As-built Baseline Monitoring Report

Mill Dam Creek Restoration Site
Yadkin River Basin - 03040101
Monitoring Year 00
DEQ Contract 6898
DMS Project Number 97136

DWR #: 18-1349
USACE Action ID: 2016-01335
Yadkin County, North Carolina

Prepared for:
NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699

Baseline Data Collected: January and April 2020
Date Submitted: April 2020

Monitoring and Design Firm

Prepared by:

KCI Associates of North Carolina, PC
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Suite 400
Raleigh, NC 27609
(919) 783-9214

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

April 2020

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: June 19, 2020

To: Matthew Reid, DMS Project Manager

From: Tim Morris, Project Manager
KCI Associates of North Carolina, PA

Subject: Mill Dam Creek Stream Restoration Site
MY-00 Monitoring Report Comments
Yadkin River Basin CU 03040101
NCDMS Project # 97136
Contract # 6898

Please find below our responses in italics to the MY-00 Baseline Monitoring Report comments from NCDMS received on June 10, 2020, for the Mill Dam Creek Stream Restoration Site.

- The total project assets should be 10,291.066 SMUs. This is the amount of assets that is used for DMS accounting as well as IRT debit ledgers. This number is a result of using three significant digits for the mitigation credit calculation. Please revise the asset table to show three significant digits in the mitigation credit column. I have reworked the totals, and the assets will add up to 10,291.066 when the EI and EII reaches are calculated this way. Please let me know if you need any further clarification on this comment.
  KCI Response: The asset table has been updated to show three significant digits. A typo in the asset table in the Mitigation Plan listed the Creditable Footage of T6A-1 as 61 feet, while the Restoration Footage was only listed as 60 feet. This resulted in 1 extra foot at a ratio of 2.5:1 being included in the asset table of the Mitigation Plan. It appears that this extra 0.4 credits was also included in DMS's calculation of project assets above. When we extended assets out to 3 digits in the asset table we calculated 10,290.666 SMU's.

- CCPV: The project overview page did not print correctly in the hard copy and also displays an error in the digital copy. Please verify it is shown and opens correctly for the final.
  KCI Response: It appears that the large file size of the PDF was causing an error. KCI has created a PDF of smaller file size for use in the report. A separate georeferenced PDF is now included in the digital deliverables.

- CCPV: Please label stream reaches.
  KCI Response: This change has been made.

- The Mitigation Plan showed a gauge being placed in the jurisdictional wetland WA on T7; however, the final placement of the gauge was downstream, adjacent to the stream and appears to be outside the jurisdictional wetland. Please explain the alternative placement for this gauge.
  KCI Response: When installing this gauge shallow bedrock was encountered during the initial attempts. Since restoration, a large area of the left bank and floodplain along T7 appears to have wetland conditions. A location outside of WA, with similar conditions, was chosen to install this gauge. KCI believes that the area achieving wetland hydrology has expanded since the completion of construction. Since this location is in a similar setting as WA this gauge should provide sufficient evidence that the hydrology of wetland WA has not been negatively impacted by the project and that the wetland area has expanded because of the restoration project.

- Profile: There are many instances where the water surface profile does not follow the riffle/pool geometry of the channel (UTHC-1, T1, T1A, T3). Is this a result of a lack of survey data, does the water go subsurface or something else?
  KCI Response: Looking back at the data, the as-built profile did not include as many water surface shots as we would have liked. KCI will work with our surveyor to make sure that more water surface shots are taken in future as-built surveys. There are no areas on the project where the water goes subsurface.

Please contact me if you have any questions or would like clarification concerning these responses.

Sincerely,

Tim Morris
Project Manager

TABLE OF CONTENTS

Appendix A – Background Tables

Appendix B – Visual Assessment Data

Appendix C – Vegetation Plot Data

Appendix D – Stream Measurement and Geomorphology Data

Appendix E – As-Built Plan Sheets

Appendix F – Additional Information

PROJECT SUMMARY

The Mill Dam Creek Restoration Site (MDCRS) was completed in March 2020 and restored and enhanced a total of 13,505 linear feet of stream. The MDCRS is a riparian system in the Upper Yadkin Pee-Dee River Basin (3040101 8-digit cataloging unit) in Yadkin County, North Carolina. The site's natural hydrologic regime had been substantially modified through the relocation and straightening of the existing stream channels, livestock impacts, and clearing of riparian buffer. This completed project will restore streams impacted by pasture and agriculture to a stable headwater ecosystem with a functional riparian buffer and floodplain access.

The MDCRS is protected by a 40.2 acre permanent conservation easement, held by the State of North Carolina. The site is located approximately 0.5 miles north of East Bend, NC. Specifically, the site is 0.2 mile north on Shady Grove Church Road (SR-1538) from its intersection with Shoals Road (SR-1546).

The North Carolina Ecosystem Enhancement Program (NCEEP) published the Upper Yadkin Pee-Dee River Basin Restoration Priorities (RBRP) in 2009. The project's 14 digit CU (03040101110070, Grassy Creek and Horne Creek) was identified as a Targeted Local Watershed (TLW) in the RBRP. The goals and priorities for the MDCRS are based on the information presented in the UPPER Yadkin Pee-Dee 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
- Reducing fecal coliform inputs
- Improving/restoring riparian buffers
- Reducing sediment loading
- Improving stream stability
- Reducing nutrient loading
- Excluding livestock and implementing other agricultural BMP's
- Protecting high-resource value waters, including water supply watershed designated waters

The project is also located in the Ararat River Local Watershed Plan (LWP) study area. The Ararat River was designated a LWP Study Area due to poor water quality and aquatic habitat degradation issues, as well as the presence of good candidate sites for stream restoration in rural catchments (NCEEP, 2009). The stressors within the Ararat River LWP are erosion and sedimentation, missing or degraded riparian buffers, stormwater runoff, and nutrient and fecal coliform "hot spots" (NCEEP, 2013).

The goals for the project are to:

- Restore channelized and livestock-impacted streams to stable C and B type channels.
- Restore a forested riparian buffer to provide bank stability, filtration, and shading.

The project goals will be addressed through the following objectives:

- Relocate or stabilize channelized and/or incised streams to connect to a floodplain or floodprone area.
- Install a cross-section sized to the bankfull discharge.
- Create bedform diversity with pools, riffles, and habitat structures
- Fence out livestock to reduce nutrient, bacterial, and sediment impacts from adjacent grazing and farming practices to the project tributaries
- Plant the site with native trees and shrubs and an herbaceous seed mix.

Project planting and construction were completed in March 2020. The 13,505 linear feet of streams at MDCRS were enhanced and 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 only minor modifications from the design plan. These modifications generally consisted of slight adjustments in the alignment and spacing of riffles/pools due to bedrock encountered during construction. Several areas of additional bank stabilization were also installed. See Appendix E – As-Built Plan Sheets for details concerning these changes. On February 6, 2020, shortly after construction was completed and before woody stems had been planted, the site received over 6 inches of rain in a 24 hour period. This storm caused significant damage to portions of the site and required repairs to be completed in March 2020. These repairs mainly involved repair of bank erosion through the installation of live lifts, removal of aggradation from the stream channel, and regrading areas of floodplain scour. Approximately 500 cubic yards of topsoil were also brought in and placed on the floodplain in areas of severe floodplain scour. See Appendix E – As-Built Plan Sheets for the details of these repairs.

The monitoring components were installed in March/April 2020. Five automatically recording pressure transducer stream gauges that take a reading every 10 minutes were installed: one each in the upper third of T1A, T5A, and T8A to document flow within those reaches, and two on UTHC to record the occurrence of bankfull events. Cameras were installed in the vicinity of each of the flow gauges and set to record a short video once a day to provide additional verification of flow. Two automatically recording pressure transducer groundwater monitoring gauges were installed within pre-existing wetlands on the site to monitor wetland hydrology and ensure the existing wetlands on the site are not adversely affected by the restoration project. One of these gauges is located in the vicinity of the pre-existing wetland on the left bank of T7 and the other is located within the pre-existing wetland on the right bank of T8. To determine the success of the planted mitigation areas, eighteen 10 m x 10 m permanent vegetation monitoring plots were established. An additional twelve 10 m x 10 m random temporary vegetation monitoring plots were sampled throughout the site 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 grouped into size categories by species, but separate from the planted stems. Twelve permanent photo reference points were established and will be taken annually. Thirty-two permanent cross-sections (24 riffle cross-sections and 8 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 and the first year of monitoring will take place in 2020. First year monitoring data is scheduled to be collected in October 2020, six months after baseline data collection.

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 (assuming normal precipitation) A “normal” year is based on NRCS climatological data for Yadkin County with the 30th and 70th percentile thresholds as the range of normal, as documented in the USACE Technical Report “Accessing and Using Meteorological Data to Evaluate Wetland Hydrology, April 2000.” 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 previous 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.

BASELINE CONDITIONS

For an aerial video of the site in the as-built condition, please visit this link: https://www.youtube.com/watch?v=-TcVkEUU1Ho

The site was planted in March 2020. The baseline vegetation monitoring was conducted April 16 through 24, 2020. The average plot stem density from the thirty surveyed plots is 969 planted stems/acre. Baseline monitoring was conducted during dormancy, so many of the stems were not identified to species. During MY01, these trees will be identified to species.

The baseline longitudinal profile was surveyed in December 2019. The majority of baseline cross-sections were surveyed between January 17 and January 30, 2020, and several cross-sections were surveyed between April 15 and 16, 2020. The baseline survey found that the stream was constructed as designed and all structures were installed as planned with small variations, as called out in the as-built plans. The profile and cross-section survey found that the dimension and profile of the stream are as designed, with some small variation as is typical for stream restoration projects.

REFERENCES

NCDENR, Ecosystem Enhancement Program. 2009. Upper Yadkin Pee-Dee River Basin Restoration Priorities 2009. Raleigh, NC. https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Yadkin_River_Basin/2009%20Upper%20Yadkin%20RBRP_Final%20Final%2C%2026feb%2709.pdf

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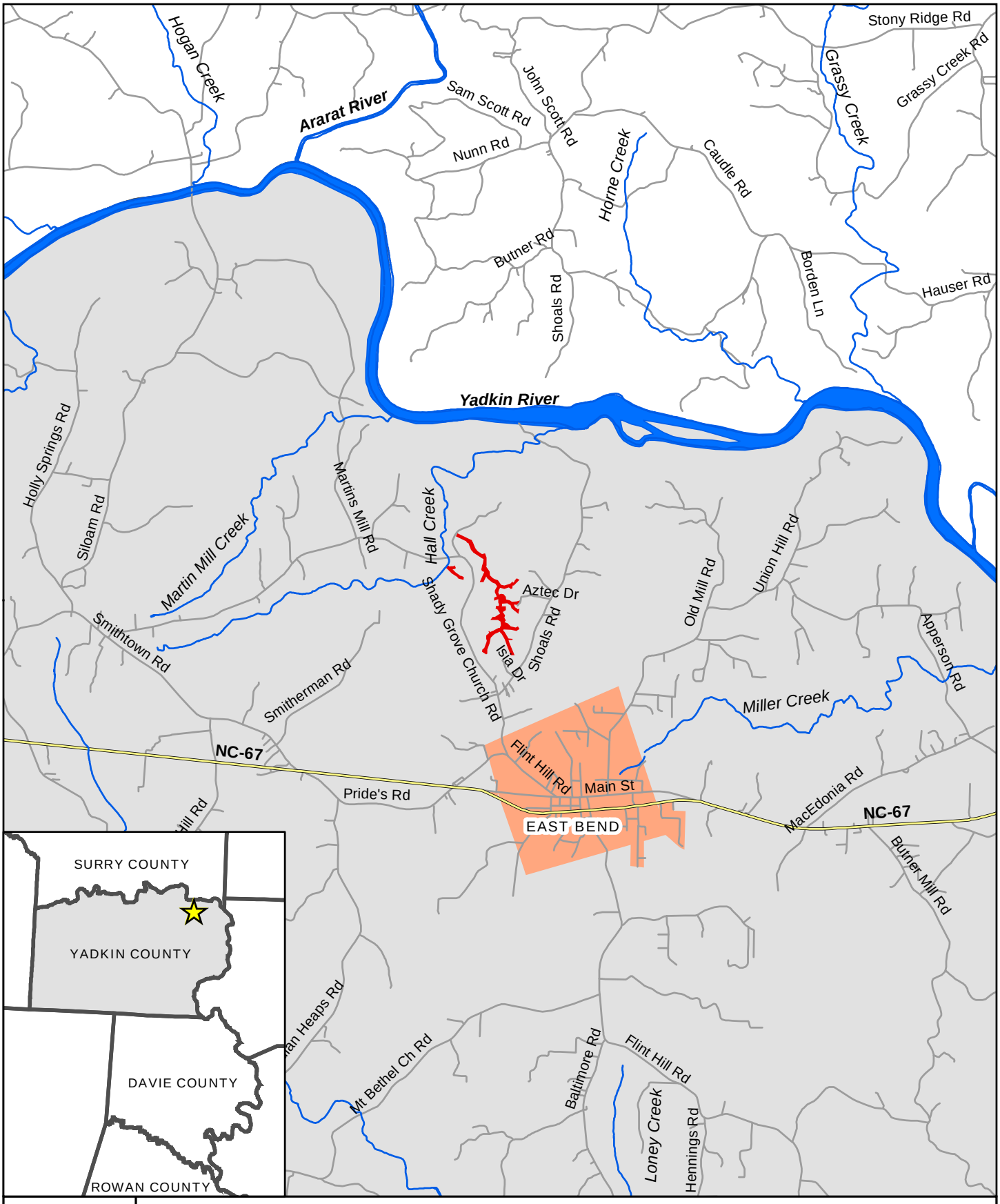
NCIRT. October 24, 2016. "Wilmington District Stream and Wetland Compensatory Mitigation Update." https://saw-reg.usace.army.mil/PN/2016/Wilmington-District-Mitigation-Update.pdf

USACE, Sprecher, S. W.; Warne, A. G. 2000. "Accessing and Using Meteorological Data to Evaluate Wetland Hydrology." https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/ADA378910.xhtml


Hogan Creek
Ararat River
Sam Scott Rd
John Scott Rd
Nunn Rd
Horne Creek
Caudle Rd
Grassy Creek
Stony Ridge Rd
Grassy Creek Rd
Butner Rd
Shoals Rd
Borden Ln
Hauser Rd
Yadkin River
Holly Springs Rd
Siloam Rd
Martin Mill Creek
Martins Mill Rd
Hall Creek
Aztec Dr
Isla Dr
Shoals Rd
Shady Grove Church Rd
Old Mill Rd
Union Hill Rd
Smithtown Rd
Smitherman Rd
Appersons Rd
Miller Creek
NC-67
Flint Hill Rd
Main St
EAST BEND
Pride's Rd
MacEdonia Rd
NC-67
Butner Mill Rd
SURRY COUNTY
YADKIN COUNTY
DAVIE COUNTY
ROWAN COUNTY
Mt Bethel Ch Rd
Baltimore Rd
Flint Hill Rd
Loney Creek
Hennings Rd
KCI
Figure 1. Vicinity Map, Mill Dam Creek, Yadkin County, NC
Project Easement
Cities and Towns
Streams
Major Rivers
Roads
State Highway
N
0
0.5
1
Miles

APPENDIX A

Background Tables

Table 1. Project Components and Mitigation Credits
Mill Dam Creek Restoration Site, DMS Project #97136

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	7,166	6,340								
Credits	7,166.000	3,124.666								
TOTAL CREDITS	**10,290.666**									

Project Components

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Acreage	Restoration Footage or Acreage	Creditable Footage or Acreage	Restoration Level	Approach (PI, PII etc.)	Mitigation Ratio (X:1)	Mitigation Credits	Notes/Comments
UTHC1 Top	10+00-22+81	1,333	1,281	1,249	R	P2 10+00-11+50, then P1	1	1,249.000	Crossing Exception STA 20+51 – 20+83
UTHC1 Bottom	22+81-27+39	541	457	438	R	P1, then P2 24+50-27+39	1	438.000	Crossing Exception STA 25+72 – 25+91
UTHC2	27+39-42+32	1,494	1,493	1,493	EI	N/A	1.5	995.333	
UTHC3	42+32-55+57	1,411	1,325	1,240	R	P1 except P2 42+32-44+00 and 53+50-55+57	1	1,240.000	Utility Exception STA54+07 – 54+49 Crossing Exception STA 55+14 – 55+57
UTHC4-1	55+57-58+53	1,840	297	297	EI	N/A	1.5	198.000	
UTHC4-2	58+53-63+75		521	521	EII	N/A	2.5	208.400	
UTHC4-3	63+75-68+55		481	419	EI	N/A	1.5	279.333	Crossing Exception STA 63+75 -64+37
UTHC4-4	68+55-73+97		542	497	EII	N/A	2.5	199.800	Utility Exception STA 68+55 – 69+00
T1	100+00-107+51	764	751	734	R	P2 100+00-101+80, then P1	1	734.000	Crossing Exception STA 104+00-104+16
T1A	150+00-157+95	746	795	795	R	P2	1	795.000	

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Acreage	Restoration Footage or Acreage	Creditable Footage or Acreage	Restoration Level	Approach (PI, PII etc.)	Mitigation Ratio (X:1)	Mitigation Credits	Notes/Comments
T2-1	200+00-204+98	499	498	498	EII	N/A	2.5	199.200	
T2-2	204+98-207+63	232	265	265	R	P2	1	265.000	
T3	300+00-303+69	378	369	369	R	P1/P2	1	369.000	
T4	400+00-401+51	151	151	151	R	P1	1	151.000	
T5	1000+00-1012+13	1,205	1,213	1,182	EII	N/A	2.5	472.800	Crossing Exception STA 1003+59-1003+90
T5A	1200+00-1200+65	65	65	65	EII	N/A	2.5	26.000	
T5B	1300+00-1304+38	438	438	438	EII	N/A	2.5	175.200	
T6-1	600+00-603+22	325	322	259	EII	N/A	2.5	103.600	Crossing Exception STA 602+59 – 603+22
T6-2	603+22-609+80	621	658	658	R	P1	1	658.000	
T6A-1	650+00-650+60	60	60	60	EII	N/A	2.5	24.000	
T6A-2	650+60-651+61	97	101	101	R	P1	1	101.000	
T7-1	700+00-701+65	165	165	165	EII	N/A	2.5	66.000	
T7-2	701+65-705+13	335	348	348	R	P1	1	348.000	
T8-1	800+00-804+45	445	445	445	EII	N/A	2.5	178.000	
T8-2	804+45-808+94	486	448	426	R	P1	1	426.000	Crossing Exception STA 808+20 – 808+42
T8A	850+00-852+63	258	263	263	R	P1	1	263.000	
T9	900+00-901+29	133	129	129	R	P1, then P2 900+71-901+29	1	129.000	
TOTAL		**14,024**	**13,882**	**13,505**				**10,290.666**	

Component Summation					
Restoration Level	**Stream (linear feet)**	**Riparian Wetlands (Acres)**		**Non-Riparian Wetlands (Acres)**	**Buffer (square feet)**
		Riverine	Non-Riverine		
Restoration	7,166				
Enhancement					
Enhancement I	2,209				
Enhancement II	4,130				
Creation					
Preservation					
High Quality Preservation					

Table 2. Project Activity & Reporting History
Mill Dam Creek Restoration Site, DMS Project #97136

Activity or Report	Data Collection Complete	Actual Completion or Delivery
Mitigation Plan		Dec. 7, 2018
Final Design - Construction Plans		Jan. 14, 2019
Construction Grading Completed		Dec. 12, 2019
Repairs from Storm Damage Completed		March 26, 2020
Planting Completed		March 26, 2020
Baseline Monitoring/Report		May 2020
Vegetation Monitoring	April 24, 2020	
Stream Survey	April 16, 2020	

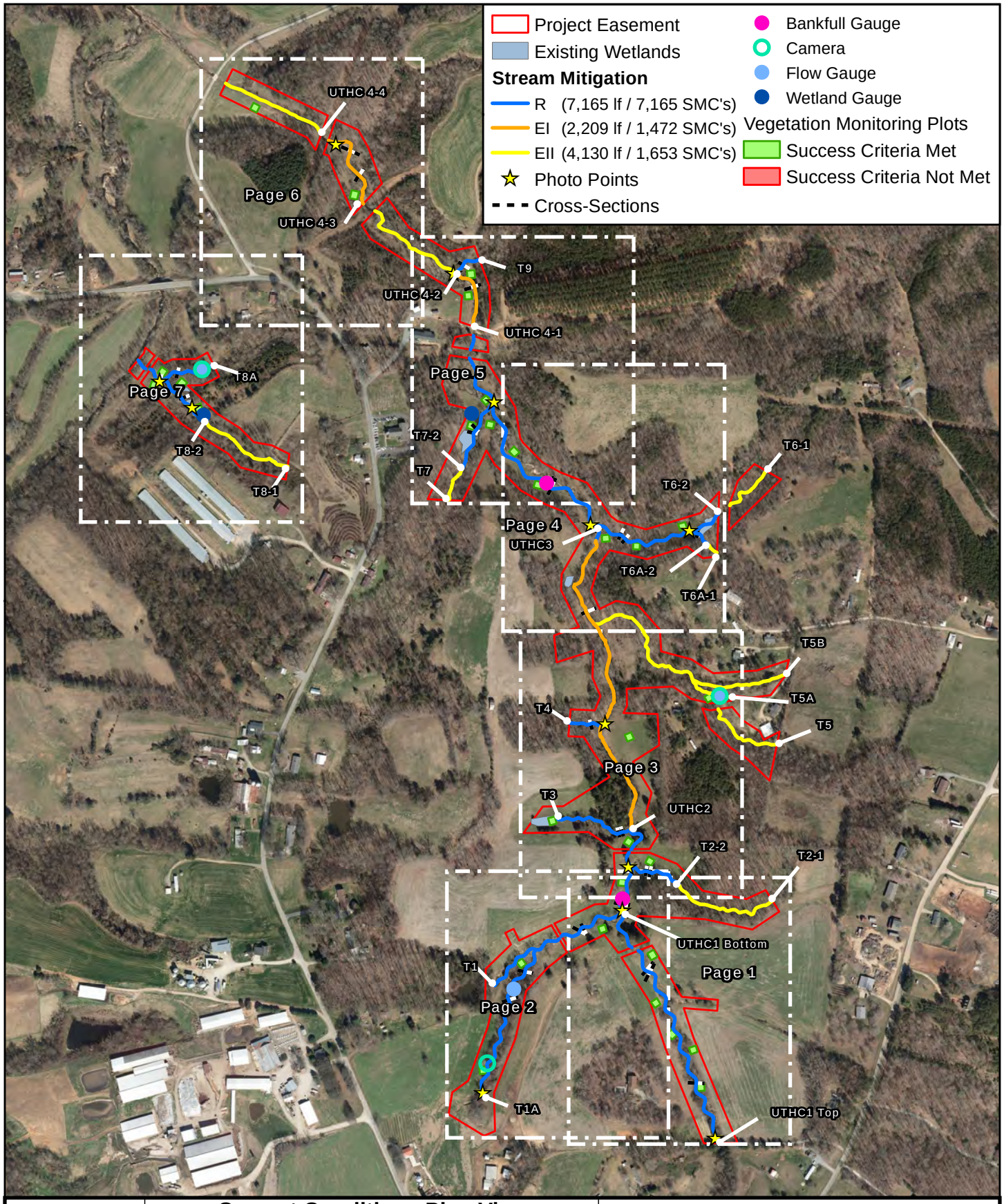
Table 3. Project Contacts **Mill Dam Creek Restoration Site, DMS Project #97136**	
Design Firm	KCI Associates of North Carolina, PC 4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512 Fax: (919) 783-9266
Construction Contractor	Carolina Environmental Contracting, Inc. PO Box 1905 Mount Airy, NC 27030 Contact: Mr. Wayne Taylor Phone: (336)320-3849
Planting Contractor	Shenandoah Habitats 1983 Jefferson Highway Waynesboro, VA 22980 Contact: Mr. David Coleman Phone: (540) 941-0067
Monitoring Performers	
	KCI Associates of North Carolina, PC 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 **Mill Dam Creek Restoration Site, DMS Project #97136**			
Project Name	Mill Dam Creek Restoration Site		
County	Yadkin County		
Project Area	40.2 acres		
Project Coordinates (lat. and long.)	36.2390 °N, 80.5201°W		
Planted Acreage (acres of woody stems planted)	29.2 acres		
Project Watershed Summary Information			
Physiographic Province	Piedmont		
River Basin	Yadkin		
USGS Hydrologic Unit 8-digit	030401014	**USGS Hydrologic Unit 14-digit**	03010101110070
DWQ Sub-basin	03-07-02		
Project Drainage Area (acres)	400 acres		
Project Drainage Area Percentage of Impervious Area	3%		
CGIA Land Use Classification	Forest (45%), Pasture/Farmland (39%), Low-density Residential Development (15%), and Roads (1%)		
Existing Reach Summary Information			
Parameters	**All Reaches Combined**		
Length of reach (linear feet)	14,024		
Valley confinement	Partially confined to confined		
Drainage area (acres)	400 acres		
Perennial, Intermittent, Ephemeral	Intermittent – Perennial		
NCDWQ Water Quality Classification	C (Aquatic Life, Secondary Recreation)		
Rosgen Stream Classification (Existing / Proposed)	F4/G4/C4/B4		
Evolutionary trend (Simon)	Stage III		
FEMA classification	Zone AE at confluence of T8 and Hall Creek, otherwise none		
Existing Wetland Summary Information			
Parameters	**WA, WB, WE, WG, WK**	**WC**	**WH, WI , WJ**
Size of Wetland (acres)	0.23	0.10	0.10
Wetland Type	Riparian Non-riverine	Riparian Non-riverine	Riparian Non-riverine
Mapped Soil Series	Fairview	Fairview	Siloam
Drainage class	Well drained	Well drained	Well drained
Soil Hydric Status	Non-Hydric	Non-Hydric	Non-Hydric
Source of Hydrology	Groundwater	Groundwater	Groundwater
Restoration or Enhancement Method	N/A (Preservation)	Areas of erosion to stabilize	N/A (Preservation)

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States – Section 404	Yes	NWP 27	Preliminary JD
Waters of the United States – Section 401	Yes	NWP 27	Preliminary JD
Endangered Species Act	Yes	Yes	USFWS
Historic Preservation Act	No	Yes	NCSHPO
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	No	Yes	N/A
Essential Fisheries Habitat	No	N/A	N/A

APPENDIX B

Visual Assessment Data



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Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Overview Page

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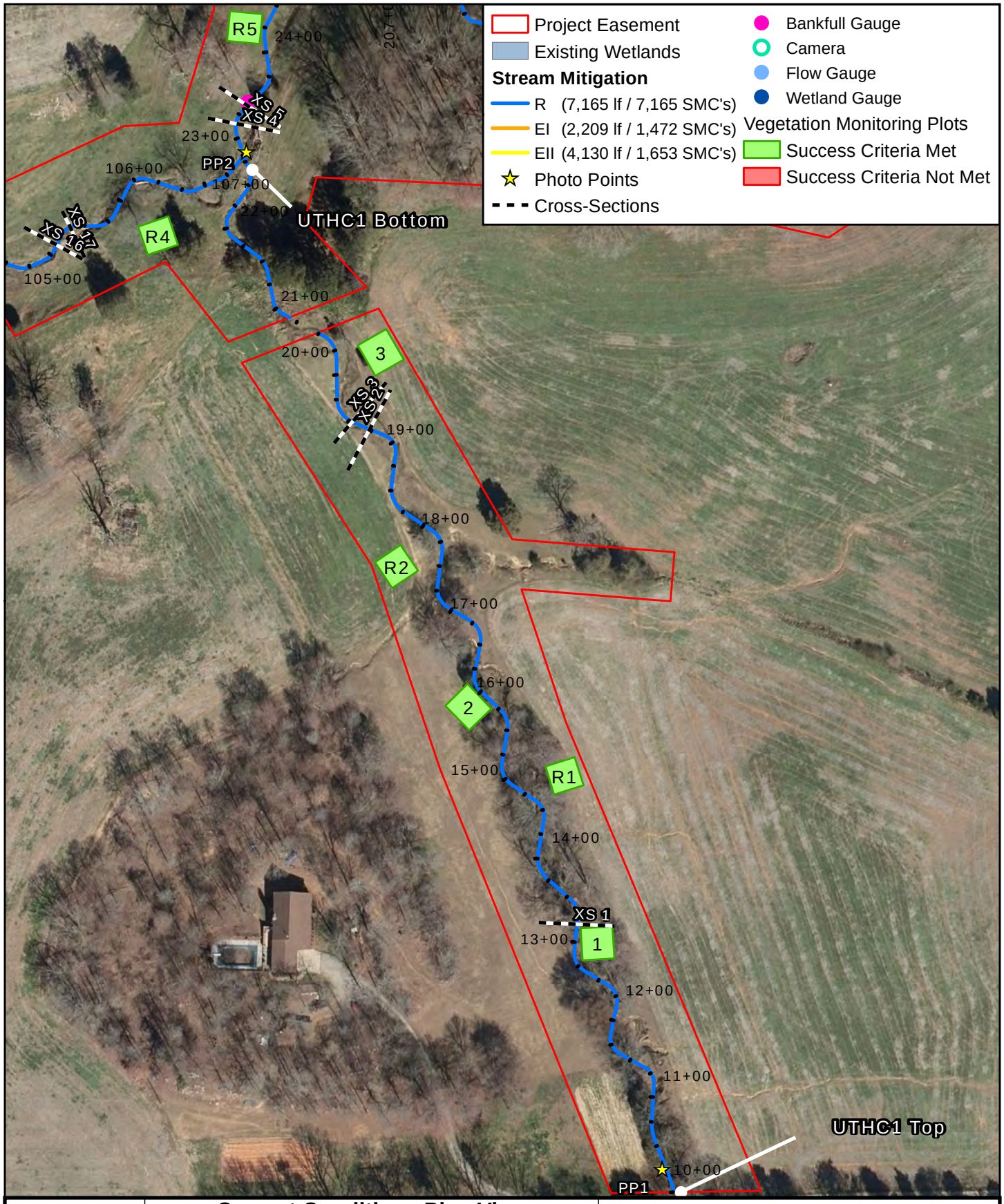
Image Source: NC OneMap Orthoimagery, 2015.



Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Page 1

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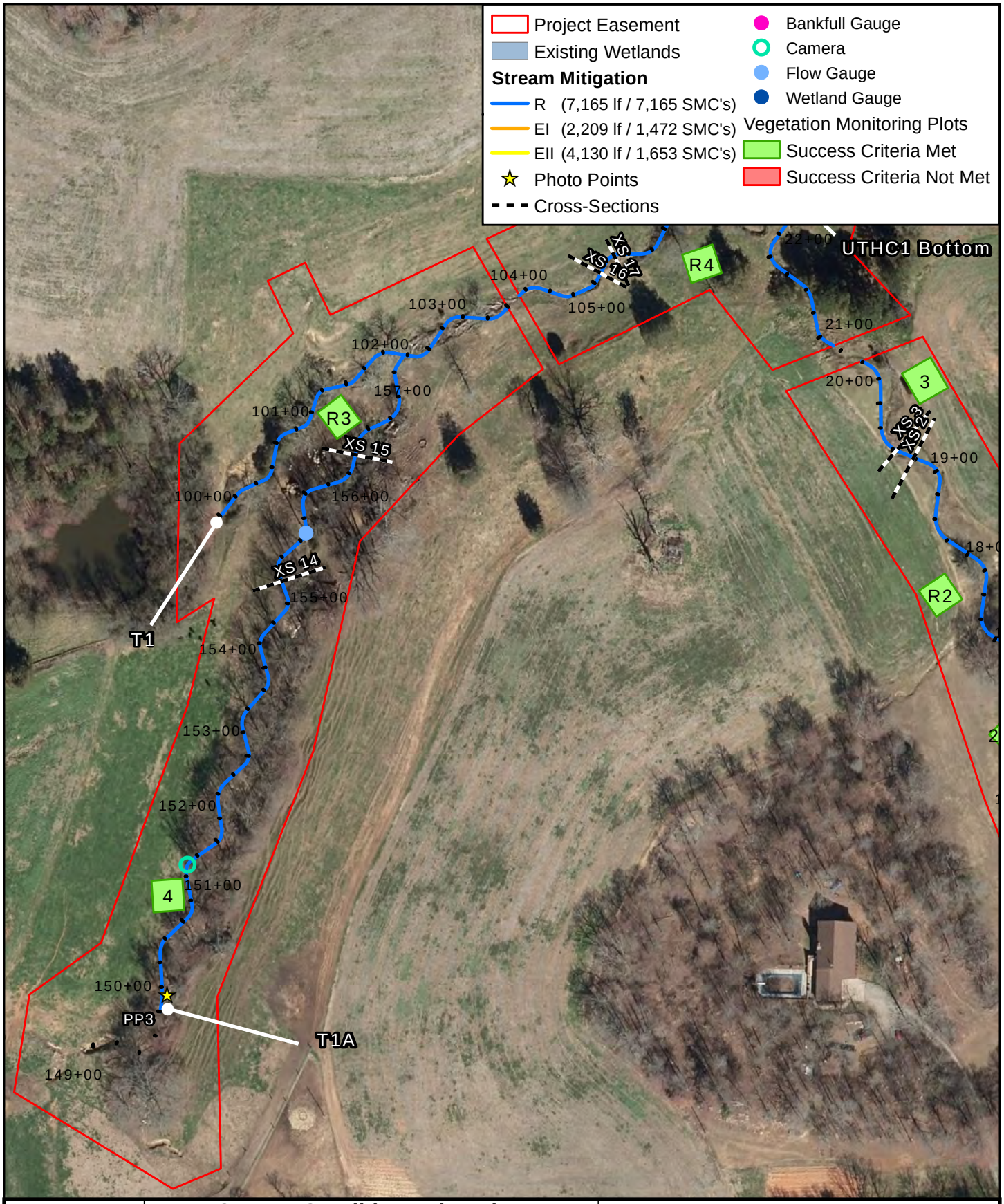

Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Page 2

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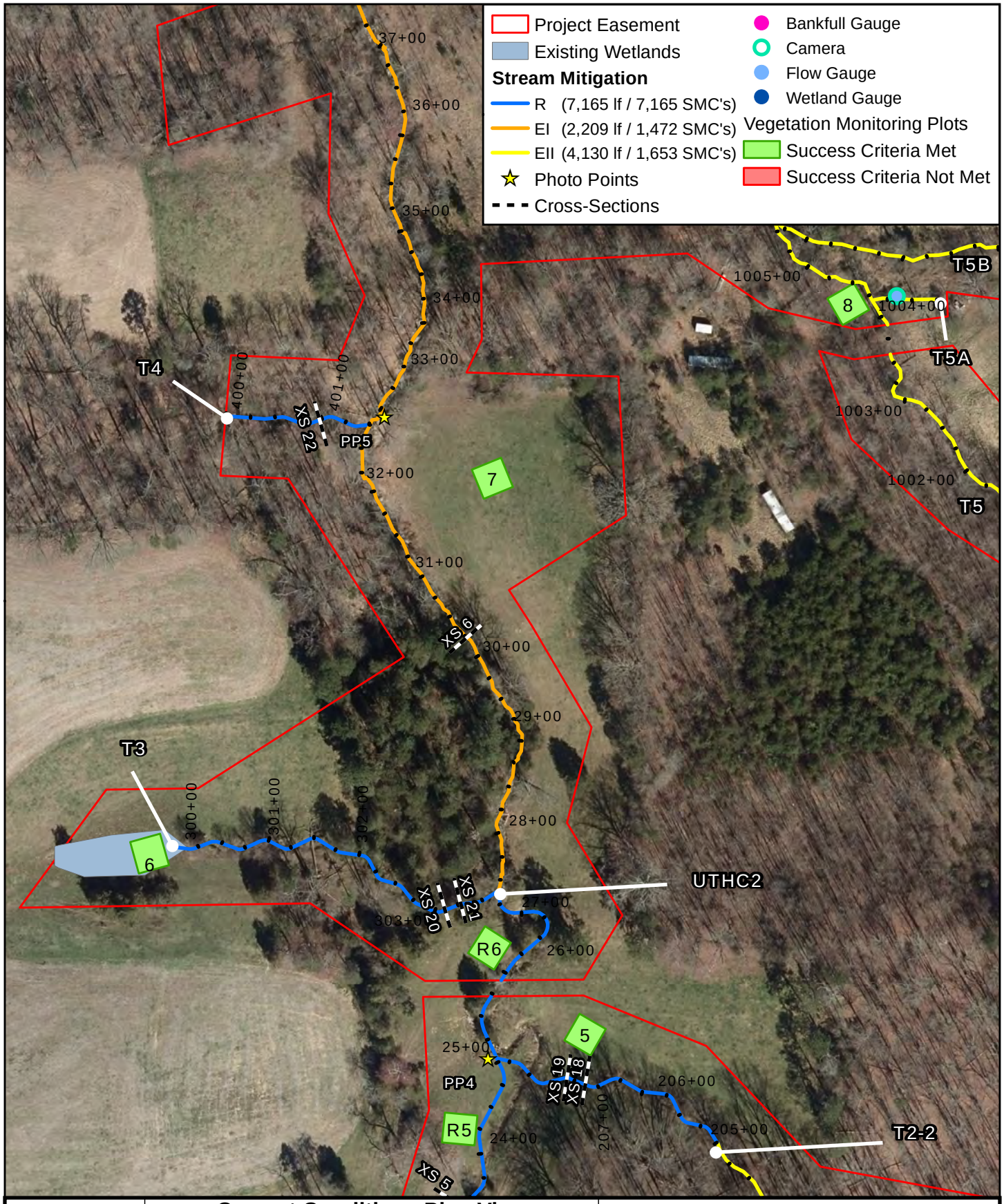

Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Page 3

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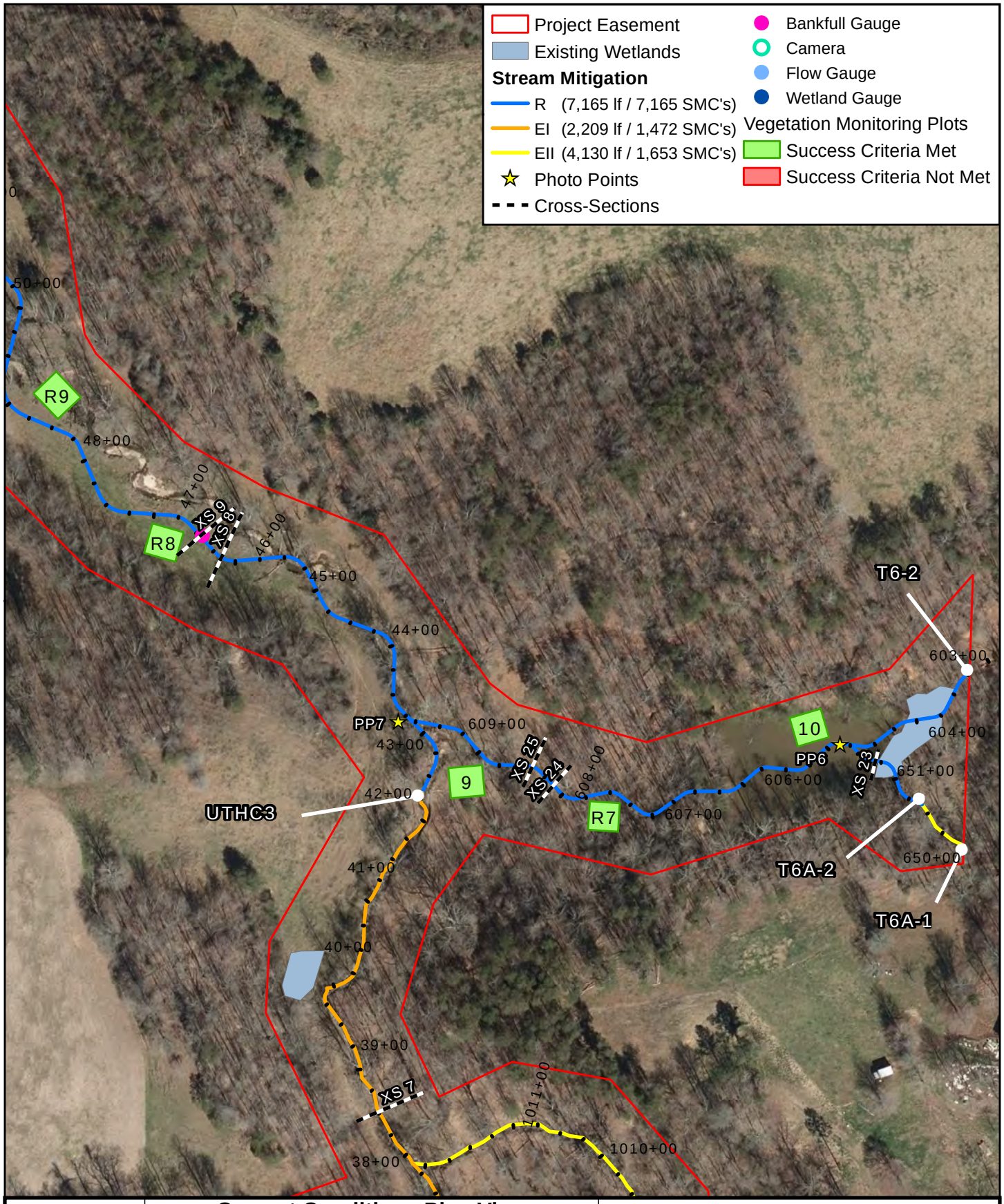

Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Page 4

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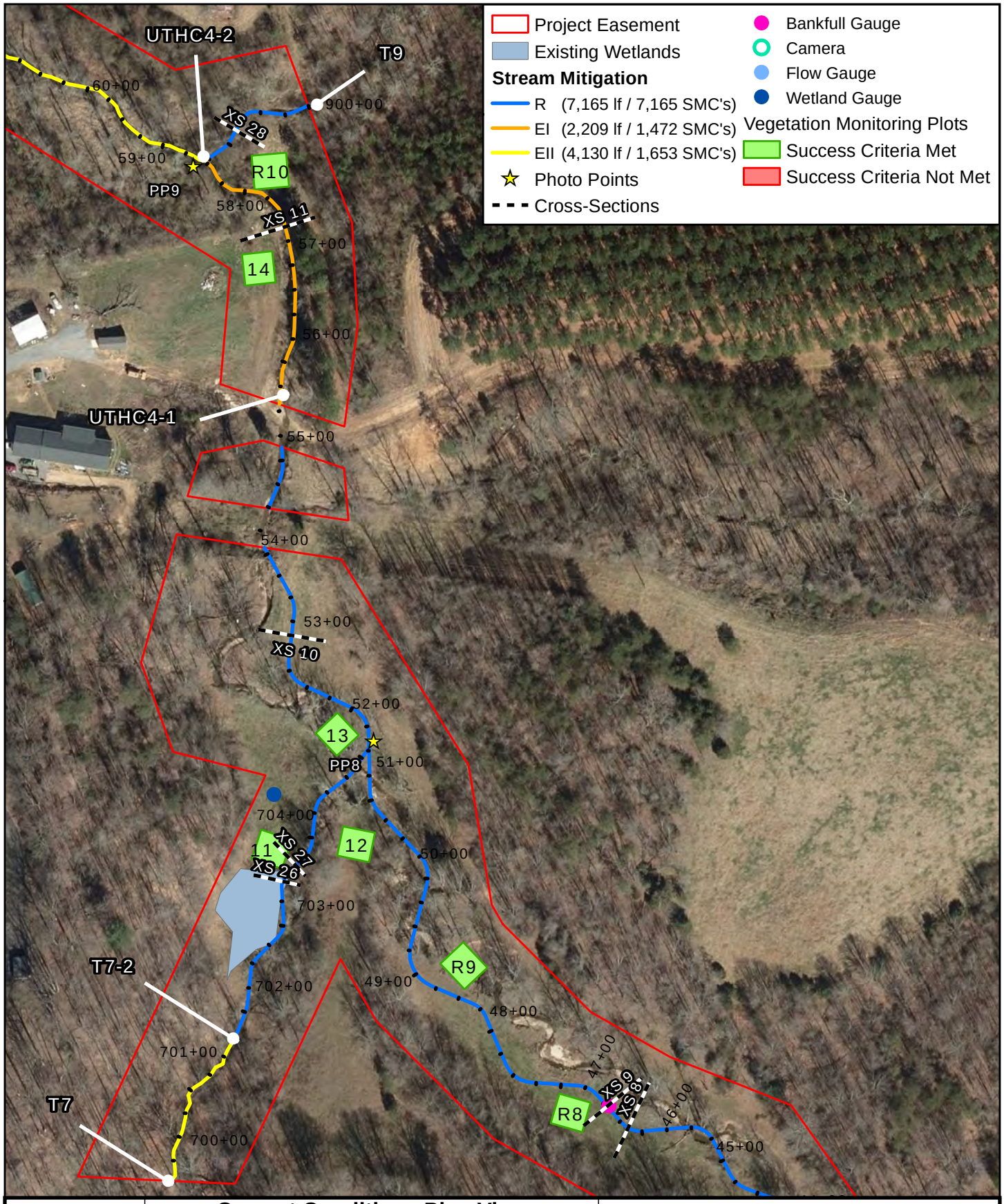

Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Page 5

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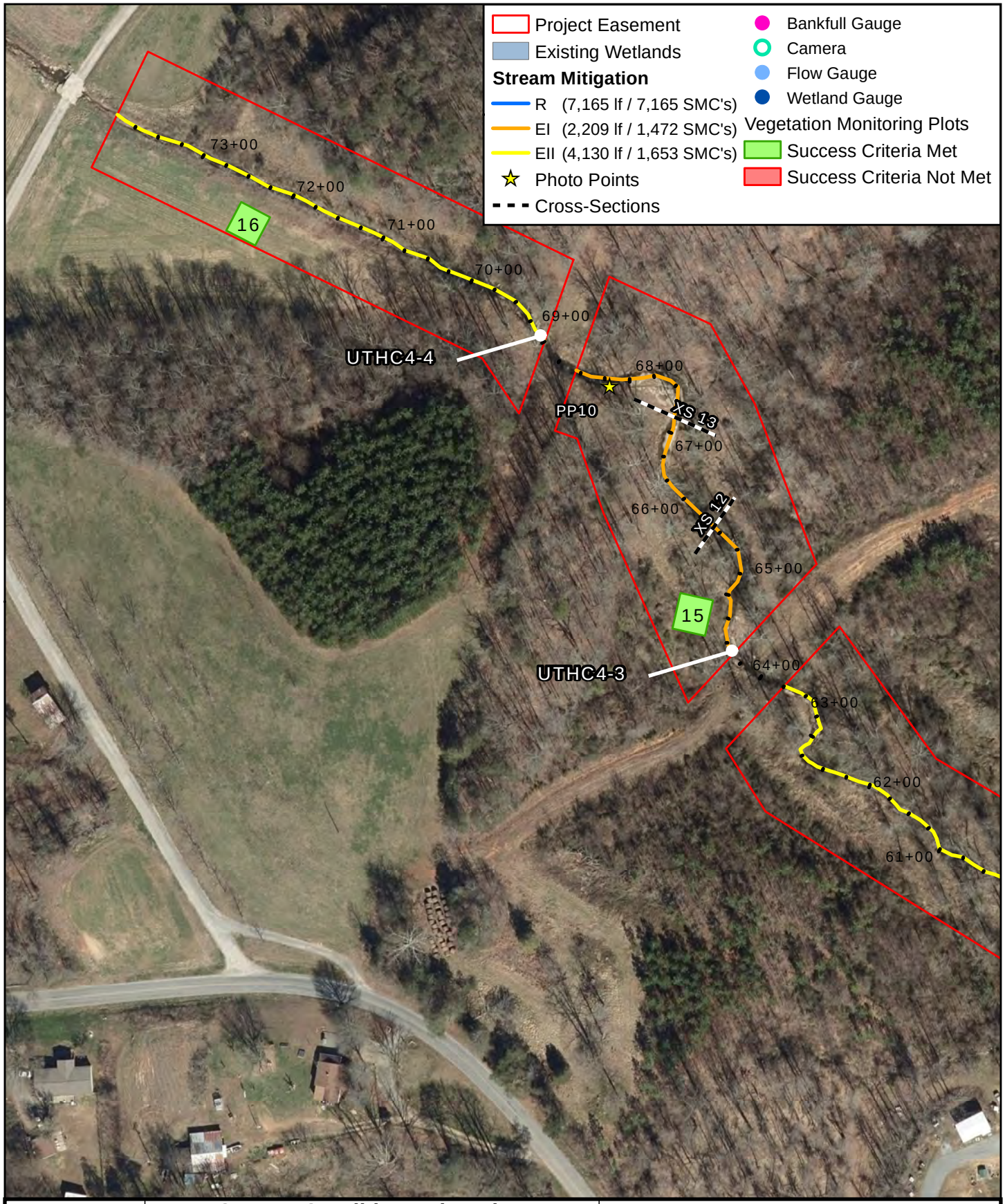

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Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Page 6

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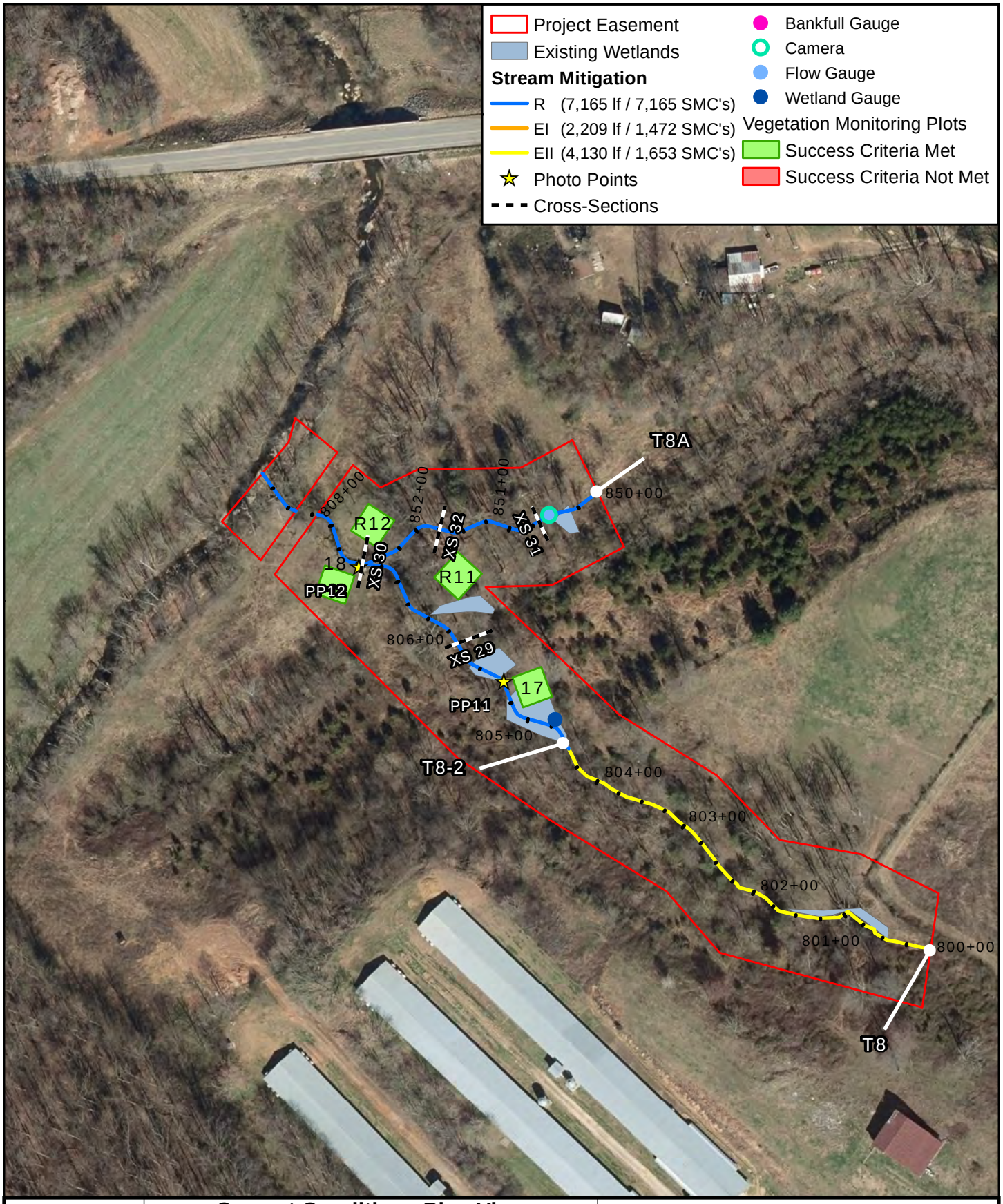

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Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Page 7

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0 100 200 Feet

Image Source: NC OneMap Orthoimagery, 2015.

Photo Reference Photos

PP1 – MY-00 – 4/17/20

PP2 – MY-00 – 4/17/20

PP3 – MY-00 – 4/17/20

PP4 – MY-00 – 4/17/20

PP5 – MY-00 – 4/17/20

PP6 – MY-00 – 4/16/20

PP7 – MY-00 – 4/16/20

PP8 – MY-00 – 4/16/20

PP9 – MY-00 – 4/17/20

PP10 – MY-00 – 4/17/20

PP11 – MY-00 – 4/16/20

PP12 – MY-00 – 4/16/20

Vegetation Monitoring Plot Photos

Vegetation Plot 1 – MY-00 – 4/17/20

Vegetation Plot 2 – MY-00 – 4/17/20

Vegetation Plot 3 – MY-00 – 4/17/20

Vegetation Plot 4 – MY-00 – 4/17/20

Vegetation Plot 5 – MY-00 – 4/17/20

Vegetation Plot 6 – MY-00 - 4/17/20

Vegetation Plot 7 – MY-00 – 4/17/20

Vegetation Plot 8 – MY-00 – 4/17/20

Vegetation Plot 9 – MY-00 – 4/16/20

Vegetation Plot 10 – MY-00 – 4/16/20

Vegetation Plot 11 – MY-00 – 4/16/20

Vegetation Plot 12 – MY-00 - 4/16/20

Vegetation Plot 13 – MY-00 – 4/16/20

Vegetation Plot 14 – MY-00 – 4/17/20

Vegetation Plot 15 – MY-00 – 4/17/20

Vegetation Plot 16 – MY-00 – 4/17/20

Vegetation Plot 17 – MY-00 – 4/16/20

Vegetation Plot 18 – MY-00 - 4/16/20

Vegetation Plot R1 – MY-00 – 4/24/20

Vegetation Plot R2 – MY-00 – 4/24/20

Vegetation Plot R3 – MY00 – 4/24/20

Vegetation Plot R4 – MY00 – 4/24/20

Vegetation Plot R5 – MY00 – 4/24/20

Vegetation Plot R6 – MY00 – 4/24/20

Vegetation Plot R7 – MY-00 – 4/24/20

Vegetation Plot R8 – MY-00 – 4/24/20

Vegetation Plot R9 – MY00 – 4/24/20

Vegetation Plot R10 – MY00 – 4/24/20

Vegetation Plot R11 – MY00 – 4/16/20

Vegetation Plot R12 – MY00 – 4/16/20

APPENDIX C

Vegetation Plot Data

Table 5. Species and Quantity of Planted Stems Mill Dam Creek Restoration Site, DMS Project #97136			
Common Name	Scientific Name	Bare Root	Live Stakes
Sycamore	*Platanus occidentalis*	5,000	
Swamp Chestnut Oak	*Quercus michauxii*	5,000	
River Birch	*Betula nigra*	5,000	
Willow Oak	*Quercus phellos*	5,800	
Tulip Poplar	*Liriodenron tulipifera*	5,800	
Southern Red Oak	*Quercus falcata*	1,000	
White Oak	*Quercus alba*	800	
Persimmon	*Diospyros virginiana*	300	
Pin Oak	*Quercus palustris*	300	
Elderberry	*Sambucus Canadensis*		2,000
Black Willow	*Salix nigra*		2,600
Silky Willow	*Salix sericea*		2,000
Silky Dogwood	*Cornus ammomum*		2,500

Table 6. Stem Count by Plot and Species
Mill Dam Creek Restoration Site, DMS Project #97136

	Current Plot Data (MY00 2020)													
	Plot 01		Plot 02		Plot 03		Plot 04		Plot 05		Plot 06		Plot 07	
Species	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**
American Persimmon (*Diospyros virginiana*)														
American Sycamore (*Platanus occidentalis*)	3	3	3	3	4	4	7	7	1	1	9	9	1	1
Black Walnut (*Juglans nigra*)						2								
Black Willow (*Salix nigra*)														
Northern Red Oak (*Quercus rubra*)														
Oak (*Quercus sp.*)	6	6	6	6	10	10	5	5	10	10	1	1	17	17
River Birch (*Betula nigra*)	7	7	6	6	2	2	4	4	4	4	3	3	5	5
Swamp Chestnut Oak (*Quercus michauxii*)			2	2	1	1								
Tulip Poplar (*Liriodendron tulipifera*)	3	3	1	1	5	5	6	6	5	5			2	2
Willow Oak (*Quercus phellos*)	1	1	1	1	2	2								
Unknown			3	3	5	5			1	1				
Stem count	20	20	22	22	29	31	22	22	21	21	13	13	25	25
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	5	5	7	7	7	8	4	4	5	5	3	3	4	4
Stems per ACRE	809	809	890	890	1,174	1,255	890	890	850	850	526	526	1,012	1,012

Table 6. Stem Count by Plot and Species
Mill Dam Creek Restoration Site, DMS Project #97136

	Current Plot Data (MY00 2020)													
	Plot 08		Plot 09		Plot 10		Plot 11		Plot 12		Plot 13		Plot 14	
Species	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**
American Persimmon (*Diospyros virginiana*)											1	1		
American Sycamore (*Platanus occidentalis*)	4	4			2	2	2	2					5	5
Black Walnut (*Juglans nigra*)												1		
Black Willow (*Salix nigra*)							2	2			3	3		
Northern Red Oak (*Quercus rubra*)		1												
Oak (*Quercus sp.*)	6	6	8	8	3	3	3	3	8	8	7	7	15	15
River Birch (*Betula nigra*)	2	2	6	6	14	14								
Swamp Chestnut Oak (*Quercus michauxii*)					1	1								
Tulip Poplar (*Liriodendron tulipifera*)	14	14	5	5	1	1	9	9	8	8	10	10	6	6
Willow Oak (*Quercus phellos*)			2	2	1	1	3	3	4	4	1	1	1	1
Unknown	1	1	3	3	9	9	2	2	2	2	8	8	4	4
Stem count	27	28	24	24	31	31	21	21	22	22	30	31	31	31
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	5	6	5	5	7	7	6	6	4	4	6	7	5	5
Stems per ACRE	1,093	1,133	971	971	1,255	1,255	850	850	890	890	1,214	1,255	1,255	1,255

Table 6. Stem Count by Plot and Species
Mill Dam Creek Restoration Site, DMS Project #97136

	Current Plot Data (MY00 2020)													
	Plot 15		Plot 16		Plot 17		Plot 18		Plot R1		Plot R2		Plot R3	
Species	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**
American Persimmon (*Diospyros virginiana*)														
American Sycamore (*Platanus occidentalis*)	7	7	1	1	4	4	5	5	2	2				
Black Walnut (*Juglans nigra*)		1												
Black Willow (*Salix nigra*)														
Northern Red Oak (*Quercus rubra*)														
Oak (*Quercus sp.*)	10	10	10	10	6	6	13	13	2	2	5	5	10	10
River Birch (*Betula nigra*)	8	8	11	11					6	6	9	9	4	4
Swamp Chestnut Oak (*Quercus michauxii*)	2	2							3	3	2	2		
Tulip Poplar (*Liriodendron tulipifera*)	3	3	3	3	8	8	5	5	5	5	2	2	8	8
Willow Oak (*Quercus phellos*)			1	1	1	1	1	1			1	1		
Unknown	2	2	2	2	1	1	7	7			2	2	2	2
Stem count	32	33	28	28	20	20	31	31	18	18	21	21	24	24
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	6	7	6	6	5	5	5	5	5	5	6	6	4	4
Stems per ACRE	1,295	1,335	1,133	1,133	809	809	1,255	1,255	728	728	850	850	971	971

Table 6. Stem Count by Plot and Species
Mill Dam Creek Restoration Site, DMS Project #97136

	Current Plot Data (MY00 2020)													
	Plot R4		Plot R5		Plot R6		Plot R7		Plot R8		Plot R9		Plot R10	
Species	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**
American Persimmon (*Diospyros virginiana*)														
American Sycamore (*Platanus occidentalis*)	4	4	4	4	11	11	1	1	4	4	2	2		
Black Walnut (*Juglans nigra*)														
Black Willow (*Salix nigra*)														
Northern Red Oak (*Quercus rubra*)														
Oak (*Quercus sp.*)	7	7	3	3			5	5	7	7	5	5	8	8
River Birch (*Betula nigra*)					3	3	3	3			8	8	1	1
Swamp Chestnut Oak (*Quercus michauxii*)					1	1					1	1	6	6
Tulip Poplar (*Liriodendron tulipifera*)	7	7	5	5	1	1	8	8	8	8	5	5	9	9
Willow Oak (*Quercus phellos*)			3	3	4	4					1	1		
Unknown	5	5	1	1	10	10	3	3	2	2	1	1	2	2
Stem count	23	23	16	16	30	30	20	20	21	21	23	23	26	26
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	4	4	5	5	6	6	5	5	4	4	7	7	5	5
Stems per ACRE	931	931	647	647	1,214	1,214	809	809	850	850	931	931	1,052	1,052

Table 6. Stem Count by Plot and Species
Mill Dam Creek Restoration Site, DMS Project #97136

	Current Plot Data (MY00 2020)				Annual Means	
	Plot R11		Plot R12		MY00 (2020)	
Species	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**
American Persimmon (*Diospyros virginiana*)					1	1
American Sycamore (*Platanus occidentalis*)	2	2			88	88
Black Walnut (*Juglans nigra*)						4
Black Willow (*Salix nigra*)					5	5
Northern Red Oak (*Quercus rubra*)						1
Oak (*Quercus sp.*)	3	3	7	7	206	206
River Birch (*Betula nigra*)	1	1			107	107
Swamp Chestnut Oak (*Quercus michauxii*)			1	1	20	20
Tulip Poplar (*Liriodendron tulipifera*)	9	9	11	11	172	172
Willow Oak (*Quercus phellos*)	1	1	1	1	30	30
Unknown	6	6	5	5	89	89
Stem count	22	22	25	25	718	723
size (ares)	1		1		30	
size (ACRES)	0.025		0.025		0.74	
Species count	6	6	5	5	9	11
Stems per ACRE	890	890	1,012	1,012	969	975

APPENDIX D

Stream Measurement and Geomorphology Data

Table 7a. UTHC-1 Data Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	5.8 – 10.6	9.0 – 10.0	6.5 – 9	6.0	7.6	8.9	3
Floodprone Width (ft)	9.0 – 27.3	13 – 21	50	59.1	64.6	68.3	3
Bankfull Mean Depth (ft)	0.4 – 0.8	1.1 – 1.2	0.5 – 0.7	0.6	0.7	0.7	3
Bankfull Max Depth (ft)	0.4 – 1.2	1.3 – 1.5	0.8 – 1.0	1.0	1.1	1.2	3
Bankfull Cross-Sectional Area (ft^2)	2.8 – 4.5	10.4 – 10.7	3.4 – 6.1	4.5	5.1	5.5	3
Width/Depth Ratio	7.6 – 28.2	8 – 10	12.4 – 13.4	8.2	11.6	14.4	3
Entrenchment Ratio	1.2 – 2.6	1.3 – 2.3	5.6 – 7.7	6.6	8.7	11.0	3
Bank Height Ratio	1.0 – 10.4	1.0	1.0	1.0	1.0	1.0	3
Pattern							
Channel Beltwidth (ft)	*	45	26 – 61	26 – 61			
Radius of Curvature (ft)	*	13 – 42	18 – 27	18 – 27			
Rc:Bankfull width (ft/ft)	*	1.3 – 4.4	2.0 – 4.1	2.0 – 4.1			
Meander Wavelength (ft)	*	93 – 136	54 – 125	54 – 125			
Meander Width Ratio	*	4.5 – 5.0	4.0 – 7.5	4.0 – 7.5			
Riffle Length (ft)	*			4.2	27.2	40.9	30
Riffle Slope (ft/ft)	0.024 – 0.033	0.013 – 0.028	0.018 – 0.046	0.011	0.024	0.059	30
Pool Length (ft)	*			9.8	61.1	161.9	28
Pool Spacing (ft)	*	30 – 59	48 – 70	31.3	59.3	118.6	27
SC% / Sa% / G% / C% / B% /Be%	2/18/51/28/0/0			1/19/51/26/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	1.3/18/37/97/130	Gravel	Gravel	1.3/9.7/31/91/147			
Channel length (ft)	1,874		1,739	1,739			
Drainage Area (acres)	114	Variable	114	114			
Rosgen Classification	F4	B4c	C4	C4			
Sinuosity	1.2	1.2	1.2	1.2			
Water Surface Slope (ft/ft)	0.021	0.013	0.025	0.026			

* : no data shown due to channelization / lack of bed diversity

Table 7b. UTHC3 Baseline Stream Data Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Parameter	Pre-Existing Condition	Reference Reach(es) Data (SF)	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	8.5 – 14.1	9.0 – 10.0	12	10.9	11.3	11.7	2
Floodprone Width (ft)	17.1	13 – 21	68	69.4	72.6	75.8	2
Bankfull Mean Depth (ft)	0.8 – 1.6	1.1 – 1.2	0.9	1.0	1.1	1.1	2
Bankfull Max Depth (ft)	1.1 – 2.0	1.3 – 1.5	1.5	1.4	1.5	1.7	2
Bankfull Cross-Sectional Area (ft^2)	8.5 – 12.5	10.4 – 10.7	11.4	10.6	12.0	13.3	2
Width/Depth Ratio	17	8 – 10	12.7	10.2	10.7	11.1	2
Entrenchment Ratio	1.2	1.3 – 2.3	5.7	5.9	6.5	7.0	2
Bank Height Ratio	3.2	1.0	1.0	1.0	1.0	1.0	2
Pattern							
Channel Beltwidth (ft)	*	45	39 – 57	39 – 57			
Radius of Curvature (ft)	*	13 – 42	24 – 36	24 – 36			
Rc:Bankfull width (ft/ft)	*	1.3 – 4.4	24 – 36	24 – 36			
Meander Wavelength (ft)	*	93 – 136	111 – 173	111 – 173			
Meander Width Ratio	*	4.5 – 5.0	3.3 – 4.8	3.3 – 4.8			
Profile							
Riffle Length (ft)	*			18.2	46.0	85.8	18
Riffle Slope (ft/ft)	0.015	0.013 – 0.028	0.0007 – 0.032	0.003	0.015	0.040	18
Pool Length (ft)	*			15.9	26.6	49.1	17
Pool Spacing (ft)	*	30 – 59	52 – 101	48.8	75.5	113.5	16
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	3/15/57/19/0/6			0/13/48/37/1/0			
d16 / d35 / d50 / d84 / d95 (mm)	2.7/15/26/40/92	Gravel	Gravel	2.5/23/48/125/165			
Channel length (ft)	1,411		1,325	1,325			
Drainage Area (acres)	297	Variable	297	297			
Rosgen Classification	F4	B4c	C4	C4			
Sinuosity	1.2	1.2	1.2	1.2			
Water Surface Slope (ft/ft)	0.014	0.013	0.015	0.015			

Table 7c. T1 Baseline Stream Data Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Parameter	Pre-Existing Condition	Reference Reach(es) Data (SF)	Design	As-built			
Dimension – Riffle							
Bankfull Width (ft)	4.1 – 7.5		6.5	6.5			
Floodprone Width (ft)	6.0 – 32.8		35	48.4			
Bankfull Mean Depth (ft)	0.5 – 0.7		0.5	0.6			
Bankfull Max Depth (ft)	0.8 – 1.0		0.8	1.2			
Bankfull Cross-Sectional Area (ft^2)	2.7 – 3.8		3.4	3.9			
Width/Depth Ratio	6.2 – 14.9	12 – 18	12.4	10.9			
Entrenchment Ratio	1.5 – 4.4	2.2+	5.4	7.5			
Bank Height Ratio	1.0 – 4.5	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		23 – 41	23 – 41			
Radius of Curvature (ft)	*		15 – 22	15 – 22			
Rc:Bankfull width (ft/ft)	*		2.2 – 3.4	2.2 – 3.4			
Meander Wavelength (ft)	*		60 – 83	60 – 83			
Meander Width Ratio	*		3.5 – 6.3	3.5 – 6.3			
Profile							
Riffle Length (ft)	*			7.8	22.0	42.2	16
Riffle Slope (ft/ft)	0.019 – 0.028		0.015 – 0.60	0.002	0.022	0.035	16
Pool Length (ft)	*			3.5	12.6	20.1	16
Pool Spacing (ft)	*		25 – 63	24.4	41.3	58.4	15
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	31/21/44/4/1/0			2/15/66/17/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.13/0.37/3/38/66	Gravel	Gravel	1.9/8.8/22/67/94			
Channel length (ft)	764		751	751			
Drainage Area (acres)	43	Variable	43	43			
Rosgen Classification	B4, C4, G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.026	N/A	0.026	0.025			

Table 7d. T1A Baseline Stream Data Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Parameter	Pre-Existing Condition	Reference Reach(es) Data (SF)	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	7.1		5.5	5.4	5.6	5.8	2
Floodprone Width (ft)	7.7		35	44.5	49.4	54.4	2
Bankfull Mean Depth (ft)	0.4		0.5	0.3	0.4	0.4	2
Bankfull Max Depth (ft)	0.5		0.7	0.7	0.7	0.7	2
Bankfull Cross-Sectional Area (ft^2)	2.8		2.5	1.8	2.1	2.3	2
Width/Depth Ratio	18.2	12 – 18	12.1	14.1	15.0	15.9	2
Entrenchment Ratio	1.1	2.2+	6.4	7.7	8.9	10.1	2
Bank Height Ratio	19.6	1.0 – 1.1	1.0	1.0	1.0	1.0	2
Pattern							
Channel Beltwidth (ft)	*		20 – 28	20 – 28			
Radius of Curvature (ft)	*		15 – 22	15 – 22			
Rc:Bankfull width (ft/ft)	*		2.3 – 3.4	2.3 – 3.4			
Meander Wavelength (ft)	*		72 – 84	72 – 84			
Meander Width Ratio	*		3.6 – 5.1	3.6 – 5.1			
Profile							
Riffle Length (ft)				1.4	20.7	51.8	16
Riffle Slope (ft/ft)	0.025		0.020 – 0.062	0.000	0.025	0.046	16
Pool Length (ft)				4.9	14.7	27.2	16
Pool Spacing (ft)	*		32 – 58	32.8	44.7	65.8	15
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	31/51/12/6/0/0			5/19/62/14/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.062/0.072/0.13/2.9/71	Gravel	Gravel	0.7/5.8/20/59/99			
Channel length (ft)	746		795	795			
Drainage Area (acres)	29	Variable	29	29			
Rosgen Classification	F4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.022	N/A	0.030	0.030			

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

Table 7e. T2-2 Baseline Stream Data Summary **Mill Dam Creek Restoration Site, DMS Project #97136**							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	3.1		4.5	4.7			
Floodprone Width (ft)	4		22	24.1			
Bankfull Mean Depth (ft)	0.5		0.4	0.5			
Bankfull Max Depth (ft)	0.8		0.6	0.9			
Bankfull Cross-Sectional Area (ft^2)	1.5		1.7	2.3			
Width/Depth Ratio	6.3	12 – 18	12.0	9.9			
Entrenchment Ratio	1.3	2.2+	4.9	5.1			
Bank Height Ratio	3.3	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)				1.6	13.2	40.9	8
Riffle Slope (ft/ft)	0.04		0.024-0.063	0.023	0.049	0.099	8
Pool Length (ft)				3.6	14.8	31.4	7
Pool Spacing (ft)	*		21 – 34	24.1	37.8	55.6	6
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	11/14/63/13/0/0			14/30/27/30/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.26/13/21/58/84	Gravel	Gravel	0.1/0.7/6/87/130			
Channel length (ft)	232		265	265			
Drainage Area (acres)	16	Variable	16	16			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.038	N/A	0.042	0.040			

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

Table 7f. T3 Baseline Stream Data Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	3.5		4.5	4.7			
Floodprone Width (ft)	4.2		18	19.2			
Bankfull Mean Depth (ft)	0.3		0.4	0.4			
Bankfull Max Depth (ft)	0.4		0.6	0.7			
Bankfull Cross-Sectional Area (ft^2)	1.1		1.7	1.9			
Width/Depth Ratio	11.3	12 – 18	12.0	11.6			
Entrenchment Ratio	1.2	2.2+	4.0	4.1			
Bank Height Ratio	3.3	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)				2.2	13.3	25.7	13
Riffle Slope (ft/ft)	0.058		0.051 – 0.074	0.032	0.058	0.125	13
Pool Length (ft)				3.4	9.5	20.7	12
Pool Spacing (ft)	*		20 – 30	22.8	28.2	46.7	11
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	28/5/38/27/4			6/11/71/13/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.062/3.1/25/130/240	Gravel	Gravel	1.7/7.8/28/61/84			
Channel length (ft)	378		369	369			
Drainage Area (acres)	7	Variable	7	7			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.059	N/A	0.059	0.057			

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

Table 7g. T4 Baseline Stream Data Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	2.5		4.5	4.0			
Floodprone Width (ft)	4.7		16	18.7			
Bankfull Mean Depth (ft)	0.3		0.6	0.5			
Bankfull Max Depth (ft)	0.4		0.6	0.8			
Bankfull Cross-Sectional Area (ft^2)	0.7		1.7	1.9			
Width/Depth Ratio	9.4	12 – 18	12.0	8.3			
Entrenchment Ratio	1.9	2.2+	3.6	4.7			
Bank Height Ratio	6.9	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)				7.9	13.4	22.2	7
Riffle Slope (ft/ft)	0.1		0.102 – 0.103	0.039	0.11	0.23	7
Pool Length (ft)				3.2	5.4	11.0	7
Pool Spacing (ft)	*		24 – 27	9.5	19.5	26.5	6
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	12/65/13/8/2/0			0/15/77/8/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.11/0.16/0.21/4.3/120	Gravel	Gravel	2.2/9.6/15/48/76			
Channel length (ft)	151		151	151			
Drainage Area (acres)	3	Variable	3	3			
Rosgen Classification	B4	B4c	C4b	C4b			
Sinuosity	1.0	1.1 – 1.3	1.0	1.0			
Water Surface Slope (ft/ft)	0.089	N/A	0.113	0.109			

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

Table 7h. T6-2 Baseline Stream Data Summary **Mill Dam Creek Restoration Site, DMS Project #97136**							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	4.4		5.5	5.6			
Floodprone Width (ft)	5.4		24	27.4			
Bankfull Mean Depth (ft)	0.6		0.5	0.5			
Bankfull Max Depth (ft)	0.7		0.7	1.0			
Bankfull Cross-Sectional Area (ft^2)	2.6		2.5	2.6			
Width/Depth Ratio	7.5	12 – 18	12.1	11.9			
Entrenchment Ratio	1.1	2.2+	4.4	4.9			
Bank Height Ratio	4.4	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)				15.4	25.1	37.9	15
Riffle Slope (ft/ft)	0.02		0.020 – 0.063	0.007	0.033	0.070	15
Pool Length (ft)				5.9	14.1	22.7	15
Pool Spacing (ft)	*		32 – 47	28.8	42.9	50.9	14
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	7/33/60/0/0/0			1/16/53/30/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.19/1.6/4.1/13/27	Gravel	Gravel	1.7/16/38/93/140			
Channel length (ft)	621		658	658			
Drainage Area (acres)	29	Variable	29	29			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.0	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.041	N/A	0.034	0.037			

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

Table 7i. T6A-2 Baseline Stream Data Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	**		4.5	4.4			
Floodprone Width (ft)	**		24	25.3			
Bankfull Mean Depth (ft)	**		0.4	0.4			
Bankfull Max Depth (ft)	**		0.6	0.6			
Bankfull Cross-Sectional Area (ft^2)	**		1.7	1.7			
Width/Depth Ratio	**	12 – 18	12.0	11.0			
Entrenchment Ratio	**	2.2+	5.3	5.8			
Bank Height Ratio	**	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	**		N/A	N/A			
Radius of Curvature (ft)	**		N/A	N/A			
Rc:Bankfull width (ft/ft)	**		N/A	N/A			
Meander Wavelength (ft)	**		N/A	N/A			
Meander Width Ratio	**		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)	**			9.3	14.8	24.0	3
Riffle Slope (ft/ft)	**		0.087 – 0.099	0.056	0.091	0.118	3
Pool Length (ft)	**			14.2	16.7	19.5	3
Pool Spacing (ft)	**		22 – 23	29.4	30.0	30.6	2
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	**			0/14/70/16/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	**	Gravel	Gravel	2.6/25/36/64/85			
Channel length (ft)	97		101	101			
Drainage Area (acres)	9	Variable	9	9			
Rosgen Classification	**	B4c	C4b	C4b			
Sinuosity	**	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	**	N/A	0.091	0.095			

** Existing conditions are ponded

Table 7j. T7-2 Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	3.2		6.5	10.1			
Floodprone Width (ft)	4.6		28	47.4			
Bankfull Mean Depth (ft)	0.8		0.5	0.4			
Bankfull Max Depth (ft)	1.1		0.8	1.0			
Bankfull Cross-Sectional Area (ft^2)	2.4		3.4	4.3			
Width/Depth Ratio	4.1	12 – 18	12.4	23.9			
Entrenchment Ratio	1.4	2.2+	4.3	4.7			
Bank Height Ratio	1.7	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		20 – 24	20 – 24			
Radius of Curvature (ft)	*		15 – 22	15 – 22			
Rc:Bankfull width (ft/ft)	*		2.3 – 3.4	2.3 – 3.4			
Meander Wavelength (ft)	*		85 – 88	85 – 88			
Meander Width Ratio	*		3.1 – 3.7	3.1 – 3.7			
Profile				Min	Mean	Max	n
Riffle Length (ft)				4.5	32.4	68.1	6
Riffle Slope (ft/ft)	0.032		0.017 – 0.043	0.015	0.025	0.029	6
Pool Length (ft)				4.9	12.5	19.7	6
Pool Spacing (ft)	*		36 – 57	45.7	54.6	86.6	5
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	3/18/62/16/1/0			0/20/62/17/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	1.2/7.9/22/66/89	Gravel	Gravel	0.8/8.5/17/67/110			
Channel length (ft)	335		348	348			
Drainage Area (acres)	41	Variable	41	41			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.033	N/A	0.024	0.022			

Table 7k. T8-2 Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	3.6		5.5	5.5	5.6	5.7	2
Floodprone Width (ft)	4.1		25	34.8	39.1	43.4	2
Bankfull Mean Depth (ft)	0.7		0.5	0.6	0.6	0.6	2
Bankfull Max Depth (ft)	0.9		0.7	1.0	1.0	1.0	2
Bankfull Cross-Sectional Area (ft^2)	2.4		2.5	3.2	3.3	3.4	2
Width/Depth Ratio	5.5	12 – 18	12.1	9.1	9.6	10.1	2
Entrenchment Ratio	1.1	2.2+	4.4	6.3	7.0	7.6	2
Bank Height Ratio	2.5	1.0 – 1.1	1.0	1.0	1.0	1.0	2
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile							
Riffle Length (ft)				9.3	23.3	31.9	10
Riffle Slope (ft/ft)	0.041		0.043 – 0.050	0.033	0.048	0.063	10
Pool Length (ft)				7.9	13.4	16.6	10
Pool Spacing (ft)	*		32 - 45	34.1	42.2	53.6	9
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	18/27/40/14/0/0			4/17/52/27/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.13/2.2/8.5/81/140	Gravel	Gravel	0.7/14/37/95/135			
Channel length (ft)	486		448	448			
Drainage Area (acres)	21	Variable	21	21			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.044	N/A	0.045	0.048			

Table 7l. T8A Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	3.1		4.5	4.7	5.7	6.6	2
Floodprone Width (ft)	4.1		20	21.6	44.7	67.9	2
Bankfull Mean Depth (ft)	0.3		0.4	0.4	0.5	0.5	2
Bankfull Max Depth (ft)	0.9		0.6	0.9	1.0	1.1	2
Bankfull Cross-Sectional Area (ft^2)	1.0		1.7	2.6	2.7	2.9	2
Width/Depth Ratio	5.5	12 – 18	12.0	8.6	11.9	15.2	2
Entrenchment Ratio	1.1	2.2+	4.4	4.6	7.4	10.3	2
Bank Height Ratio	2.7	1.0 – 1.1	1.0	1.0	1.0	1.0	2
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile							
Riffle Length (ft)				12.3	22.7	42.7	7
Riffle Slope (ft/ft)	0.044		0.019 – 0.062	0.027	0.053	0.10	7
Pool Length (ft)				6.3	12.4	22.4	6
Pool Spacing (ft)	*		28 – 38	27.7	40.3	66.1	5
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	100/0/0/0/0/0			4/17/54/25/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.062/0.062/0.062/0.062/0.062	Gravel	Gravel	1.8/23/32/84/135			
Channel length (ft)	258		262	262			
Drainage Area (acres)	7	Variable	7	7			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.052	N/A	0.044	0.047			

Table 7m. T9 Baseline Stream Data Summary **Mill Dam Creek Restoration Site, DMS Project #97136**							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	2.9		5.5	4.1			
Floodprone Width (ft)	5.5		22	29.6			
Bankfull Mean Depth (ft)	0.7		0.5	0.7			
Bankfull Max Depth (ft)	0.9		0.7	0.9			
Bankfull Cross-Sectional Area (ft^2)	2.0		2.5	2.8			
Width/Depth Ratio	4.3	12 – 18	12.1	6.0			
Entrenchment Ratio	1.9	2.2+	4.0	7.2			
Bank Height Ratio	1.7	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)				10.5	22.8	31.7	4
Riffle Slope (ft/ft)	0.031		0.037	0.033	0.039	0.056	4
Pool Length (ft)				3.9	6.2	7.7	3
Pool Spacing (ft)	*		34 – 36	37.02	39.1	41.1	2
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	26/66/8/0/0/0			3/7/59/31/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.062/0.13/0.15/0.23/3.7	Gravel	Gravel	12/32/42/90/150			
Channel length (ft)	133		129	129			
Drainage Area (acres)	29	Variable	29	29			
Rosgen Classification	B4	B4c	C4b	C4b			
Sinuosity	1.0	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.039	N/A	0.042	0.038			

Table 8. Cross Section Dimensional Morphology Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Dimension and Substrate	Cross-Section 1 (Riffle) Station 13+50, UTHC-1							Cross-Section 2 (Riffle) Station 19+25, UTHC-1							Cross-Section 3 (Pool) Station 19+50, UTHC-1						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	948.81							930.99							930.33						
Bankfull Width (ft)	6.0							8.0							8.4						
Floodprone Width (ft)	66.3							68.3							---						
Bankfull Mean Depth (ft)	0.7							0.7							0.9						
Bankfull Max Depth (ft)	1.2							1.2							1.7						
Cross-Sectional Area (ft2) based on AB BKF area	4.5							5.3							7.4						
Cross-Sectional Area (ft2) based on AB BKF elevation	4.5							5.3							7.4						
Bankfull Width/Depth Ratio	8.2							12.1							---						
Bankfull Entrenchment Ratio	11.0							8.6							---						
Bankfull Bank Height Ratio	1.0							1.0							---						
d50 (mm)	48							24							---						
	Cross-Section 4 (Pool) Station 23+17, UTHC-1							Cross-Section 5 (Riffle) Station 23+32, UTHC-1							Cross-Section 6 (Riffle) Station 30+20, UTHC-2						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	923.05							922.85							908.71						
Bankfull Width (ft)	13.1							8.9							22.6						
Floodprone Width (ft)	---							59.1							43.0						
Bankfull Mean Depth (ft)	1.2							0.6							2.5						
Bankfull Max Depth (ft)	2.2							1.0							3.7						
Cross-Sectional Area (ft2) based on AB BKF area	15.4							5.5							55.5						
Cross-Sectional Area (ft2) based on AB BKF elevation	15.4							5.5							55.5						
Bankfull Width/Depth Ratio	---							14.4							9.2						
Bankfull Entrenchment Ratio	---							6.6							1.9						
Bankfull Bank Height Ratio	---							1.0							1.0						
d50 (mm)	---							21							19						
	Cross-Section 7 (Riffle) Station 38+52, UTHC-2							Cross-Section 8 (Pool) Station 46+20, UTHC-3							Cross-Section 9 (Riffle) Station 46+48, UTHC-3						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	883.72							871.16							871.00						
Bankfull Width (ft)	12.9							10.4							10.9						
Floodprone Width (ft)	37.6							---							75.8						
Bankfull Mean Depth (ft)	1.3							2.0							1.0						
Bankfull Max Depth (ft)	2.0							3.8							1.4						
Cross-Sectional Area (ft2) based on AB BKF area	16.7							20.8							10.6						
Cross-Sectional Area (ft2) based on AB BKF elevation	16.7							20.8							10.6						
Bankfull Width/Depth Ratio	9.9							---							11.1						
Bankfull Entrenchment Ratio	2.9							---							7.0						
Bankfull Bank Height Ratio	1.0							---							1.0						
d50 (mm)	19							---							50						

Table 8. Cross Section Dimensional Morphology Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Dimension and Substrate	Cross-Section 10 (Riffle) Station 53+10, UTHC-3							Cross-Section 11 (Riffle) Station 57+40, UTHC-4							Cross-Section 12 (Riffle) Station 65+80, UTHC-6						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	861.59							853.80							845.38						
Bankfull Width (ft)	11.7							11.9							17.6						
Floodprone Width (ft)	69.4							43.2							30.7						
Bankfull Mean Depth (ft)	1.1							1.4							1.7						
Bankfull Max Depth (ft)	1.7							2.2							2.8						
Cross-Sectional Area (ft2) based on AB BKF area	13.3							17.3							30.2						
Cross-Sectional Area (ft2) based on AB BKF elevation	13.3							17.3							30.2						
Bankfull Width/Depth Ratio	10.2							8.2							10.3						
Bankfull Entrenchment Ratio	5.9							3.6							1.7						
Bankfull Bank Height Ratio	1.0							1.1							3.2						
d50 (mm)	45							19							20						
	Cross-Section 13 (Riffle) Station 67+20, UTHC-6							Cross-Section 14 (Riffle) Station 155+00, T1A							Cross-Section 15 (Riffle) Station 156+20, T1A						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	847.35							943.60							938.93						
Bankfull Width (ft)	24.9							5.4							5.8						
Floodprone Width (ft)	67.7							54.4							44.5						
Bankfull Mean Depth (ft)	1.6							0.3							0.4						
Bankfull Max Depth (ft)	2.6							0.7							0.7						
Cross-Sectional Area (ft2) based on AB BKF area	38.7							1.8							2.3						
Cross-Sectional Area (ft2) based on AB BKF elevation	38.7							1.8							2.3						
Bankfull Width/Depth Ratio	16.0							15.9							14.1						
Bankfull Entrenchment Ratio	2.7							10.1							7.7						
Bankfull Bank Height Ratio	1.0							1.0							1.0						
d50 (mm)	21							24							16						
	Cross-Section 16 (Riffle) Station 104+80, T1							Cross-Section 17 (Pool) Station 105+10, T1							Cross-Section 18 (Riffle) Station 206+60, T2						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	929.17							928.37							923.36						
Bankfull Width (ft)	6.5							8.7							4.7						
Floodprone Width (ft)	48.4							---							24.1						
Bankfull Mean Depth (ft)	0.6							1.0							0.5						
Bankfull Max Depth (ft)	1.2							2.3							0.9						
Cross-Sectional Area (ft2) based on AB BKF area	3.9							8.3							2.3						
Cross-Sectional Area (ft2) based on AB BKF elevation	3.9							8.3							2.3						
Bankfull Width/Depth Ratio	10.9							---							9.9						
Bankfull Entrenchment Ratio	7.5							---							5.1						
Bankfull Bank Height Ratio	1.0							---							1.0						
d50 (mm)	22							---							6.4						

Table 8. Cross Section Dimensional Morphology Summary
Mill Dam Creek Restoration Site, DMS Project #97136

