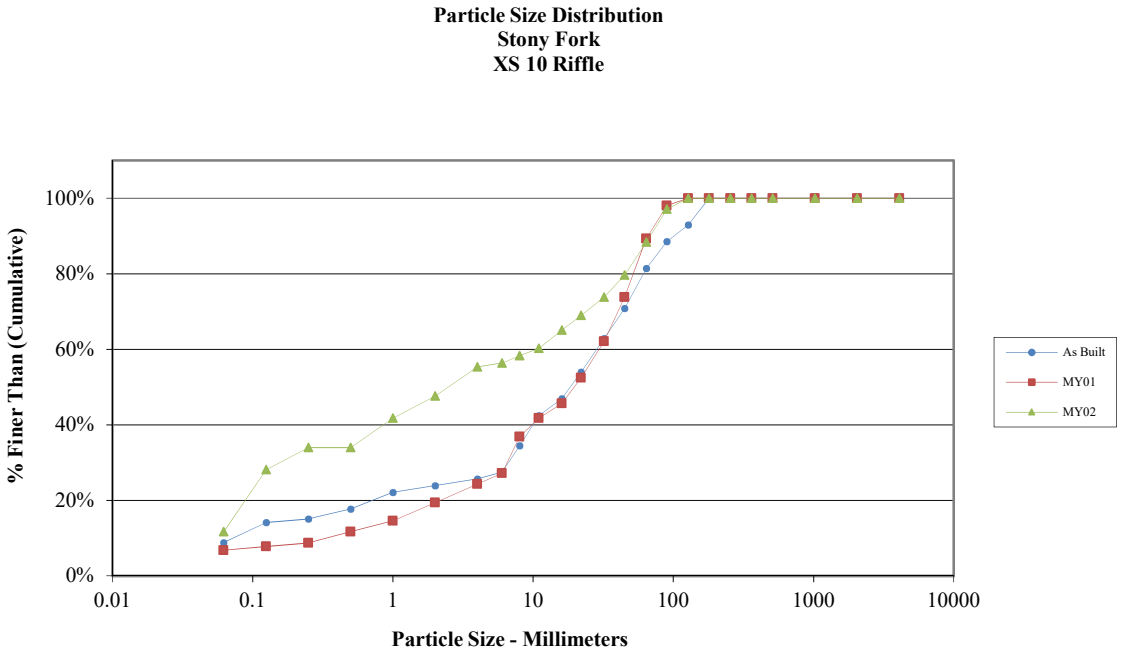
Size (mm)	
D16	2.7
D35	25
D50	41
D65	65
D84	100
D95	150

Size Distribution	
mean	16.4
dispersion	8.8
skewness	-0.32

Type	
silt/clay	5%
sand	9%
gravel	50%
cobble	33%
boulder	2%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 10 Riffle - MY02			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	12
Very Fine	.062 - .125	S	17
Fine	.125 - .25	A	6
Medium	.25 - .50	N	
Coarse	.50 - 1	D	8
Very Coarse	1 - 2	S	6
Very Fine	2 - 4		8
Fine	4 - 5.7	G	1
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	2
Medium	11.3 - 16	V	5
Coarse	16 - 22.6	E	4
Coarse	22.6 - 32	L	5
Very Coarse	32 - 45	S	6
Very Coarse	45 - 64		9
Small	64 - 90	C	9
Small	90 - 128	O	3
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	103

Note:



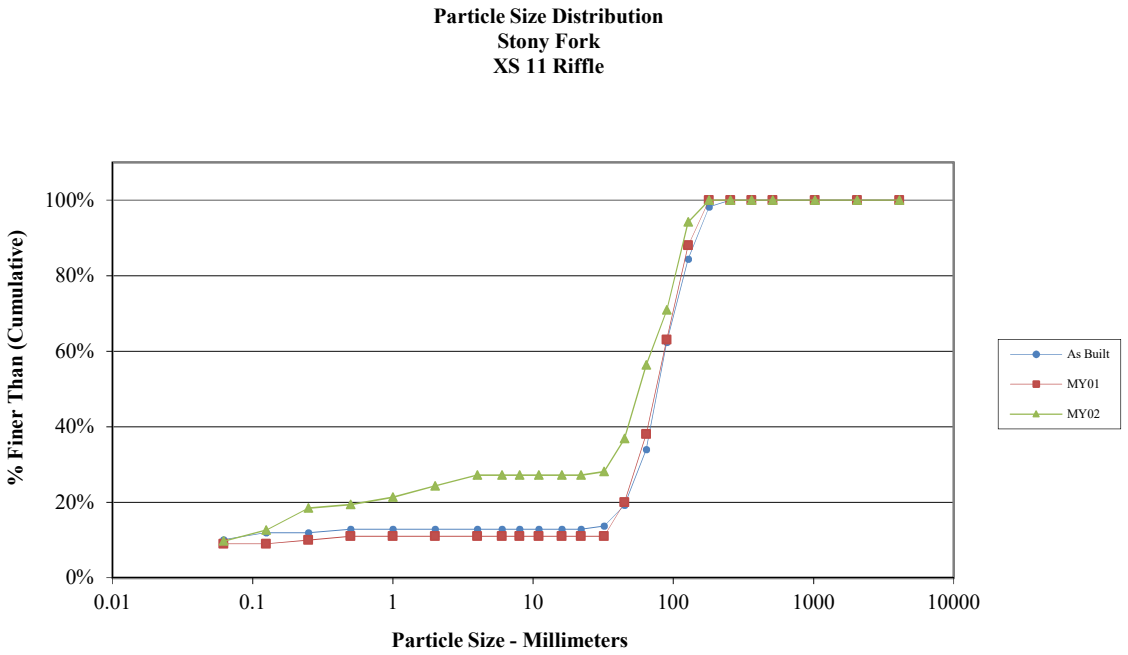
Size (mm)	
D16	0.075
D35	0.55
D50	2.5
D65	16
D84	54
D95	83

Size Distribution	
mean	2.0
dispersion	27.5
skewness	-0.06

Type	
silt/clay	12%
sand	36%
gravel	41%
cobble	12%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 11 Riffle -MY02			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	10
Very Fine	.062 - .125	S	3
Fine	.125 - .25	A	6
Medium	.25 - .50	N	1
Coarse	.50 - 1	D	2
Very Coarse	1 - 2	S	3
Very Fine	2 - 4		3
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	1
Very Coarse	32 - 45	S	9
Very Coarse	45 - 64		20
Small	64 - 90	C	15
Small	90 - 128	O	24
Large	128 - 180	B	6
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	103

Note:



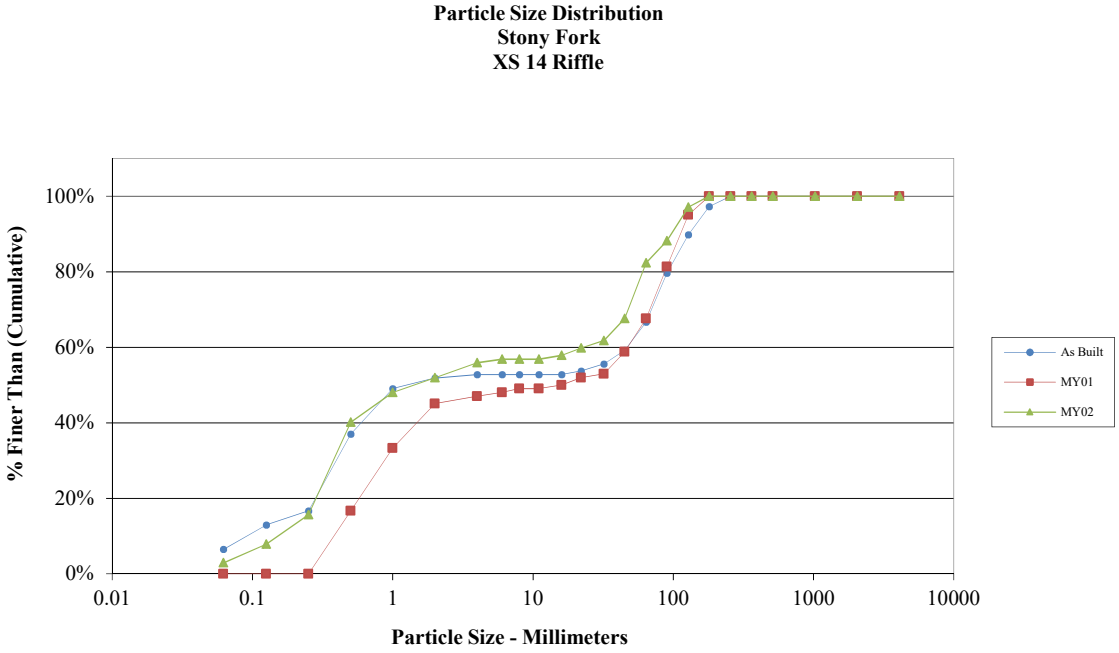
Size (mm)	
D16	0.19
D35	42
D50	57
D65	78
D84	110
D95	130

Size Distribution	
mean	4.6
dispersion	151.0
skewness	-0.66

Type	
silt/clay	10%
sand	15%
gravel	32%
cobble	44%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 14 Riffle - MY02			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	3
Very Fine	.062 - .125	S	5
Fine	.125 - .25	A	8
Medium	.25 - .50	N	25
Coarse	.50 - 1	D	8
Very Coarse	1 - 2	S	4
Very Fine	2 - 4		4
Fine	4 - 5.7	G	1
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	1
Coarse	16 - 22.6	E	2
Coarse	22.6 - 32	L	2
Very Coarse	32 - 45	S	6
Very Coarse	45 - 64		15
Small	64 - 90	C	6
Small	90 - 128	O	9
Large	128 - 180	B	3
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	102

Note:



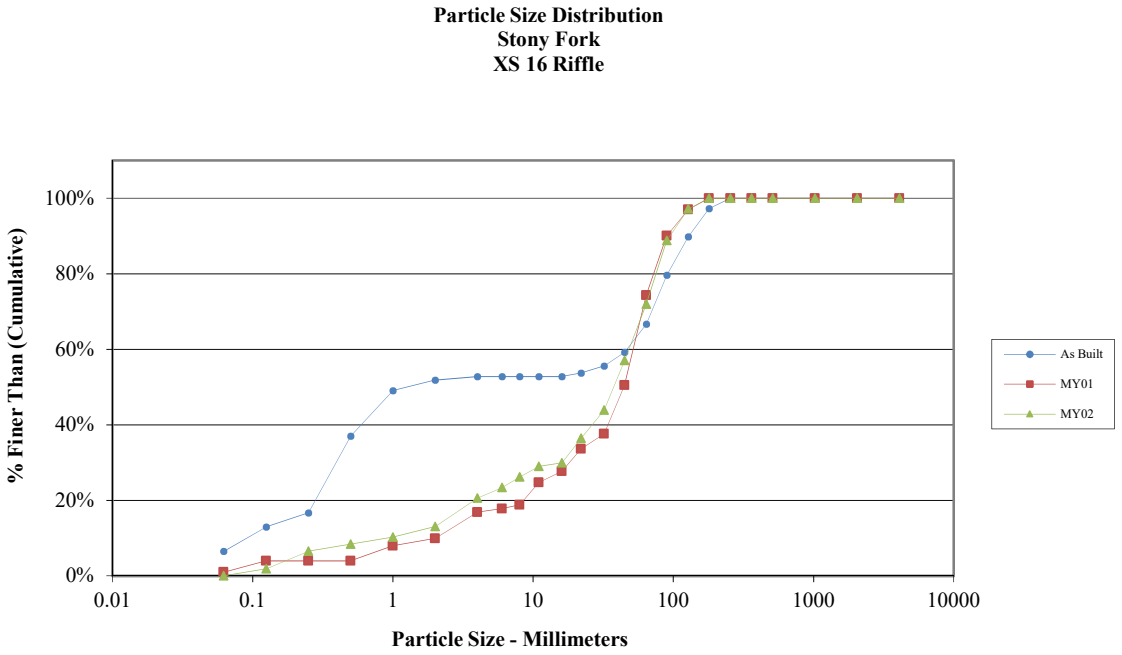
Size (mm)	
D16	0.25
D35	0.43
D50	1.4
D65	39
D84	70
D95	120

Size Distribution	
mean	4.2
dispersion	27.8
skewness	0.30

Type	
silt/clay	3%
sand	49%
gravel	30%
cobble	18%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 16 Riffle - MY02			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	2
Fine	.125 - .25	A	5
Medium	.25 - .50	N	2
Coarse	.50 - 1	D	2
Very Coarse	1 - 2	S	3
Very Fine	2 - 4		8
Fine	4 - 5.7	G	3
Fine	5.7 - 8	R	3
Medium	8 - 11.3	A	3
Medium	11.3 - 16	V	1
Coarse	16 - 22.6	E	7
Coarse	22.6 - 32	L	8
Very Coarse	32 - 45	S	14
Very Coarse	45 - 64		16
Small	64 - 90	C	18
Small	90 - 128	O	9
Large	128 - 180	B	3
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	107

Note:



Size (mm)	
D16	2.6
D35	21
D50	37
D65	54
D84	82
D95	120

Size Distribution	
mean	14.6
dispersion	8.2
skewness	-0.33

Type	
silt/clay	0%
sand	13%
gravel	59%
cobble	28%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