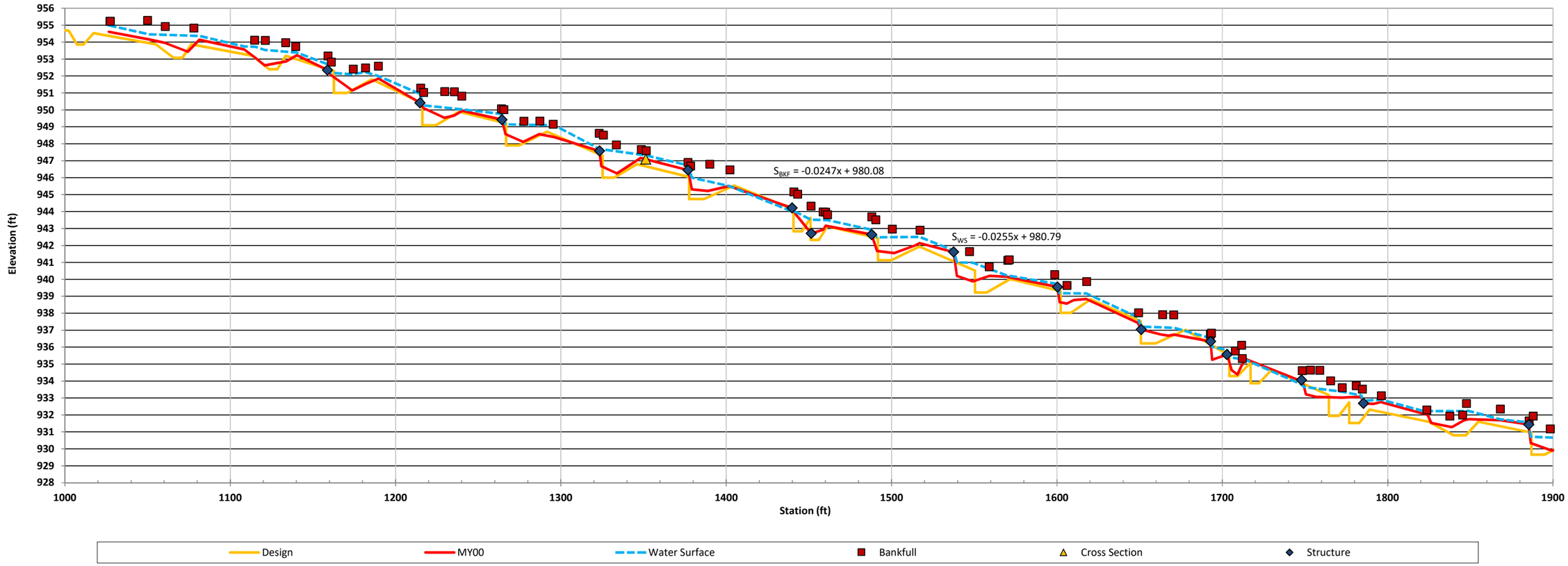
Dimension and Substrate	Cross-Section 19 (Pool) Station 206+80, T2							Cross-Section 20 (Riffle) Station 302+80, T3							Cross-Section 21 (Pool) Station 303+30 T3						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	922.57							917.69							916.64						
Bankfull Width (ft)	6.7							4.7							7.8						
Floodprone Width (ft)	---							19.2							---						
Bankfull Mean Depth (ft)	0.8							0.4							1.0						
Bankfull Max Depth (ft)	1.7							0.7							1.9						
Cross-Sectional Area (ft2) based on AB BKF area	5.6							1.9							7.7						
Cross-Sectional Area (ft2) based on AB BKF elevation	5.6							1.9							7.7						
Bankfull Width/Depth Ratio	---							11.6							---						
Bankfull Entrenchment Ratio	---							4.1							---						
Bankfull Bank Height Ratio	---							1.0							---						
d50 (mm)	---							28							---						
	Cross-Section 22 (Riffle) Station 400+90, T4							Cross-Section 23 (Riffle) Station 651+25, T6A							Cross-Section 24 (Riffle) Station 608+15, T6						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	906.18							894.33							877.88						
Bankfull Width (ft)	4.0							4.4							5.6						
Floodprone Width (ft)	18.7							25.3							27.4						
Bankfull Mean Depth (ft)	0.5							0.4							0.5						
Bankfull Max Depth (ft)	0.8							0.6							1.0						
Cross-Sectional Area (ft2) based on AB BKF area	1.9							1.7							2.6						
Cross-Sectional Area (ft2) based on AB BKF elevation	1.9							1.7							2.6						
Bankfull Width/Depth Ratio	8.3							11.0							11.9						
Bankfull Entrenchment Ratio	4.7							5.8							4.9						
Bankfull Bank Height Ratio	1.0							1.0							1.0						
d50 (mm)	15							36							38						
	Cross-Section 25 (Pool) Station 608+40, T6							Cross-Section 26 (Pool) Station 703+40, T7							Cross-Section 27 (Riffle) Station 703+70, T7						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	877.58							868.21							867.54						
Bankfull Width (ft)	8.4							7.2							10.1						
Floodprone Width (ft)	---							---							47.4						
Bankfull Mean Depth (ft)	0.6							0.6							0.4						
Bankfull Max Depth (ft)	1.1							1.2							1.0						
Cross-Sectional Area (ft2) based on AB BKF area	5.1							4.6							4.3						
Cross-Sectional Area (ft2) based on AB BKF elevation	5.1							4.6							4.3						
Bankfull Width/Depth Ratio	---							---							23.9						
Bankfull Entrenchment Ratio	---							---							4.7						
Bankfull Bank Height Ratio	---							---							1.0						
d50 (mm)	---							---							17						

Table 8. Cross Section Dimensional Morphology Summary
Mill Dam Creek Restoration Site, DMS Project #97136

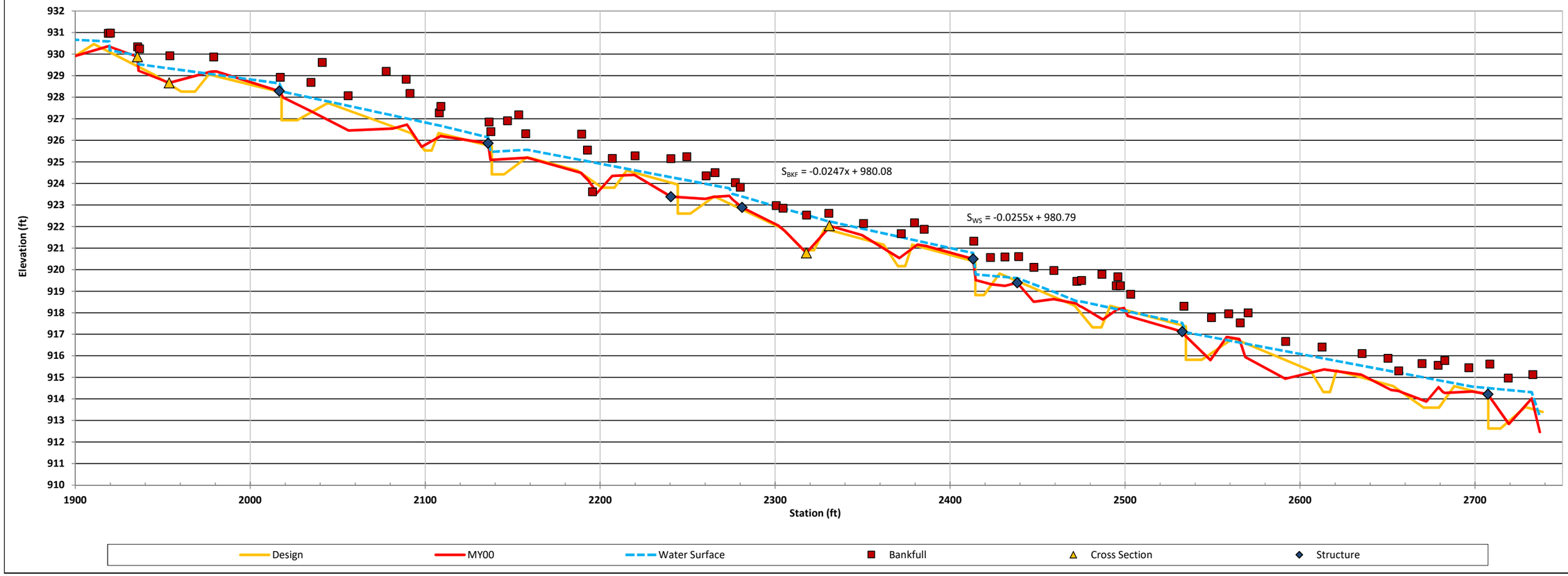
Dimension and Substrate	Cross-Section 28 (Riffle) Station 900+80, T9							Cross-Section 29 (Riffle) Station 806+10, T8							Cross-Section 30 (Riffle) Station 807+45, T8						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	853.02							849.83							842.84						
Bankfull Width (ft)	4.1							5.5							5.7						
Floodprone Width (ft)	29.6							34.8							43.4						
Bankfull Mean Depth (ft)	0.7							0.6							0.6						
Bankfull Max Depth (ft)	0.9							1.0							1.0						
Cross-Sectional Area (ft2) based on AB BKF area	2.8							3.4							3.2						
Cross-Sectional Area (ft2) based on AB BKF elevation	2.8							3.4							3.2						
Bankfull Width/Depth Ratio	6.0							9.1							10.1						
Bankfull Entrenchment Ratio	7.2							6.3							7.6						
Bankfull Bank Height Ratio	1.0							1.0							1.0						
d50 (mm)	42							36							37						

	Cross-Section 31 (Riffle) Station 850+60, T8A							Cross-Section 32 (Riffle) Station 851+75, T8A						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	850.81							845.75						
Bankfull Width (ft)	4.7							6.6						
Floodprone Width (ft)	21.6							67.9						
Bankfull Mean Depth (ft)	0.5							0.4						
Bankfull Max Depth (ft)	1.1							0.9						
Cross-Sectional Area (ft2) based on AB BKF area	2.6							2.9						
Cross-Sectional Area (ft2) based on AB BKF elevation	2.6							2.9						
Bankfull Width/Depth Ratio	8.6							15.2						
Bankfull Entrenchment Ratio	4.6							10.3						
Bankfull Bank Height Ratio	1.0							1.0						
d50 (mm)	54							10						

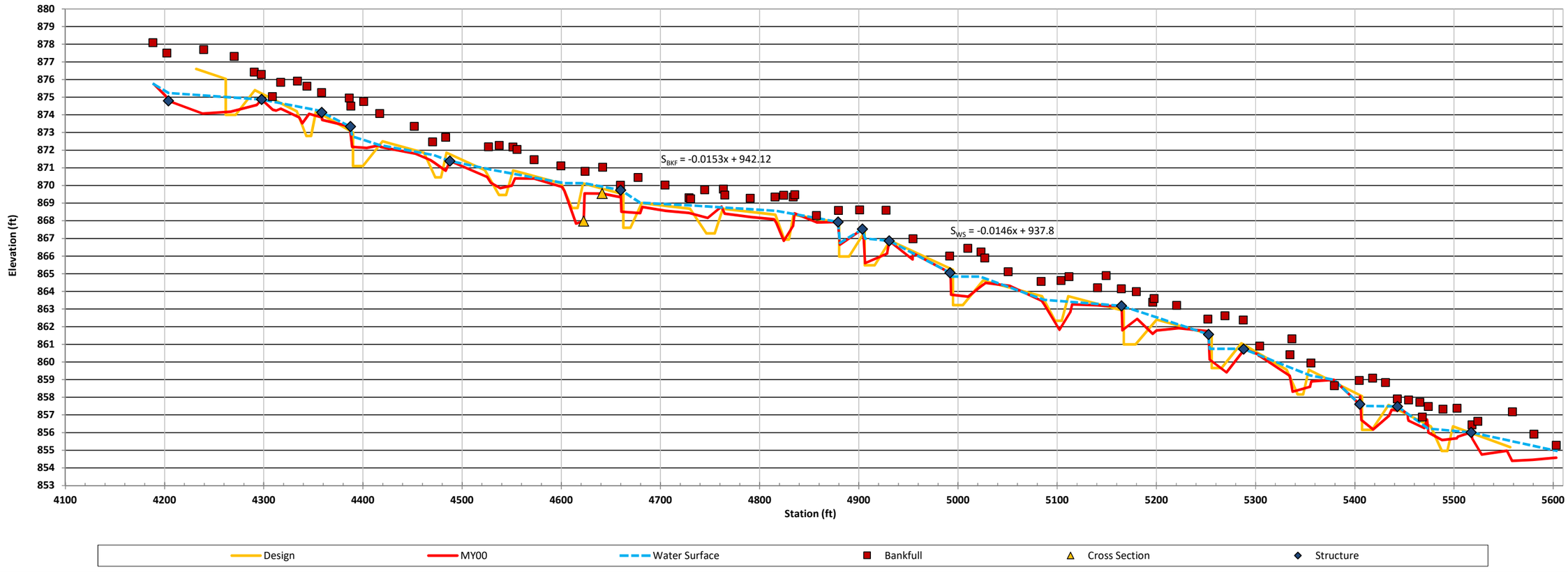
Longitudinal Profile
Mill Dam Creek - UTHC-1
Monitoring Year 00, 2020



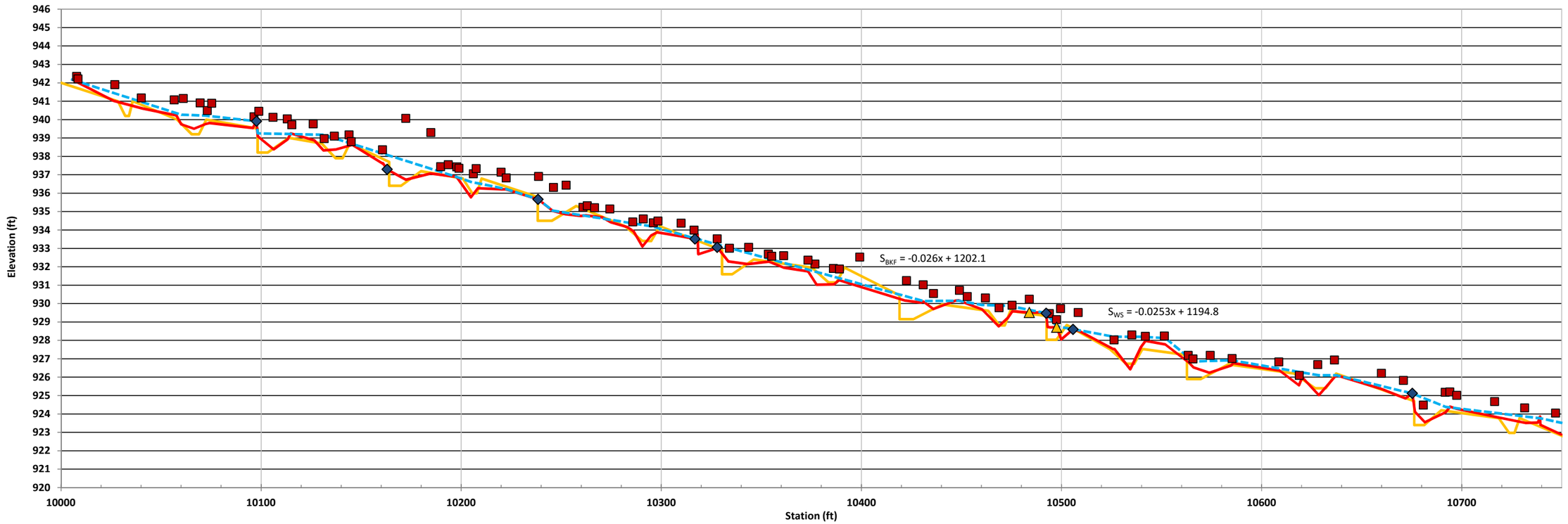
Longitudinal Profile
Mill Dam Creek - UTHC-1
Monitoring Year 00, 2020



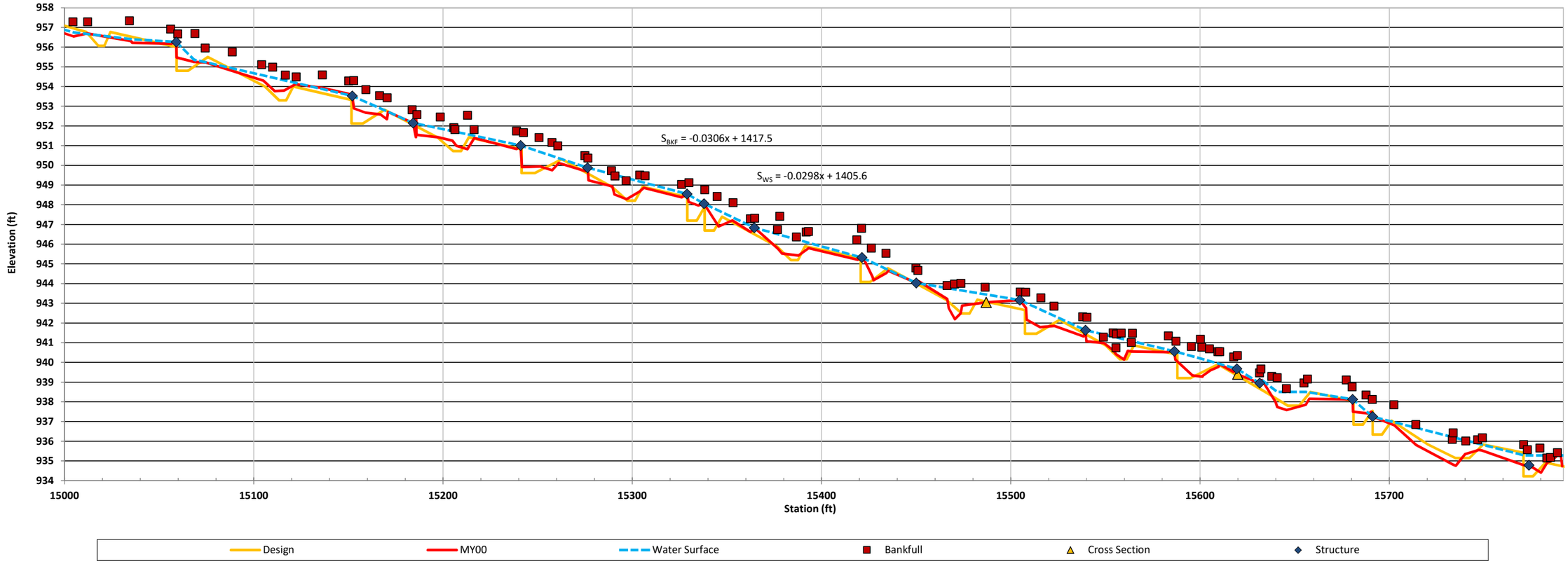
Longitudinal Profile
Mill Dam Creek - UTHC-3
Monitoring Year 00, 2020



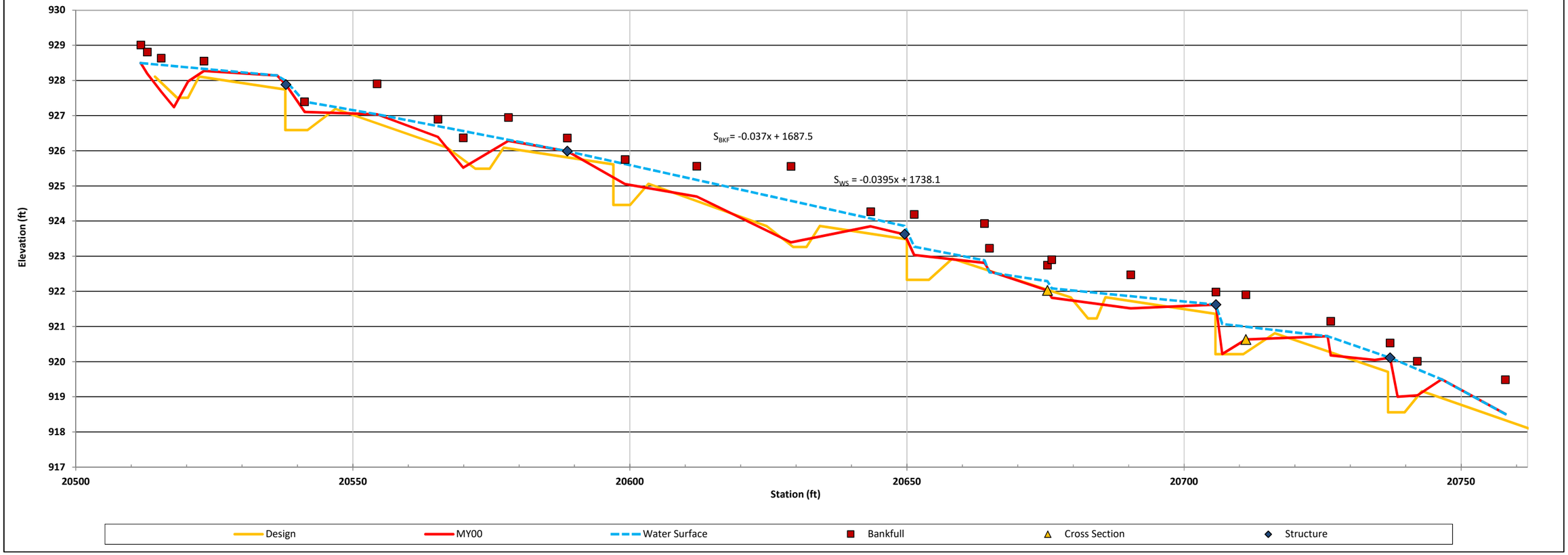
Longitudinal Profile
Mill Dam Creek - T1
Monitoring Year 00, 2020



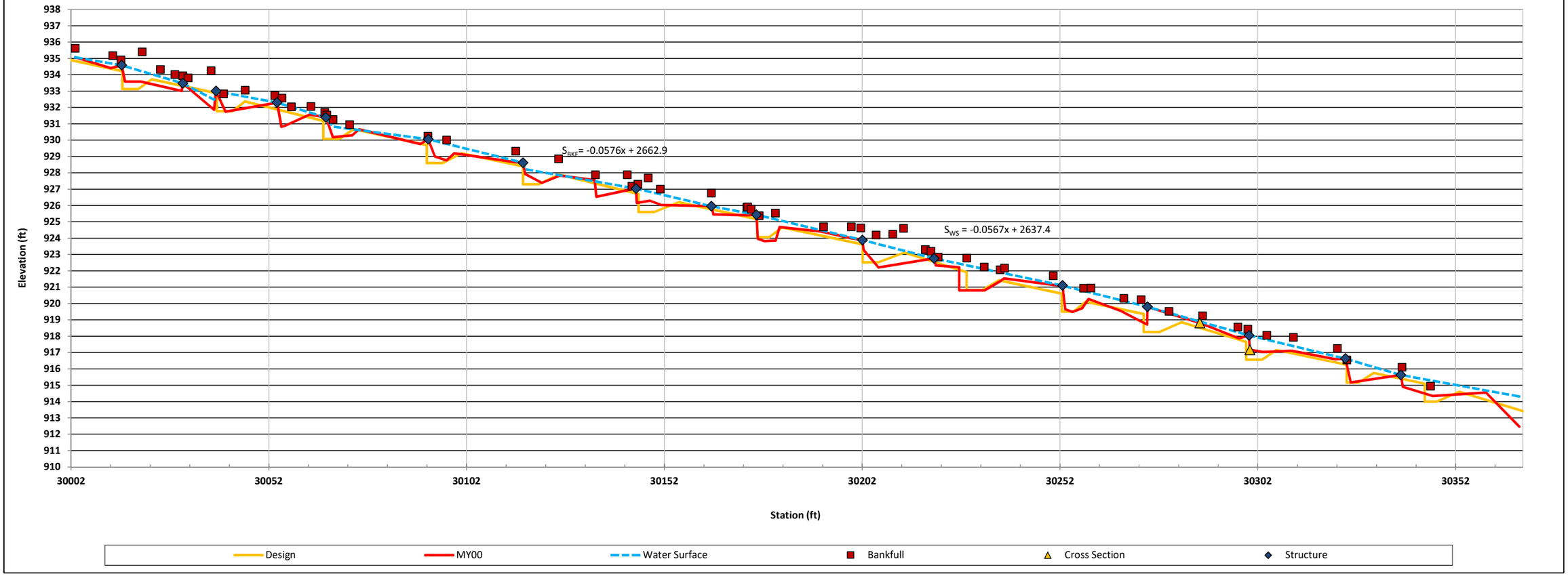
Longitudinal Profile
Mill Dam Creek - T1-A
Monitoring Year 00, 2020



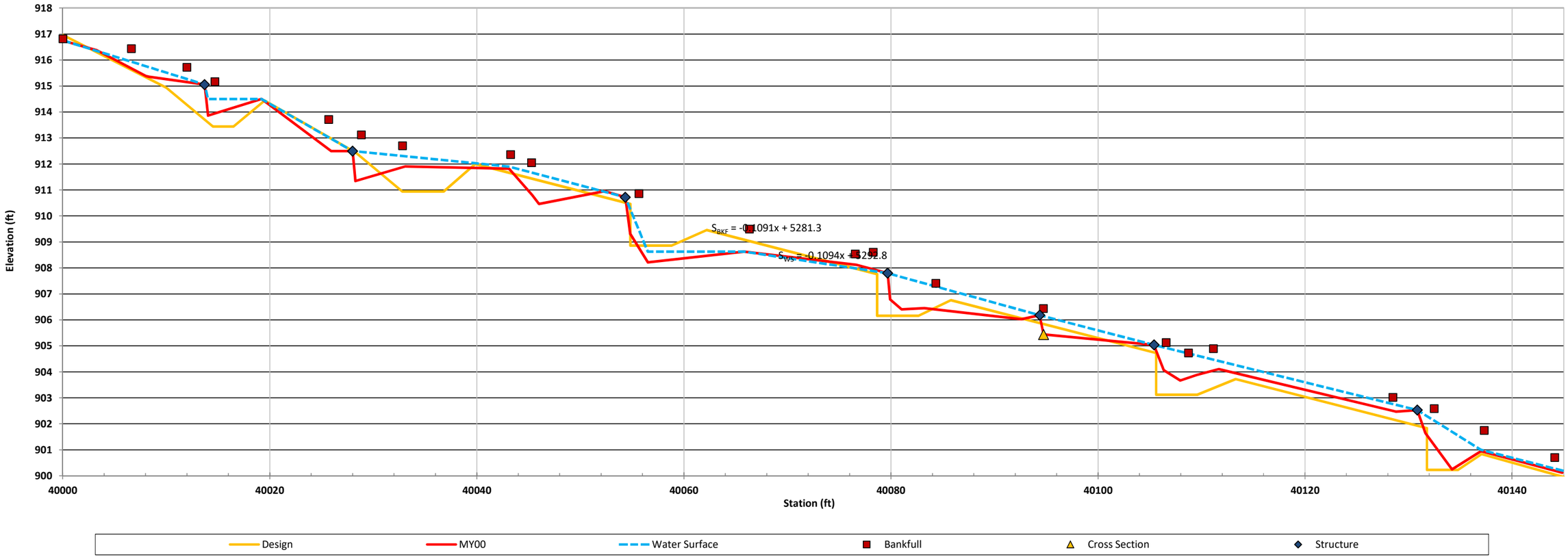
Longitudinal Profile
Mill Dam Creek- T2
Monitoring Year 00, 2020



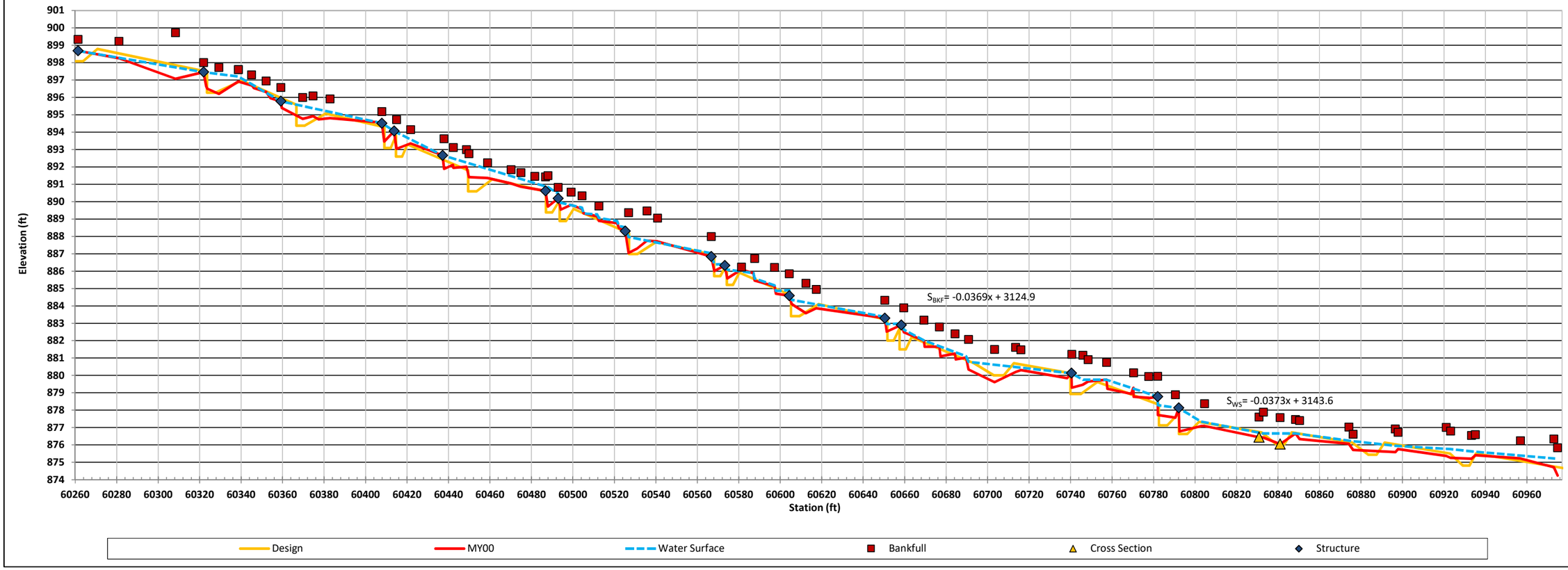
Longitudinal Profile
Mill Dam Creek- T3
Monitoring Year 00, 2020



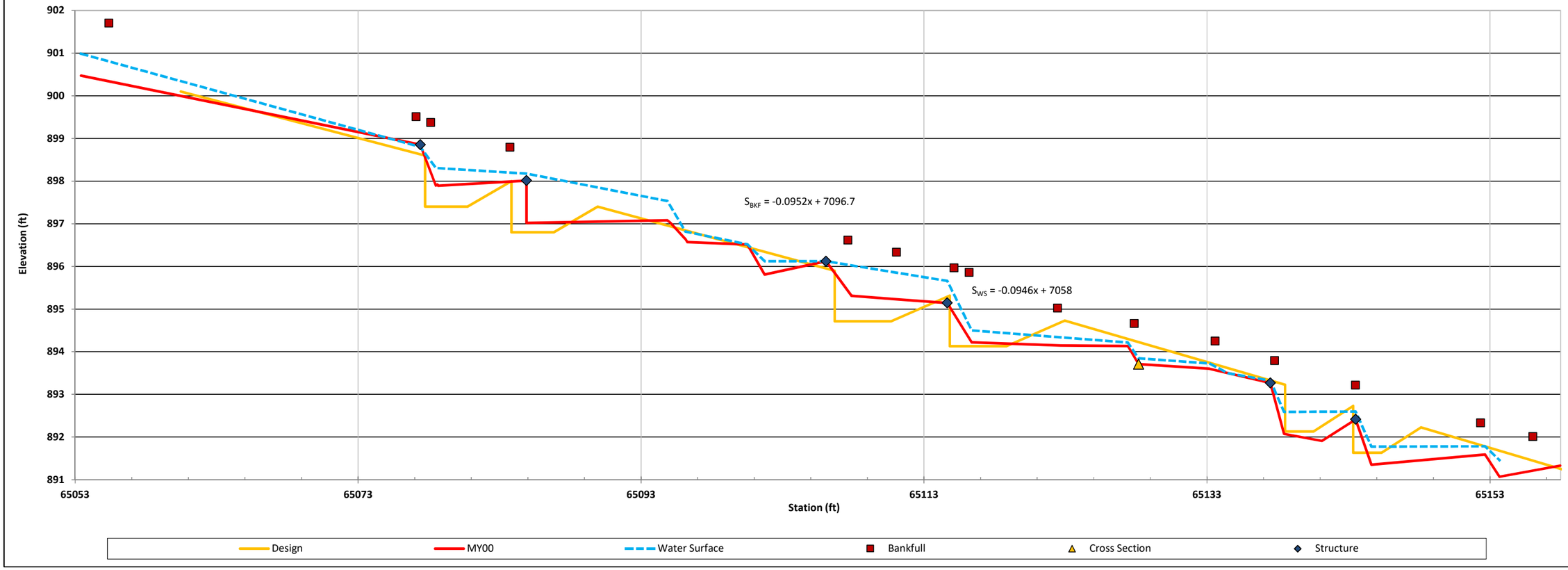
Longitudinal Profile
Mill Dam Creek - T4
Monitoring Year 00, 2020



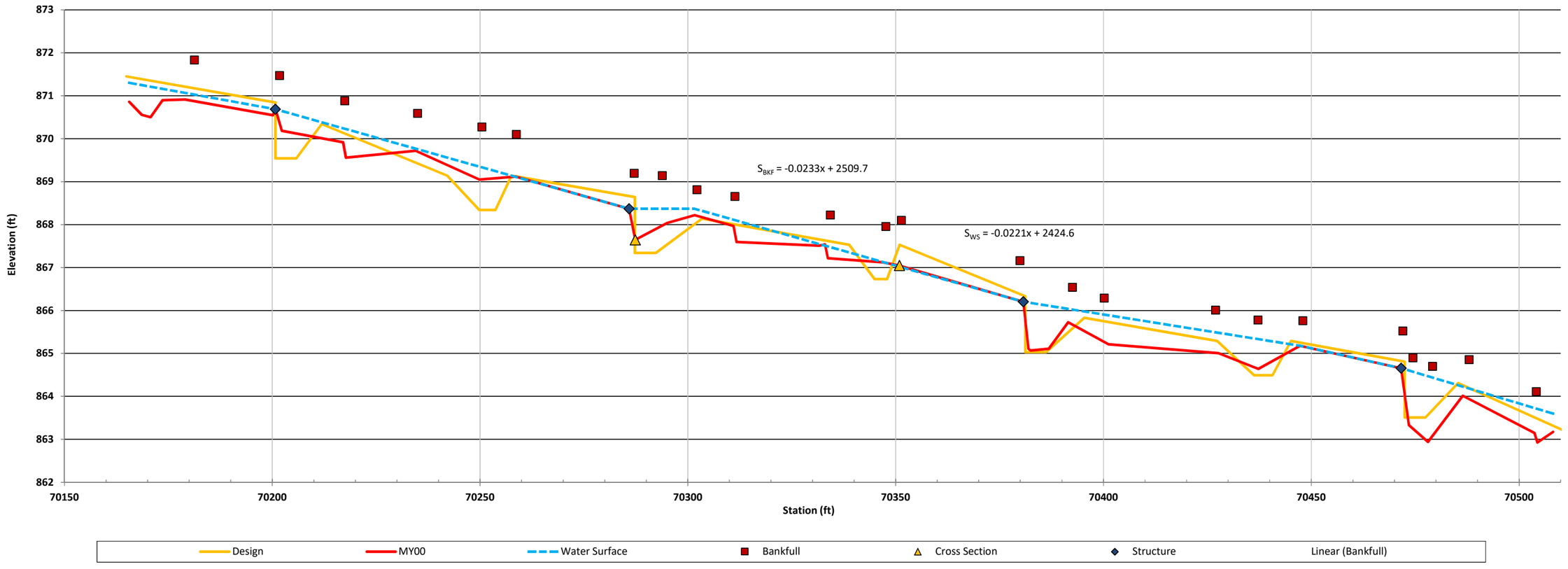
Longitudinal Profile
Mill Dam Creek - T6
Monitoring Year 00, 2020



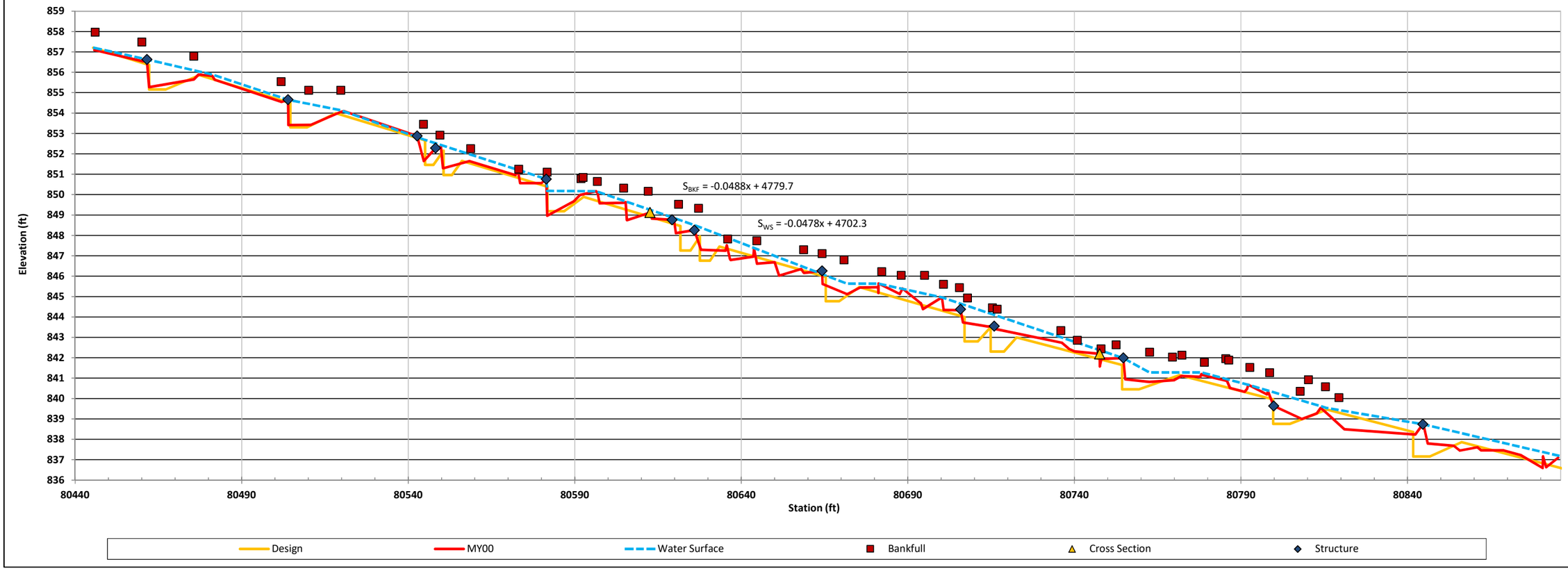
Longitudinal Profile
Mill Dam Creek - T6-A
Monitoring Year 00, 2020



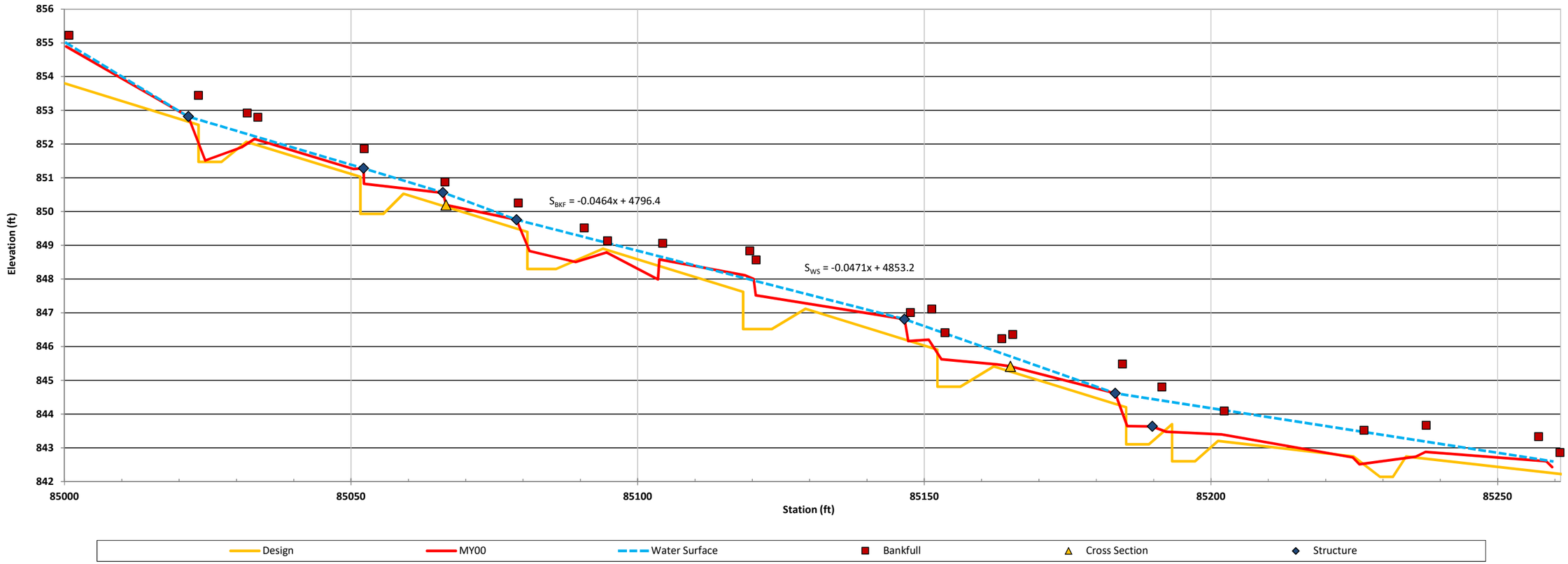
Longitudinal Profile
Mill Dam Creek - T7
Monitoring Year 00, 2020



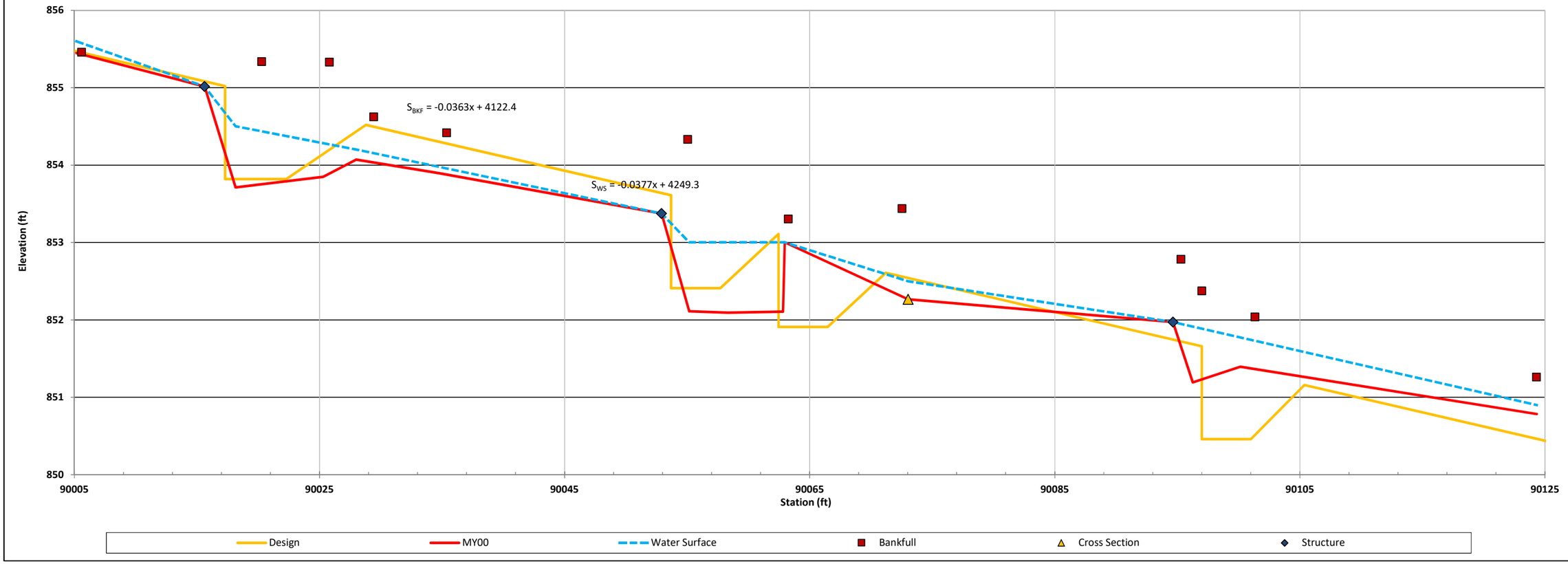
Longitudinal Profile
Mill Dam Creek - T8
Monitoring Year 00, 2020



Longitudinal Profile
Mill Dam Creek - T8-A
Monitoring Year 00, 2020



Longitudinal Profile
Mill Dam Creek - T9
Monitoring Year 00, 2020

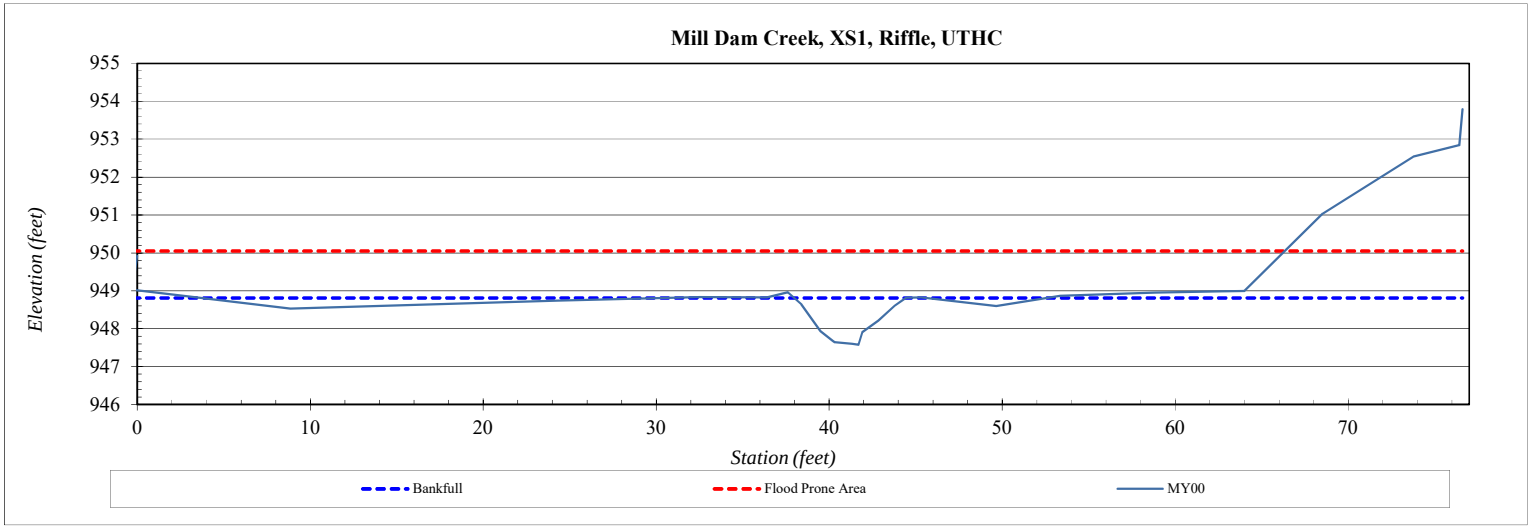


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS1
Drainage Area (sq mi):	0.18
Date:	1/29/2020
Field Crew:	TS, KB

Station	Elevation
0.0	949.92
-0.3	949.03
8.9	948.53
24.3	948.73
32.5	948.83
36.4	948.82
37.6	948.95
38.4	948.64
39.5	947.94
40.2	947.69
40.3	947.64
41.3	947.60
41.7	947.58
41.9	947.91
42.8	948.22
43.8	948.61
44.4	948.81
45.3	948.82
49.7	948.59
53.4	948.87
58.8	948.95
62.7	948.98
64.0	948.99
68.5	951.04
73.8	952.54
76.4	952.84
76.6	953.79