APPENDIX E

Hydrologic Data

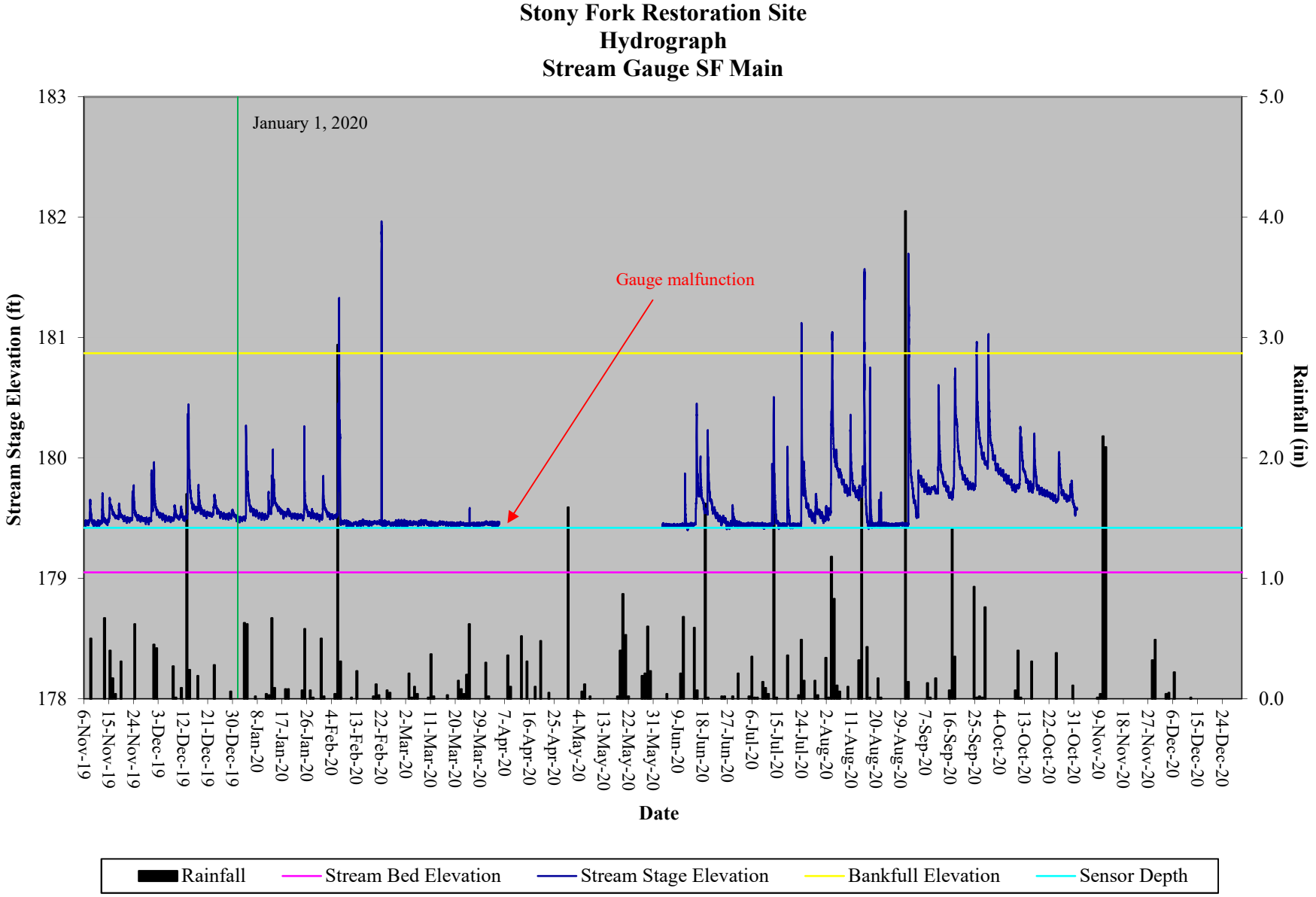
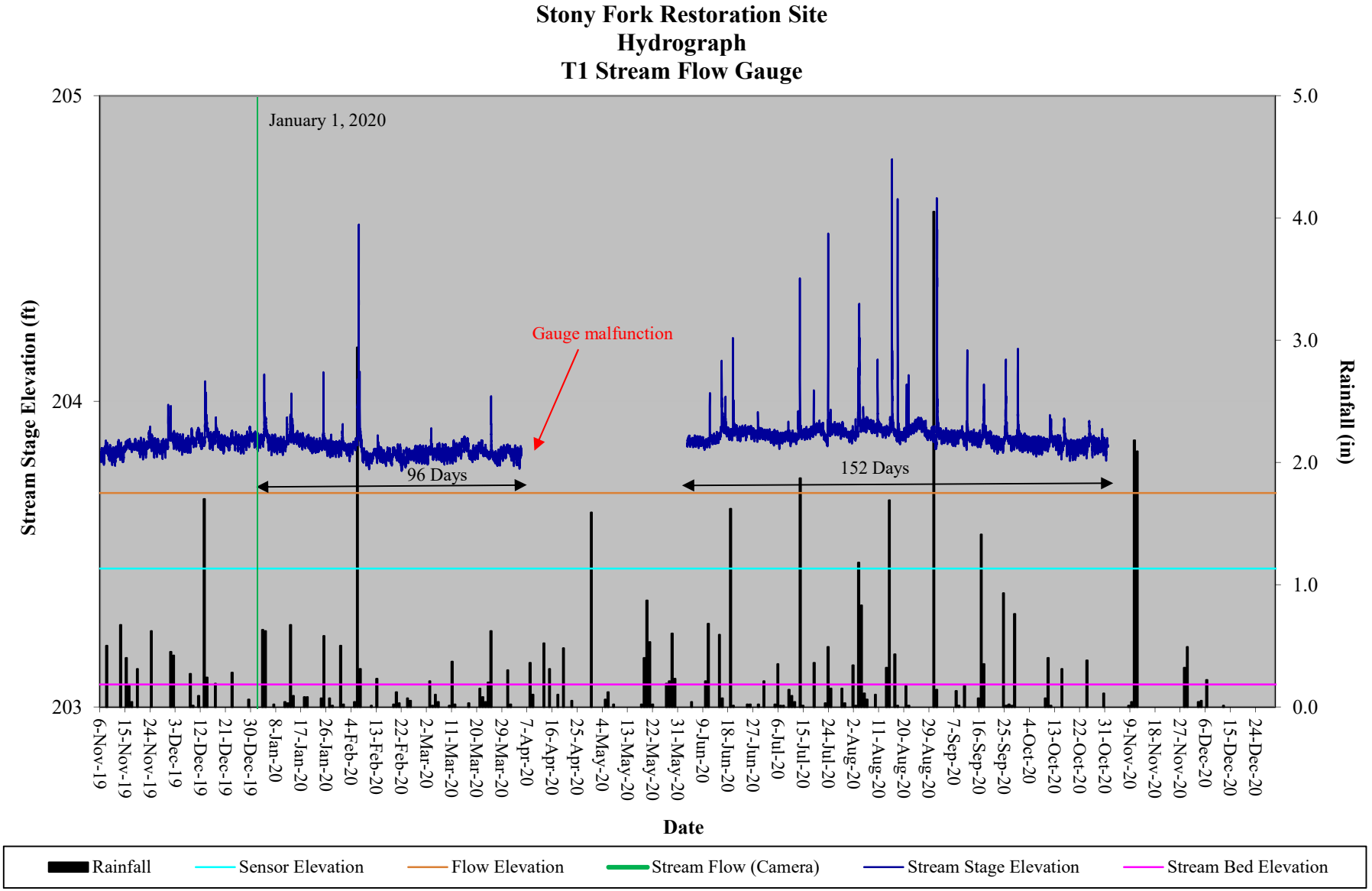

Stony Fork Restoration Site
Hydrograph
Stream Gauge SF Main
January 1, 2020
Gauge malfunction
Stream Stage Elevation (ft)
Rainfall (in)
Date
183
182
181
180
179
178
5.0
4.0
3.0
2.0
1.0
0.0
6-Nov-19
15-Nov-19
24-Nov-19
3-Dec-19
12-Dec-19
21-Dec-19
30-Dec-19
8-Jan-20
17-Jan-20
26-Jan-20
4-Feb-20
13-Feb-20
22-Feb-20
2-Mar-20
11-Mar-20
20-Mar-20
29-Mar-20
7-Apr-20
16-Apr-20
25-Apr-20
4-May-20
13-May-20
22-May-20
31-May-20
9-Jun-20
18-Jun-20
27-Jun-20
6-Jul-20
15-Jul-20
24-Jul-20
2-Aug-20
11-Aug-20
20-Aug-20
29-Aug-20
7-Sep-20
16-Sep-20
25-Sep-20
4-Oct-20
13-Oct-20
22-Oct-20
31-Oct-20
9-Nov-20
18-Nov-20
27-Nov-20
6-Dec-20
15-Dec-20
24-Dec-20
Rainfall
Stream Bed Elevation
Stream Stage Elevation
Bankfull Elevation
Sensor Depth

Table 10. Verification of Stream Flow Stony Fork Restoration Site, DMS Project #97085				
	Gauge		Camera	
Reach	Dates Achieving	Maximum Consecutive Days	Dates Achieving	Maximum Consecutive Days
T1	January 1 – April 5; June 3 – November 1	152	*	*
T1A	January 1 – April 5; June 3 – November 1	152	January 1 – July 1	183
T2	January 1 – April 5; June 3 – November 1	152	January 1 – February 22	53
T3	January 1 – April 5; June 3 – November 1	152	*	*

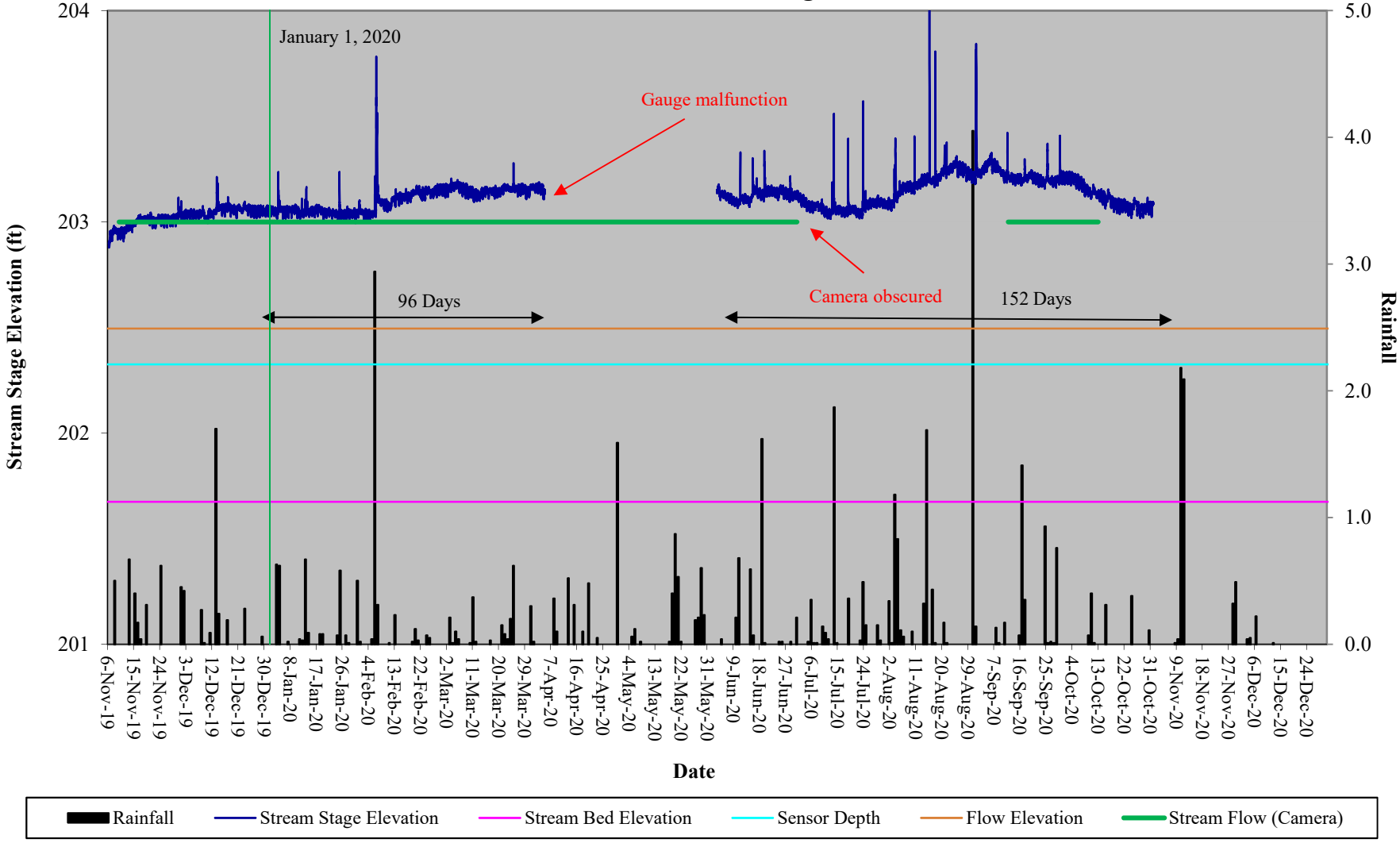
*Camera obscured or malfunctioned for most of the year

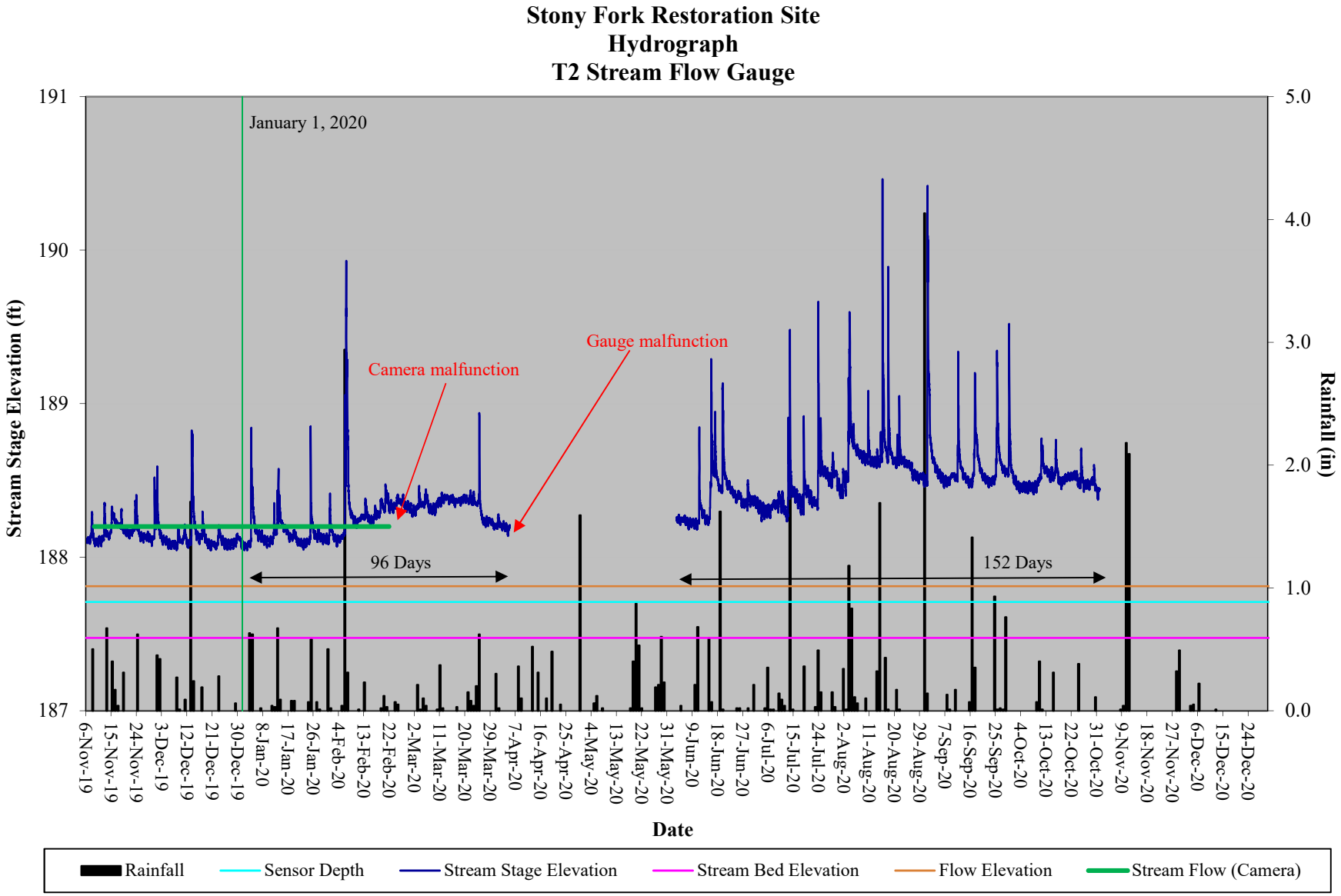
Table 11. Stream Flow Criteria Attainment Stony Fork Restoration Site, DMS Project #97085							
	Greater than 30 Days of Flow/Max Consecutive Days						
Reach	MY-01 2019	MY-02 2019	MY-03 2020	MY-04 2021	MY-05 2022	MY-06 2023	MY-07 2024
T1 (Gauge)	Yes/60	Yes/152					
T1 (Camera)	*	*					
T1A (Gauge)	Yes/182	Yes/152					
T1A (Camera)	Yes/46	Yes/183					
T2 (Gauge)	Yes/85	Yes/152					
T2 (Camera)	Yes/84	Yes/53					
T3 (Gauge)	Yes/55	Yes/152					
T3 (Camera)	Yes/55	*					