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	948.81
Bankfull Cross-Sectional Area:	4.5
Total Cross-Sectional Area:	4.5
Bankfull Width:	6.0
Flood Prone Area Elevation:	950.05
Flood Prone Width:	66.3
Max Depth at Bankfull:	1.2
Mean Depth at Bankfull:	0.7
W / D Ratio:	8.2
Entrenchment Ratio:	11.0
Bank Height Ratio:	1.0
Thalweg Elevation:	947.58

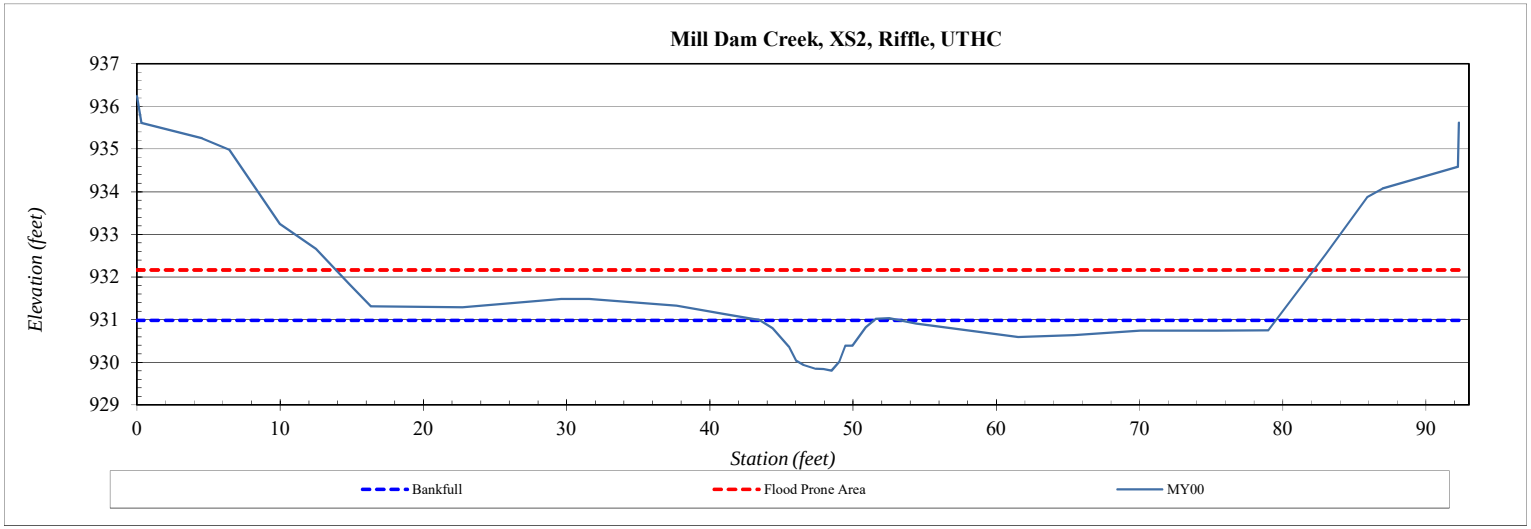


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS2
Drainage Area (sq mi):	0.18
Date:	1/29/2020
Field Crew:	TS, KB

Station	Elevation
0.0	936.24
0.3	935.61
4.6	935.25
6.5	934.99
10.0	933.24
12.5	932.66
14.8	931.83
16.3	931.31
22.7	931.29
29.6	931.48
31.6	931.49
37.7	931.32
41.1	931.12
43.5	930.99
44.4	930.80
45.5	930.36
46.0	930.04
46.6	929.93
47.4	929.85
47.9	929.84
48.5	929.81
49.0	930.01
49.5	930.39
49.9	930.39
50.9	930.82
51.6	931.01
52.5	931.03
54.4	930.91
61.5	930.59
65.4	930.63
70.0	930.74
75.4	930.74
79.0	930.75
83.0	932.53
85.9	933.88
87.0	934.07

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	930.99
Bankfull Cross-Sectional Area:	5.3
Total Cross-Sectional Area:	5.3
Bankfull Width:	8.0
Flood Prone Area Elevation:	932.17
Flood Prone Width:	68.3
Max Depth at Bankfull:	1.2
Mean Depth at Bankfull:	0.7
W / D Ratio:	12.1
Entrenchment Ratio:	8.6
Bank Height Ratio:	1.0
Thalweg Elevation:	929.81

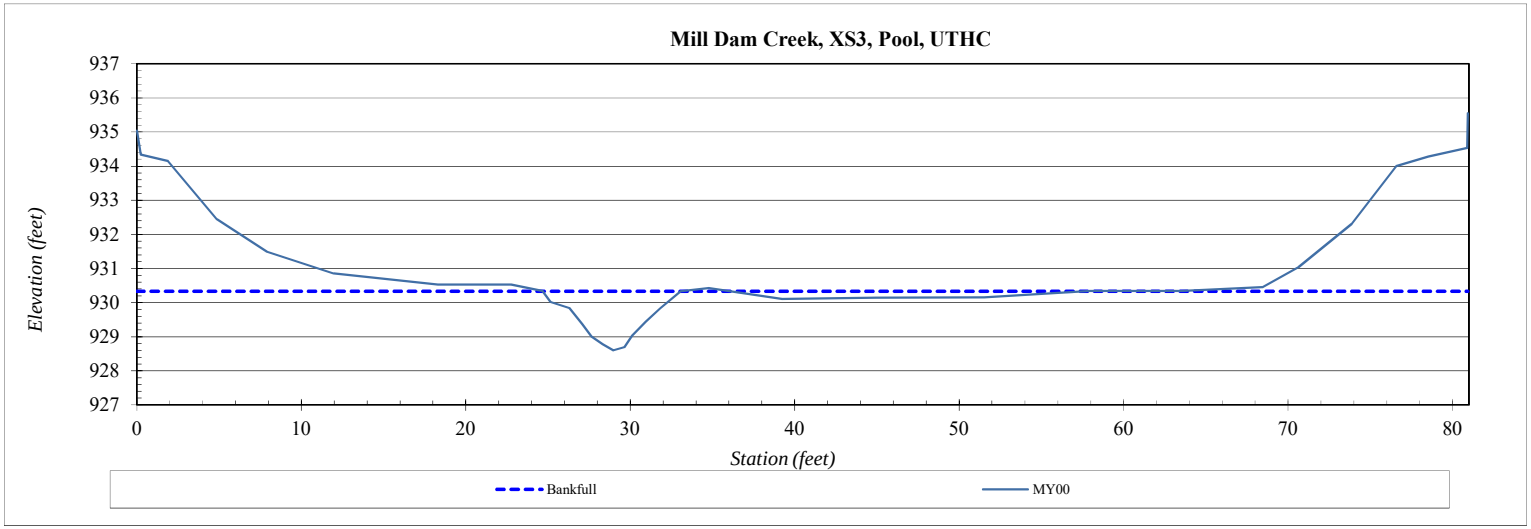


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS3
Drainage Area (sq mi):	0.18
Date:	1/29/2020
Field Crew:	TS, KB

Station	Elevation
0.0	935.04
0.2	934.33
1.9	934.15
4.8	932.45
7.9	931.49
11.9	930.86
18.3	930.53
22.8	930.53
24.7	930.34
25.2	930.02
26.3	929.85
27.1	929.38
27.7	929.00
28.3	928.78
29.0	928.60
29.7	928.70
30.1	929.04
30.9	929.44
31.8	929.83
33.1	930.33
34.8	930.42
39.2	930.10
45.0	930.14
51.5	930.15
58.0	930.34
63.5	930.34
68.4	930.45
70.6	931.04
73.9	932.31
76.6	933.99
78.5	934.28
80.9	934.53
80.9	935.55

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	930.33
Bankfull Cross-Sectional Area:	7.4
Total Cross-Sectional Area:	7.4
Bankfull Width:	8.4
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.7
Mean Depth at Bankfull:	0.9
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	928.60

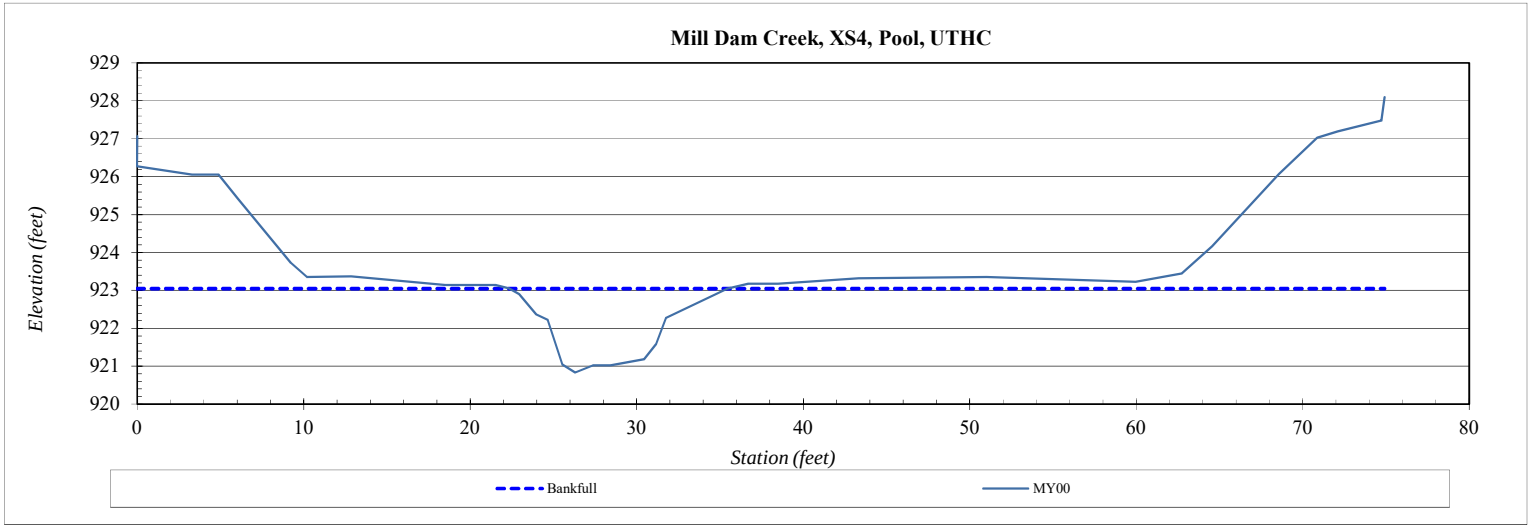


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS4
Drainage Area (sq mi):	0.18
Date:	1/17/2020
Field Crew:	TS, KB

Station	Elevation
0.0	927.07
0.0	926.27
3.3	926.05
4.9	926.06
6.1	925.41
9.2	923.72
10.2	923.35
12.8	923.37
18.5	923.14
21.5	923.14
22.4	923.05
22.9	922.91
24.0	922.37
24.7	922.23
25.5	921.05
26.3	920.83
27.4	921.02
28.4	921.02
30.4	921.18
31.2	921.59
31.8	922.28
33.0	922.54
35.4	923.04
36.7	923.17
38.5	923.17
43.3	923.31
51.0	923.35
60.0	923.23
62.7	923.45
64.6	924.16
68.6	926.07
70.9	927.02
72.1	927.19
74.7	927.48
74.9	928.10

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	923.05
Bankfull Cross-Sectional Area:	15.4
Total Cross-Sectional Area:	15.4
Bankfull Width:	13.1
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	2.2
Mean Depth at Bankfull:	1.2
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	920.83

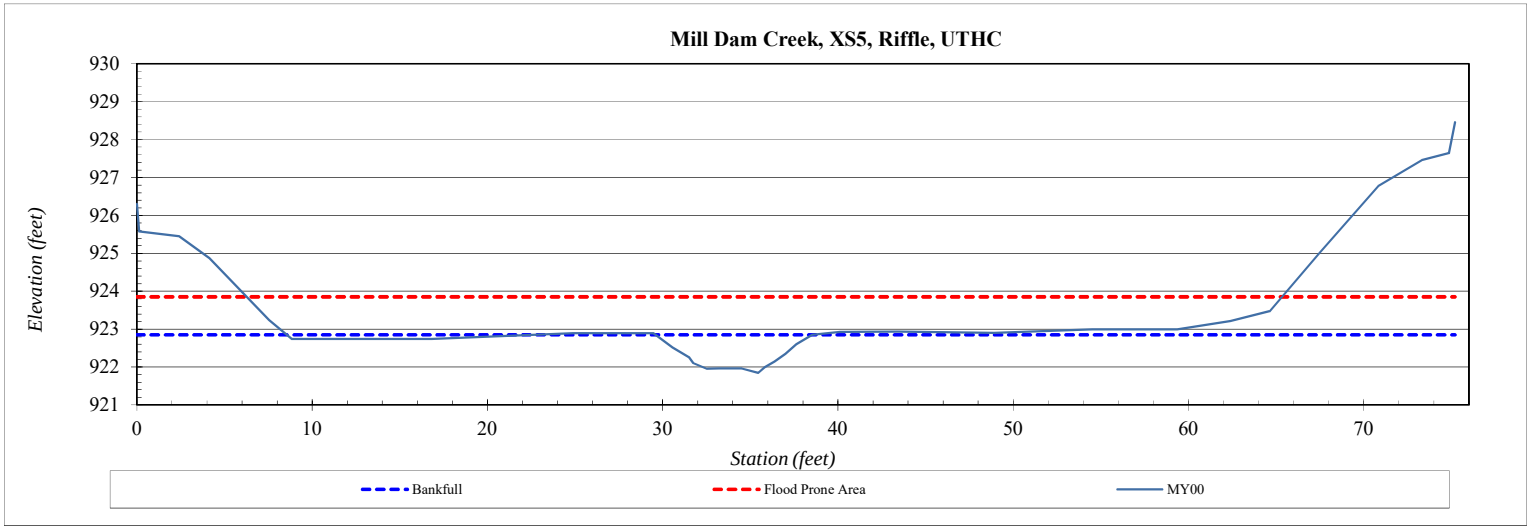


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS5
Drainage Area (sq mi):	0.18
Date:	1/17/2020
Field Crew:	TS, KB

Station	Elevation
0.0	926.30
0.1	925.57
2.4	925.45
4.1	924.87
7.5	923.23
8.9	922.74
11.3	922.73
16.8	922.74
24.9	922.89
28.2	922.89
29.5	922.89
30.6	922.52
31.5	922.25
31.8	922.11
32.5	921.95
33.2	921.96
34.1	921.96
34.5	921.96
35.5	921.85
35.8	922.00
36.4	922.14
37.0	922.35
37.6	922.61
38.5	922.85
40.1	922.93
43.4	922.93
48.9	922.90
54.5	923.00
59.4	922.99
62.4	923.21
64.6	923.47
67.5	925.03
70.9	926.78
73.3	927.46
74.9	927.65
75.2	928.46

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	922.85
Bankfull Cross-Sectional Area:	5.5
Total Cross-Sectional Area:	5.5
Bankfull Width:	8.9
Flood Prone Area Elevation:	923.85
Flood Prone Width:	59.1
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.6
W / D Ratio:	14.4
Entrenchment Ratio:	6.6
Bank Height Ratio:	1.0
Thalweg Elevation:	921.85

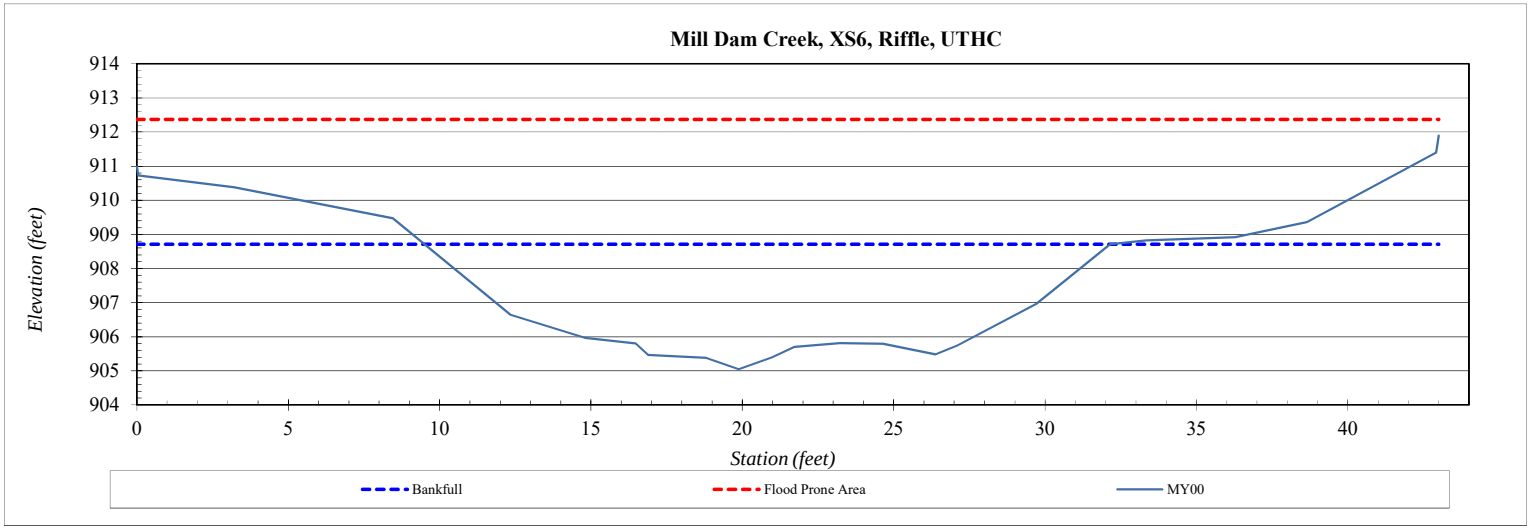


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS6
Drainage Area (sq mi):	0.22
Date:	4/15/2020
Field Crew:	TS, KB

Station	Elevation
0.0	910.98
0.0	910.73
3.2	910.38
8.5	909.47
12.3	906.65
14.8	905.96
16.5	905.80
16.9	905.46
18.8	905.38
19.9	905.05
21.0	905.40
21.7	905.69
23.2	905.81
24.6	905.79
26.4	905.48
27.1	905.74
29.7	906.97
32.1	908.71
33.3	908.82
36.3	908.91
38.6	909.36
42.9	911.40
43.0	911.90

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	908.71
Bankfull Cross-Sectional Area:	55.5
Total Cross-Sectional Area:	55.5
Bankfull Width:	22.6
Flood Prone Area Elevation:	912.37
Flood Prone Width:	43.0
Max Depth at Bankfull:	3.7
Mean Depth at Bankfull:	2.5
W / D Ratio:	9.2
Entrenchment Ratio:	1.9
Bank Height Ratio:	1.0
Thalweg Elevation:	905.05

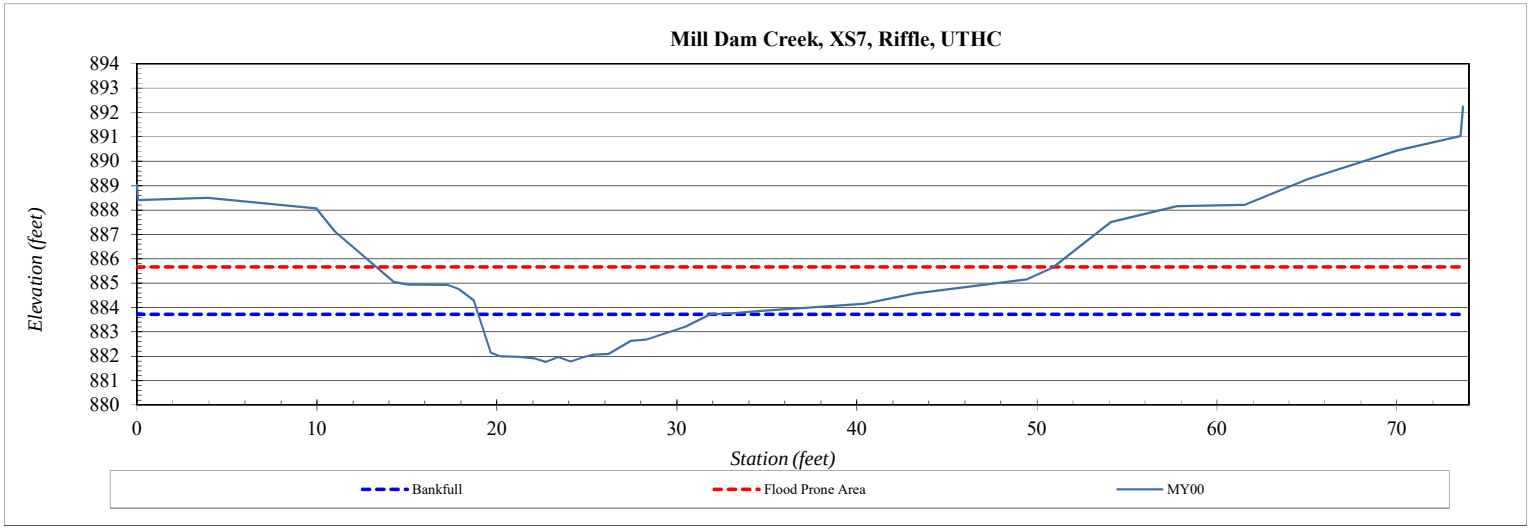


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS7
Drainage Area (sq mi):	0.22
Date:	1/30/2020
Field Crew:	TS, KB

Station	Elevation
0.0	889.02
0.1	888.41
3.9	888.50
10.0	888.07
11.0	887.10
14.3	885.05
15.1	884.94
17.3	884.92
17.9	884.75
18.7	884.29
19.7	882.15
20.2	882.00
21.3	881.97
22.1	881.90
22.7	881.77
23.4	881.97
24.1	881.78
24.8	881.96
25.4	882.06
26.2	882.08
27.4	882.63
28.3	882.67
30.5	883.22
31.8	883.72
33.0	883.76
34.5	883.85
40.4	884.15
43.2	884.56
49.4	885.15
50.9	885.64
54.1	887.49
57.8	888.16
61.5	888.21
65.1	889.27
70.0	890.44
73.5	891.03

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	883.72
Bankfull Cross-Sectional Area:	16.7
Total Cross-Sectional Area:	16.7
Bankfull Width:	12.9
Flood Prone Area Elevation:	885.67
Flood Prone Width:	37.6
Max Depth at Bankfull:	2.0
Mean Depth at Bankfull:	1.3
W / D Ratio:	9.9
Entrenchment Ratio:	2.9
Bank Height Ratio:	1.0
Thalweg Elevation:	881.77

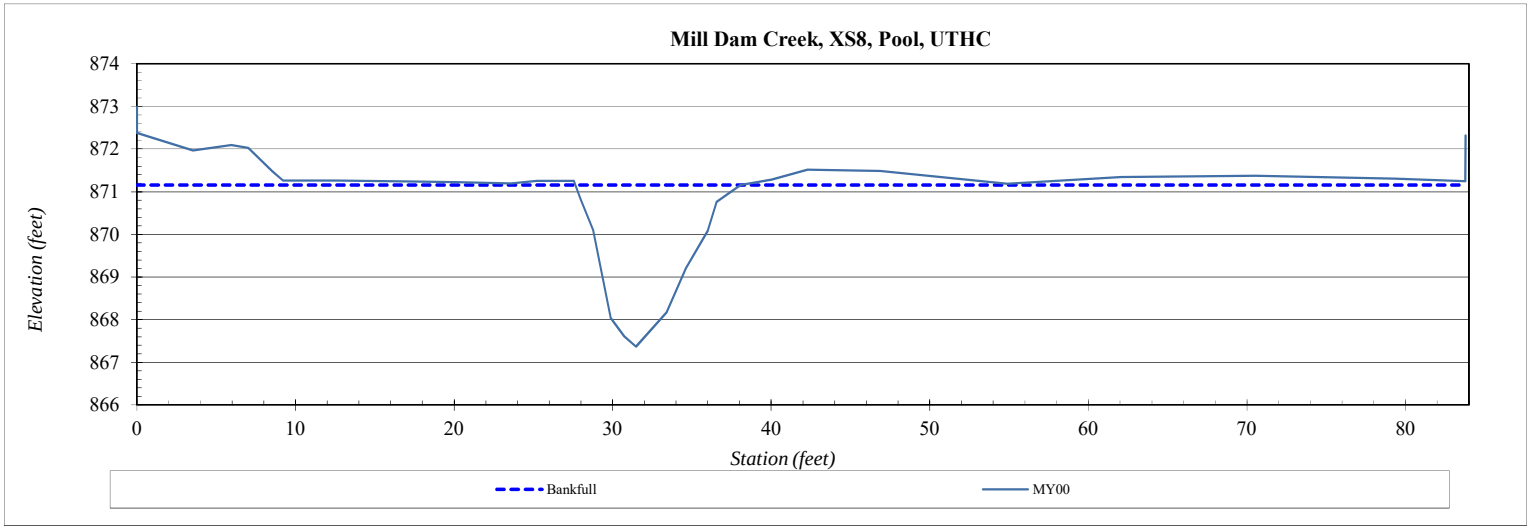


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS8
Drainage Area (sq mi):	1.07
Date:	1/30/2020
Field Crew:	TS, KB

Station	Elevation
0.0	872.99
0.0	872.38
3.5	871.97
6.0	872.10
7.0	872.03
8.5	871.48
9.2	871.26
12.6	871.26
17.4	871.24
20.1	871.22
23.6	871.19
25.2	871.25
27.6	871.26
28.0	870.83
28.8	870.11
29.9	868.04
30.7	867.62
31.5	867.37
33.4	868.17
34.6	869.21
36.0	870.08
36.6	870.77
38.0	871.16
40.0	871.28
42.3	871.52
46.9	871.48
54.9	871.19
62.1	871.35
70.6	871.37
79.3	871.30
83.8	871.24
83.8	872.32

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	871.16
Bankfull Cross-Sectional Area:	20.8
Total Cross-Sectional Area:	20.8
Bankfull Width:	10.4
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	3.8
Mean Depth at Bankfull:	2.0
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	867.37

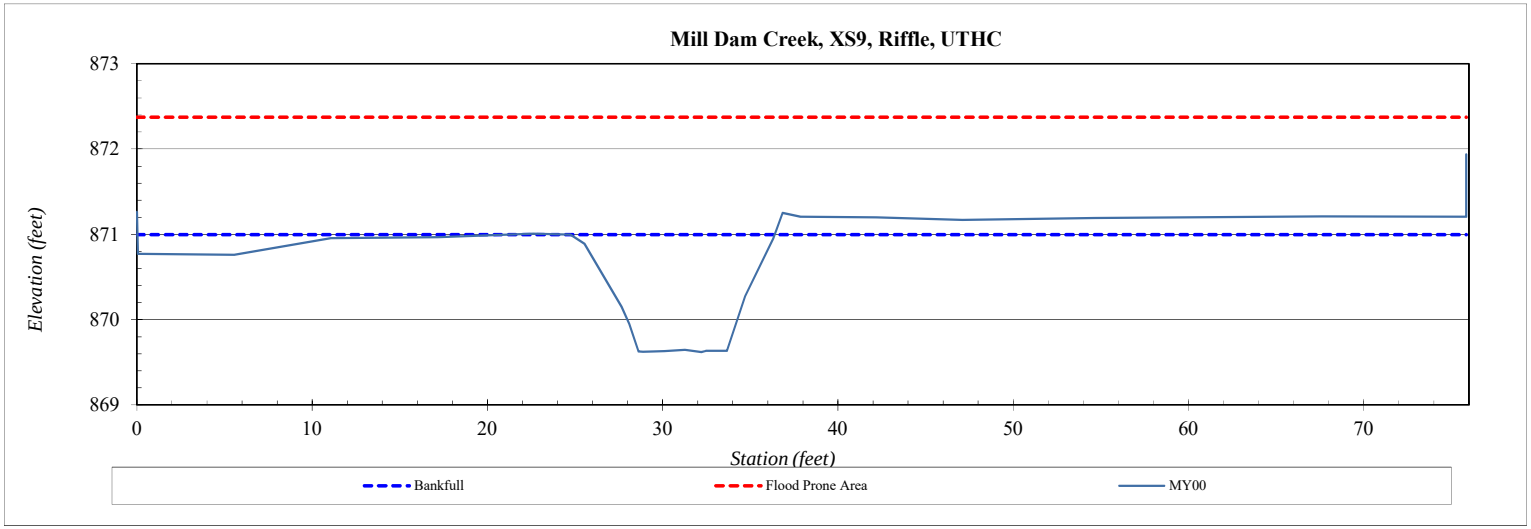


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS9
Drainage Area (sq mi):	0.46
Date:	1/30/2020
Field Crew:	TS, KB

Station	Elevation
0.0	871.26
0.1	870.77
5.6	870.76
11.1	870.96
17.2	870.97
22.6	871.01
24.8	871.00
25.5	870.89
27.7	870.15
28.1	869.95
28.6	869.63
28.9	869.62
29.5	869.63
30.1	869.63
31.3	869.65
32.2	869.62
32.5	869.63
33.7	869.63
34.7	870.28
36.3	870.95
36.8	871.25
37.9	871.20
42.2	871.20
47.1	871.17
54.7	871.19
62.5	871.20
67.6	871.21
75.8	871.21
75.8	871.94

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	871.00
Bankfull Cross-Sectional Area:	10.6
Total Cross-Sectional Area:	10.6
Bankfull Width:	10.9
Flood Prone Area Elevation:	872.37
Flood Prone Width:	75.8
Max Depth at Bankfull:	1.4
Mean Depth at Bankfull:	1.0
W / D Ratio:	11.1
Entrenchment Ratio:	7.0
Bank Height Ratio:	1.0
Thalweg Elevation:	869.62

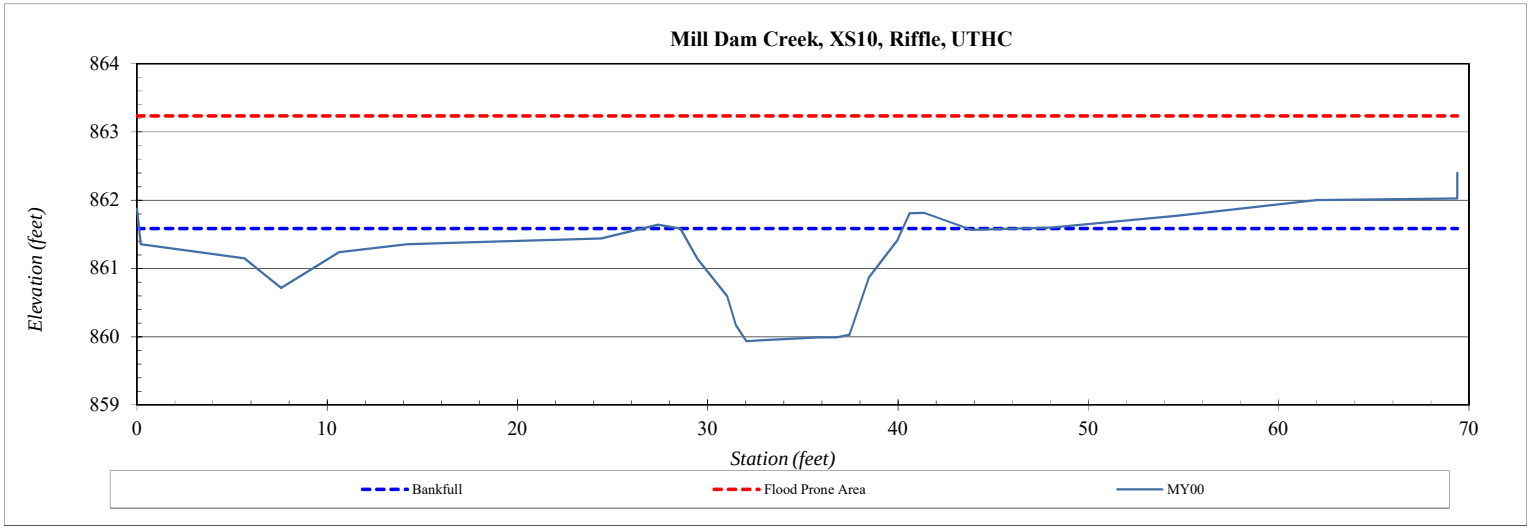


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS10
Drainage Area (sq mi):	0.46
Date:	1/30/2020
Field Crew:	TS, KB

Station	Elevation
0.0	861.88
0.2	861.35
5.7	861.15
7.6	860.72
10.6	861.24
14.2	861.35
18.6	861.39
24.4	861.44
27.4	861.64
28.6	861.59
29.5	861.14
31.0	860.59
31.5	860.17
32.0	859.93
33.1	859.95
34.5	859.97
35.8	859.99
36.8	859.99
37.5	860.02
38.5	860.87
40.0	861.41
40.6	861.81
41.4	861.81
43.9	861.57
48.0	861.60
54.7	861.77
62.0	862.00
69.4	862.03
69.4	862.40

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	861.59
Bankfull Cross-Sectional Area:	13.3
Total Cross-Sectional Area:	13.3
Bankfull Width:	11.7
Flood Prone Area Elevation:	863.24
Flood Prone Width:	69.4
Max Depth at Bankfull:	1.7
Mean Depth at Bankfull:	1.1
W / D Ratio:	10.2
Entrenchment Ratio:	5.9
Bank Height Ratio:	1.0
Thalweg Elevation:	859.93

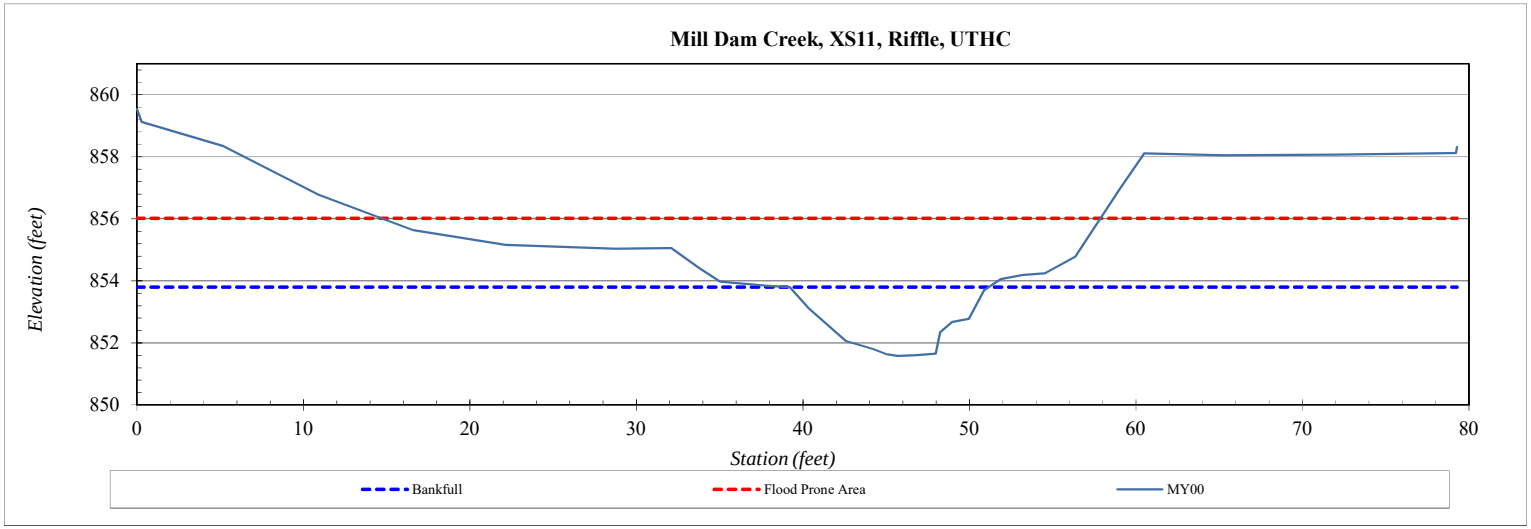


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS11
Drainage Area (sq mi):	0.46
Date:	4/15/2020
Field Crew:	TS, KB

Station	Elevation
0.0	859.54
0.3	859.12
5.2	858.34
10.9	856.77
16.6	855.63
22.1	855.16
28.7	855.03
32.1	855.06
33.8	854.40
35.1	853.97
37.9	853.84
39.2	853.80
40.4	853.11
42.6	852.06
43.2	851.97
44.2	851.80
45.1	851.63
45.7	851.58
46.7	851.59
48.0	851.65
48.2	852.34
49.0	852.67
50.0	852.77
50.9	853.70
51.9	854.05
53.2	854.18
54.5	854.24
56.4	854.79
59.0	856.96
60.5	858.11
65.2	858.05
72.0	858.07
79.2	858.12
79.3	858.32

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	853.80
Bankfull Cross-Sectional Area:	17.3
Total Cross-Sectional Area:	17.3
Bankfull Width:	11.9
Flood Prone Area Elevation:	856.02
Flood Prone Width:	43.2
Max Depth at Bankfull:	2.2
Mean Depth at Bankfull:	1.4
W / D Ratio:	8.2
Entrenchment Ratio:	3.6
Bank Height Ratio:	1.1
Thalweg Elevation:	851.58

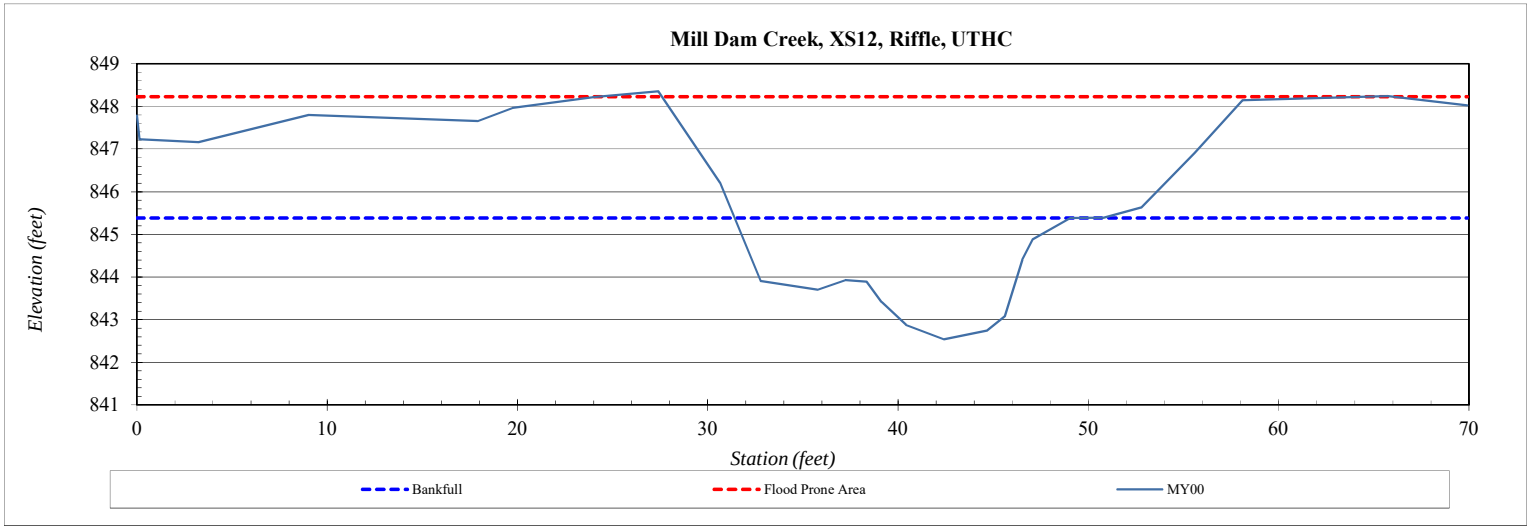


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS12
Drainage Area (sq mi):	0.61
Date:	4/15/2020
Field Crew:	TS, KB

Station	Elevation
0.0	847.79
0.1	847.23
3.2	847.16
9.0	847.80
17.9	847.66
19.7	847.97
24.0	848.22
27.4	848.35
30.6	846.21
32.8	843.91
35.8	843.70
37.2	843.93
38.4	843.89
39.1	843.41
40.4	842.87
42.4	842.54
44.7	842.74
45.6	843.08
46.5	844.40
47.1	844.89
49.0	845.38
50.8	845.39
52.8	845.63
55.6	846.91
58.1	848.14
65.7	848.24
69.9	848.02

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	845.38
Bankfull Cross-Sectional Area:	30.2
Total Cross-Sectional Area:	30.2
Bankfull Width:	17.6
Flood Prone Area Elevation:	848.23
Flood Prone Width:	30.7
Max Depth at Bankfull:	2.8
Mean Depth at Bankfull:	1.7
W / D Ratio:	10.3
Entrenchment Ratio:	1.7
Bank Height Ratio:	3.2
Thalweg Elevation:	842.54

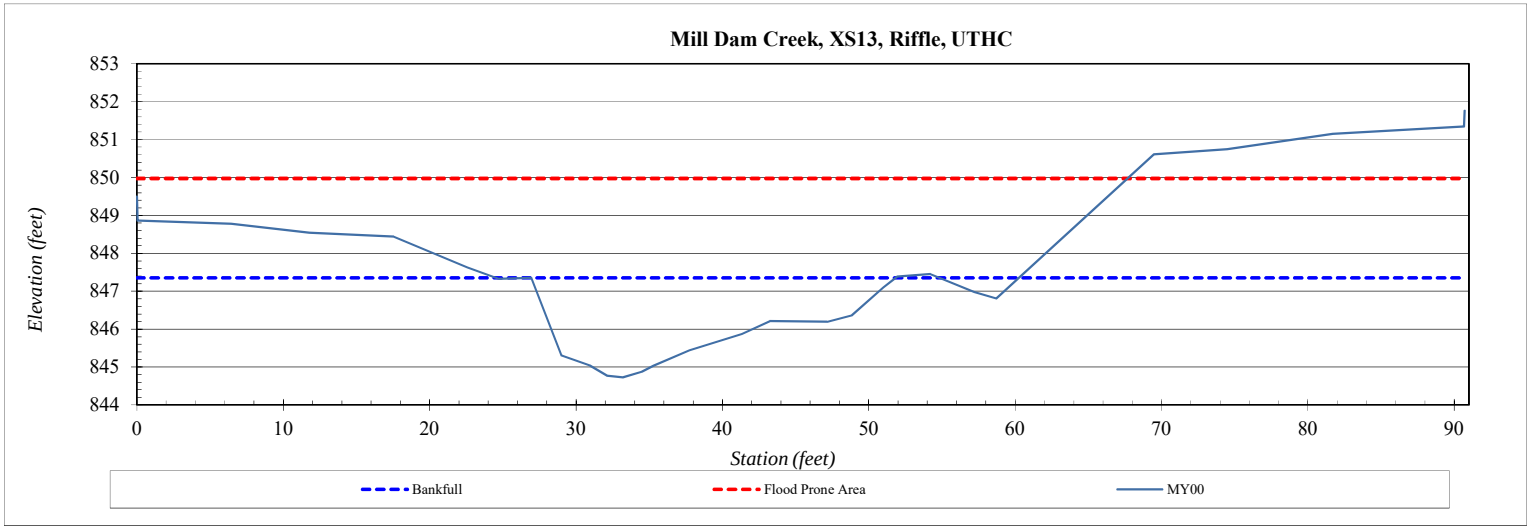


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS13
Drainage Area (sq mi):	0.04
Date:	4/15/2020
Field Crew:	TS, KB

Station	Elevation
0.0	849.49
0.0	848.86
6.4	848.78
11.8	848.54
17.6	848.44
22.6	847.63
24.7	847.33
26.9	847.35
29.0	845.31
30.9	845.05
32.2	844.77
33.2	844.73
34.5	844.88
35.3	845.04
37.7	845.45
41.3	845.88
43.2	846.21
47.2	846.20
48.8	846.36
51.0	847.09
51.9	847.39
54.2	847.45
57.2	846.98
58.7	846.81
69.5	850.61
74.5	850.74
81.7	851.15
90.7	851.34
90.7	851.76

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	847.35
Bankfull Cross-Sectional Area:	38.7
Total Cross-Sectional Area:	38.7
Bankfull Width:	24.9
Flood Prone Area Elevation:	849.98
Flood Prone Width:	67.7
Max Depth at Bankfull:	2.6
Mean Depth at Bankfull:	1.6
W / D Ratio:	16.0
Entrenchment Ratio:	2.7
Bank Height Ratio:	1.0
Thalweg Elevation:	844.73

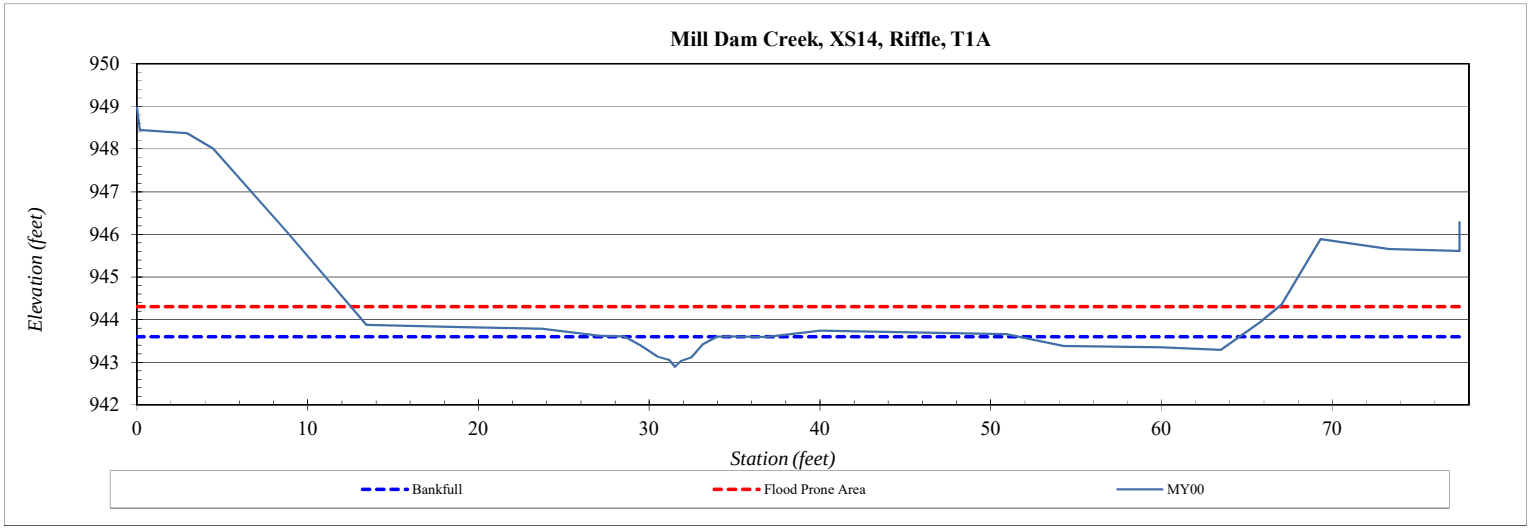


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS14
Drainage Area (sq mi):	0.04
Date:	1/29/2020
Field Crew:	TS, KB