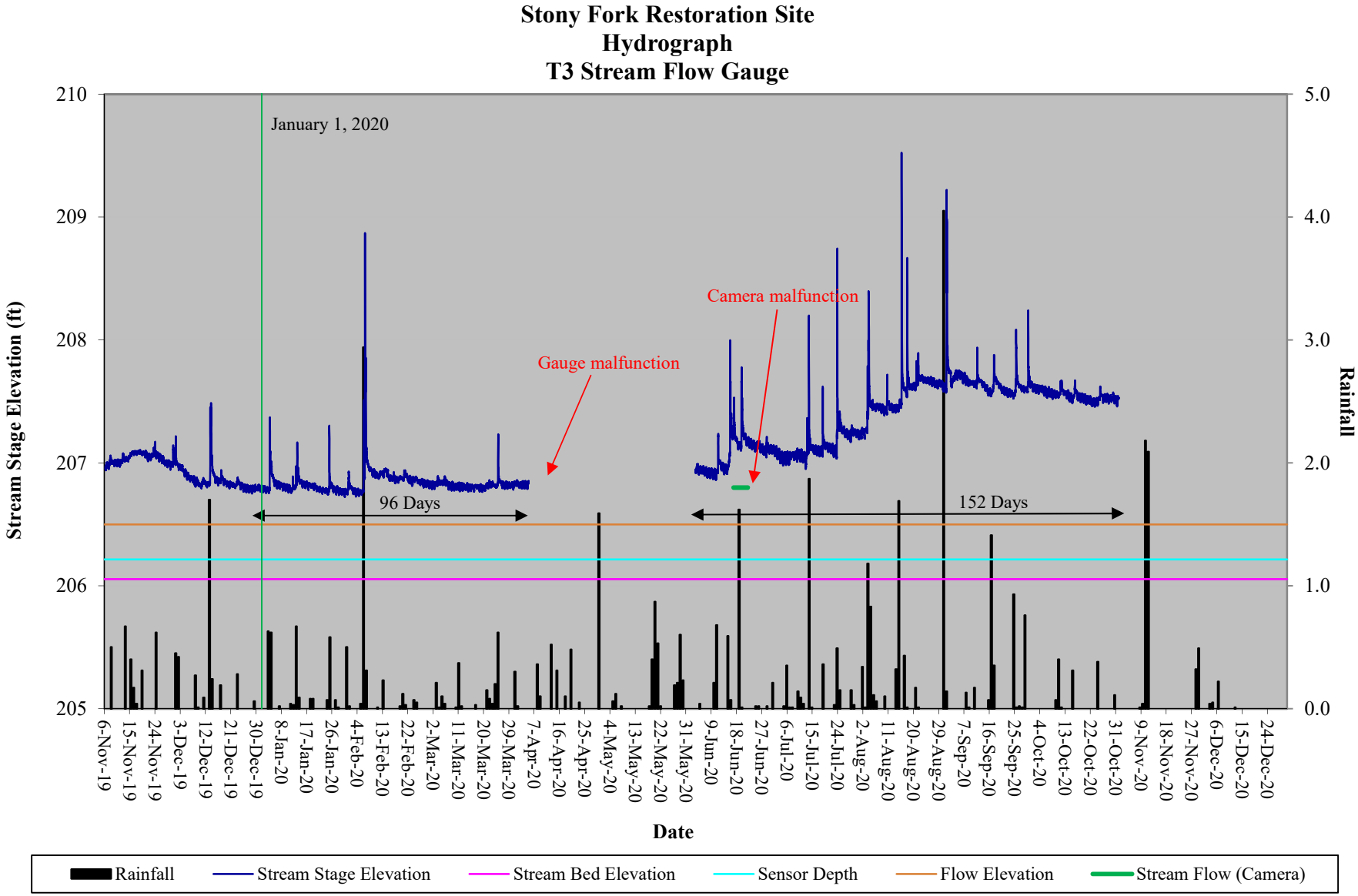
*Camera obscured or malfunctioned for most of the year


Stony Fork Restoration Site
Hydrograph
T1 Stream Flow Gauge
January 1, 2020
Gauge malfunction
96 Days
152 Days
Stream Stage Elevation (ft)
Rainfall (in)
Date
205
204
203
5.0
4.0
3.0
2.0
1.0
0.0
6-Nov-19
15-Nov-19
24-Nov-19
3-Dec-19
12-Dec-19
21-Dec-19
30-Dec-19
8-Jan-20
17-Jan-20
26-Jan-20
4-Feb-20
13-Feb-20
22-Feb-20
2-Mar-20
11-Mar-20
20-Mar-20
29-Mar-20
7-Apr-20
16-Apr-20
25-Apr-20
4-May-20
13-May-20
22-May-20
31-May-20
9-Jun-20
18-Jun-20
27-Jun-20
6-Jul-20
15-Jul-20
24-Jul-20
2-Aug-20
11-Aug-20
20-Aug-20
29-Aug-20
7-Sep-20
16-Sep-20
25-Sep-20
4-Oct-20
13-Oct-20
22-Oct-20
31-Oct-20
9-Nov-20
18-Nov-20
27-Nov-20
6-Dec-20
15-Dec-20
24-Dec-20
Rainfall
Sensor Elevation
Flow Elevation
Stream Flow (Camera)
Stream Stage Elevation
Stream Bed Elevation

Stony Fork Restoration Site
Hydrograph
T1-A Stream Flow Gauge




Stony Fork Restoration Site
Hydrograph
T2 Stream Flow Gauge
January 1, 2020
Camera malfunction
Gauge malfunction
96 Days
152 Days
Stream Stage Elevation (ft)
Rainfall (in)
Date
191
190
189
188
187
5.0
4.0
3.0
2.0
1.0
0.0
6-Nov-19
15-Nov-19
24-Nov-19
3-Dec-19
12-Dec-19
21-Dec-19
30-Dec-19
8-Jan-20
17-Jan-20
26-Jan-20
4-Feb-20
13-Feb-20
22-Feb-20
2-Mar-20
11-Mar-20
20-Mar-20
29-Mar-20
7-Apr-20
16-Apr-20
25-Apr-20
4-May-20
13-May-20
22-May-20
31-May-20
9-Jun-20
18-Jun-20
27-Jun-20
6-Jul-20
15-Jul-20
24-Jul-20
2-Aug-20
11-Aug-20
20-Aug-20
29-Aug-20
7-Sep-20
16-Sep-20
25-Sep-20
4-Oct-20
13-Oct-20
22-Oct-20
31-Oct-20
9-Nov-20
18-Nov-20
27-Nov-20
6-Dec-20
15-Dec-20
24-Dec-20
Rainfall
Sensor Depth
Stream Stage Elevation
Stream Bed Elevation
Flow Elevation
Stream Flow (Camera)


Stony Fork Restoration Site
Hydrograph
T3 Stream Flow Gauge
Stream Stage Elevation (ft)
Rainfall
Date
January 1, 2020
Gauge malfunction
Camera malfunction
96 Days
152 Days
210
209
208
207
206
205
5.0
4.0
3.0
2.0
1.0
0.0
6-Nov-19
15-Nov-19
24-Nov-19
3-Dec-19
12-Dec-19
21-Dec-19
30-Dec-19
8-Jan-20
17-Jan-20
26-Jan-20
4-Feb-20
13-Feb-20
22-Feb-20
2-Mar-20
11-Mar-20
20-Mar-20
29-Mar-20
7-Apr-20
16-Apr-20
25-Apr-20
4-May-20
13-May-20
22-May-20
31-May-20
9-Jun-20
18-Jun-20
27-Jun-20
6-Jul-20
15-Jul-20
24-Jul-20
2-Aug-20
11-Aug-20
20-Aug-20
29-Aug-20
7-Sep-20
16-Sep-20
25-Sep-20
4-Oct-20
13-Oct-20
22-Oct-20
31-Oct-20
9-Nov-20
18-Nov-20
27-Nov-20
6-Dec-20
15-Dec-20
24-Dec-20
Rainfall
Stream Stage Elevation
Stream Bed Elevation
Sensor Depth
Flow Elevation
Stream Flow (Camera)