Station	Elevation
0.0	948.98
0.2	948.44
2.9	948.37
4.5	948.01
8.9	946.01
13.5	943.87
19.0	943.83
23.7	943.78
27.1	943.62
28.6	943.60
29.5	943.39
30.5	943.13
31.2	943.06
31.5	942.89
31.9	943.04
32.5	943.12
33.1	943.43
33.9	943.60
34.8	943.60
36.8	943.59
40.0	943.74
43.9	943.71
50.9	943.66
54.3	943.38
57.1	943.37
59.9	943.35
63.5	943.29
65.8	943.94
67.1	944.36
69.3	945.88
73.3	945.65
77.5	945.61
77.5	946.29

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	943.60
Bankfull Cross-Sectional Area:	1.8
Total Cross-Sectional Area:	1.8
Bankfull Width:	5.4
Flood Prone Area Elevation:	944.31
Flood Prone Width:	54.4
Max Depth at Bankfull:	0.7
Mean Depth at Bankfull:	0.3
W / D Ratio:	15.9
Entrenchment Ratio:	10.1
Bank Height Ratio:	1.0
Thalweg Elevation:	942.89

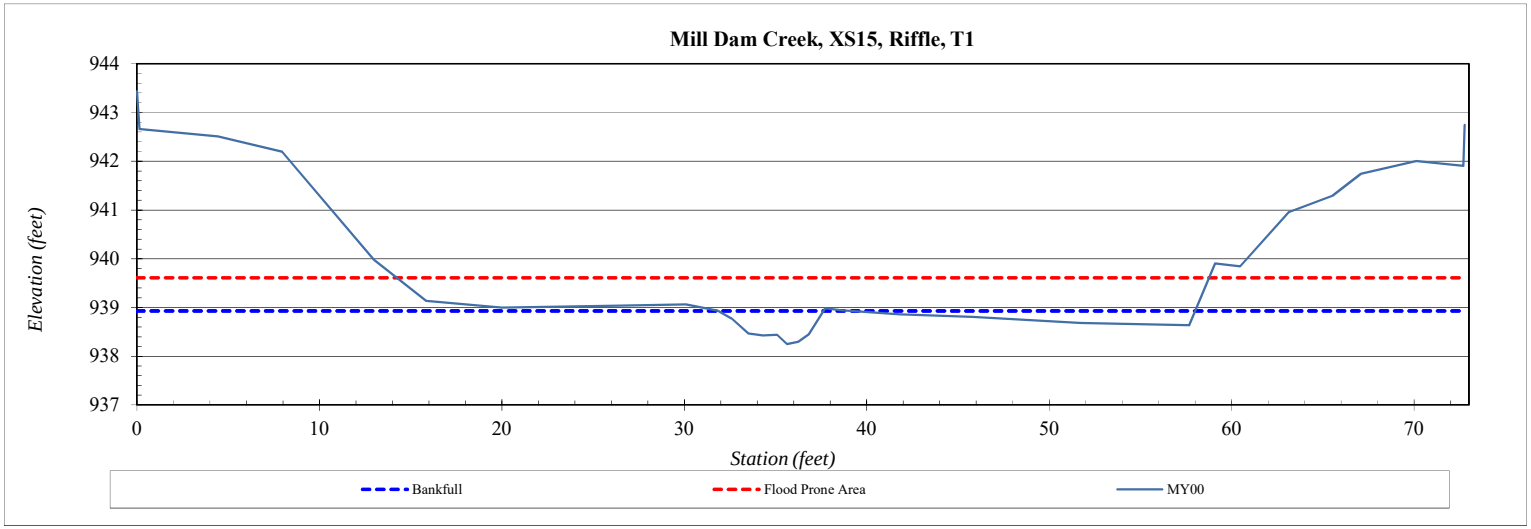


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS15
Drainage Area (sq mi):	0.07
Date:	1/29/2020
Field Crew:	TS, KB

Station	Elevation
0.0	943.44
0.2	942.66
4.4	942.51
8.0	942.20
13.0	939.98
15.9	939.14
20.0	938.99
26.3	939.04
30.1	939.06
31.9	938.93
32.6	938.77
33.5	938.47
34.3	938.43
35.1	938.43
35.6	938.25
36.2	938.29
36.8	938.45
37.7	938.99
38.5	938.94
41.8	938.86
45.8	938.80
51.7	938.68
57.7	938.63
59.1	939.90
60.4	939.84
63.1	940.96
65.5	941.29
67.1	941.74
70.1	942.00
72.7	941.90
72.8	942.74

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	938.93
Bankfull Cross-Sectional Area:	2.3
Total Cross-Sectional Area:	2.3
Bankfull Width:	5.8
Flood Prone Area Elevation:	939.61
Flood Prone Width:	44.5
Max Depth at Bankfull:	0.7
Mean Depth at Bankfull:	0.4
W / D Ratio:	14.1
Entrenchment Ratio:	7.7
Bank Height Ratio:	1.0
Thalweg Elevation:	938.25

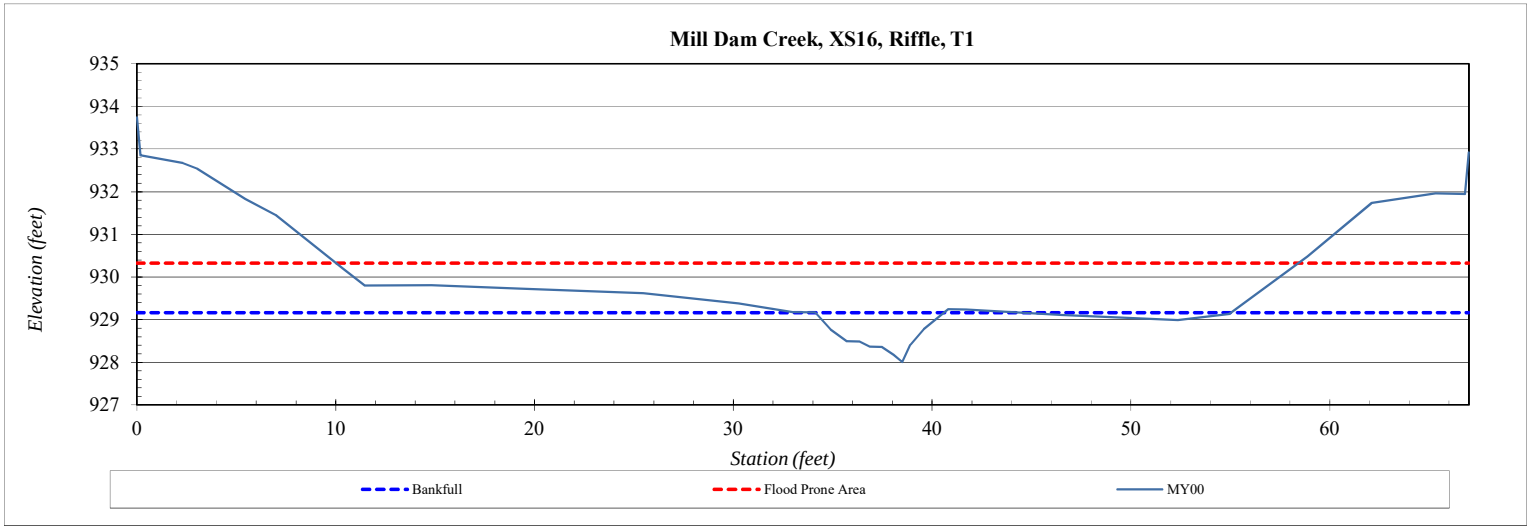


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS16
Drainage Area (sq mi):	0.07
Date:	1/29/2020
Field Crew:	TS, KB

Station	Elevation
0.0	933.74
0.2	932.86
2.3	932.67
3.0	932.54
5.4	931.84
7.0	931.46
10.4	930.19
11.5	929.80
14.8	929.80
19.4	929.73
25.5	929.62
30.3	929.38
33.0	929.17
34.1	929.17
34.9	928.77
35.7	928.49
36.4	928.48
36.9	928.36
37.5	928.36
38.1	928.18
38.5	928.01
38.9	928.41
39.6	928.77
40.8	929.24
41.7	929.23
46.5	929.11
52.4	928.99
54.9	929.13
58.9	930.48
62.1	931.73
65.3	931.96
66.8	931.95
67.0	932.92

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	929.17
Bankfull Cross-Sectional Area:	3.9
Total Cross-Sectional Area:	3.9
Bankfull Width:	6.5
Flood Prone Area Elevation:	930.33
Flood Prone Width:	48.4
Max Depth at Bankfull:	1.2
Mean Depth at Bankfull:	0.6
W / D Ratio:	10.9
Entrenchment Ratio:	7.5
Bank Height Ratio:	1.0
Thalweg Elevation:	928.01

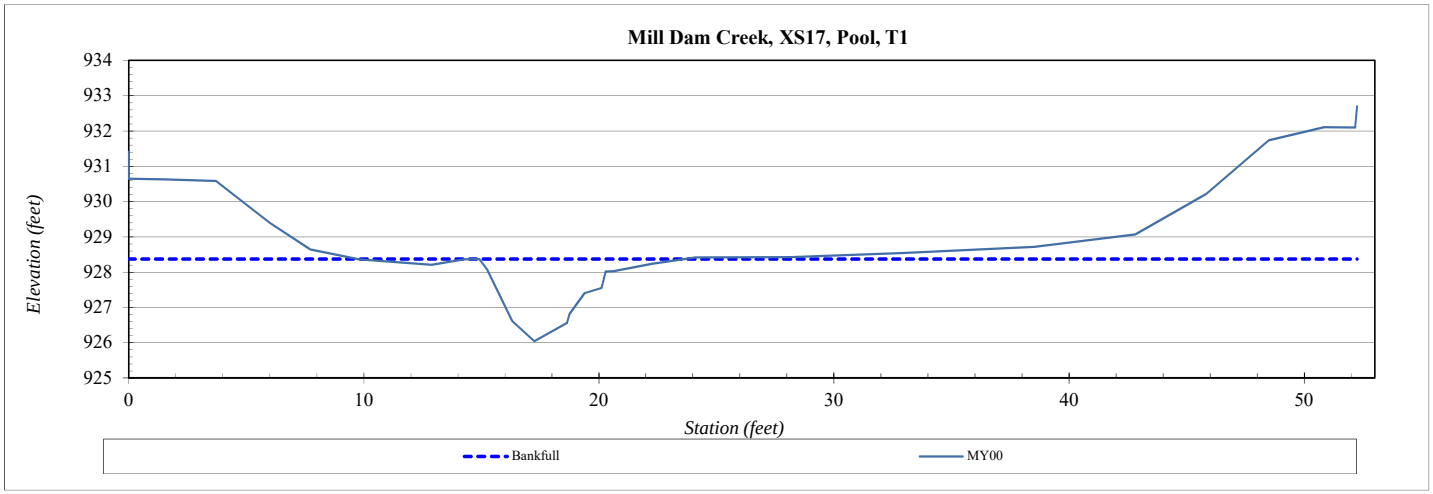


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS17
Drainage Area (sq mi):	0.07
Date:	1/29/2020
Field Crew:	TS, KB

Station	Elevation
0.0	931.41
0.0	930.64
1.5	930.63
3.7	930.58
6.0	929.40
7.7	928.64
9.8	928.36
12.9	928.21
14.2	928.36
14.9	928.37
15.3	928.05
16.3	926.62
17.3	926.04
18.6	926.55
18.8	926.81
19.4	927.40
20.1	927.54
20.3	928.02
20.6	928.02
22.2	928.23
24.1	928.42
28.2	928.42
33.0	928.55
38.5	928.72
42.8	929.07
45.8	930.20
48.5	931.73
50.9	932.11
52.2	932.10
52.2	932.70

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	928.37
Bankfull Cross-Sectional Area:	8.3
Total Cross-Sectional Area:	8.3
Bankfull Width:	8.7
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	2.3
Mean Depth at Bankfull:	1.0
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	926.04

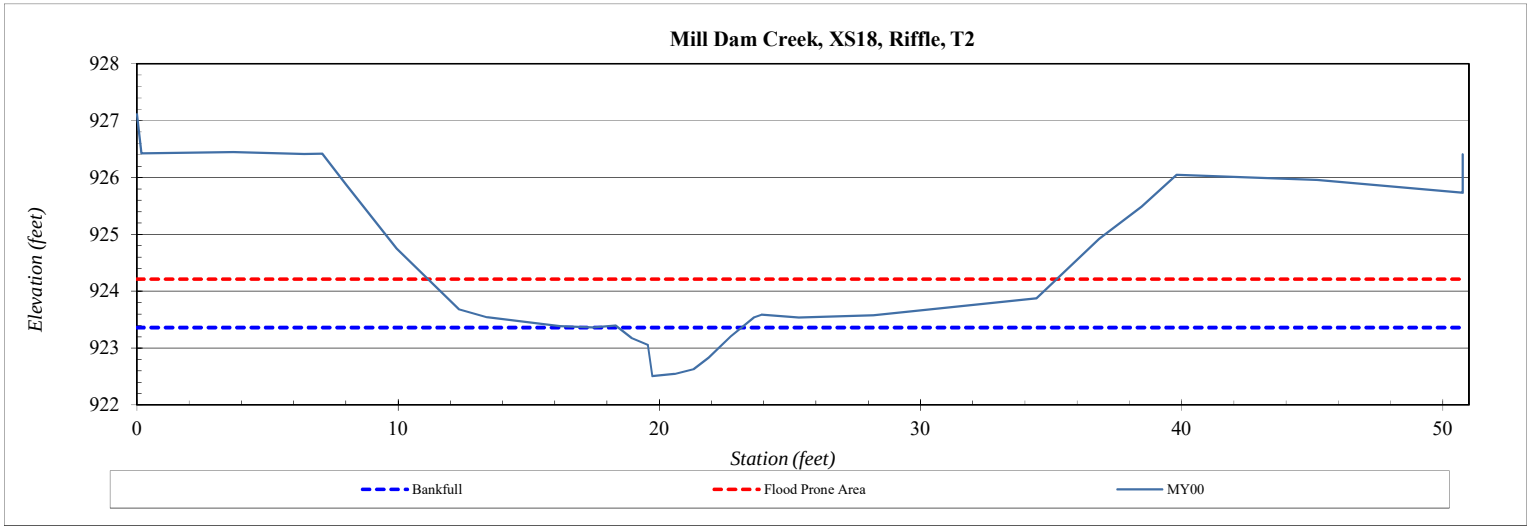


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS18
Drainage Area (sq mi):	0.02
Date:	1/17/2020
Field Crew:	TS, KB

Station	Elevation
0.0	927.11
0.2	926.43
3.7	926.45
6.4	926.41
7.1	926.42
8.0	925.88
9.9	924.75
12.3	923.68
13.4	923.54
16.2	923.39
17.5	923.36
18.3	923.40
18.9	923.18
19.6	923.06
19.7	922.51
20.6	922.55
21.3	922.63
21.9	922.83
22.7	923.21
23.6	923.54
23.9	923.58
25.3	923.54
28.2	923.57
34.4	923.87
36.8	924.92
38.5	925.49
39.8	926.05
45.2	925.96
50.8	925.73
50.8	926.40

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	923.36
Bankfull Cross-Sectional Area:	2.3
Total Cross-Sectional Area:	2.3
Bankfull Width:	4.7
Flood Prone Area Elevation:	924.21
Flood Prone Width:	24.1
Max Depth at Bankfull:	0.9
Mean Depth at Bankfull:	0.5
W / D Ratio:	9.9
Entrenchment Ratio:	5.1
Bank Height Ratio:	1.0
Thalweg Elevation:	922.51

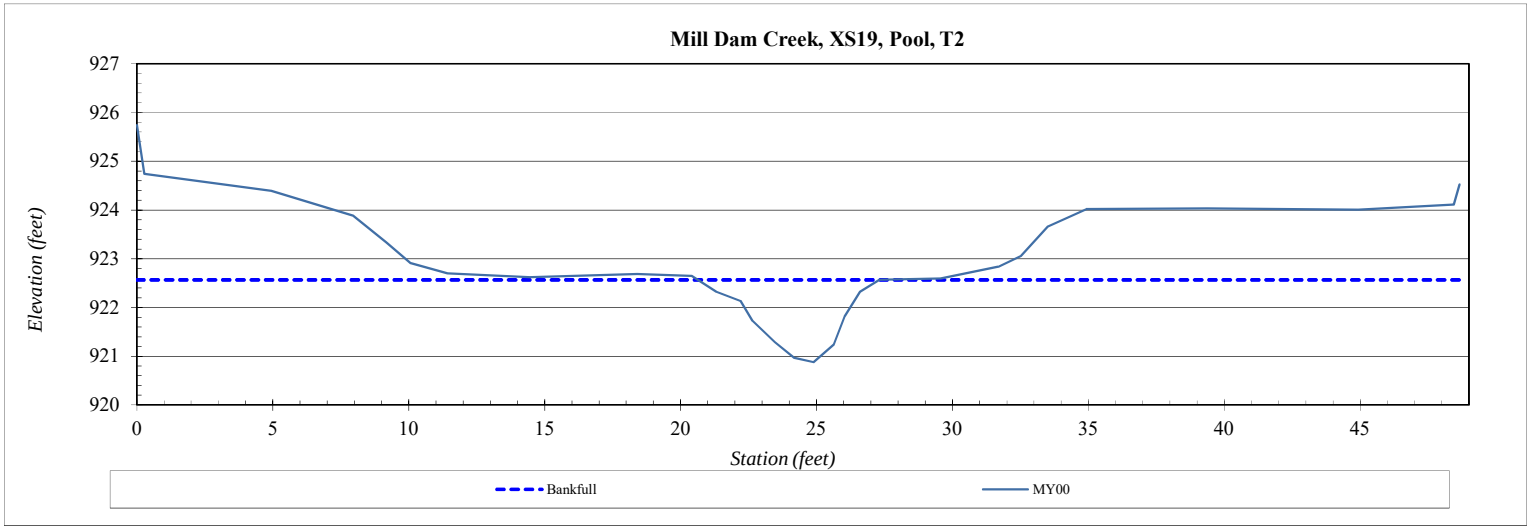


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS19
Drainage Area (sq mi):	0.02
Date:	1/17/2020
Field Crew:	TS, KB

Station	Elevation
0.0	925.74
0.3	924.74
4.9	924.39
8.0	923.88
9.2	923.34
10.1	922.91
11.4	922.70
14.5	922.62
18.4	922.69
20.4	922.64
21.3	922.32
22.2	922.13
22.6	921.72
23.5	921.29
24.2	920.96
24.9	920.88
25.6	921.24
26.0	921.82
26.6	922.33
27.3	922.57
29.6	922.60
31.7	922.84
32.5	923.06
33.5	923.66
34.9	924.02
39.4	924.03
44.9	924.01
48.4	924.11
48.7	924.53

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	922.57
Bankfull Cross-Sectional Area:	5.6
Total Cross-Sectional Area:	5.6
Bankfull Width:	6.7
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.7
Mean Depth at Bankfull:	0.8
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	920.88

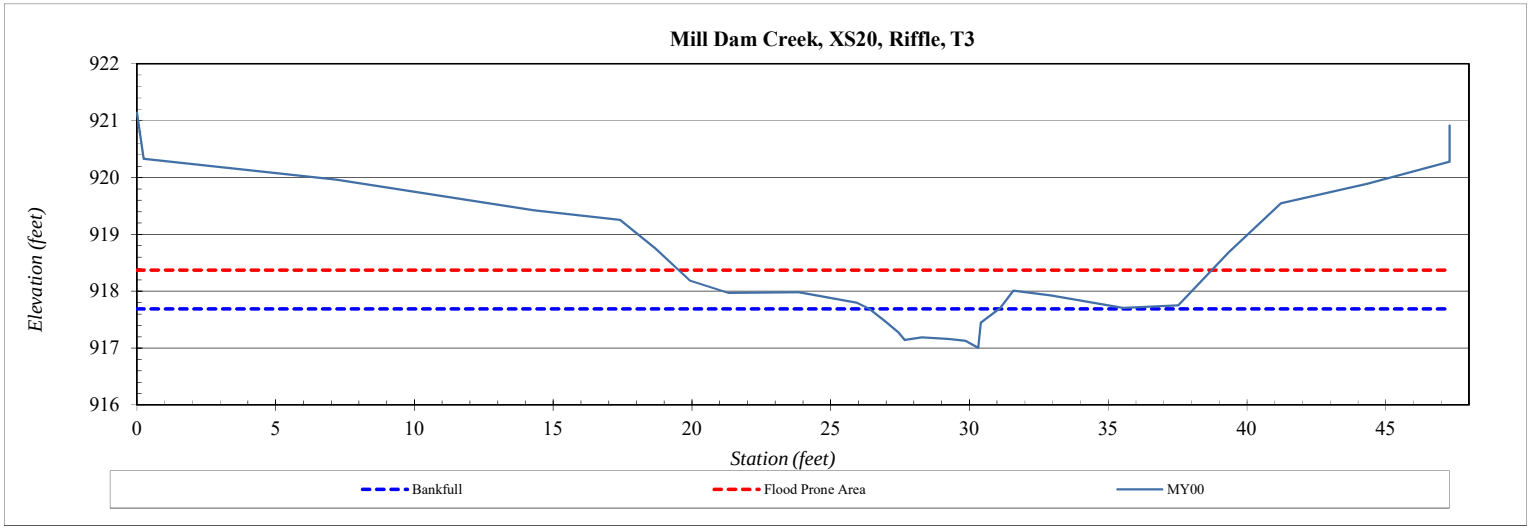


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS20
Drainage Area (sq mi):	0.01
Date:	1/17/2020
Field Crew:	TS, KB

Station	Elevation
0.0	921.14
0.2	920.33
7.2	919.96
14.3	919.42
17.4	919.25
18.7	918.75
19.9	918.19
21.3	917.97
23.9	917.98
26.0	917.79
26.4	917.69
27.0	917.45
27.4	917.28
27.7	917.14
28.3	917.19
29.3	917.16
29.9	917.13
30.3	917.00
30.4	917.45
31.1	917.71
31.6	918.01
32.9	917.92
35.5	917.70
37.5	917.75
39.3	918.69
41.2	919.55
44.3	919.89
47.3	920.28
47.3	920.91

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	917.69
Bankfull Cross-Sectional Area:	1.9
Total Cross-Sectional Area:	1.9
Bankfull Width:	4.7
Flood Prone Area Elevation:	918.37
Flood Prone Width:	19.2
Max Depth at Bankfull:	0.7
Mean Depth at Bankfull:	0.4
W / D Ratio:	11.6
Entrenchment Ratio:	4.1
Bank Height Ratio:	1.0
Thalweg Elevation:	917.00

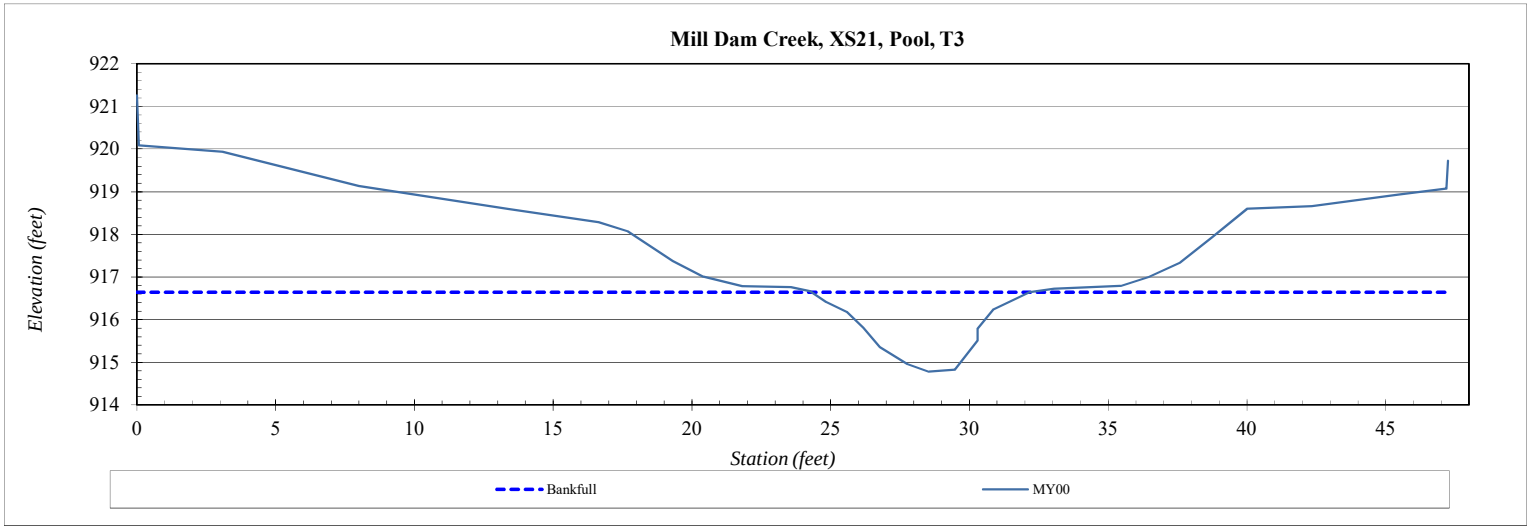


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS21
Drainage Area (sq mi):	0.01
Date:	1/17/2020
Field Crew:	TS, KB

Station	Elevation
0.0	921.26
0.1	920.09
3.1	919.94
8.0	919.13
13.4	918.60
16.6	918.29
17.7	918.07
19.3	917.37
20.4	917.01
21.8	916.78
23.6	916.76
24.3	916.66
24.8	916.42
25.6	916.18
26.2	915.81
26.8	915.36
27.8	914.96
28.5	914.78
29.5	914.82
30.3	915.50
30.3	915.78
30.9	916.25
31.6	916.47
32.1	916.64
33.0	916.73
35.5	916.79
36.5	917.00
37.6	917.34
38.7	917.93
40.0	918.60
42.3	918.66
45.5	918.93
47.2	919.07
47.2	919.73

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	916.64
Bankfull Cross-Sectional Area:	7.7
Total Cross-Sectional Area:	7.7
Bankfull Width:	7.8
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.9
Mean Depth at Bankfull:	1.0
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	914.78

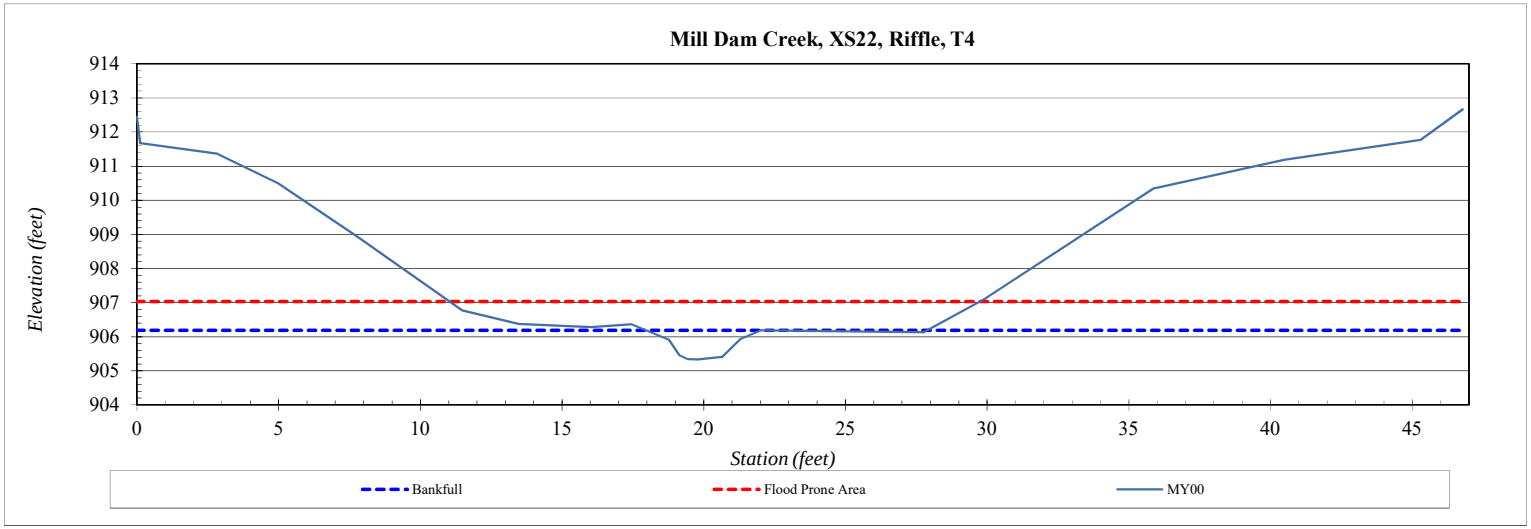


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS22
Drainage Area (sq mi):	0.01
Date:	4/15/2020
Field Crew:	TS, KB

Station	Elevation
0.0	912.44
0.1	911.68
2.8	911.36
5.0	910.51
7.8	908.94
11.5	906.77
13.5	906.37
16.0	906.28
17.5	906.37
18.8	905.91
19.1	905.46
19.5	905.34
19.8	905.34
20.6	905.41
21.3	905.93
22.0	906.18
23.9	906.17
27.8	906.12
29.9	907.10
35.9	910.34
40.5	911.19
45.3	911.77
46.8	912.67

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	906.18
Bankfull Cross-Sectional Area:	1.9
Total Cross-Sectional Area:	1.9
Bankfull Width:	4.0
Flood Prone Area Elevation:	907.03
Flood Prone Width:	18.7
Max Depth at Bankfull:	0.8
Mean Depth at Bankfull:	0.5
W / D Ratio:	8.3
Entrenchment Ratio:	4.7
Bank Height Ratio:	1.0
Thalweg Elevation:	905.34

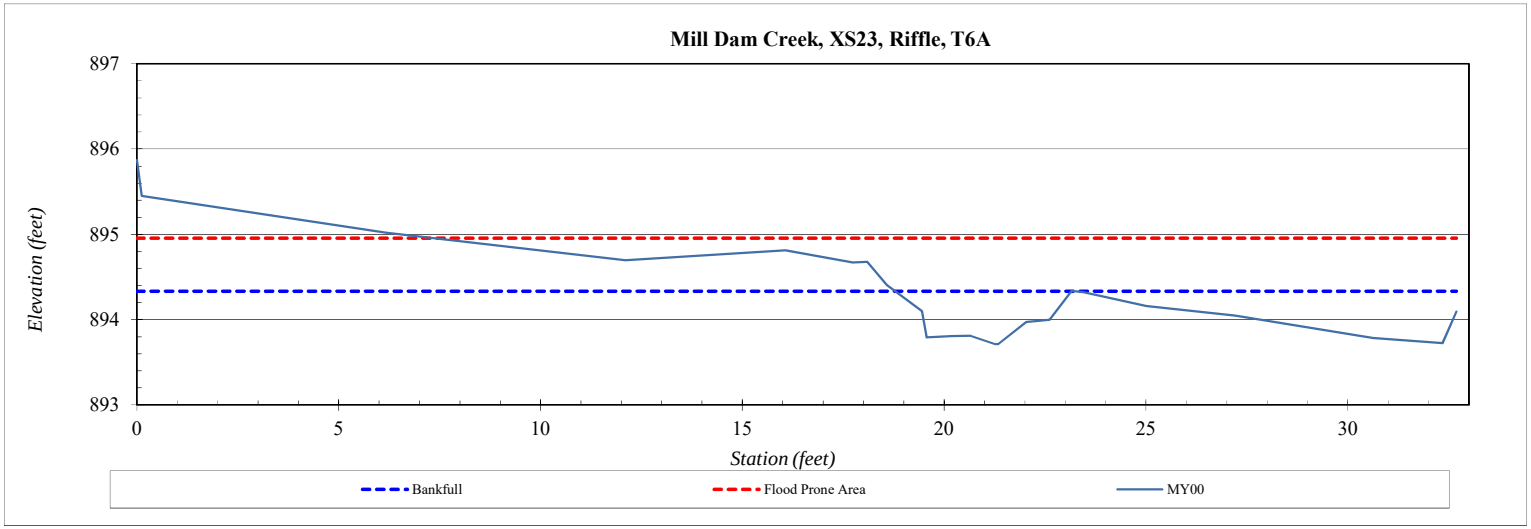


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS23
Drainage Area (sq mi):	0.01
Date:	1/30/2020
Field Crew:	TS, KB

Station	Elevation
0.0	895.87
0.1	895.45
6.2	895.02
12.1	894.70
16.1	894.81
17.7	894.67
18.1	894.68
18.6	894.41
19.4	894.10
19.6	893.79
20.2	893.81
20.7	893.81
21.3	893.71
21.3	893.71
22.0	893.97
22.6	894.00
23.2	894.33
23.4	894.33
25.0	894.16
27.2	894.05
30.6	893.78
32.3	893.72
32.7	894.09

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	894.33
Bankfull Cross-Sectional Area:	1.7
Total Cross-Sectional Area:	1.7
Bankfull Width:	4.4
Flood Prone Area Elevation:	894.96
Flood Prone Width:	25.3
Max Depth at Bankfull:	0.6
Mean Depth at Bankfull:	0.4
W / D Ratio:	11.0
Entrenchment Ratio:	5.8
Bank Height Ratio:	1.0
Thalweg Elevation:	893.71

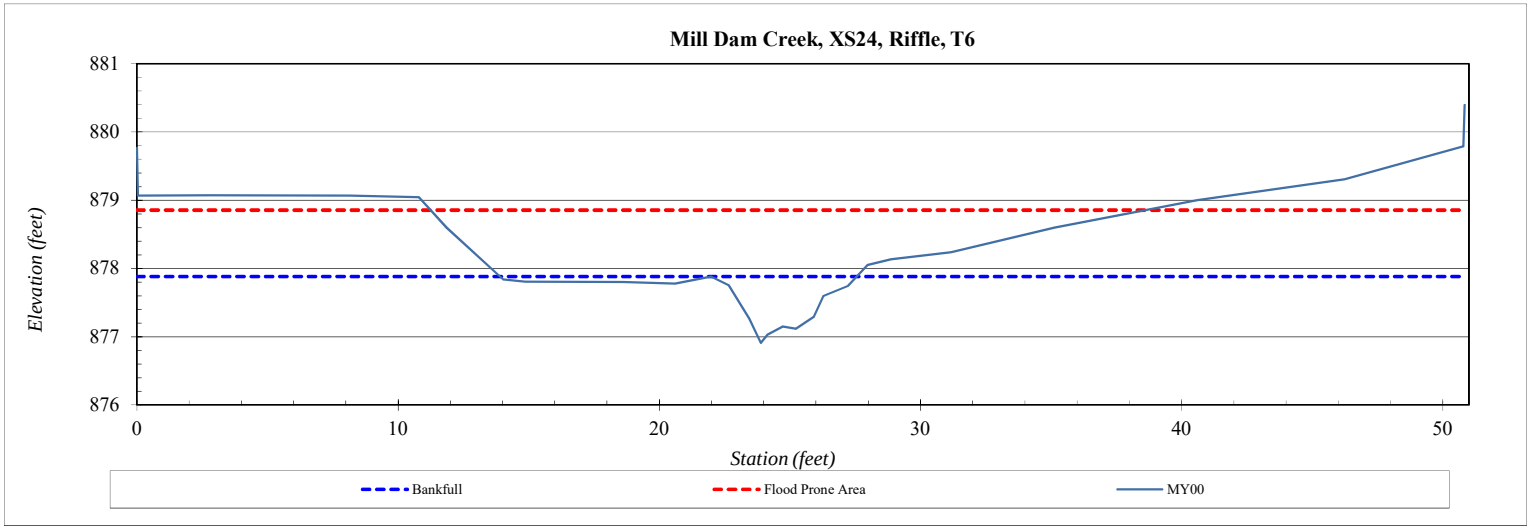


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS24
Drainage Area (sq mi):	0.07
Date:	1/30/2020
Field Crew:	TS, KB

Station	Elevation
0.0	879.77
0.0	879.07
2.8	879.07
8.2	879.07
10.8	879.04
11.9	878.60
14.0	877.84
14.9	877.80
18.6	877.80
20.6	877.78
22.0	877.88
22.7	877.75
23.4	877.26
23.9	876.91
24.1	877.03
24.7	877.15
25.2	877.12
25.9	877.30
26.3	877.60
27.2	877.75
28.0	878.05
28.9	878.13
31.2	878.24
35.1	878.60
40.6	879.00
46.2	879.30
50.8	879.79
50.8	880.40

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	877.88
Bankfull Cross-Sectional Area:	2.6
Total Cross-Sectional Area:	2.6
Bankfull Width:	5.6
Flood Prone Area Elevation:	878.86
Flood Prone Width:	27.4
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.5
W / D Ratio:	11.9
Entrenchment Ratio:	4.9
Bank Height Ratio:	1.0
Thalweg Elevation:	876.91

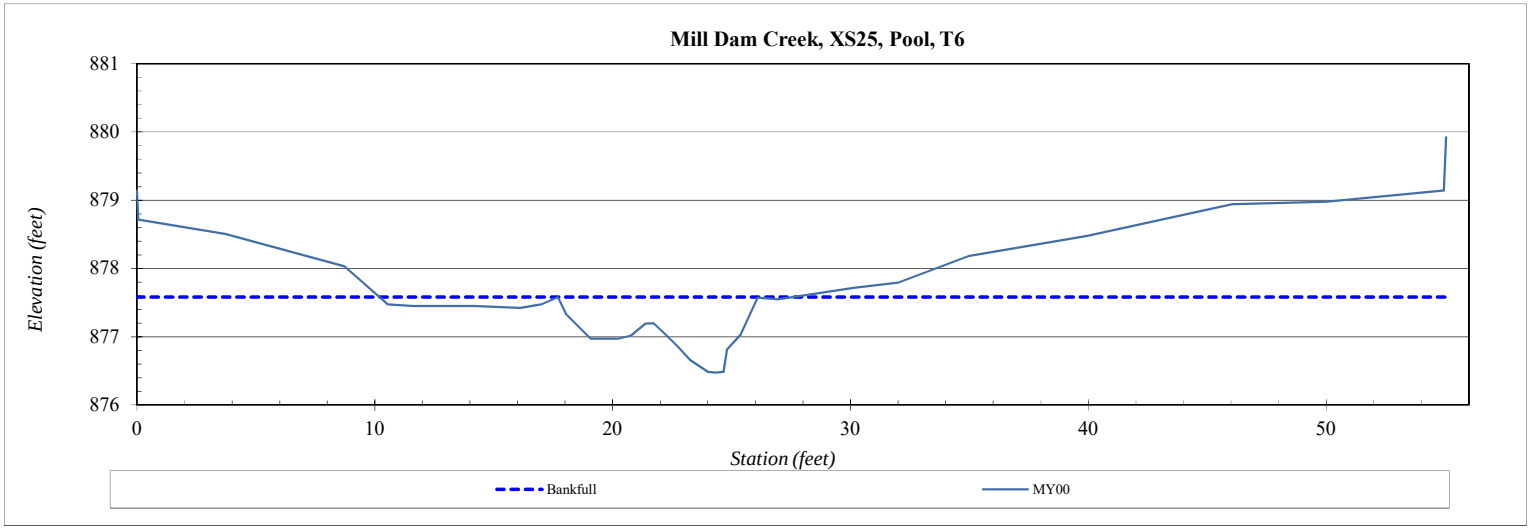


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS25
Drainage Area (sq mi):	0.07
Date:	1/30/2020
Field Crew:	TS, KB

Station	Elevation
0.0	879.14
0.1	878.72
3.7	878.50
8.7	878.03
10.5	877.47
11.6	877.45
14.2	877.45
16.1	877.42
17.0	877.47
17.7	877.58
18.0	877.33
19.1	876.97
20.2	876.97
20.8	877.02
21.4	877.19
21.7	877.19
22.2	877.06
22.7	876.87
23.3	876.66
24.0	876.48
24.3	876.48
24.7	876.48
24.8	876.81
25.4	877.03
26.1	877.57
27.0	877.55
30.2	877.72
32.0	877.79
35.0	878.18
39.9	878.48
46.0	878.94
50.0	878.98
54.9	879.14
55.0	879.92

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	877.58
Bankfull Cross-Sectional Area:	5.1
Total Cross-Sectional Area:	5.1
Bankfull Width:	8.4
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.1
Mean Depth at Bankfull:	0.6
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	876.48

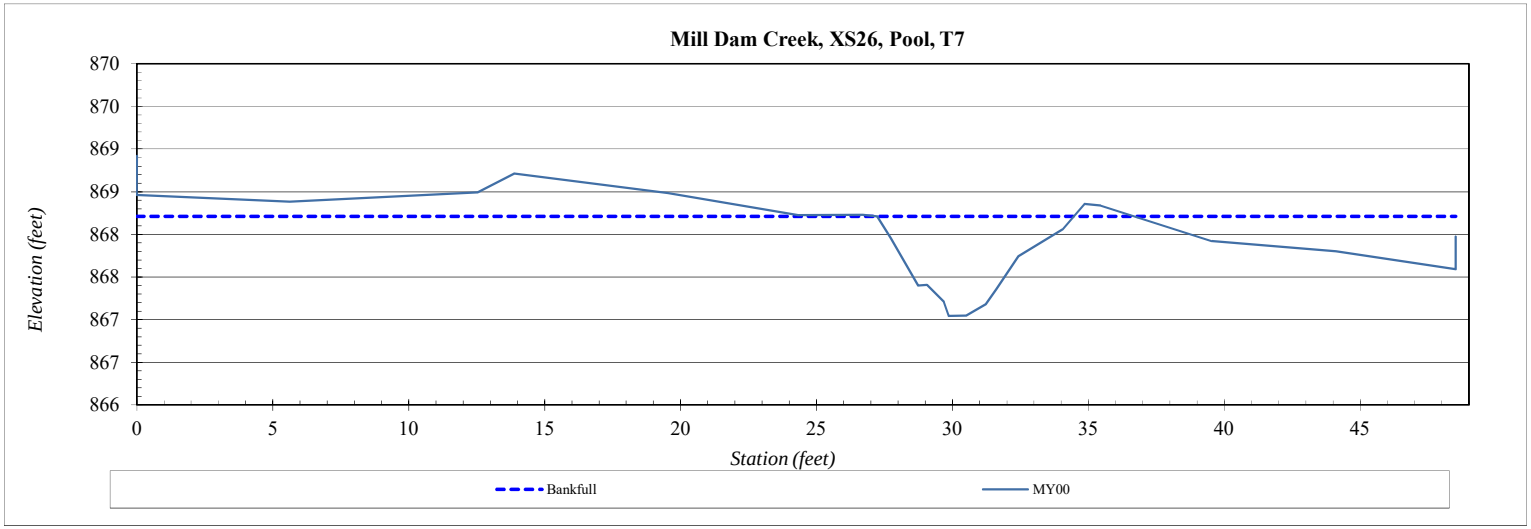


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS26
Drainage Area (sq mi):	0.07
Date:	1/30/2020
Field Crew:	TS, KB

Station	Elevation
0.0	868.92
0.0	868.46
5.6	868.38
12.5	868.49
13.9	868.71
19.5	868.49
24.3	868.23
26.7	868.23
27.2	868.21
27.7	867.96
28.7	867.40
29.1	867.41
29.7	867.21
29.9	867.05
30.5	867.05
31.2	867.18
31.6	867.36
32.4	867.74
34.1	868.06
34.9	868.36
35.5	868.34
39.5	867.92
44.1	867.80
48.5	867.59
48.5	867.97

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	868.21
Bankfull Cross-Sectional Area:	4.6
Total Cross-Sectional Area:	4.6
Bankfull Width:	7.2
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.2
Mean Depth at Bankfull:	0.6
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	867.05