APPENDIX F

Additional Information

ISO 9001:2008 CERTIFIED
ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS
4505 Falls of Neuse Rd., Suite 400 • Raleigh, NC 27609 • Phone 919-783-9214 • Fax 919-783-9266

February 12, 2021

Jerry Parrish and Lisa Parrish
4141 Elevation Road
Benson, NC 27504

RE: Conservation Easement Encroachment

Dear Mr. and Mrs. Parrish

I am writing to inform you that at a recent visit to the site (February 9, 2021), 4-wheeler tracks were noted entering the conservation easement from your property. These tracks entered the easement from the path along the eastern edge of your property and continued for about 400 feet before exiting the easement near the end of Sherrill Farm Drive. The Conservation Easement is associated with a stream restoration project and the purpose of this project was to restore portions of Stony Fork (the stream near your property) and several feeder streams to mitigate the impacts to streams associated with development projects in the area. As such, the use of motorized vehicles within the easement is prohibited. Specifically, Section II, Item B of the recorded conservation easement states:

> **Motorized Vehicle Use.** Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat.

I have included a copy of the recorded survey plat for your reference. Additionally, the easement line is clearly marked with signage along its length, including in the area of 4-wheeler access. We appreciate your efforts to abide by the terms of the easement and to help resolve this issue. If you would like further assistance in ensuring there is no unauthorized access to the easement or have any other questions, please feel free to contact me.

Regards,

Tim Morris
Senior Environmental Scientist
KCI Technologies Inc.
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
tim.morris@kci.com
Office 919.278.2511
Cell 919.793.6886
www.kci.com

OWNER CERTIFICATION (CE #1&6) SPO FILE NO. 51-CD

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON, WHICH IS LOCATED IN THE SUBDIVISION JURISDICTION OF THE COUNTY OF JOHNSTON AND THAT I HEREBY ADOPT THIS SUBDIVISION PLAN WITH MY FREE CONSENT, ESTABLISH MINIMUM SETBACK LINES, AND DEDICATE ALL STREETS, ALLEYS, PARKS AND OTHER SITES AND EASEMENTS TO PUBLIC OR PRIVATE USE AS NOTED.

GARY T. BENSON — DATE 10/12/17

LINDA W. BENSON — DATE 10/12/17

OWNER CERTIFICATION (CE #2) SPO FILE NO. 51-CH

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON, WHICH IS LOCATED IN THE SUBDIVISION JURISDICTION OF THE COUNTY OF JOHNSTON AND THAT I HEREBY ADOPT THIS SUBDIVISION PLAN WITH MY FREE CONSENT, ESTABLISH MINIMUM SETBACK LINES, AND DEDICATE ALL STREETS, ALLEYS, PARKS AND OTHER SITES AND EASEMENTS TO PUBLIC OR PRIVATE USE AS NOTED.

FATISHA BETH BLACKMON — DATE 10/11/17

OWNER CERTIFICATION (CE #3) SPO FILE NO. 51-CG

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON, WHICH IS LOCATED IN THE SUBDIVISION JURISDICTION OF THE COUNTY OF JOHNSTON AND THAT I HEREBY ADOPT THIS SUBDIVISION PLAN WITH MY FREE CONSENT, ESTABLISH MINIMUM SETBACK LINES, AND DEDICATE ALL STREETS, ALLEYS, PARKS AND OTHER SITES AND EASEMENTS TO PUBLIC OR PRIVATE USE AS NOTED.

JERRY W. PARRISH — DATE 10/12/17

LISA B. PARRISH — DATE 10/12/17

OWNER CERTIFICATION (CE #4) SPO FILE NO. 51-CF

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON, WHICH IS LOCATED IN THE SUBDIVISION JURISDICTION OF THE COUNTY OF JOHNSTON AND THAT I HEREBY ADOPT THIS SUBDIVISION PLAN WITH MY FREE CONSENT, ESTABLISH MINIMUM SETBACK LINES, AND DEDICATE ALL STREETS, ALLEYS, PARKS AND OTHER SITES AND EASEMENTS TO PUBLIC OR PRIVATE USE AS NOTED.

DANIEL MEDLIN JR. — DATE 10.12.17

CATHRYN Z. MEDLIN — DATE 10/12/17

WILLIAM R. MEDLIN — DATE 10.11.17

BONNIE J. MEDLIN — DATE 10-11-17

DEVAN BARBOUR, III — DATE 10/7/17

DEVAN BARBOUR, IV — DATE 10/11/17

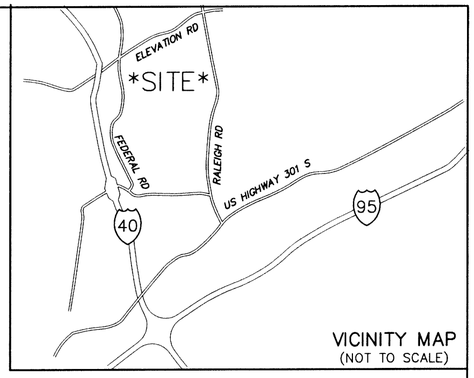
OWNER CERTIFICATION (CE #5) SPO FILE NO. 51-CE

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON, WHICH IS LOCATED IN THE SUBDIVISION JURISDICTION OF THE COUNTY OF JOHNSTON AND THAT I HEREBY ADOPT THIS SUBDIVISION PLAN WITH MY FREE CONSENT, ESTABLISH MINIMUM SETBACK LINES, AND DEDICATE ALL STREETS, ALLEYS, PARKS AND OTHER SITES AND EASEMENTS TO PUBLIC OR PRIVATE USE AS NOTED.

SHERRILL FARM LLC — DATE 10-12-17

NOTES:

1. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARENT TRACTS. THE PARENT TRACT BOUNDARIES ADJACENT TO THIS EASEMENT ARE NOT CHANGED BY THIS PLAT. BOUNDARY INFORMATION SHOWN HEREON WAS DERIVED FROM DEEDS AND MAPS OF RECORD IN JOHNSTON COUNTY AND MONUMENTATION FOUND IN THE FIELD.
2. DISTANCES SHOWN ARE HORIZONTAL GROUND DISTANCES IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.
3. AREA COMPUTED BY COORDINATE METHOD.
4. THE BASIS OF THE MERIDIANS AND COORDINATES FOR THIS PLAT IS THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM 1983 (NAD 83), BASED ON DIFFERENTIAL GPS OBSERVATIONS PERFORMED IN OCTOBER 2016. ALL DISTANCES ARE GROUND UNLESS OTHERWISE NOTED.
5. DEED REFERENCES: AS SHOWN HEREON.
6. SUBJECT PROPERTIES KNOWN AS TAX NUMBER: AS SHOWN HEREON.
7. SUBJECT PROPERTIES PARTIALLY LIE WITHIN THE AREA DESIGNATED AS ZONE "X", BASED ON FEDERAL FLOOD INSURANCE RATE MAP 3720164100J EFFECTIVE DECEMBER 2, 2005.
8. NO UNDERGROUND UTILITY LOCATING PERFORMED DURING THE COURSE OF THIS SURVEY.
9. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT.