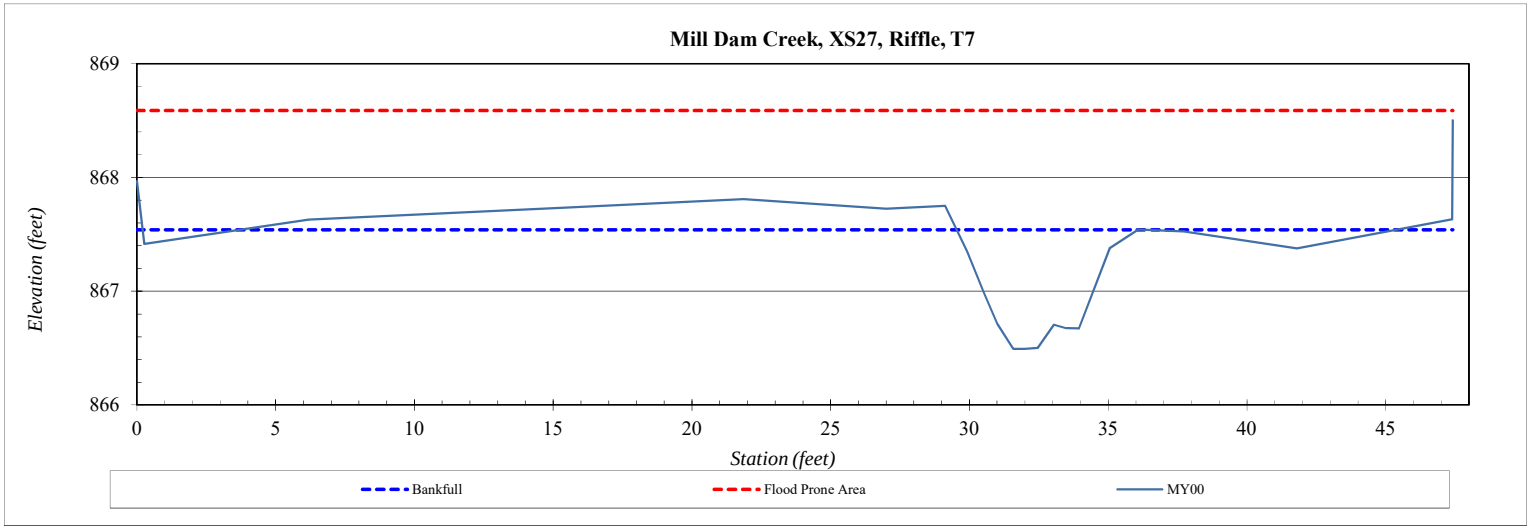


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS27
Drainage Area (sq mi):	0.07
Date:	1/30/2020
Field Crew:	TS, KB

Station	Elevation
0.0	867.97
0.3	867.42
6.2	867.63
15.3	867.73
21.9	867.81
27.0	867.73
29.1	867.75
29.9	867.35
30.5	866.98
31.0	866.72
31.6	866.49
32.0	866.49
32.5	866.50
33.1	866.71
33.5	866.68
34.0	866.67
35.1	867.38
36.1	867.54
37.7	867.53
41.8	867.38
47.4	867.63
47.4	868.50

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	867.54
Bankfull Cross-Sectional Area:	4.3
Total Cross-Sectional Area:	4.3
Bankfull Width:	10.1
Flood Prone Area Elevation:	868.59
Flood Prone Width:	47.4
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.4
W / D Ratio:	23.9
Entrenchment Ratio:	4.7
Bank Height Ratio:	1.0
Thalweg Elevation:	866.49

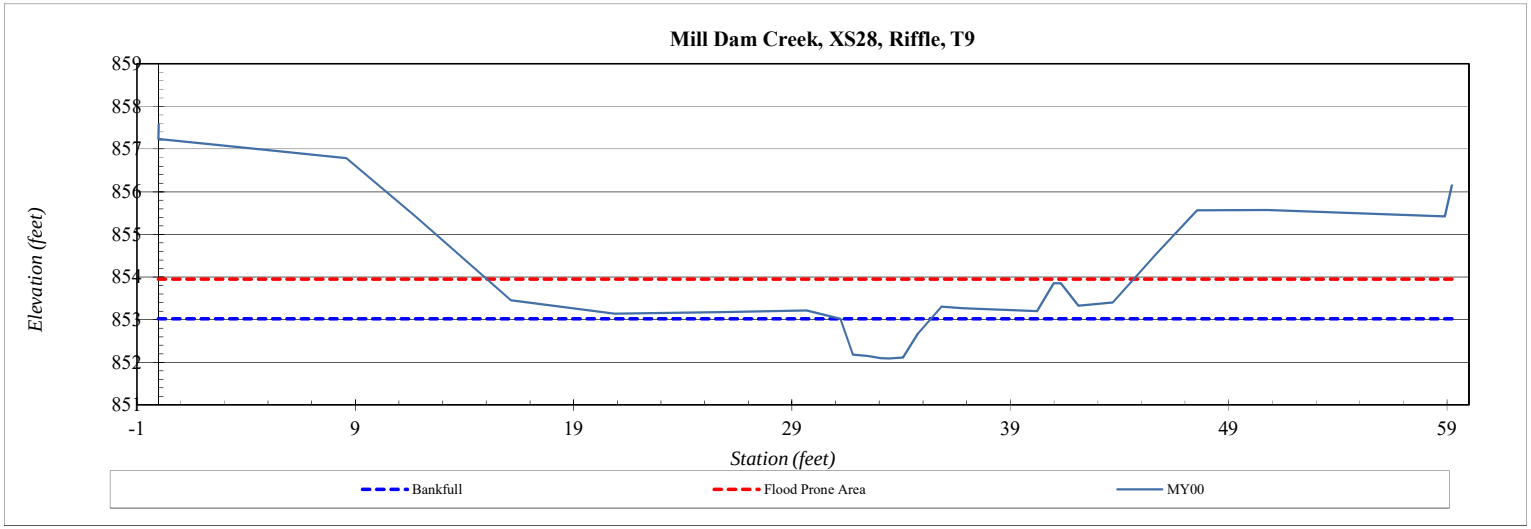


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS28
Drainage Area (sq mi):	0.04
Date:	4/15/2020
Field Crew:	TS, KB

Station	Elevation
0.0	857.58
0.0	857.24
4.9	856.98
8.6	856.78
11.8	855.41
16.1	853.45
20.9	853.14
25.9	853.18
29.7	853.21
31.2	853.02
31.8	852.18
32.4	852.15
33.0	852.09
33.5	852.09
34.1	852.11
34.8	852.69
35.8	853.30
36.8	853.27
40.2	853.19
41.0	853.85
41.3	853.85
42.1	853.32
43.7	853.40
45.7	854.54
47.5	855.56
50.8	855.57
58.9	855.42
59.2	856.15

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	853.02
Bankfull Cross-Sectional Area:	2.8
Total Cross-Sectional Area:	2.8
Bankfull Width:	4.1
Flood Prone Area Elevation:	853.95
Flood Prone Width:	29.6
Max Depth at Bankfull:	0.9
Mean Depth at Bankfull:	0.7
W / D Ratio:	6.0
Entrenchment Ratio:	7.2
Bank Height Ratio:	1.0
Thalweg Elevation:	852.09

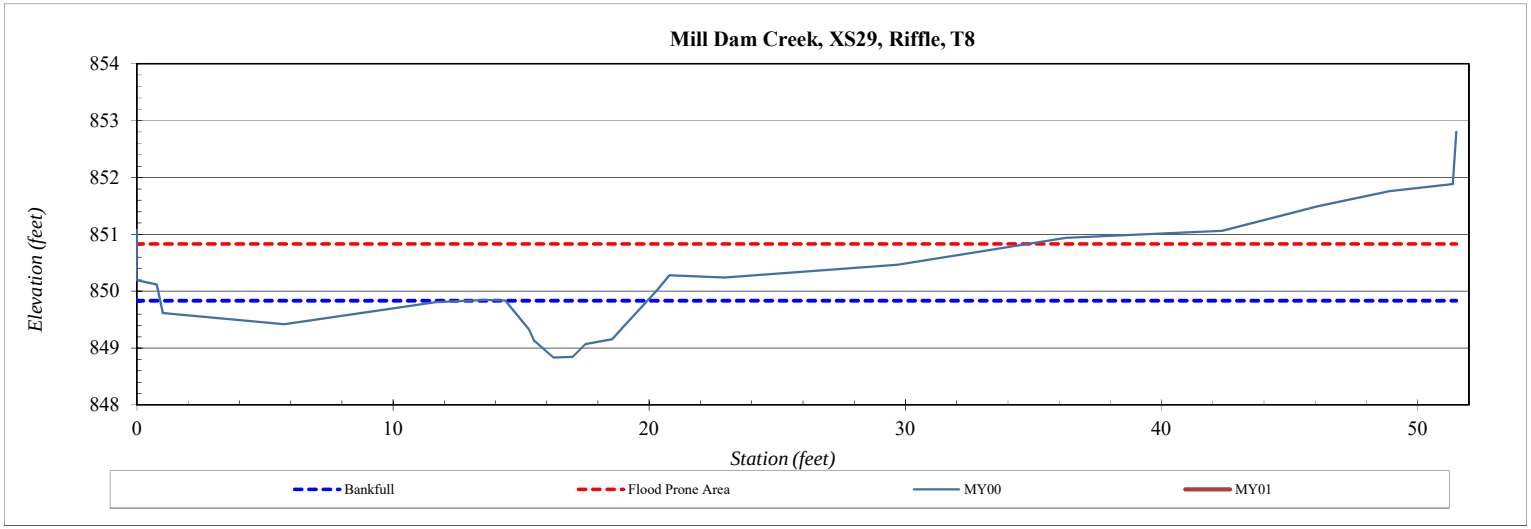


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS29
Drainage Area (sq mi):	0.03
Date:	4/16/2020
Field Crew:	TS, KB

Station	Elevation
0.0	851.08
0.0	850.19
0.8	850.12
1.0	849.61
5.7	849.42
11.7	849.81
13.6	849.85
14.4	849.83
15.3	849.33
15.5	849.14
16.3	848.84
17.0	848.84
17.5	849.07
18.5	849.15
19.0	849.38
20.3	850.02
20.8	850.28
23.0	850.24
29.7	850.46
36.3	850.94
42.4	851.06
46.1	851.50
48.9	851.76
51.4	851.89
51.5	852.80

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	849.83
Bankfull Cross-Sectional Area:	3.4
Total Cross-Sectional Area:	3.4
Bankfull Width:	5.5
Flood Prone Area Elevation:	850.83
Flood Prone Width:	34.8
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.6
W / D Ratio:	9.1
Entrenchment Ratio:	6.3
Bank Height Ratio:	1.0
Thalweg Elevation:	848.84

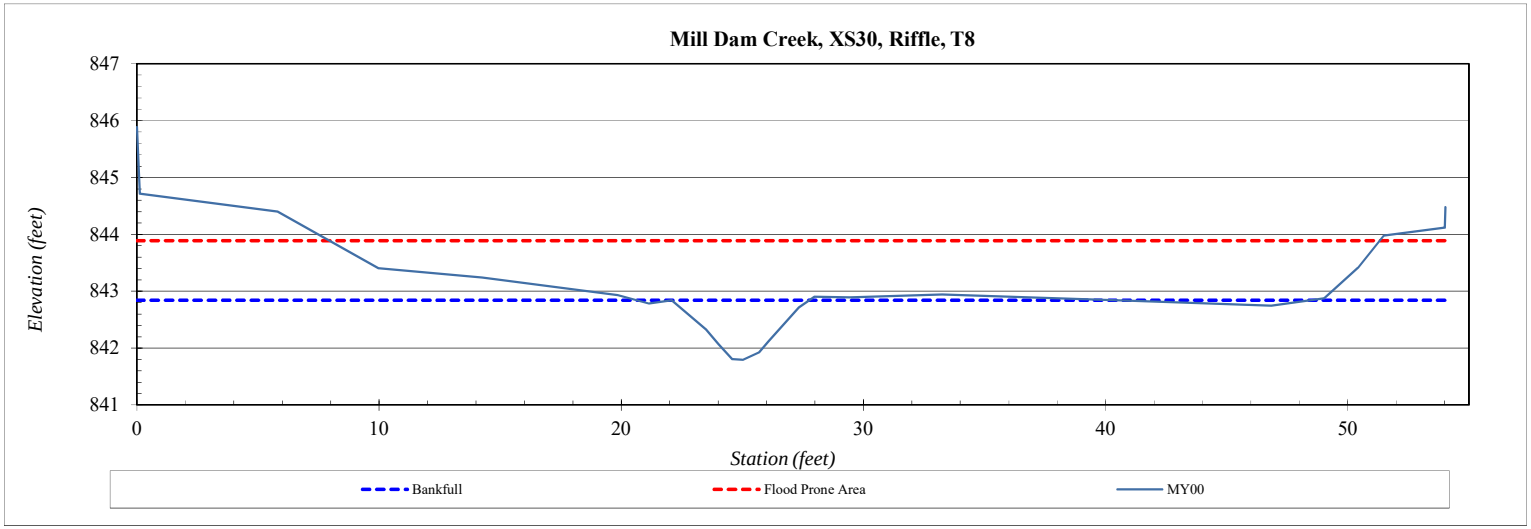


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS30
Drainage Area (sq mi):	0.03
Date:	4/16/2020
Field Crew:	TS, KB

Station	Elevation
0.0	845.89
0.1	844.71
5.8	844.40
10.0	843.40
14.3	843.24
19.9	842.93
21.2	842.78
22.1	842.84
23.5	842.33
24.0	842.07
24.6	841.80
25.0	841.79
25.7	841.93
26.1	842.12
27.3	842.72
28.0	842.90
29.4	842.89
33.3	842.94
41.2	842.83
46.8	842.74
49.0	842.87
50.4	843.41
51.5	843.98
54.0	844.12
54.0	844.48

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	842.84
Bankfull Cross-Sectional Area:	3.2
Total Cross-Sectional Area:	3.2
Bankfull Width:	5.7
Flood Prone Area Elevation:	843.89
Flood Prone Width:	43.4
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.6
W / D Ratio:	10.1
Entrenchment Ratio:	7.6
Bank Height Ratio:	1.0
Thalweg Elevation:	841.79

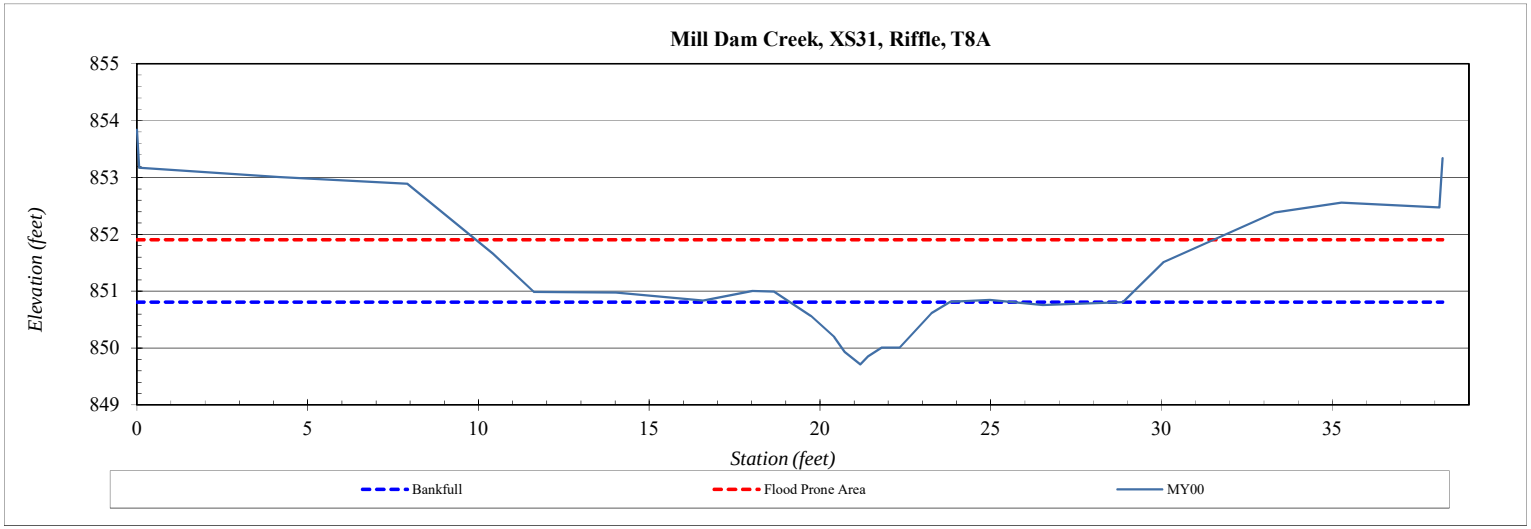


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS31
Drainage Area (sq mi):	0.01
Date:	4/16/2020
Field Crew:	TS, KB

Station	Elevation
0.0	853.84
0.1	853.17
4.2	853.01
7.9	852.89
10.4	851.66
11.6	850.99
14.0	850.98
16.6	850.84
18.0	851.00
18.7	850.99
19.7	850.56
20.4	850.20
20.7	849.93
21.2	849.71
21.4	849.86
21.8	850.01
22.3	850.01
23.3	850.62
23.8	850.81
25.0	850.84
26.5	850.76
28.9	850.81
30.1	851.52
33.3	852.38
35.3	852.56
38.1	852.47
38.2	853.34

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	850.81
Bankfull Cross-Sectional Area:	2.6
Total Cross-Sectional Area:	2.6
Bankfull Width:	4.7
Flood Prone Area Elevation:	851.91
Flood Prone Width:	21.6
Max Depth at Bankfull:	1.1
Mean Depth at Bankfull:	0.5
W / D Ratio:	8.6
Entrenchment Ratio:	4.6
Bank Height Ratio:	1.0
Thalweg Elevation:	849.71

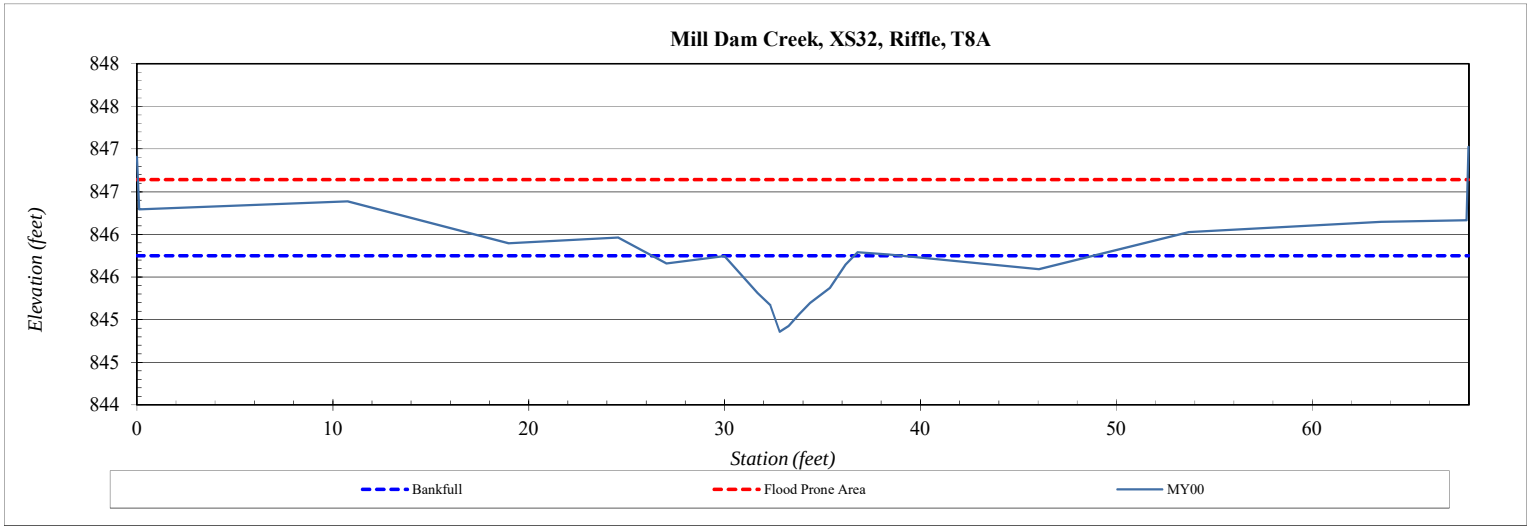


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS32
Drainage Area (sq mi):	0.01
Date:	4/16/2020
Field Crew:	TS, KB

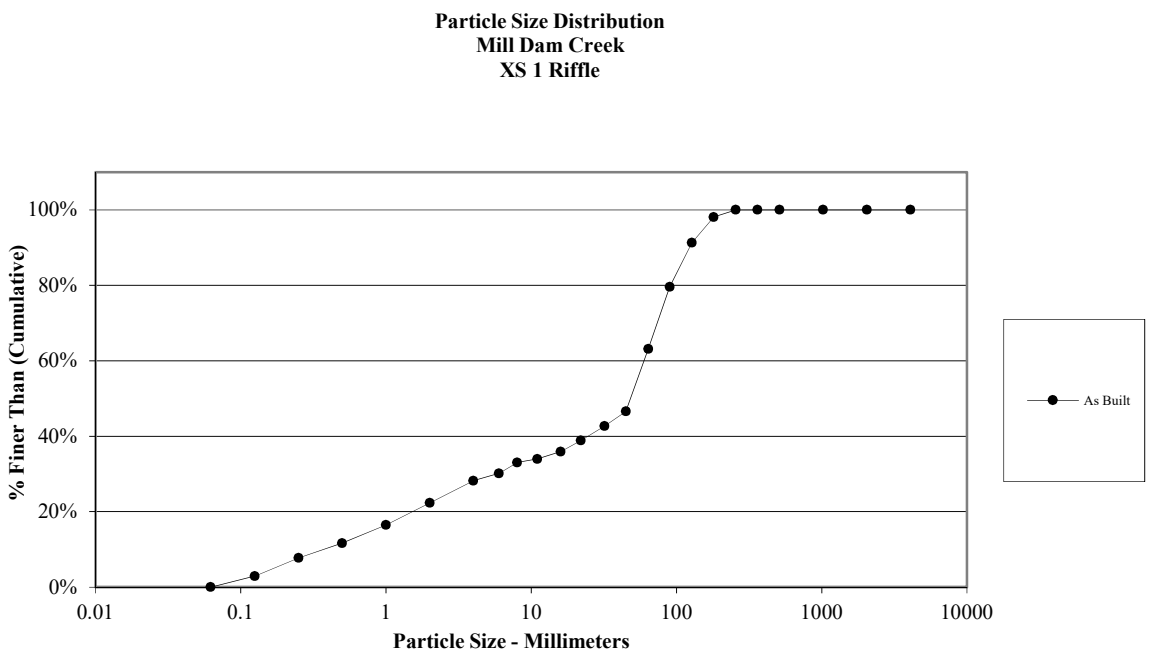
Station	Elevation
0.0	846.91
0.1	846.29
10.8	846.39
19.0	845.90
24.6	845.96
27.0	845.66
30.0	845.75
31.7	845.31
32.3	845.17
32.8	844.86
33.3	844.93
33.8	845.07
34.4	845.20
35.4	845.37
36.2	845.65
36.8	845.79
38.4	845.76
46.1	845.59
53.7	846.03
63.5	846.15
67.9	846.17
68.0	847.03

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	845.75
Bankfull Cross-Sectional Area:	2.9
Total Cross-Sectional Area:	2.9
Bankfull Width:	6.6
Flood Prone Area Elevation:	846.64
Flood Prone Width:	67.9
Max Depth at Bankfull:	0.9
Mean Depth at Bankfull:	0.4
W / D Ratio:	15.2
Entrenchment Ratio:	10.3
Bank Height Ratio:	1.0
Thalweg Elevation:	844.86



Cross-Section 1 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	3
Fine	.125 - .25	A	5
Medium	.25 - .50	N	4
Coarse	.50 - 1	D	5
Very Coarse	1 - 2	S	6
Very Fine	2 - 4		6
Fine	4 - 5.7	G	2
Fine	5.7 - 8	R	3
Medium	8 - 11.3	A	1
Medium	11.3 - 16	V	2
Coarse	16 - 22.6	E	3
Coarse	22.6 - 32	L	4
Very Coarse	32 - 45	S	4
Very Coarse	45 - 64		17
Small	64 - 90	C	17
Small	90 - 128	O	12
Large	128 - 180	B	7
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	103

Note:



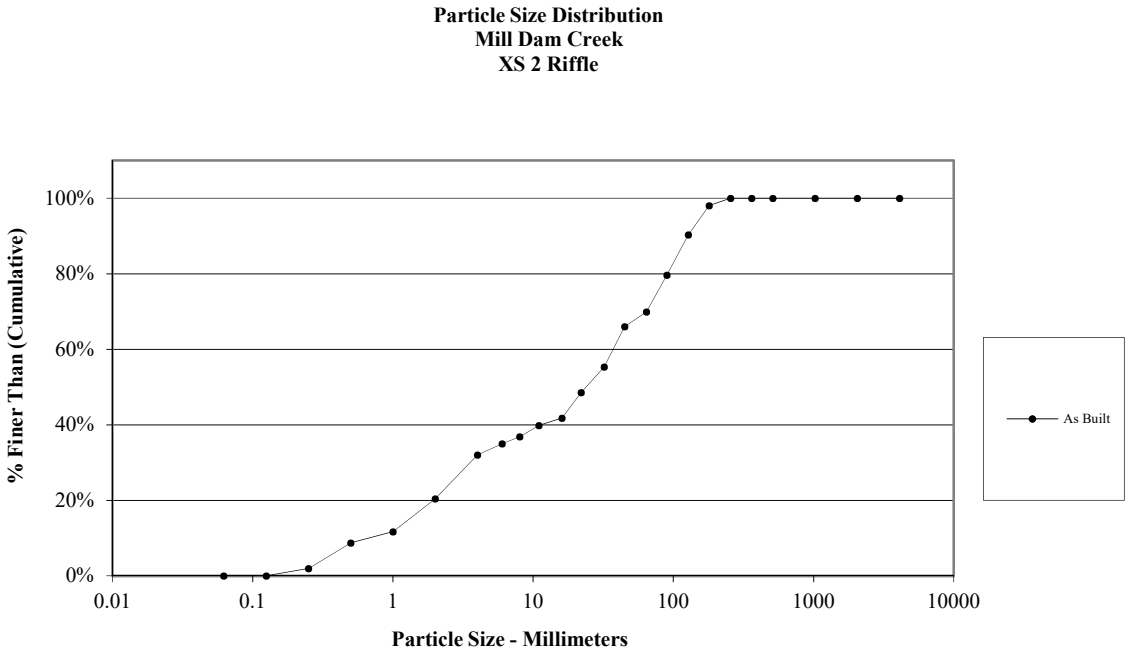
Size (mm)	
D16	0.93
D35	13
D50	48
D65	67
D84	100
D95	150

Size Distribution	
mean	9.6
dispersion	26.8
skewness	-0.49

Type	
silt/clay	0%
sand	22%
gravel	41%
cobble	28%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 2 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	2
Medium	.25 - .50	N	7
Coarse	.50 - 1	D	3
Very Coarse	1 - 2	S	9
Very Fine	2 - 4		12
Fine	4 - 5.7	G	3
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	3
Medium	11.3 - 16	V	2
Coarse	16 - 22.6	E	7
Coarse	22.6 - 32	L	7
Very Coarse	32 - 45	S	11
Very Coarse	45 - 64		4
Small	64 - 90	C	10
Small	90 - 128	O	11
Large	128 - 180	B	8
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	103

Note:



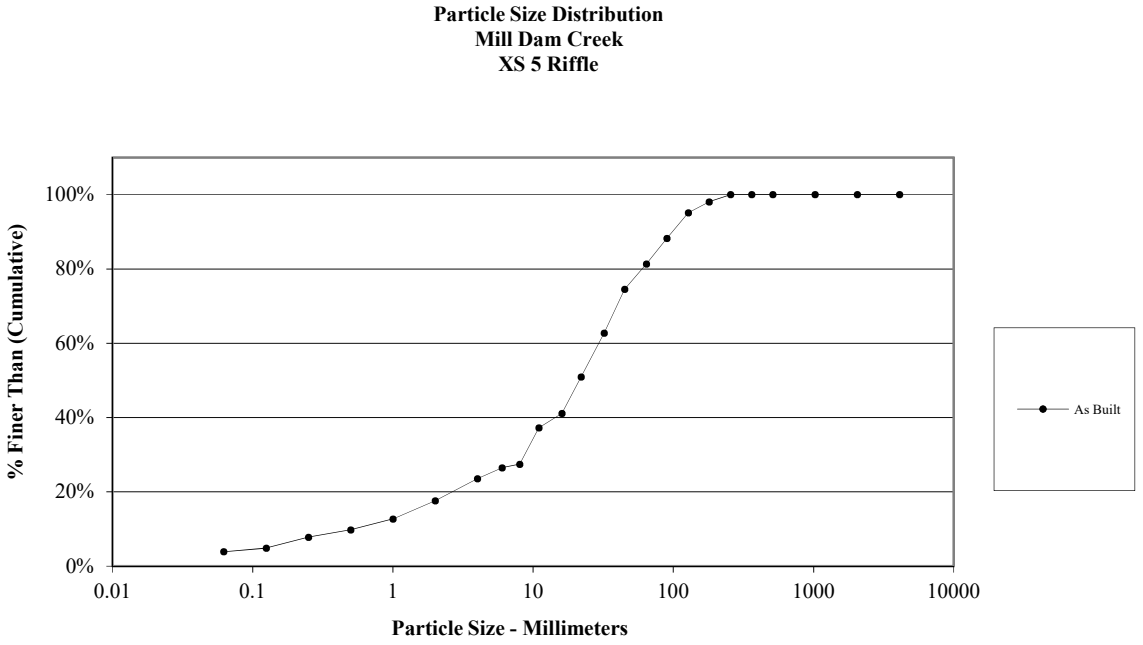
Size (mm)	
D16	1.4
D35	6
D50	24
D65	44
D84	100
D95	160

Size Distribution	
mean	11.8
dispersion	10.7
skewness	-0.23

Type	
silt/clay	0%
sand	20%
gravel	50%
cobble	30%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 5 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	4
Very Fine	.062 - .125	S	1
Fine	.125 - .25	A	3
Medium	.25 - .50	N	2
Coarse	.50 - 1	D	3
Very Coarse	1 - 2	S	5
Very Fine	2 - 4		6
Fine	4 - 5.7	G	3
Fine	5.7 - 8	R	1
Medium	8 - 11.3	A	10
Medium	11.3 - 16	V	4
Coarse	16 - 22.6	E	10
Coarse	22.6 - 32	L	12
Very Coarse	32 - 45	S	12
Very Coarse	45 - 64		7
Small	64 - 90	C	7
Small	90 - 128	O	7
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	102

Note:



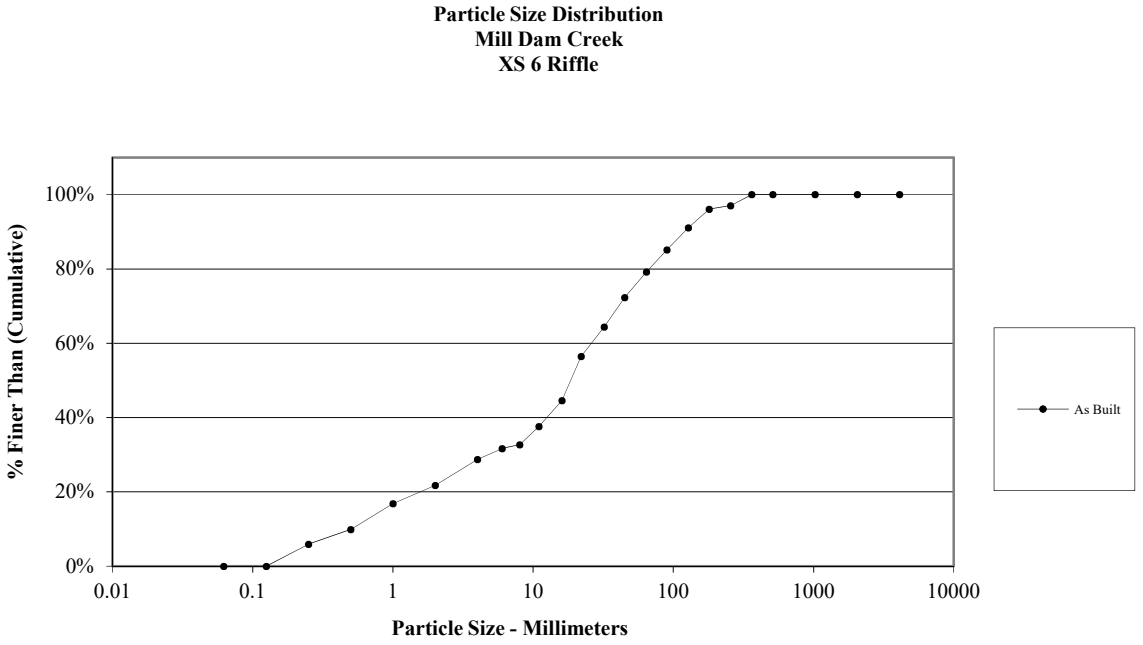
Size (mm)	
D16	1.6
D35	10
D50	21
D65	34
D84	73
D95	130

Size Distribution	
mean	10.8
dispersion	8.3
skewness	-0.22

Type	
silt/clay	4%
sand	14%
gravel	64%
cobble	19%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 6 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	6
Medium	.25 - .50	N	4
Coarse	.50 - 1	D	7
Very Coarse	1 - 2	S	5
Very Fine	2 - 4		7
Fine	4 - 5.7	G	3
Fine	5.7 - 8	R	1
Medium	8 - 11.3	A	5
Medium	11.3 - 16	V	7
Coarse	16 - 22.6	E	12
Coarse	22.6 - 32	L	8
Very Coarse	32 - 45	S	8
Very Coarse	45 - 64		7
Small	64 - 90	C	6
Small	90 - 128	O	6
Large	128 - 180	B	5
Large	180 - 256	L	1
Small	256 - 362	B	3
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	101

Note:



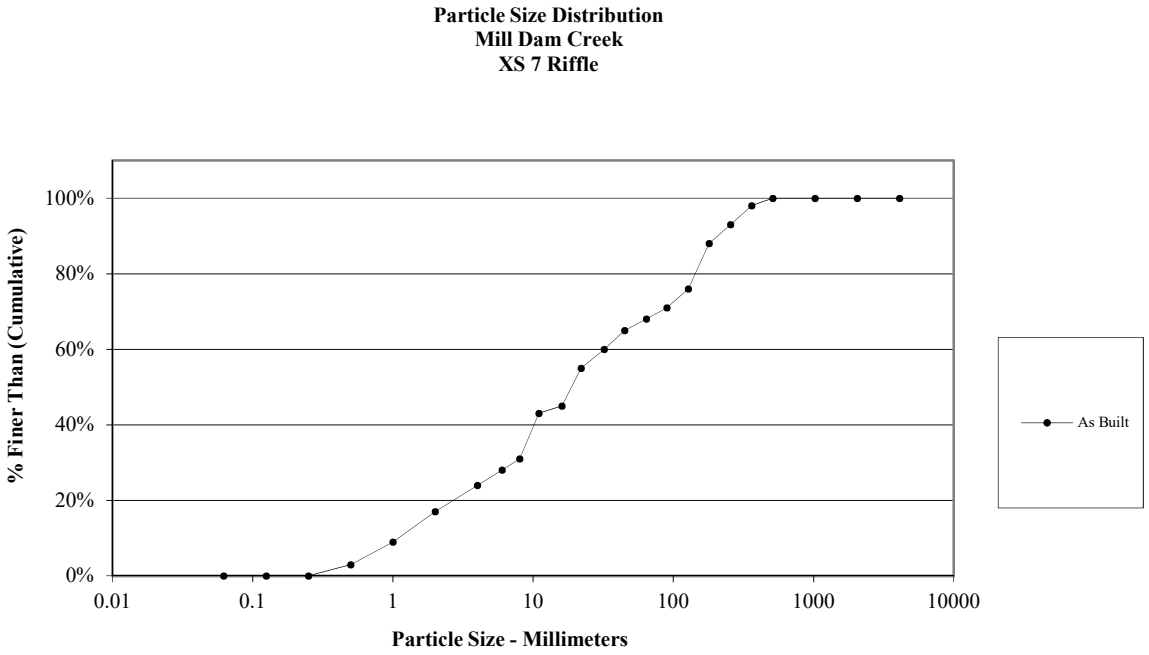
Size (mm)	
D16	0.92
D35	9.3
D50	19
D65	33
D84	84
D95	170

Size Distribution	
mean	8.8
dispersion	12.5
skewness	-0.24

Type	
silt/clay	0%
sand	22%
gravel	57%
cobble	18%
boulder	3%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 7 Riffle -MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	3
Coarse	.50 - 1	D	6
Very Coarse	1 - 2	S	8
Very Fine	2 - 4		7
Fine	4 - 5.7	G	4
Fine	5.7 - 8	R	3
Medium	8 - 11.3	A	12
Medium	11.3 - 16	V	2
Coarse	16 - 22.6	E	10
Coarse	22.6 - 32	L	5
Very Coarse	32 - 45	S	5
Very Coarse	45 - 64		3
Small	64 - 90	C	3
Small	90 - 128	O	5
Large	128 - 180	B	12
Large	180 - 256	L	5
Small	256 - 362	B	5
Small	362 - 512	L	2
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



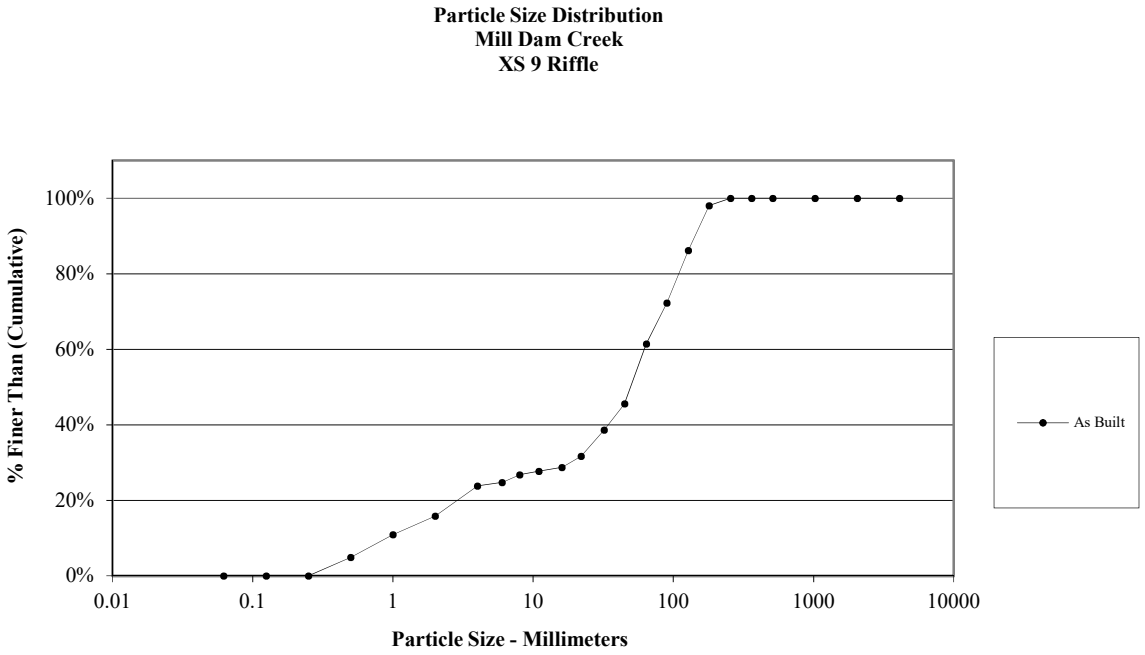
Size (mm)	
D16	1.8
D35	8.9
D50	19
D65	45
D84	160
D95	290

Size Distribution	
mean	17.0
dispersion	9.5
skewness	-0.04

Type	
silt/clay	0%
sand	17%
gravel	51%
cobble	20%
boulder	7%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 9 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	5
Coarse	.50 - 1	D	6
Very Coarse	1 - 2	S	5
Very Fine	2 - 4		8
Fine	4 - 5.7	G	1
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	1
Medium	11.3 - 16	V	1
Coarse	16 - 22.6	E	3
Coarse	22.6 - 32	L	7
Very Coarse	32 - 45	S	7
Very Coarse	45 - 64		16
Small	64 - 90	C	11
Small	90 - 128	O	14
Large	128 - 180	B	12
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:



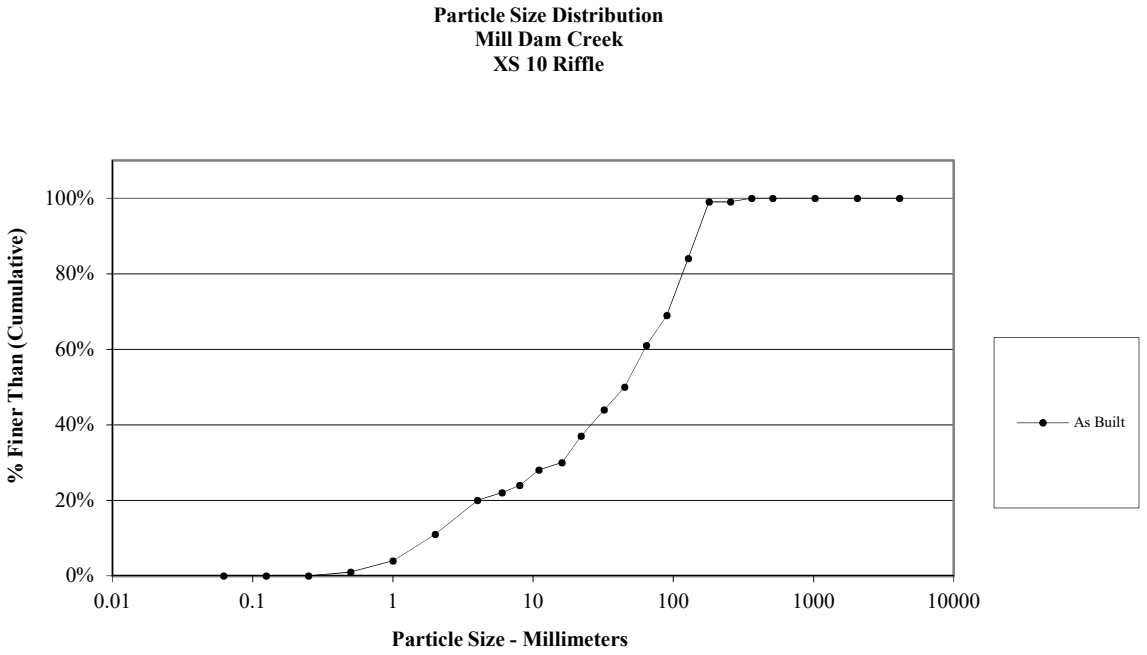
Size (mm)	
D16	2
D35	26
D50	50
D65	72
D84	120
D95	170

Size Distribution	
mean	15.5
dispersion	13.7
skewness	-0.38

Type	
silt/clay	0%
sand	16%
gravel	46%
cobble	37%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 10 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	1
Coarse	.50 - 1	D	3
Very Coarse	1 - 2	S	7
Very Fine	2 - 4		9
Fine	4 - 5.7	G	2
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	4
Medium	11.3 - 16	V	2
Coarse	16 - 22.6	E	7
Coarse	22.6 - 32	L	7
Very Coarse	32 - 45	S	6
Very Coarse	45 - 64		11
Small	64 - 90	C	8
Small	90 - 128	O	15
Large	128 - 180	B	15
Large	180 - 256	L	
Small	256 - 362	B	1
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



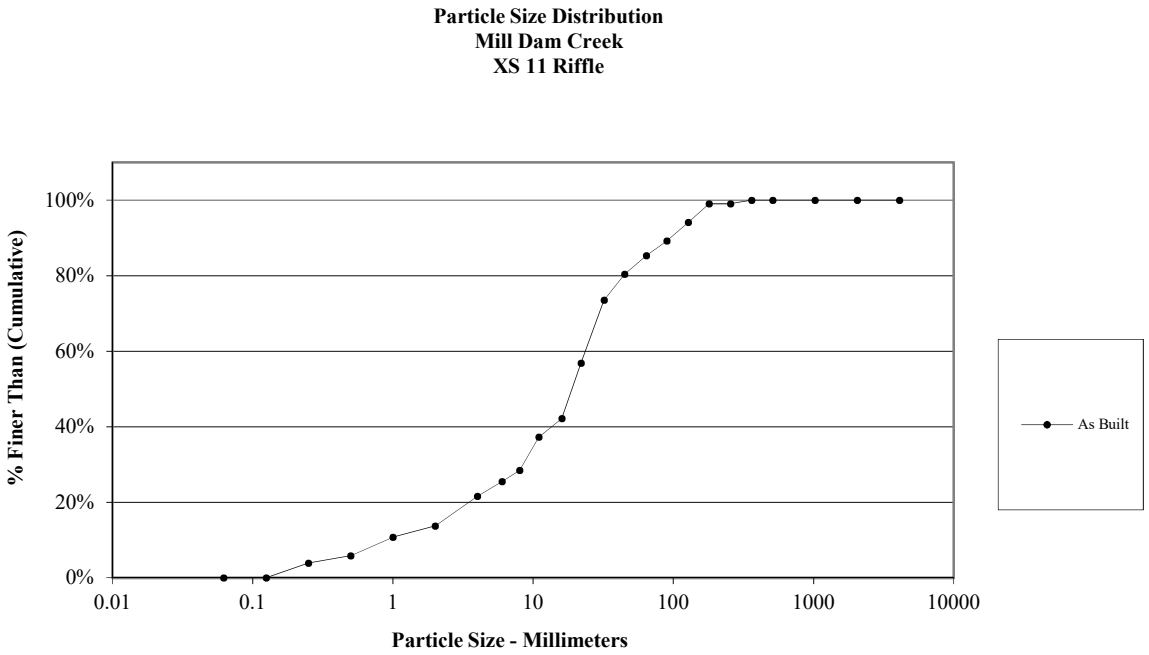
Size (mm)	
D16	2.9
D35	20
D50	45
D65	76
D84	130
D95	160