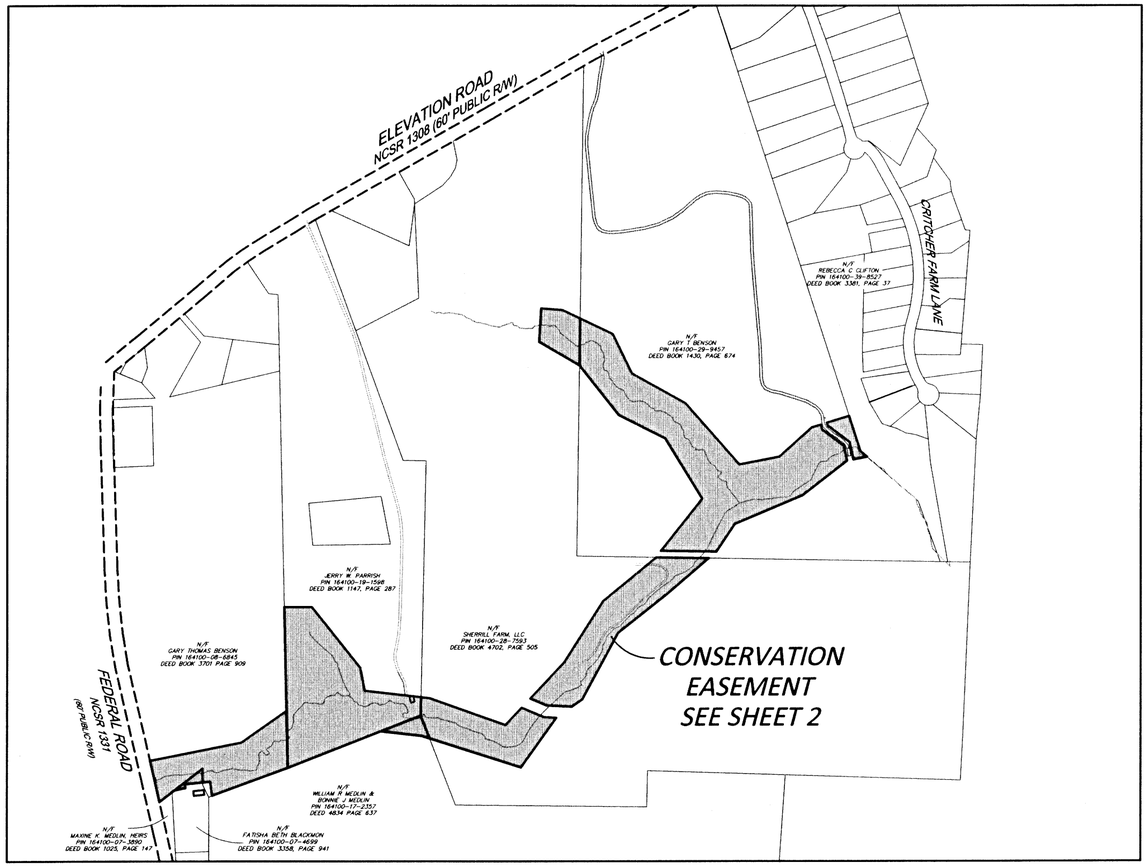


VICINITY MAP
(NOT TO SCALE)

TIE LINE TABLE		
LINE	LENGTH	BEARING
L1	467.40	N68°30'11"E
L2	58.52	S43°08'24"W
L3	30.01	N72°45'58"E

EASEMENT LINE TABLE		
LINE	LENGTH	BEARING
E1	375.77	S69°56'15"W
E2	65.59	N06°51'27"W
E3	35.52	S84°07'59"W
E4	64.76	N00°32'02"W
E5	165.63	S52°17'28"W
E6	88.06	S52°17'28"W
E7	197.03	N12°57'14"W
E8	434.06	N78°48'17"E
E9	257.12	N54°43'26"E
E10	267.02	S01°15'58"E
E11	82.49	S84°07'59"W
E12	17.62	S06°51'27"E
E13	52.77	S78°23'16"W
E14	751.47	N01°15'58"W
E15	129.25	N90°00'00"E
E16	362.76	S38°34'31"E
E17	108.15	S10°36'06"E
E18	264.70	S83°20'39"E
E19	86.54	S01°05'46"W
E20	666.35	S68°30'11"W
E21	198.94	N68°30'11"E
E22	114.57	S21°18'17"E
E23	38.86	N72°28'27"W
E24	190.96	N83°20'39"W
E25	218.84	S00°41'45"W
E26	218.16	N59°50'04"W
E27	155.96	N03°31'19"E
E28	99.28	S85°46'28"E
E29	91.49	S64°39'20"E
E30	245.32	S89°02'47"E
E31	265.78	S49°20'40"W
E32	282.13	S51°38'12"W
E33	351.68	S28°14'09"W
E34	59.84	S55°11'21"W
E35	117.75	N87°04'13"W
E36	82.35	N66°49'37"W
E37	230.44	N43°08'24"E
E38	338.41	N32°22'18"E
E39	320.77	N50°31'26"E
E40	112.15	S66°49'37"E
E41	58.55	S87°04'13"E
E42	284.31	S35°33'51"W
E43	445.87	N72°28'27"W
E44	41.06	S83°20'39"E
E45	374.12	S70°29'22"E
E46	110.43	N43°08'24"E
E47	168.44	S64°39'20"E
E48	204.84	S25°58'57"E
E49	285.89	S60°47'36"E
E50	380.21	S41°29'53"E
E51	190.03	N79°14'36"E
E52	203.38	N48°08'53"E
E53	43.25	N72°45'58"E
E54	24.38	S18°18'00"E
E55	125.76	S53°08'51"E
E56	70.38	S12°05'25"E
E57	261.95	S52°23'53"W
E58	342.50	S67°09'08"W
E59	154.05	S33°50'40"W
E60	258.94	N89°10'23"W
E61	309.35	N38°29'57"E
E62	328.72	N31°50'39"W
E63	242.58	N63°22'20"W
E64	295.56	N38°15'39"W
E65	108.84	N72°45'58"E
E66	172.06	S18°07'18"E
E67	41.18	S49°09'47"E
E68	65.98	S79°09'08"W
E69	82.27	N12°05'25"W
E70	127.58	N53°08'51"W
E71	14.40	N18°18'00"W

PT #	NORTHING	EASTING
1	618047.77	2141051.73
2	617918.86	2140698.76
3	617983.98	2140690.93
4	617980.35	2140655.60
5	618045.11	2140654.99
6	617943.80	2140523.95
7	617889.94	2140454.29
8	618081.96	2140410.12
9	618166.23	2140835.92
10	618314.72	2141045.83
11	617971.92	2140573.54
12	617954.42	2140575.64
13	618799.06	2141035.12
14	618799.06	2141164.37
15	618515.46	2141390.56
16	618409.15	2141410.46
17	618378.47	2141673.38
18	618291.95	2141671.72
19	618219.05	2141486.62
20	618185.21	2141713.34
21	618196.91	2141676.29
22	620140.32	2142411.62
23	619921.50	2142408.96
24	620031.13	2142220.35
25	620186.80	2142229.93
26	620179.48	2142328.94
27	619029.95	2142768.69
28	619025.87	2143013.98
29	618852.71	2142812.35
30	618677.61	2142591.14
31	618367.78	2142424.75
32	618333.62	2142375.63
33	618339.64	2142258.03
34	618372.04	2142182.32
35	618540.19	2142339.90
36	618826.01	2142521.09
37	618367.94	2142085.59
38	618329.34	2142142.31
39	618285.21	2142245.41
40	618282.22	2142303.88
41	618050.94	2142138.52
42	618373.72	2141714.16
43	618248.77	2142066.80
44	620068.22	2142563.85
45	619884.08	2142653.59
46	619744.57	2142903.14
47	619459.80	2143155.07
48	619495.27	2143341.76
49	619630.96	2143493.25
50	619643.78	2143534.56
51	619620.64	2143542.21
52	619545.21	2143642.84
53	619476.39	2143657.58
54	619316.56	2143450.05
55	619183.57	2143134.42
56	619055.62	2143048.63
57	619059.36	2142789.71
58	619301.46	2142982.28
59	619580.70	2142808.84
60	619689.43	2142591.99
61	619652.67	2143563.22
62	619684.92	2143667.17
63	619521.39	2143720.69
64	619494.46	2143751.85
65	619482.04	2143687.05
66	619562.48	2143669.82
67	619638.99	2143567.74



I, JAMES M. GELLENTHIN, HEREBY DECLARE THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM A SURVEY MADE UNDER MY SUPERVISION, THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED, AS DRAWN FROM INFORMATION AS SHOWN HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS GREATER THAN 1:10,000; THAT THIS MAP DOES REPRESENT AN OFFICIAL BOUNDARY SURVEY (OF THE EASEMENT AREA) AND HAS BEEN PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 25TH DAY OF SEPTEMBER, 2017

NORTH CAROLINA REGISTRATION NUMBER L-3860
JAMES M. GELLENTHIN

NORTH CAROLINA PROFESSIONAL SEAL L-3860 LAND SURVEYOR JAMES M. GELLENTHIN

I, JAMES M. GELLENTHIN, PROFESSIONAL LAND SURVEYOR, NO. L-3860 CERTIFY TO THE FOLLOWING AS REQUIRED IN G.S. 47-30 (F)(11):

THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

NORTH CAROLINA REGISTRATION NUMBER L-3860
JAMES M. GELLENTHIN

STATE OF NORTH CAROLINA
JOHNSTON COUNTY

I, Stephanie Richter, REVIEW OFFICER OF JOHNSTON COUNTY, CERTIFY THAT THE MAP OR PLAT WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

REVIEW OFFICER — DATE 10/13/17

STATE OF NORTH CAROLINA
JOHNSTON COUNTY

FILED FOR REGISTRATION AT 11:33:22 AM
October 13, 2017 IN THE
REGISTER OF DEEDS OFFICE
RECORDED IN BOOK 85 PAGE 412
Craig Olive Register of Deeds
BY Betty G. Woodall Asst. Assistant

THIS PLAT IS EXEMPT FROM THE DEFINITION OF A SUBDIVISION WITHIN THE ZONING JURISDICTION OF THE JOHNSTON COUNTY PLANNING DEPARTMENT.

12/12/17 — JOHNSTON COUNTY-PLANNER

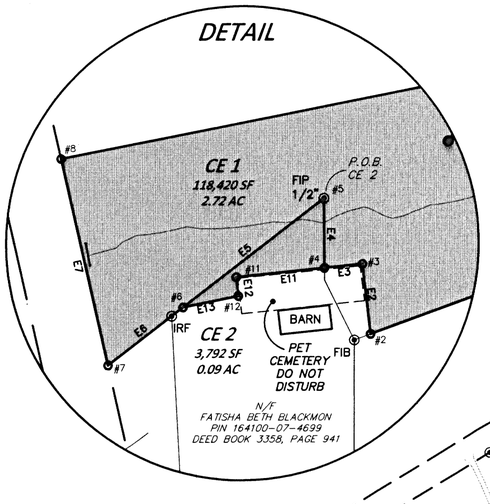
FINAL PLAT
CONSERVATION EASEMENT
FOR
STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF MITIGATION SERVICES
PROJECT NAME: STONY FORK RESTORATION PROJECT
DMS PROJECT #: 97085
SPO FILE NO. 51-CD, 51-CE, 51-CF, 51-CG, 51-CH
ELEVATION TOWNSHIP, JOHNSTON COUNTY
NORTH CAROLINA

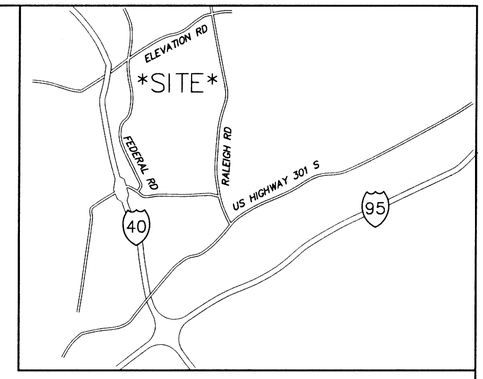
DATE:	SCALE:	SHEET:
AUGUST 16, 2017	N/A	1 OF 2

REVISED: 9/7/17

KCI ASSOCIATES OF NORTH CAROLINA C-0764

KCI ASSOCIATES OF N.C.
ENGINEERS, SURVEYORS AND PLANNERS
4505 FALLS OF NEUSE ROAD, FLOOR 4
RALEIGH, NC 27607
PHONE (919) 783-9214 * FAX (919) 783-9266





LEGEND

- EXISTING PK NAIL
- EXISTING IRON
- 5/8"*30" REBAR SET W/3.25" ALUMINUM CAP WITH STATE SEAL
- CALCULATED POINT
- EXISTING MONUMENT
- NEW CONSERVATION EASEMENT FOR "DIVISION OF MITIGATION SERVICES"
- P.O.B. POINT OF BEGINNING
- P.O.C. POINT OF COMMENCEMENT

NCGS MON LANG BEND (AH4769)
N: 627,067.59
E: 2,134,119.26
CSF: 0.99987437

S55°16'49"E
10105.98'

FIP

P.O.C.
CE 5
CE 6

ELEVATION ROAD
NCSR 1308 (60' PUBLIC R/W)

S00°41'45"W 1171.36'

CRITCHER FARM LANE

N/F
REBECCA C CLIFTON
PIN 164100-39-8527
DEED BOOK 3381, PAGE 37

FIP
FIB

P.O.B.
CE 5A
CE 6A

CE 5A
36,783 SF
0.84 AC

N/F
GARY T BENSON
PIN 164100-29-9457
DEED BOOK 1430, PAGE 674

CE 6B
12,749 SF
0.29 AC

P.O.B.
CE 6B

CE 6A
371,932 SF
8.54 AC

S00°41'45"W
885.45'

P.O.B.
CE 5B

S89°02'47"E
370.53' (TIE)

S89°02'47"E
1078.87'(TIE)

CE 5B
148,176 SF
3.40 AC

S01°15'56"E
1453.56'(TIE)

S01°05'46"W
1100.38'(TIE)

N/F
JERRY W. PARRISH
PIN 164100-19-1598
DEED BOOK 1147, PAGE 287

N/F
SHERRILL FARM, LLC
PIN 164100-28-7593
DEED BOOK 4702, PAGE 505

N/F
GARY THOMAS BENSON
PIN 164100-08-6845
DEED BOOK 3701 PAGE 909

CE 3
251,785 SF
5.78 AC

CE 1
118,420 SF
2.72 AC

P.O.B.
CE 5C

P.O.B.
CE 4

CE 4
10,696 SF
0.25 AC

CE 5C
108,065 SF
2.48 AC

P.O.B.
CE 1
CE 3
P.O.C.
CE 4

N/F
WILLIAM R MEDLIN &
BONNIE J MEDLIN
PIN 164100-17-2357
DEED 4834 PAGE 637

FEDERAL ROAD
NCSR 1331
(60' PUBLIC R/W)

PET
CEMETERY
DO NOT
DISTURB

SEE
DETAIL

CE 2
3,792 SF
0.09 AC

N/F
MAXINE K. MEDLIN, HEIRS
PIN 164100-07-3890
DEED BOOK 1025, PAGE 147

N/F
FATISHA BETH BLACKMON
PIN 164100-07-4699
DEED BOOK 3358, PAGE 941

GRAPHIC SCALE
250 0 125 250 500
1 INCH = 250 FEET

State of North Carolina, Johnston Co.
Filed For Registration at 11:33:22 A M.
October 13 2017 in the
Register of Deeds Office
Recorded in Book 85 Page 413
Craig Olive
Register Of Deeds
Patty P. Woodall Asst.
Assistant

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CONSERVATION EASEMENT
FOR
STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF MITIGATION SERVICES
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NORTH CAROLINA

DATE:	SCALE:	SHEET:
AUGUST 16, 2017	1" = 250'	2 OF 2

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C-0764

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