Size Distribution	
mean	19.4
dispersion	9.2
skewness	-0.28

Type	
silt/clay	0%
sand	11%
gravel	50%
cobble	38%
boulder	1%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 11 Riffle -MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	4
Medium	.25 - .50	N	2
Coarse	.50 - 1	D	5
Very Coarse	1 - 2	S	3
Very Fine	2 - 4		8
Fine	4 - 5.7	G	4
Fine	5.7 - 8	R	3
Medium	8 - 11.3	A	9
Medium	11.3 - 16	V	5
Coarse	16 - 22.6	E	15
Coarse	22.6 - 32	L	17
Very Coarse	32 - 45	S	7
Very Coarse	45 - 64		5
Small	64 - 90	C	4
Small	90 - 128	O	5
Large	128 - 180	B	5
Large	180 - 256	L	
Small	256 - 362	B	1
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	102

Note:



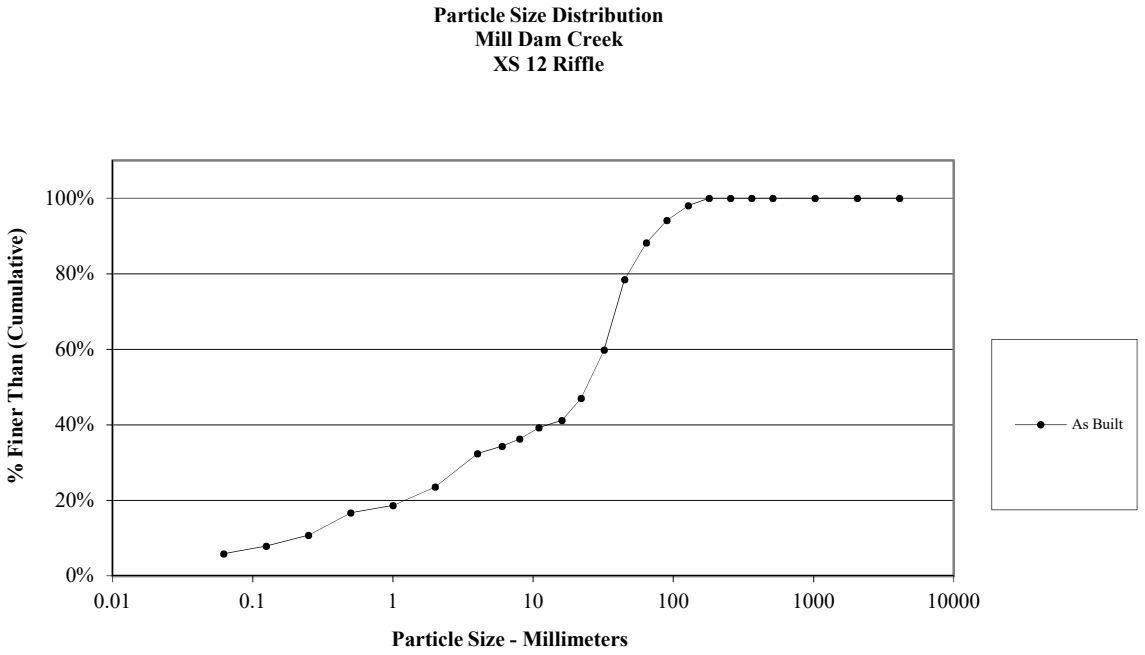
Size (mm)	
D16	2.4
D35	10
D50	19
D65	26
D84	58
D95	140

Size Distribution	
mean	11.8
dispersion	5.5
skewness	-0.18

Type	
silt/clay	0%
sand	14%
gravel	72%
cobble	14%
boulder	1%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 12 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	2
Fine	.125 - .25	A	2
Medium	.25 - .50	N	
Coarse	.50 - 1	D	3
Very Coarse	1 - 2	S	6
Very Fine	2 - 4		14
Fine	4 - 5.7	G	3
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	6
Medium	11.3 - 16	V	5
Coarse	16 - 22.6	E	16
Coarse	22.6 - 32	L	17
Very Coarse	32 - 45	S	12
Very Coarse	45 - 64		9
Small	64 - 90	C	5
Small	90 - 128	O	1
Large	128 - 180	B	3
Large	180 - 256	L	
Small	256 - 362	B	1
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	107

Note:



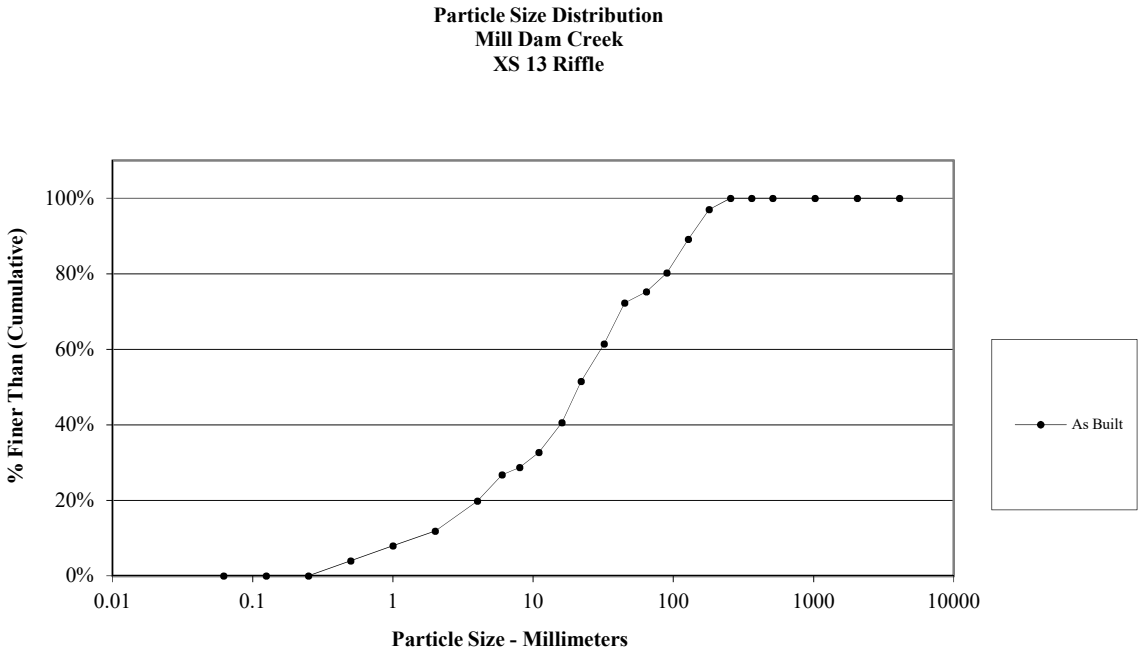
Size (mm)	
D16	2.5
D35	11
D50	20
D65	28
D84	48
D95	88

Size Distribution	
mean	11.0
dispersion	5.2
skewness	-0.23

Type	
silt/clay	0%
sand	12%
gravel	79%
cobble	8%
boulder	1%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 13 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	4
Coarse	.50 - 1	D	4
Very Coarse	1 - 2	S	4
Very Fine	2 - 4		8
Fine	4 - 5.7	G	7
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	4
Medium	11.3 - 16	V	8
Coarse	16 - 22.6	E	11
Coarse	22.6 - 32	L	10
Very Coarse	32 - 45	S	11
Very Coarse	45 - 64		3
Small	64 - 90	C	5
Small	90 - 128	O	9
Large	128 - 180	B	8
Large	180 - 256	L	3
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	101

Note:



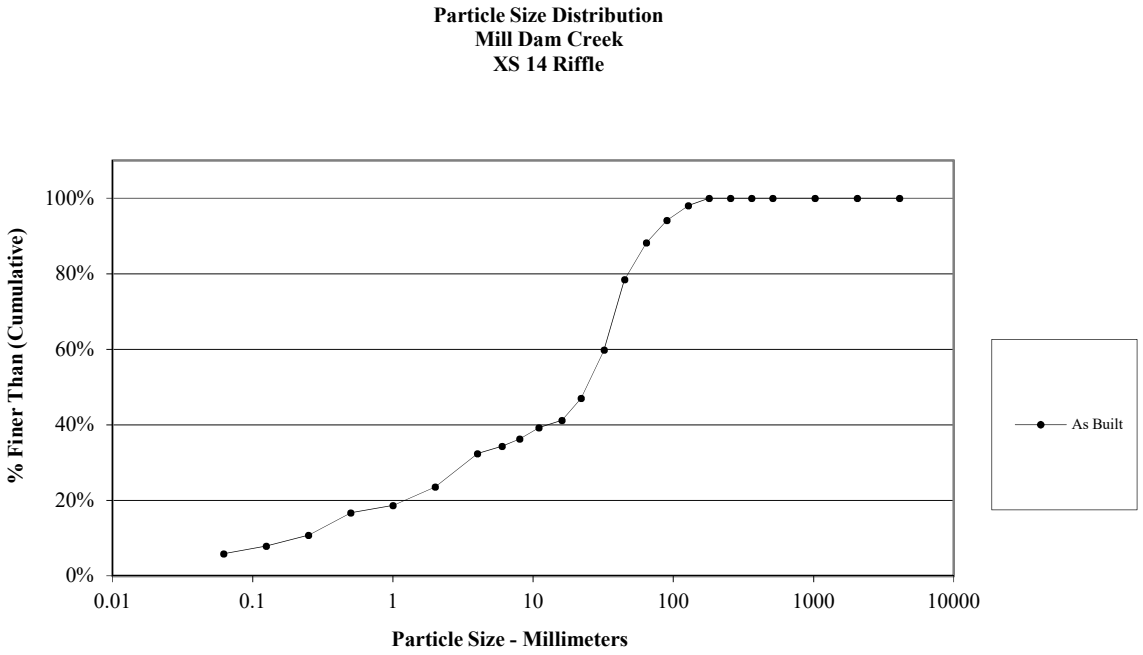
Size (mm)	
D16	2.9
D35	12
D50	21
D65	36
D84	100
D95	160

Size Distribution	
mean	17.0
dispersion	6.0
skewness	-0.07

Type	
silt/clay	0%
sand	12%
gravel	63%
cobble	25%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 14 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	6
Very Fine	.062 - .125	S	2
Fine	.125 - .25	A	3
Medium	.25 - .50	N	6
Coarse	.50 - 1	D	2
Very Coarse	1 - 2	S	5
Very Fine	2 - 4		9
Fine	4 - 5.7	G	2
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	3
Medium	11.3 - 16	V	2
Coarse	16 - 22.6	E	6
Coarse	22.6 - 32	L	13
Very Coarse	32 - 45	S	19
Very Coarse	45 - 64		10
Small	64 - 90	C	6
Small	90 - 128	O	4
Large	128 - 180	B	2
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:



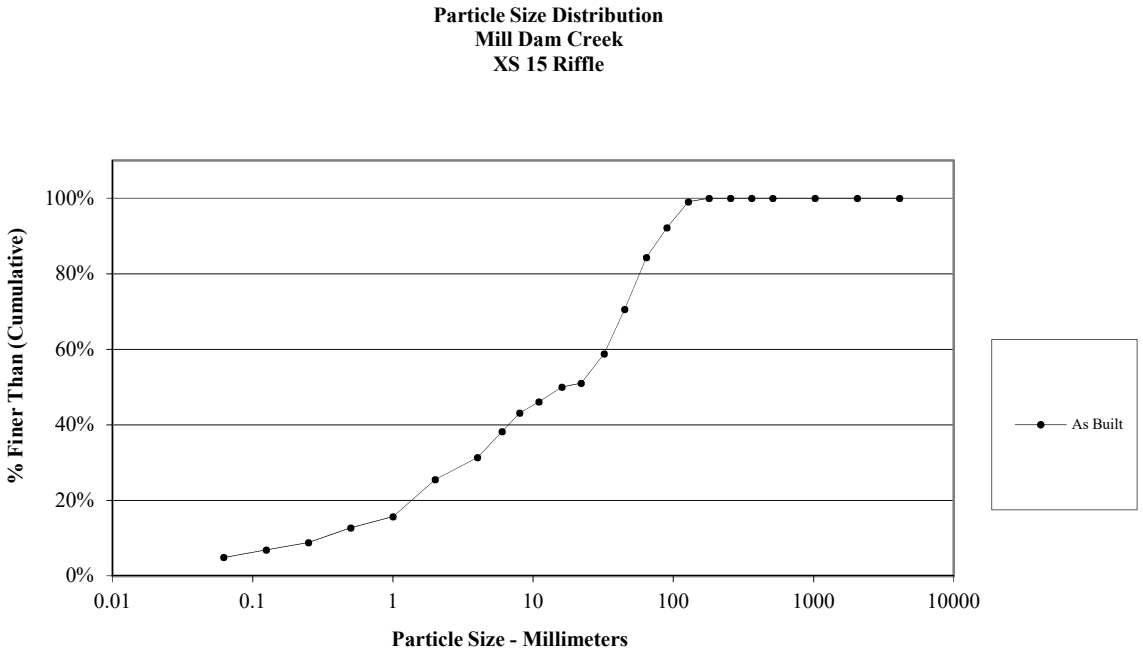
Size (mm)	
D16	0.46
D35	6.6
D50	24
D65	35
D84	55
D95	97

Size Distribution	
mean	5.0
dispersion	27.2
skewness	-0.47

Type	
silt/clay	6%
sand	18%
gravel	65%
cobble	12%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 15 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	5
Very Fine	.062 - .125	S	2
Fine	.125 - .25	A	2
Medium	.25 - .50	N	4
Coarse	.50 - 1	D	3
Very Coarse	1 - 2	S	10
Very Fine	2 - 4		6
Fine	4 - 5.7	G	7
Fine	5.7 - 8	R	5
Medium	8 - 11.3	A	3
Medium	11.3 - 16	V	4
Coarse	16 - 22.6	E	1
Coarse	22.6 - 32	L	8
Very Coarse	32 - 45	S	12
Very Coarse	45 - 64		14
Small	64 - 90	C	8
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:



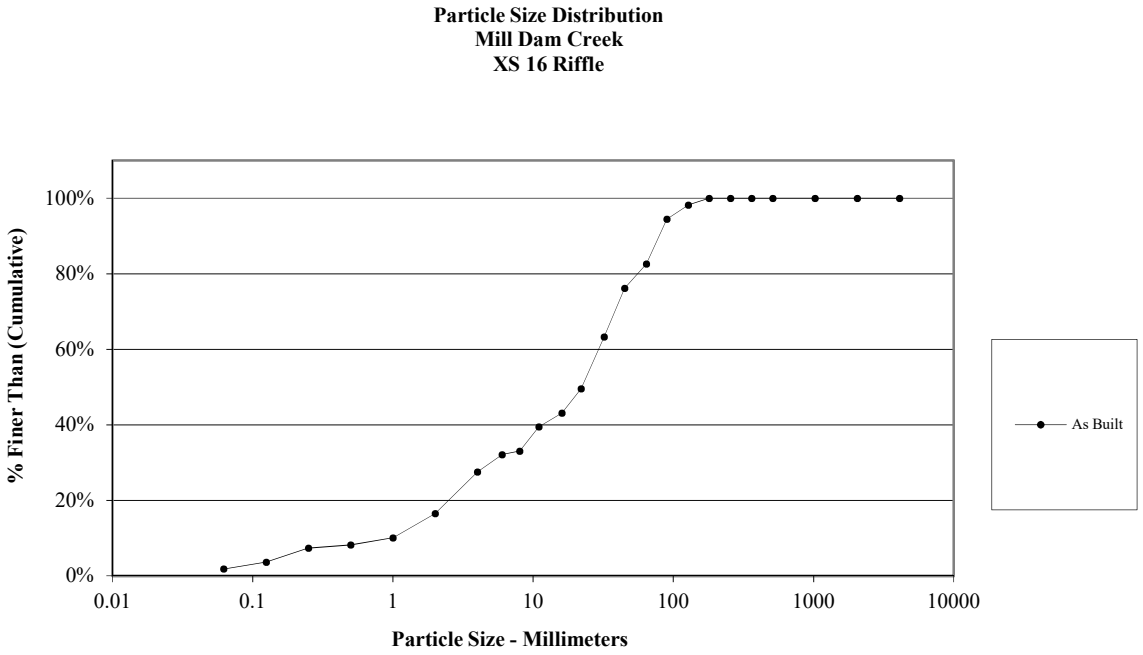
Size (mm)	
D16	1
D35	5
D50	16
D65	38
D84	63
D95	100

Size Distribution	
mean	7.9
dispersion	10.0
skewness	-0.23

Type	
silt/clay	5%
sand	21%
gravel	59%
cobble	16%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 16 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	2
Very Fine	.062 - .125	S	2
Fine	.125 - .25	A	4
Medium	.25 - .50	N	1
Coarse	.50 - 1	D	2
Very Coarse	1 - 2	S	7
Very Fine	2 - 4		12
Fine	4 - 5.7	G	5
Fine	5.7 - 8	R	1
Medium	8 - 11.3	A	7
Medium	11.3 - 16	V	4
Coarse	16 - 22.6	E	7
Coarse	22.6 - 32	L	15
Very Coarse	32 - 45	S	14
Very Coarse	45 - 64		7
Small	64 - 90	C	13
Small	90 - 128	O	4
Large	128 - 180	B	2
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	109

Note:



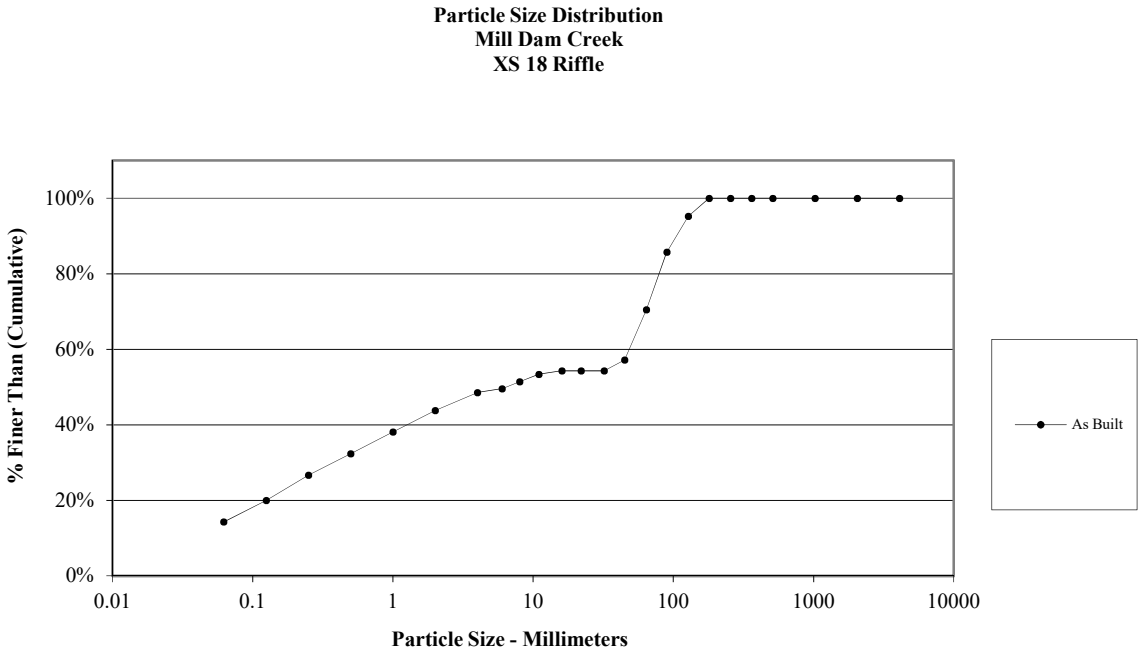
Size (mm)	
D16	1.9
D35	8.8
D50	22
D65	33
D84	67
D95	94

Size Distribution	
mean	11.3
dispersion	7.3
skewness	-0.23

Type	
silt/clay	2%
sand	15%
gravel	66%
cobble	17%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 18 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	15
Very Fine	.062 - .125	S	6
Fine	.125 - .25	A	7
Medium	.25 - .50	N	6
Coarse	.50 - 1	D	6
Very Coarse	1 - 2	S	6
Very Fine	2 - 4		5
Fine	4 - 5.7	G	1
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	2
Medium	11.3 - 16	V	1
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	3
Very Coarse	45 - 64		14
Small	64 - 90	C	16
Small	90 - 128	O	10
Large	128 - 180	B	5
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	105

Note:



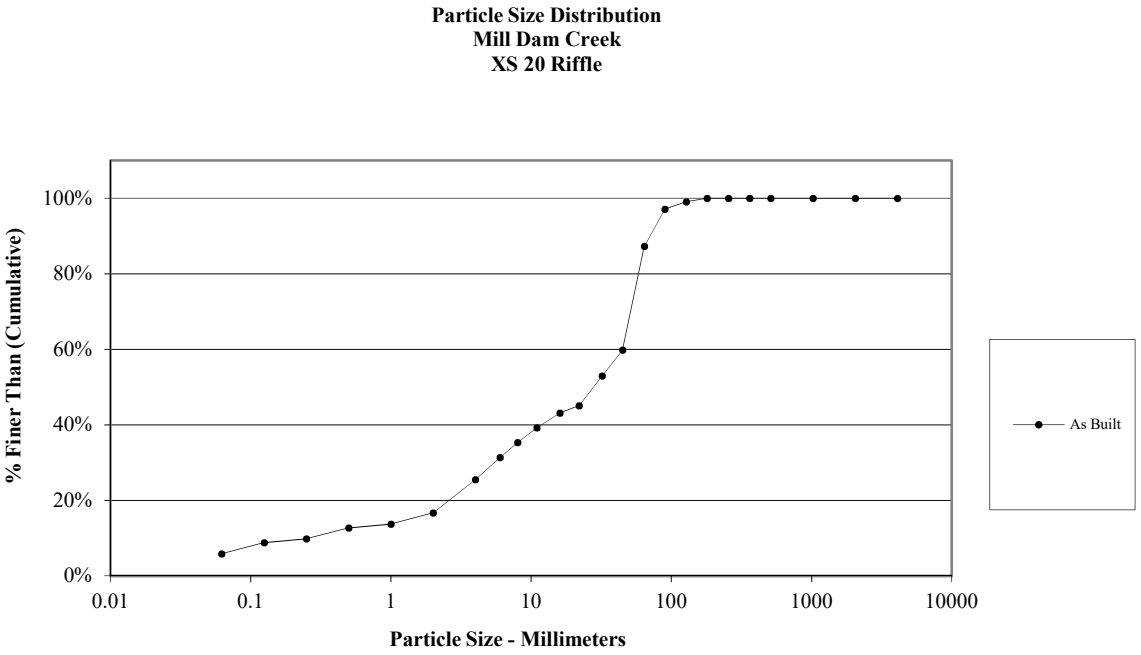
Size (mm)	
D16	0.077
D35	0.69
D50	6.4
D65	55
D84	87
D95	130

Size Distribution	
mean	2.6
dispersion	48.4
skewness	-0.23

Type	
silt/clay	14%
sand	30%
gravel	27%
cobble	30%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 20 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	6
Very Fine	.062 - .125	S	3
Fine	.125 - .25	A	1
Medium	.25 - .50	N	3
Coarse	.50 - 1	D	1
Very Coarse	1 - 2	S	3
Very Fine	2 - 4		9
Fine	4 - 5.7	G	6
Fine	5.7 - 8	R	4
Medium	8 - 11.3	A	4
Medium	11.3 - 16	V	4
Coarse	16 - 22.6	E	2
Coarse	22.6 - 32	L	8
Very Coarse	32 - 45	S	7
Very Coarse	45 - 64		28
Small	64 - 90	C	10
Small	90 - 128	O	2
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:



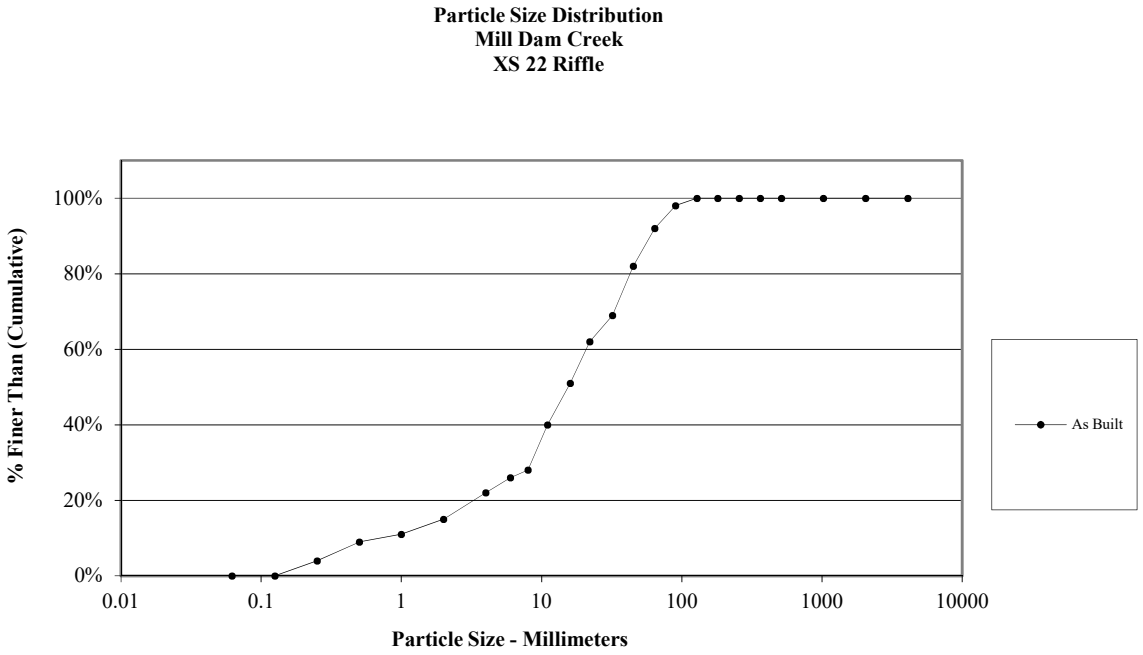
Size (mm)	
D16	1.7
D35	7.8
D50	28
D65	48
D84	61
D95	84

Size Distribution	
mean	10.2
dispersion	9.3
skewness	-0.35

Type	
silt/clay	6%
sand	11%
gravel	71%
cobble	13%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 22 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	4
Medium	.25 - .50	N	5
Coarse	.50 - 1	D	2
Very Coarse	1 - 2	S	4
Very Fine	2 - 4		7
Fine	4 - 5.7	G	4
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	12
Medium	11.3 - 16	V	11
Coarse	16 - 22.6	E	11
Coarse	22.6 - 32	L	7
Very Coarse	32 - 45	S	13
Very Coarse	45 - 64		10
Small	64 - 90	C	6
Small	90 - 128	O	2
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	100

Note:



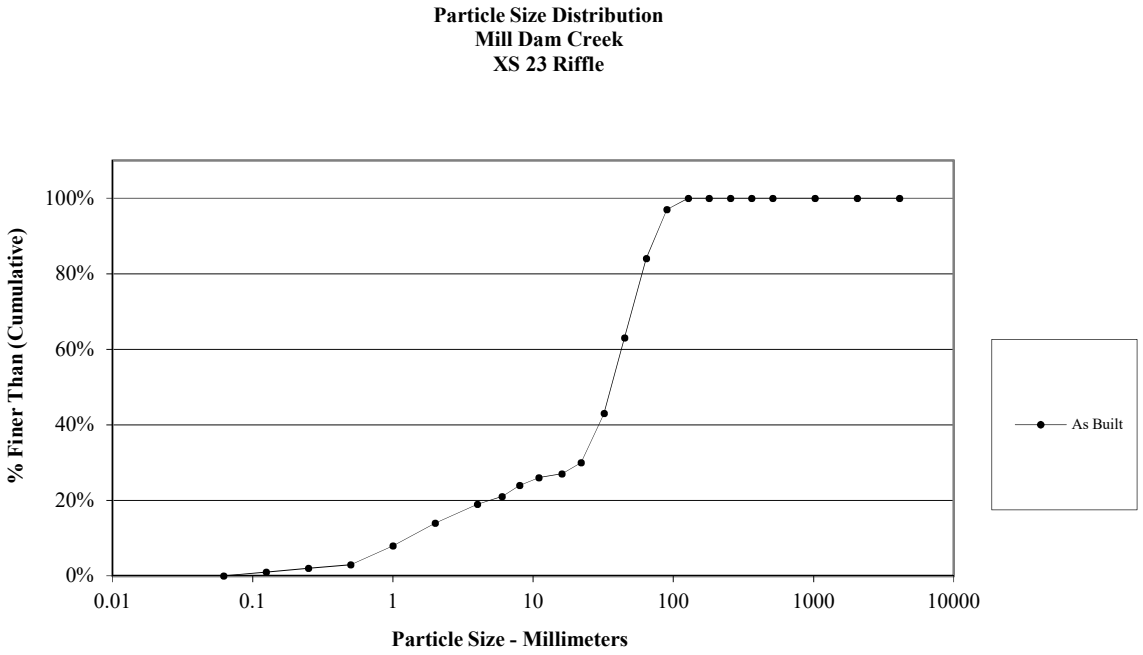
Size (mm)	
D16	2.2
D35	9.6
D50	15
D65	26
D84	48
D95	76

Size Distribution	
mean	10.3
dispersion	5.0
skewness	-0.14

Type	
silt/clay	0%
sand	15%
gravel	77%
cobble	8%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 23 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	1
Fine	.125 - .25	A	1
Medium	.25 - .50	N	1
Coarse	.50 - 1	D	5
Very Coarse	1 - 2	S	6
Very Fine	2 - 4		5
Fine	4 - 5.7	G	2
Fine	5.7 - 8	R	3
Medium	8 - 11.3	A	2
Medium	11.3 - 16	V	1
Coarse	16 - 22.6	E	3
Coarse	22.6 - 32	L	13
Very Coarse	32 - 45	S	20
Very Coarse	45 - 64		21
Small	64 - 90	C	13
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	100

Note:



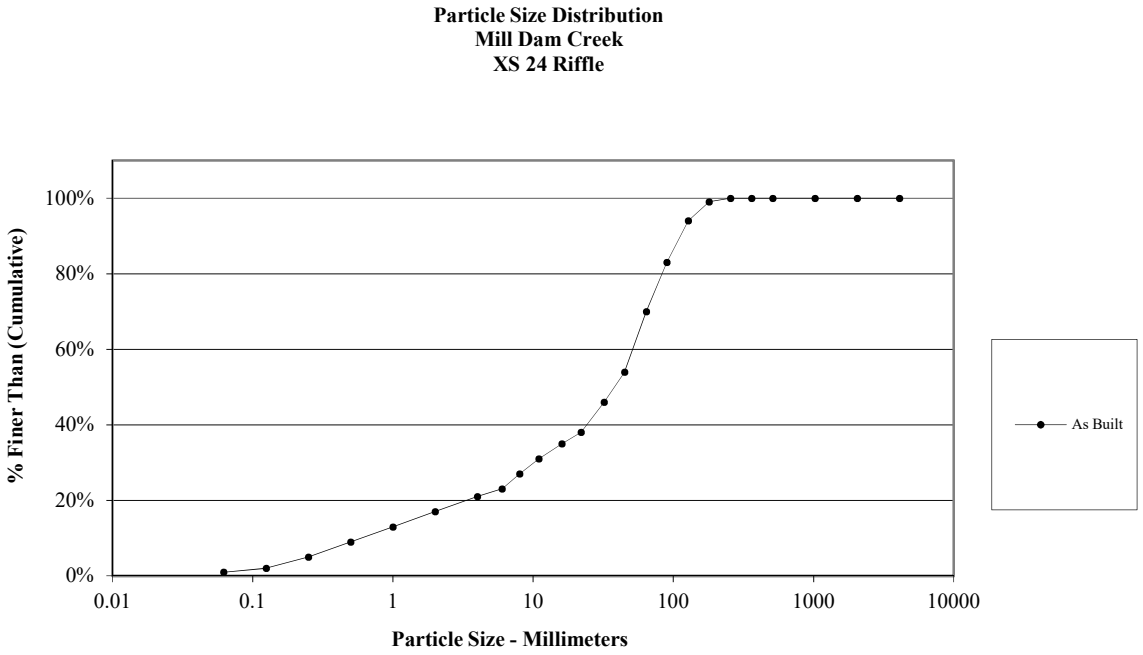
Size (mm)	
D16	2.6
D35	25
D50	36
D65	47
D84	64
D95	85

Size Distribution	
mean	12.9
dispersion	7.8
skewness	-0.38

Type	
silt/clay	0%
sand	14%
gravel	70%
cobble	16%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 24 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	1
Very Fine	.062 - .125	S	1
Fine	.125 - .25	A	3
Medium	.25 - .50	N	4
Coarse	.50 - 1	D	4
Very Coarse	1 - 2	S	4
Very Fine	2 - 4		4
Fine	4 - 5.7	G	2
Fine	5.7 - 8	R	4
Medium	8 - 11.3	A	4
Medium	11.3 - 16	V	4
Coarse	16 - 22.6	E	3
Coarse	22.6 - 32	L	8
Very Coarse	32 - 45	S	8
Very Coarse	45 - 64		16
Small	64 - 90	C	13
Small	90 - 128	O	11
Large	128 - 180	B	5
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:



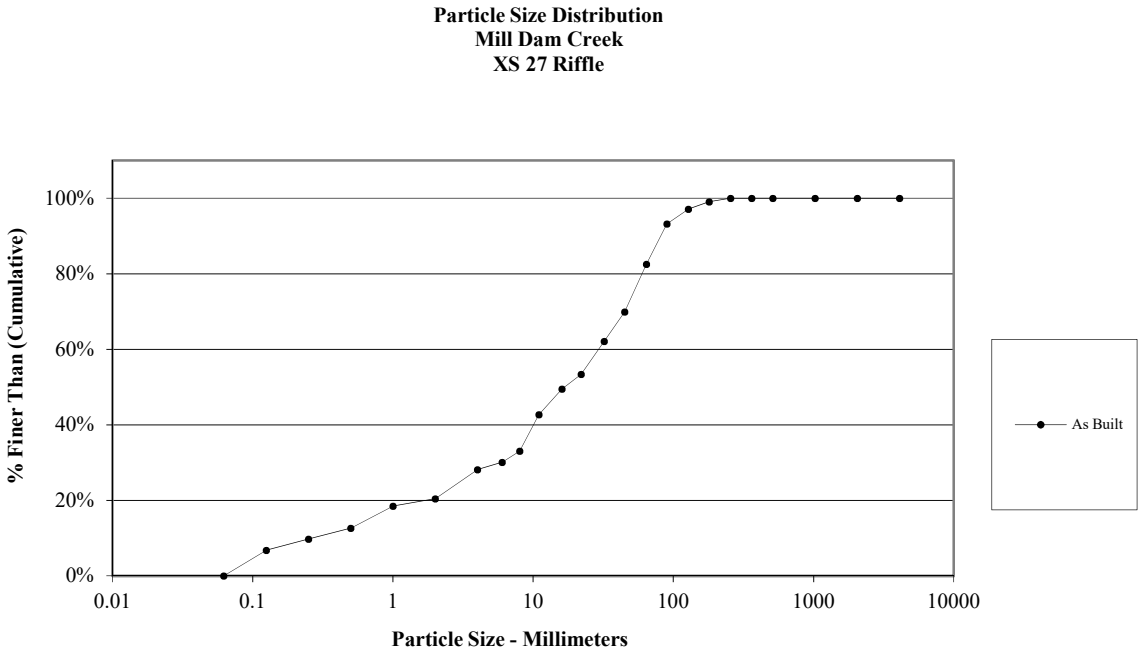
Size (mm)	
D16	1.7
D35	16
D50	38
D65	57
D84	93
D95	140

Size Distribution	
mean	12.6
dispersion	12.4
skewness	-0.36

Type	
silt/clay	1%
sand	16%
gravel	53%
cobble	30%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 27 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	7
Fine	.125 - .25	A	3
Medium	.25 - .50	N	3
Coarse	.50 - 1	D	6
Very Coarse	1 - 2	S	2
Very Fine	2 - 4		8
Fine	4 - 5.7	G	2
Fine	5.7 - 8	R	3
Medium	8 - 11.3	A	10
Medium	11.3 - 16	V	7
Coarse	16 - 22.6	E	4
Coarse	22.6 - 32	L	9
Very Coarse	32 - 45	S	8
Very Coarse	45 - 64		13
Small	64 - 90	C	11
Small	90 - 128	O	4
Large	128 - 180	B	2
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	103

Note:



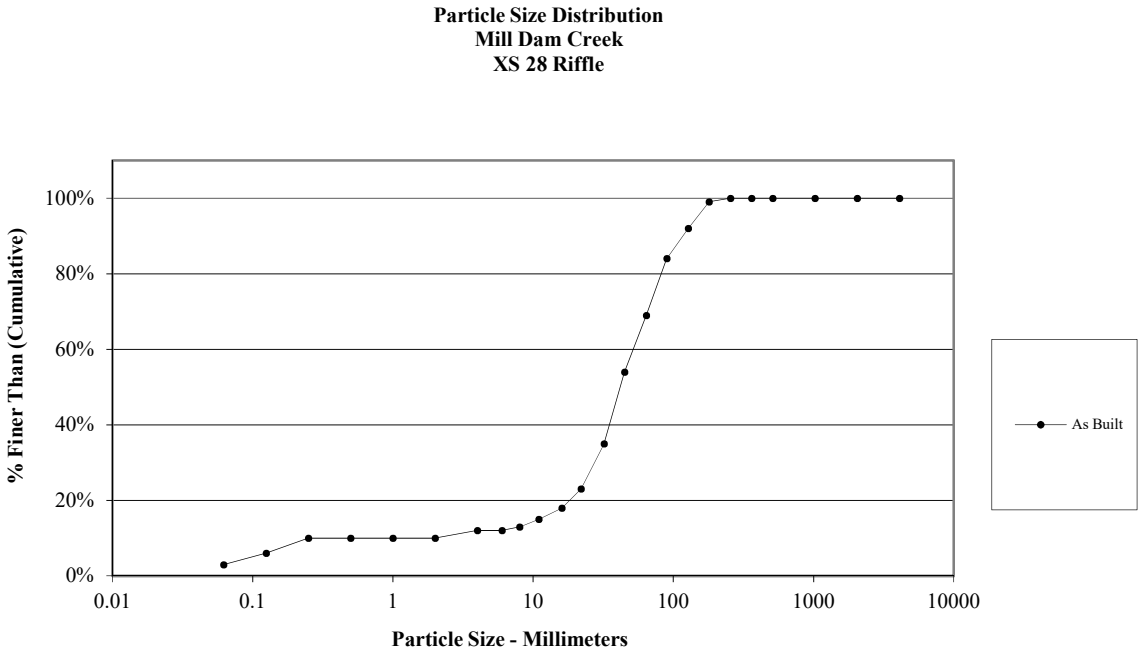
Size (mm)	
D16	0.75
D35	8.5
D50	17
D65	36
D84	67
D95	110

Size Distribution	
mean	7.1
dispersion	13.3
skewness	-0.27

Type	
silt/clay	0%
sand	20%
gravel	62%
cobble	17%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 28 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	3
Very Fine	.062 - .125	S	3
Fine	.125 - .25	A	4
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		2
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	1
Medium	8 - 11.3	A	2
Medium	11.3 - 16	V	3
Coarse	16 - 22.6	E	5
Coarse	22.6 - 32	L	12
Very Coarse	32 - 45	S	19
Very Coarse	45 - 64		15
Small	64 - 90	C	15
Small	90 - 128	O	8
Large	128 - 180	B	7
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:



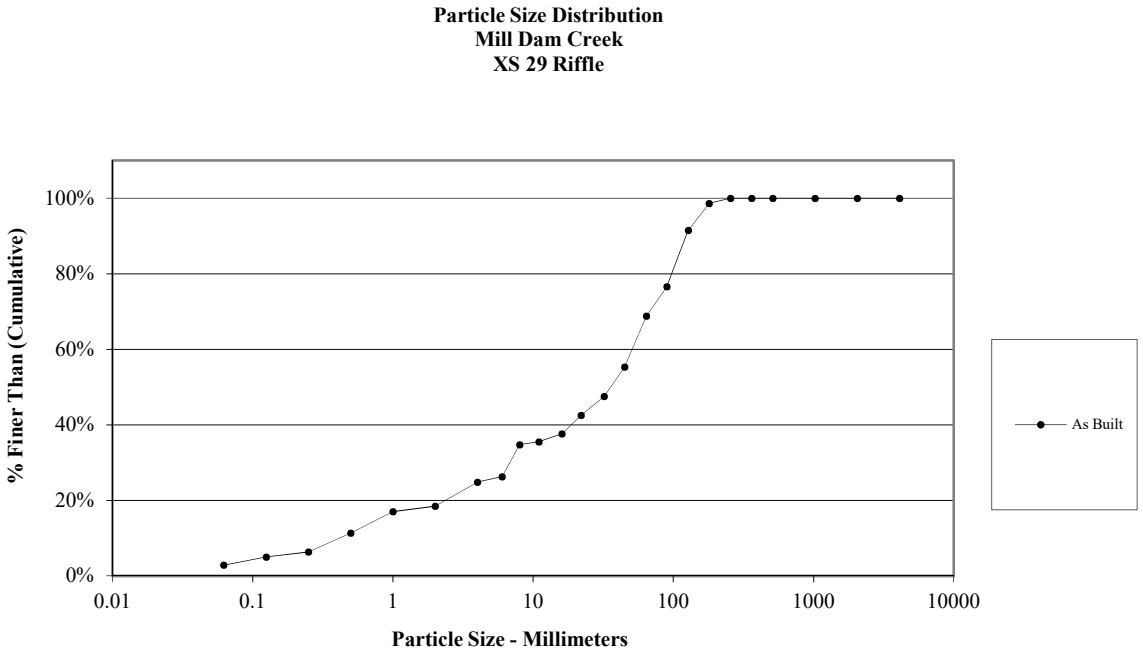
Size (mm)	
D16	12
D35	32
D50	42
D65	58
D84	90
D95	150

Size Distribution	
mean	32.9
dispersion	2.8
skewness	-0.11

Type	
silt/clay	3%
sand	7%
gravel	59%
cobble	31%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 29 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	4
Very Fine	.062 - .125	S	3
Fine	.125 - .25	A	2
Medium	.25 - .50	N	7
Coarse	.50 - 1	D	8
Very Coarse	1 - 2	S	2
Very Fine	2 - 4		9
Fine	4 - 5.7	G	2
Fine	5.7 - 8	R	12
Medium	8 - 11.3	A	1
Medium	11.3 - 16	V	3
Coarse	16 - 22.6	E	7
Coarse	22.6 - 32	L	7
Very Coarse	32 - 45	S	11
Very Coarse	45 - 64		19
Small	64 - 90	C	11
Small	90 - 128	O	21
Large	128 - 180	B	10
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	141

Note:



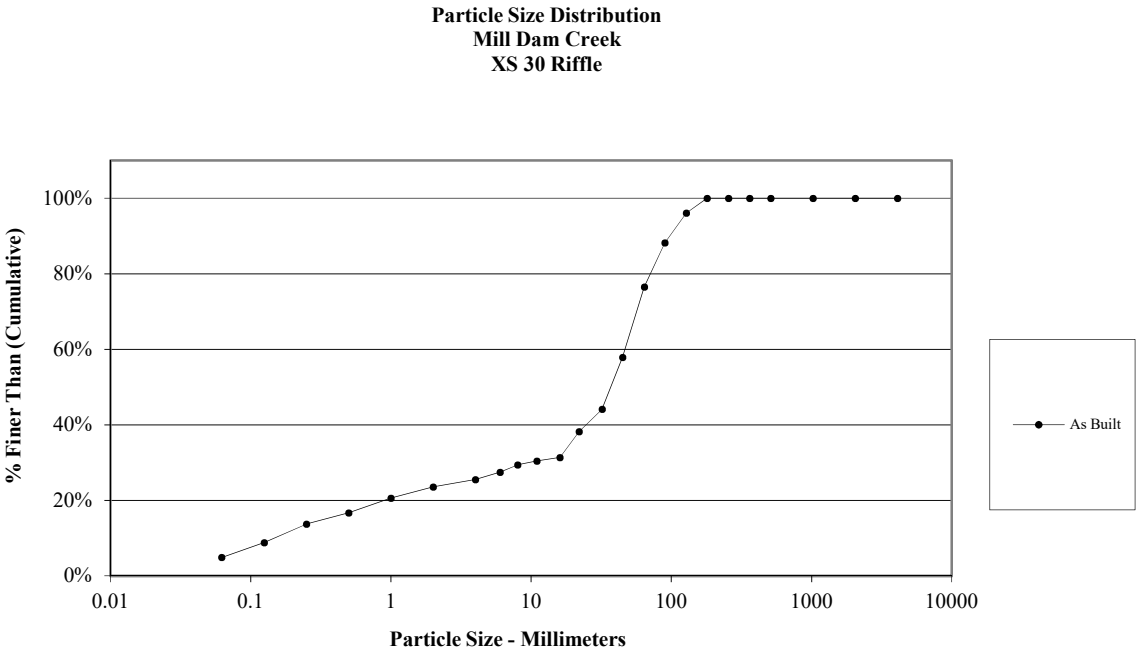
Size (mm)	
D16	0.88
D35	8.9
D50	36
D65	58
D84	110
D95	150

Size Distribution	
mean	9.8
dispersion	22.0
skewness	-0.39

Type	
silt/clay	3%
sand	16%
gravel	50%
cobble	31%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 30 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	5
Very Fine	.062 - .125	S	4
Fine	.125 - .25	A	5
Medium	.25 - .50	N	3
Coarse	.50 - 1	D	4
Very Coarse	1 - 2	S	3
Very Fine	2 - 4		2
Fine	4 - 5.7	G	2
Fine	5.7 - 8	R	2
Medium	8 - 11.3	A	1
Medium	11.3 - 16	V	1
Coarse	16 - 22.6	E	7
Coarse	22.6 - 32	L	6
Very Coarse	32 - 45	S	14
Very Coarse	45 - 64		19
Small	64 - 90	C	12
Small	90 - 128	O	8
Large	128 - 180	B	4
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:



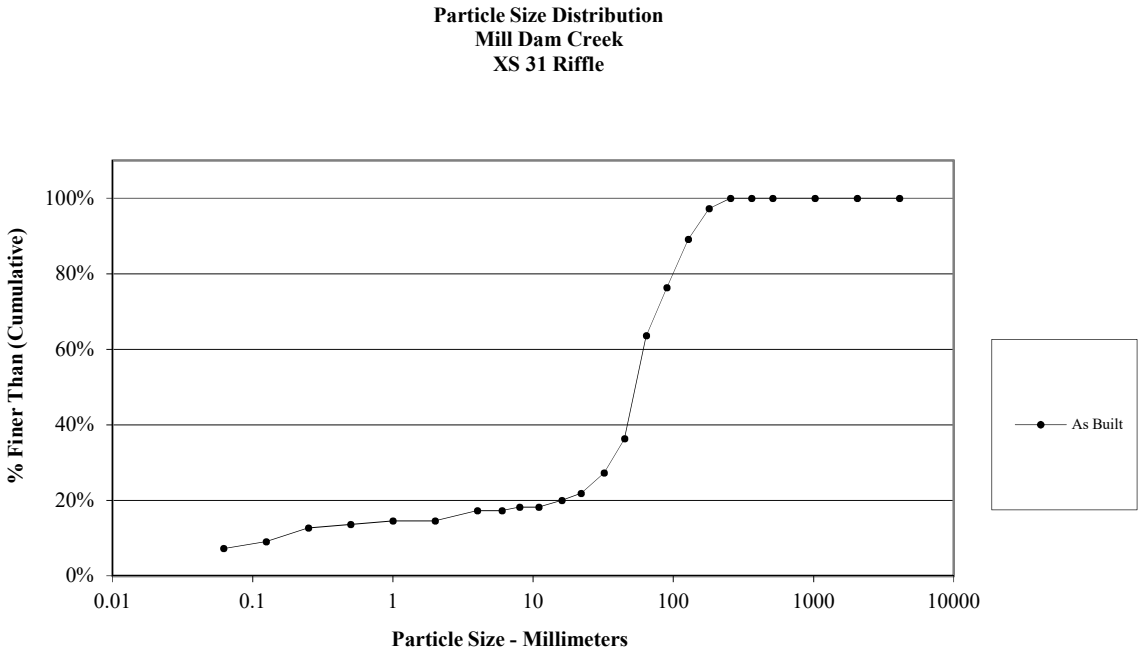
Size (mm)	
D16	0.43
D35	19
D50	37
D65	52
D84	80
D95	120

Size Distribution	
mean	5.9
dispersion	44.1
skewness	-0.53

Type	
silt/clay	5%
sand	19%
gravel	53%
cobble	24%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 31 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	8
Very Fine	.062 - .125	S	2
Fine	.125 - .25	A	4
Medium	.25 - .50	N	1
Coarse	.50 - 1	D	1
Very Coarse	1 - 2	S	
Very Fine	2 - 4		3
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	1
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	2
Coarse	16 - 22.6	E	2
Coarse	22.6 - 32	L	6
Very Coarse	32 - 45	S	10
Very Coarse	45 - 64		30
Small	64 - 90	C	14
Small	90 - 128	O	14
Large	128 - 180	B	9
Large	180 - 256	L	3
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	110

Note:



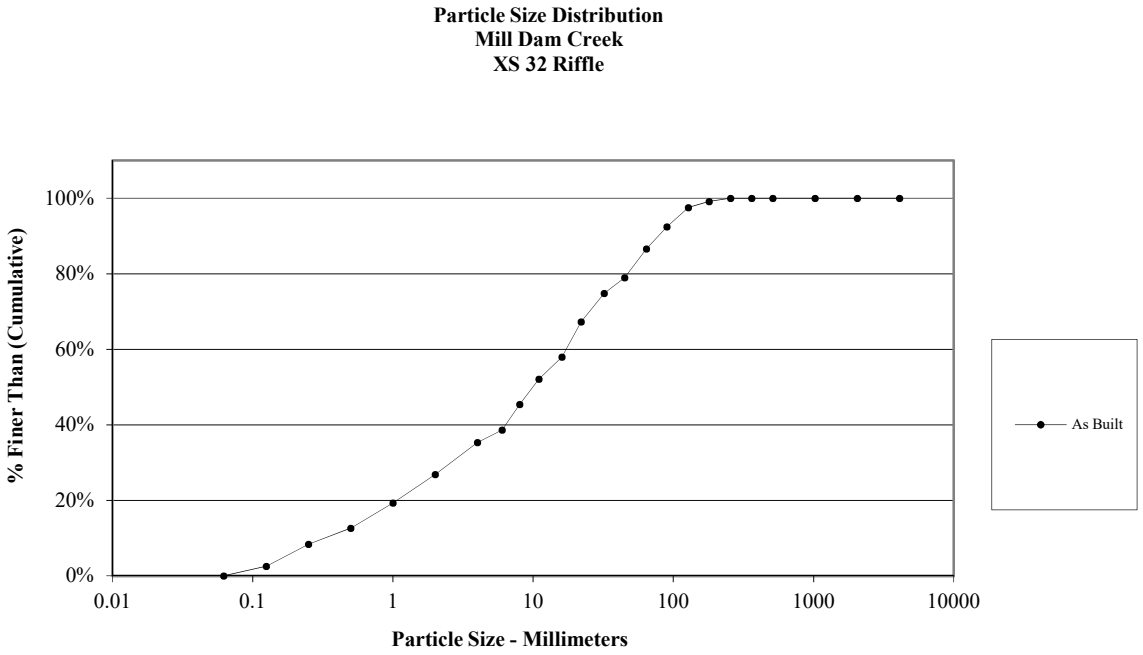
Size (mm)	
D16	2.9
D35	43
D50	54
D65	66
D84	110
D95	160

Size Distribution	
mean	17.9
dispersion	10.3
skewness	-0.38

Type	
silt/clay	7%
sand	7%
gravel	49%
cobble	36%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 32 Riffle - MY-00			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	3
Fine	.125 - .25	A	7
Medium	.25 - .50	N	5
Coarse	.50 - 1	D	8
Very Coarse	1 - 2	S	9
Very Fine	2 - 4		10
Fine	4 - 5.7	G	4
Fine	5.7 - 8	R	8
Medium	8 - 11.3	A	8
Medium	11.3 - 16	V	7
Coarse	16 - 22.6	E	11
Coarse	22.6 - 32	L	9
Very Coarse	32 - 45	S	5
Very Coarse	45 - 64		9
Small	64 - 90	C	7
Small	90 - 128	O	6
Large	128 - 180	B	2
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	119

Note:



Size (mm)	
D16	0.71
D35	3.9
D50	10
D65	20
D84	57
D95	110

Size Distribution	
mean	6.4
dispersion	9.9
skewness	-0.14

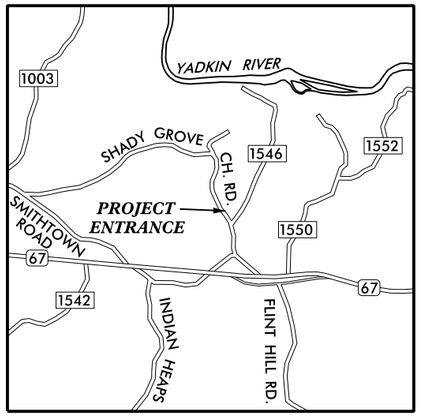
Type	
silt/clay	0%
sand	27%
gravel	60%
cobble	13%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

APPENDIX E

As-Built Plan Sheet

KCI JOB# : 161601703

CONTRACT #: 6898



VICINITY MAP
NOT TO SCALE

PROJECT COMPONENTS – TOTAL CREDITS 10,290						
Reach ID	Proposed Stationing	Existing Footage	Approach	Mitigation Ratio	R Footage	R -or- R Equivalent
T1*	100+00 to 107+51	748	R	1:1	734	734
T1A	150+00 to 157+95	739	R	1:1	795	795
T2-1	200+00 to 204+98	498	EII	2.5:1	498	199
T2-2	204+98 to 207+63	265	R	1:1	265	265
T3	300+00 to 303+69	378	R	1:1	369	369
T4	400+00 to 401+51	151	R	1:1	151	151
T5*	1000+00 to 1012+13	1,174	EII	2.5:1	1,182	473
T5A	1200+00 to 1200+65	65	EII	2.5:1	65	26
T5B	1300+00 to 1304+38	438	EII	2.5:1	438	175
T6-1*	600+00 to 602+59	259	EII	2.5:1	259	104
T6-2	602+59 to 609+80	621	R	1:1	658	658
T6A-1	650+00 to 650+60	60	EII	2.5:1	60	24
T6A-2	650+60 to 651+61	97	R	1:1	101	101
T7-1	700+00 to 701+65	165	EII	2.5:1	165	66
T7-2	701+65 to 705+13	335	R	1:1	348	348
T8-1*	800+00 to 804+45	445	EII	2.5:1	445	178
T8-2	804+45 to 808+94	464	R	1:1	426	426
T8A	850+00 to 852+63	258	R	1:1	263	263
T9	900+00 to 901+29	133	R	1:1	129	129
UTHC1 Top*	10+00-22+81	1,333	R	1:1	1,249	1,249
UTHC1 Bottom*	22+81-27+39	541	R	1:1	438	438
UTHC2	27+39-42+32	1,494	EI	1.5:1	1,493	995
UTHC3*	42+32-55+57	1,411	R	1:1	1,240	1,240
UTHC4-1	55+57-58+53	1,840	EI	1.5:1	297	198
UTHC4-2	58+53-63+75		EII	2.5:1	521	208
UTHC4-3*	63+75-68+55		EI	1.5:1	419	279
UTHC4-4*	68+55-73+97		EII	2.5:1	497	199

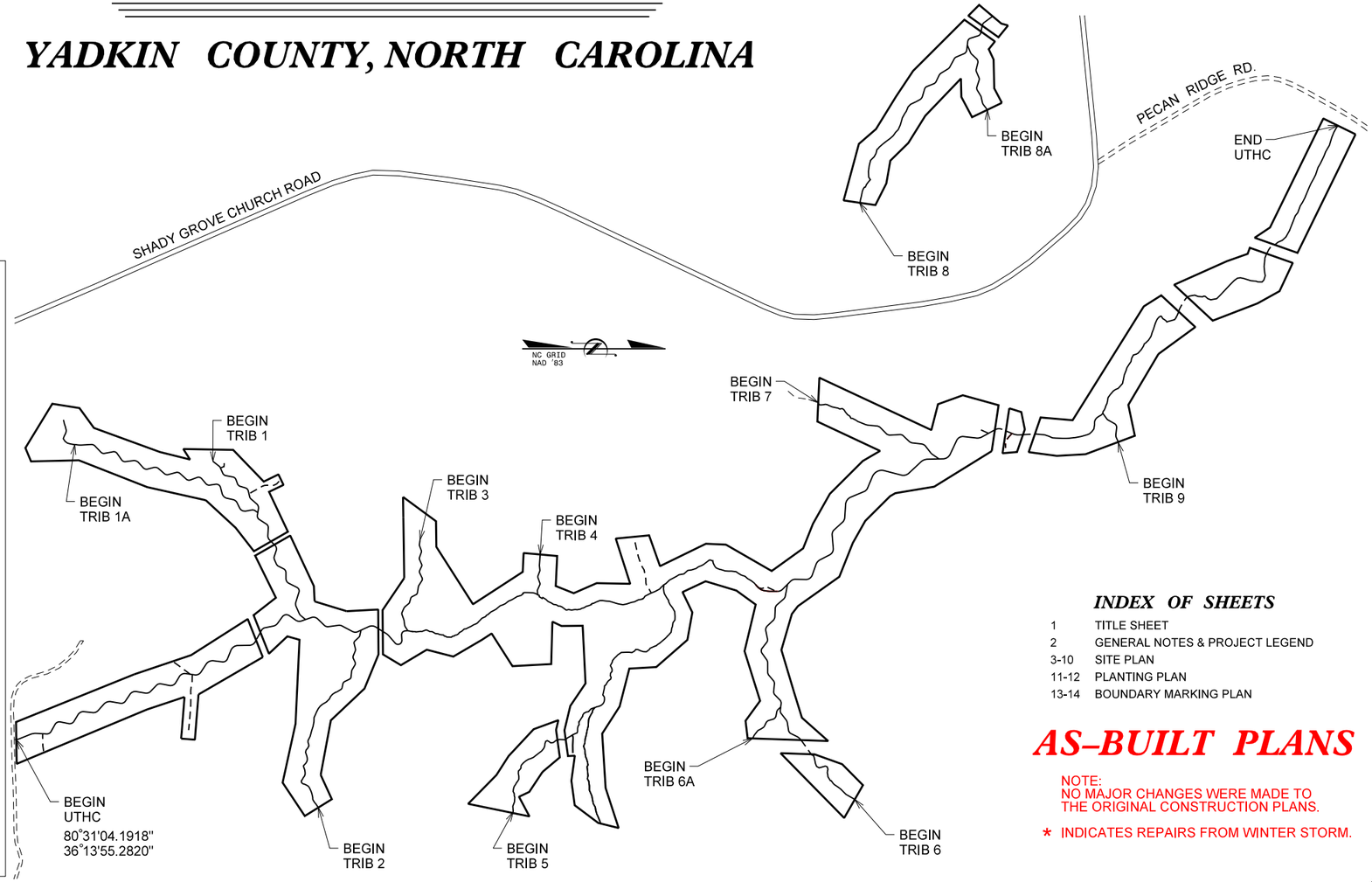
Crossings have been removed from creditable linear footage for all project streams.

NCDEQ DIVISION OF MITIGATION SERVICES

STATE	DMS PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
N.C.	97136	1	14

MILL DAM CREEK STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA



INDEX OF SHEETS

AS–BUILT PLANS

NOTE:
NO MAJOR CHANGES WERE MADE TO THE ORIGINAL CONSTRUCTION PLANS.

* INDICATES REPAIRS FROM WINTER STORM.

DIRECTIONS TO SITE

From Raleigh, follow I–40 West towards Winston–Salem. Take exit 188 to follow US–421 North. Take exit 244 off of US–421 onto Williams Road. At the traffic circle take the third exit onto Shallowford Rd. Turn right onto Conrad Rd. Turn left onto Old US421. Turn right onto Flint Hill Rd. Turn left onto Main St. Slight right onto Fairground Rd. Turn right onto Shady Grove Rd. Follow for about a mile; the site entrance will be at 4413 Shady Grove Church Rd.

Prepared in the Office of:

KCI ASSOCIATES OF NC
ENGINEERS • PLANNERS • SCIENTISTS
4505 FALLS OF NEUSE ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27609

GARY M. MRYNCZA, PE
PROJECT ENGINEER

ALEX FRENCH
PROJECT DESIGNER

Prepared for:

NCDEQ – DIVISION OF MITIGATION SERVICES

MATTHEW REID
DMS PROJECT MANAGER

LIN XU
DMS REVIEW COORDINATOR

PROJECT SURVEYOR

P.E.
SIGNATURE:

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

P.E.
SIGNATURE:

GENERAL NOTES:

THIS SET OF PLANS IS BASED OFF OF AN AS-BUILT SURVEY COMPLETED BY KCI ASSOCIATES OF NC IN OCTOBER OF 2019.

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.

DISTANCES SHOWN ARE HORIZONTAL GROUND DISTANCES IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.

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. ALL DISTANCES ARE GROUND UNLESS OTHERWISE NOTED.

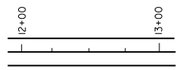
NO UNDERGROUND UTILITY LOCATING PERFORMED DURING THE COURSE OF THIS SURVEY.

AS-BUILT CONTROL POINTS:

DESCRIPTION	NORTHING	EASTING	ELEV	POINT
MILL DAM 1	906433.72	1552754.88	1007.74	1
MILL DAM 2	906784.49	1550793.65	999.31	2
MILL DAM 3	908920.82	1550521.12	968.14	3
MILL DAM 4	910728.58	1548637.89	931.06	4
MILL DAM 5	911824.03	1550305.86	861.62	5
MILL DAM 6	910632.90	1554600.60	963.71	6
MILL DAM 7	909965.25	1552331.55	947.62	7
CP	906899.28	1552214.96	956.99	12
KCI#14	906839.03	1551169.59	979.01	14
KCI#15	907378.47	1551306.72	952.23	15
KCI#16	908093.58	1552046.36	924.83	16
KCI#17	908557.45	1551959.23	924.62	17
KCI#18	907613.45	1551482.76	937.21	18
KCI	907521.34	1551394.95	944.63	19
KCI	907211.62	1551314.00	955.42	20
KCI	907089.19	1551294.01	959.66	21
KCI	906963.06	1551259.62	958.01	22
NL SET	907405.83	1552011.42	943.65	100
NL SET	907700.90	1551878.32	930.14	101
NL SET	908155.42	1552066.45	929.83	102
NL SET	907766.56	1551813.03	930.51	103
NL SET	907944.60	1552122.11	932.99	104

* CONTACT DESIGN REPRESENTATIVE FOR FULL LIST OF CONTROL POINTS

PROJECT LEGEND:

New Thalweg w/Approximate Bankfull Limits ..... 

Installed Step Pool ..... 

Installed Riffle Enhancement ..... 

Installed Riffle Grade Control ..... 

Installed Riffle Cascade ..... 

Installed Live Lift ..... 

Stabilized Incoming Drainage ..... 

Minor Contour Line .....

Major Contour Line .....

Utility Pole ..... 

PROJECT ENGINEER

PROJECT SURVEYOR

REVISIONS

SYM.	DESCRIPTION	DATE

NCDEQ – DIVISION OF MITIGATION SERVICES

KCI ASSOCIATES OF NC
ENGINEERS • PLANNERS • SCIENTISTS
4505 FALLS OF NEUSE ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27609

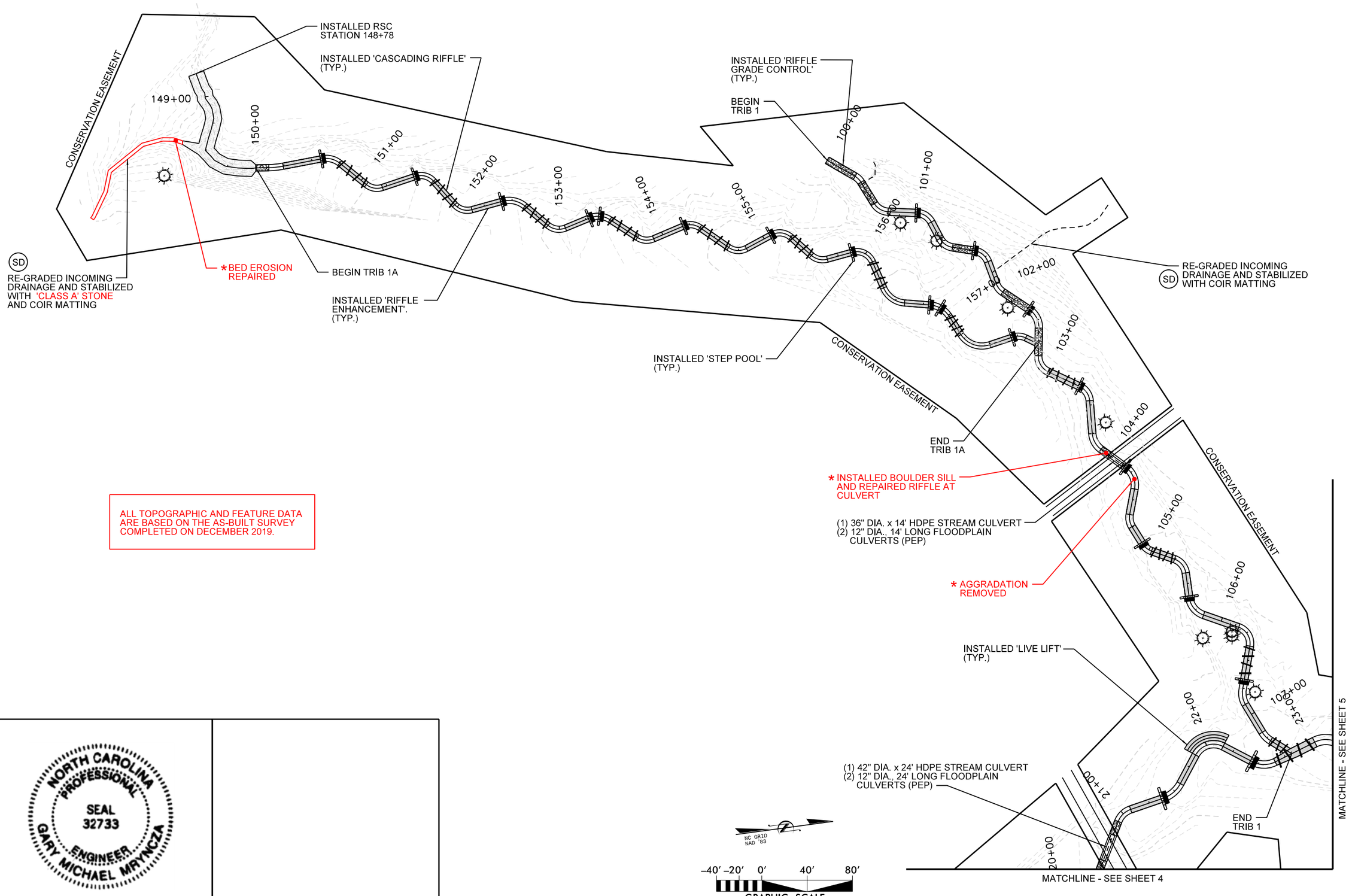
MILL DAM CREEK
STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020
SCALE: N.T.S.

GENERAL NOTES & PROJECT LEGEND

SHEET 2 OF 14



ALL TOPOGRAPHIC AND FEATURE DATA ARE BASED ON THE AS-BUILT SURVEY COMPLETED ON DECEMBER 2019.

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

PROJECT ENGINEER

PROJECT SURVEYOR

REVISIONS

SYM.	DESCRIPTION	DATE

NCDEQ – DIVISION OF MITIGATION SERVICES

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4505 FALLS OF NEUSE ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27609

MILL DAM CREEK STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020
SCALE: GRAPHIC

SITE PLAN

REACH:
T1 & T1A

SHEET 3 OF 14

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

PROJECT ENGINEER

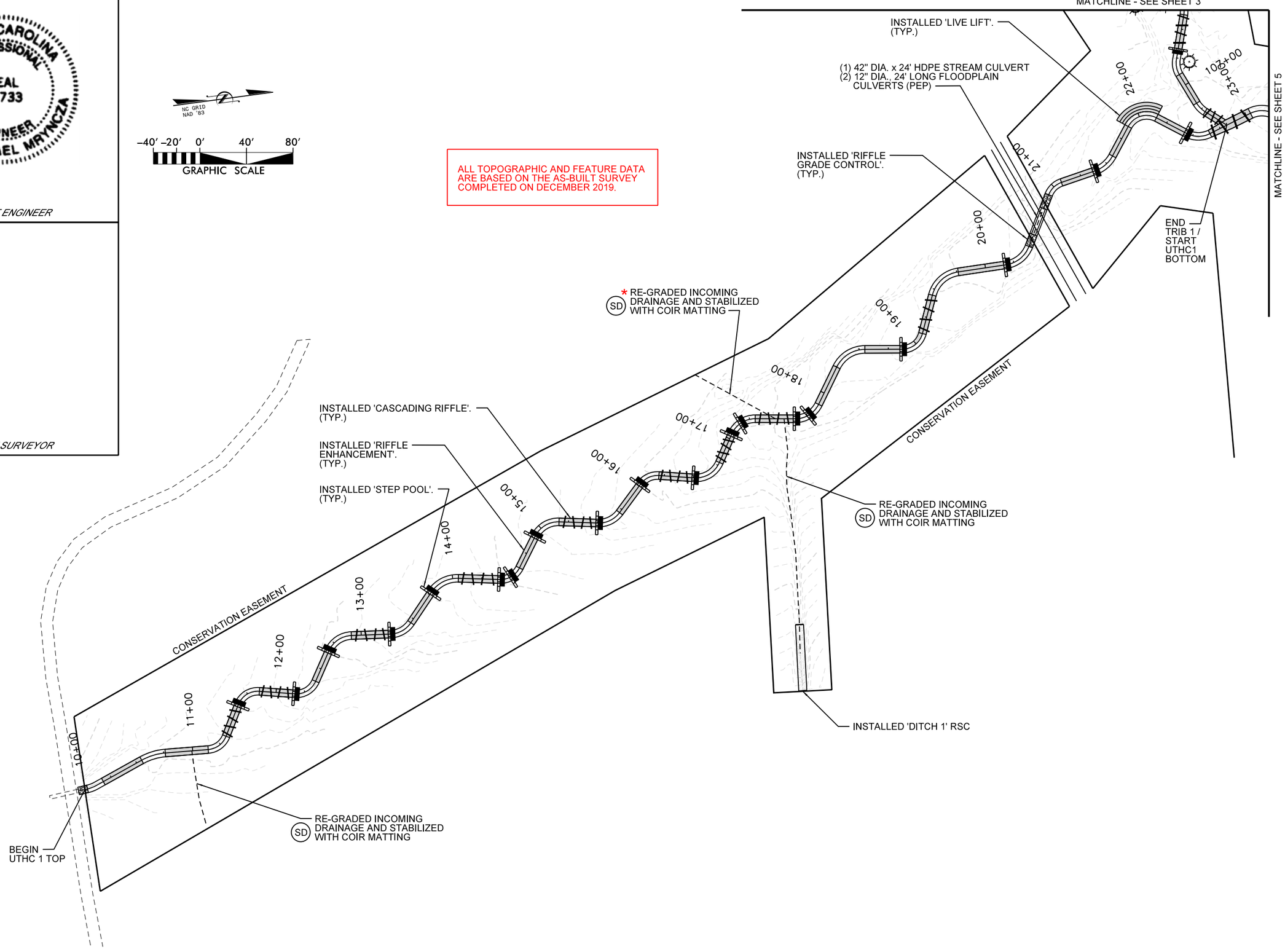
PROJECT SURVEYOR

NC GRID NAD '83

–40′ –20′ 0′ 40′ 80′

GRAPHIC SCALE

ALL TOPOGRAPHIC AND FEATURE DATA ARE BASED ON THE AS-BUILT SURVEY COMPLETED ON DECEMBER 2019.



REVISIONS	DESCRIPTION	DATE

NCDEQ – DIVISION OF MITIGATION SERVICES

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4505 FALLS OF NEUSE ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27609

MILL DAM CREEK
STREAM RESTORATION SITE

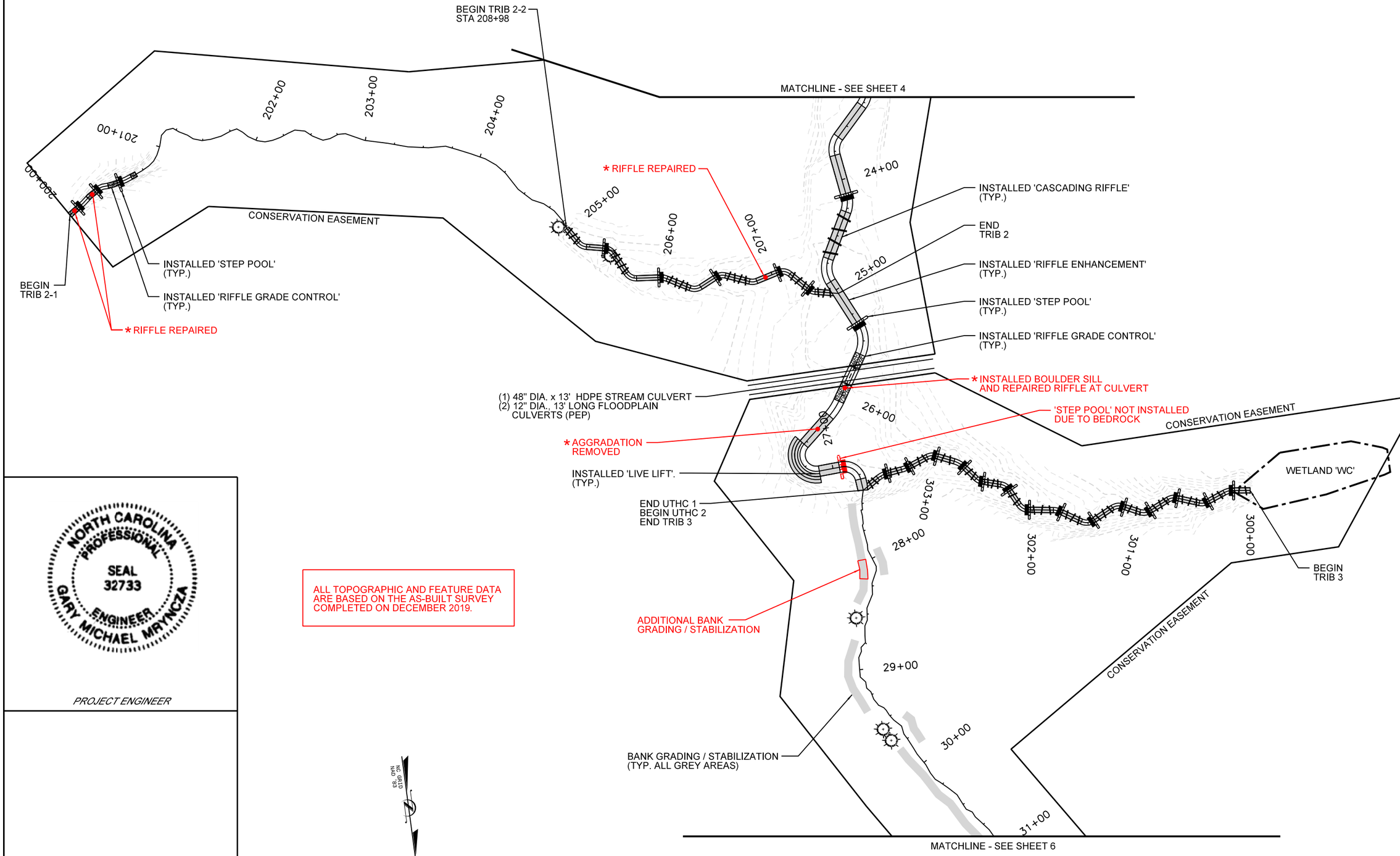
YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020
SCALE: GRAPHIC

SITE PLAN

REACH: UTHC

SHEET 4 OF 14



ALL TOPOGRAPHIC AND FEATURE DATA ARE BASED ON THE AS-BUILT SURVEY COMPLETED ON DECEMBER 2019.

NC GRID NAD '83

–40′ –20′ 0′ 40′ 80′

GRAPHIC SCALE

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

PROJECT ENGINEER

PROJECT SURVEYOR

REVISIONS

NO.	DESCRIPTION	DATE

NCDEQ – DIVISION OF MITIGATION SERVICES

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4505 FALLS OF NEUSE ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27609

MILL DAM CREEK STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020
SCALE: GRAPHIC

SITE PLAN

REACH:
T2, T3, & UTHC

SHEET 5 OF 14

MATCHLINE - SEE SHEET 5

ALL TOPOGRAPHIC AND FEATURE DATA ARE BASED ON THE AS-BUILT SURVEY COMPLETED ON DECEMBER 2019.

CONSERVATION EASEMENT

BEGIN TRIB 5

1000+00

1001+00

1002+00

1003+00

1200+00

1004+00

1005+00

1006+00

1007+00

1008+00

1009+00

1010+00

1011+00

1012+00

1303+00

1302+00

1301+00

1300+00

(1) 30" DIA. x 24' HDPE STREAM CULVERT

INSTALLED ADDITIONAL 'CASCADING RIFFLE'

ALL EXISTING DEBRIS INSIDE EASEMENT REMOVED

BEGIN TRIB 5A

INSTALLED ADDITIONAL 'RIFFLE ENHANCEMENT'

INSTALLED 'RIFFLE ENHANCEMENT' (TYP.)

END TRIB 5B

INSTALLED ADDITIONAL 'RIFFLE ENHANCEMENT'

* STABILIZED HEADCUT WITH 'STEP POOL' AND 'RIFFLE GRADE CONTROL'

BANK GRADING / STABILIZATION (TYP. ALL GREY AREAS)

BEGIN TRIB 5B

EXISTING OVERHEAD UTILITIES TO BE RELOCATED OUTSIDE OF EASEMENT DURING MONITORING / MAINTENANCE PERIOD.

CONSERVATION EASEMENT

ADDITIONAL BANK GRADING / STABILIZATION

REMOVED BANK GRADING / STABILIZATION

BEGIN TRIB 4

32+00

33+00

401+00

400+00

INSTALLED 'RIFFLE GRADE CONTROL'. (TYP.)

34+00

35+00

CONSERVATION EASEMENT

INSTALLED 'DITCH 2' RSC (RELOCATED DOWN-GRADIENT 45 FEET)

36+00

37+00

RE-GRADED INCOMING DRAINAGE AND STABILIZED WITH COIR MATTING

SD

38+00

END TRIB 5

INSTALLED 'LIVE LIFT'. (TYP.)

39+00

WETLAND 'WB'

INSTALLED 'STEP POOL' (TYP.)

CONSERVATION EASEMENT

INSTALLED 'CASCADING RIFFLE' (TYP.)

MATCHLINE - SEE SHEET 7

NAD 1983 NC GRID

–40′ –20′ 0′ 40′ 80′

GRAPHIC SCALE

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

PROJECT ENGINEER

PROJECT SURVEYOR

REVISIONS		
SYM.	DESCRIPTION	DATE

NCDEQ – DIVISION OF MITIGATION SERVICES

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4505 FALLS OF NEUSE ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27609

MILL DAM CREEK STREAM RESTORATION SITE

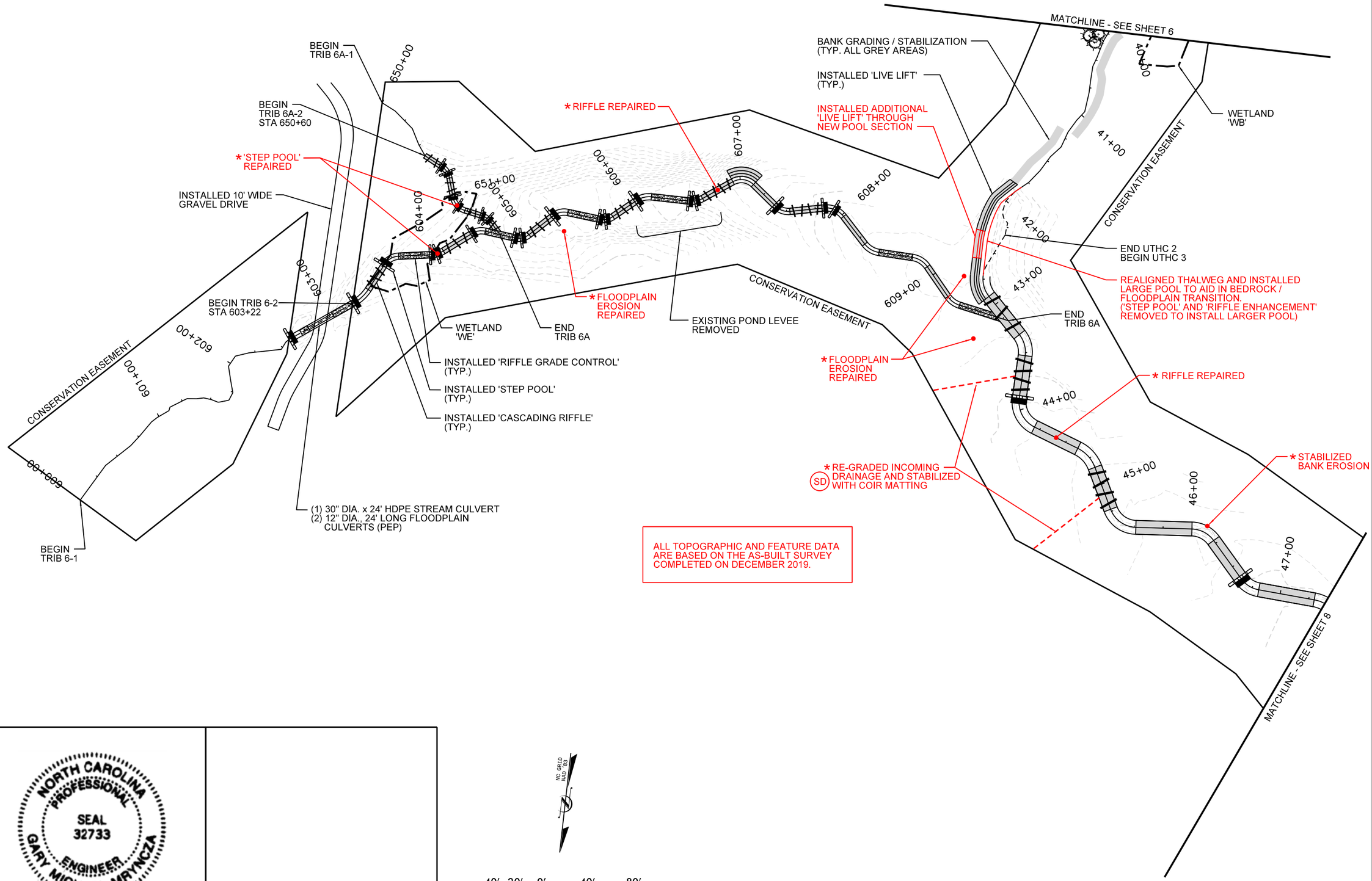
YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020

SCALE: GRAPHIC

SITE PLAN

REACH: T4, T5, T5A, T5B & UTHC



ALL TOPOGRAPHIC AND FEATURE DATA ARE BASED ON THE AS-BUILT SURVEY COMPLETED ON DECEMBER 2019.

NC GRID NAD 83

–40′ –20′ 0′ 40′ 80′

GRAPHIC SCALE

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MARYNCZA

PROJECT ENGINEER

PROJECT SURVEYOR

REVISIONS		
SYM.	DESCRIPTION	DATE

NCDEQ – DIVISION OF MITIGATION SERVICES

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ENGINEERS • PLANNERS • SCIENTISTS
4505 FALLS OF NEUSE ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27609

MILL DAM CREEK STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020

SCALE: GRAPHIC

SITE PLAN

REACH: T6, T6A & UTHC

SHEET 7 OF 14

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

PROJECT ENGINEER

PROJECT SURVEYOR

NC GRID NAD 83

–40′ –20′ 0′ 40′ 80′

GRAPHIC SCALE

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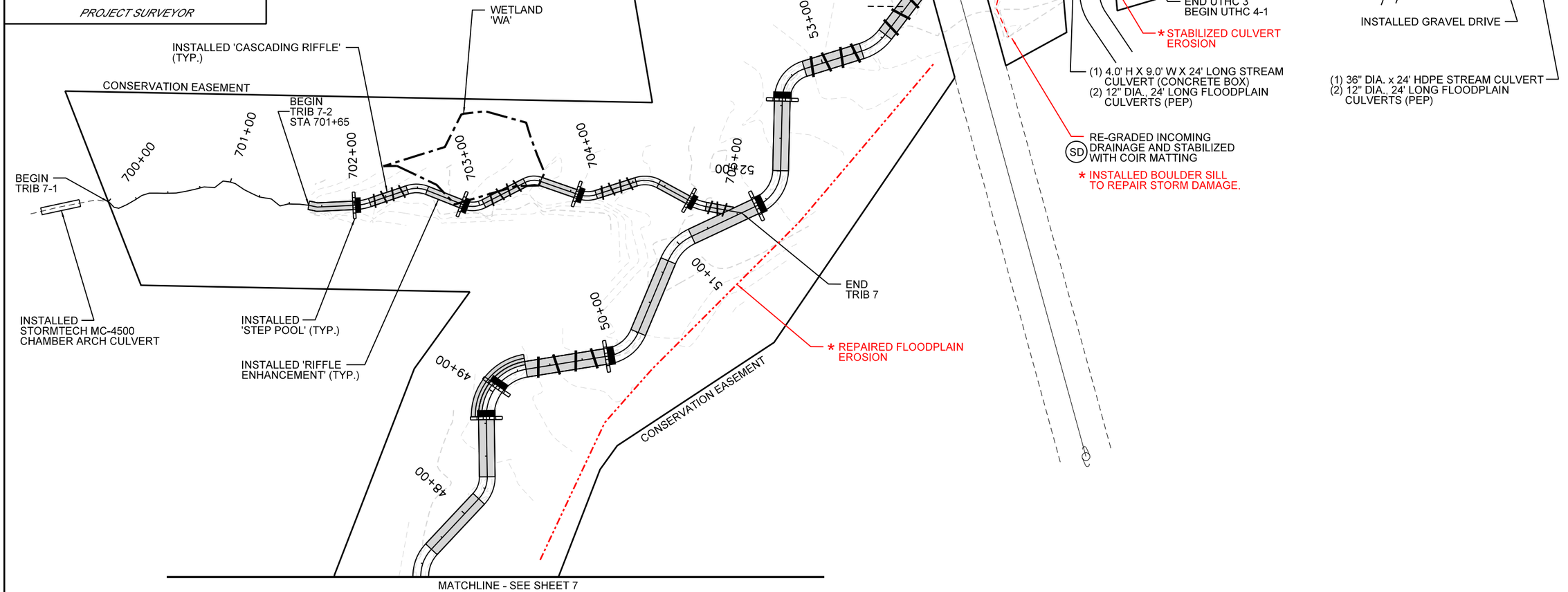

NO.	DESCRIPTION	DATE
	REVISIONS	

NCDEQ – DIVISION OF MITIGATION SERVICES

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RALEIGH, NORTH CAROLINA 27609

MILL DAM CREEK STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA

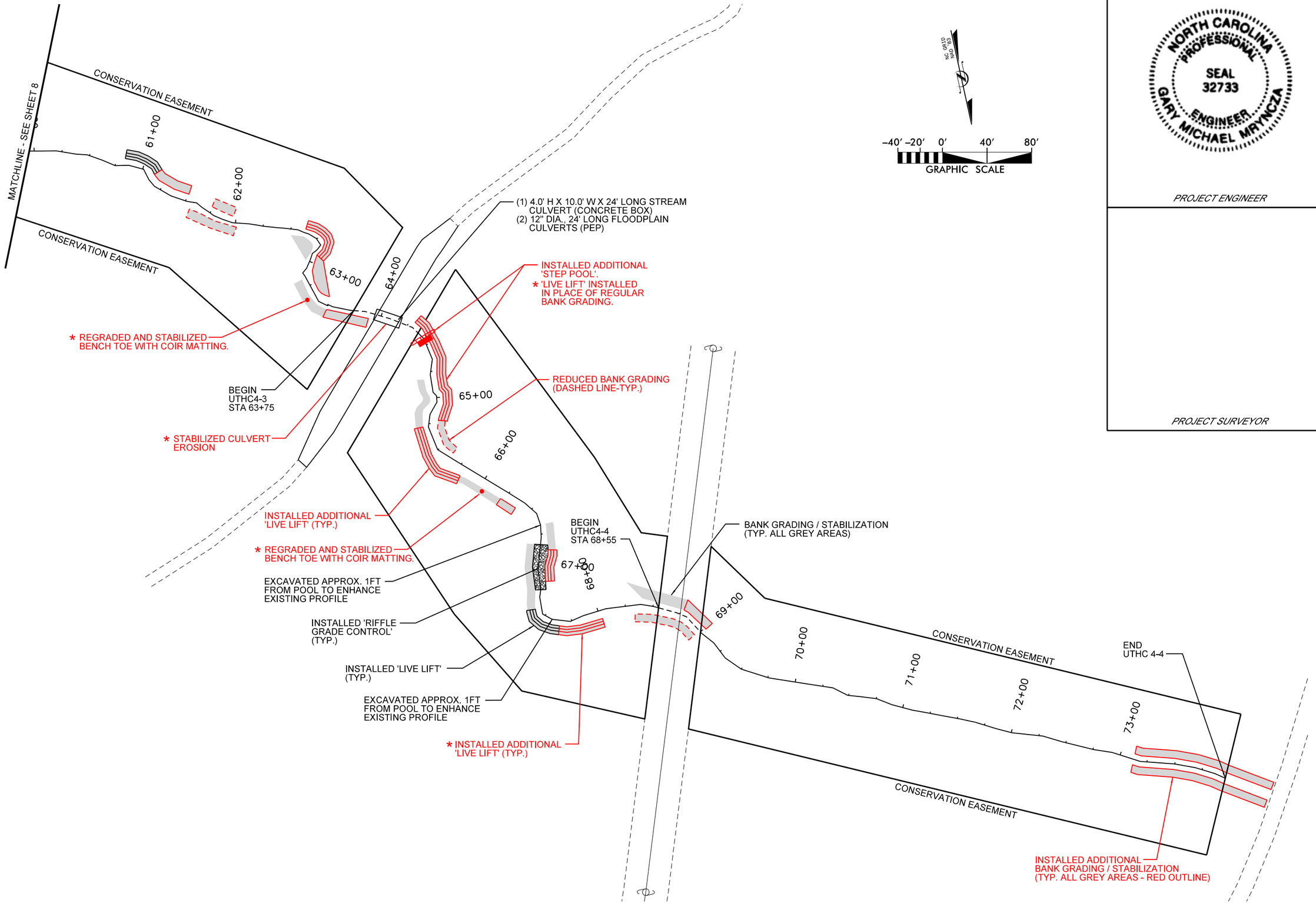
DATE: APRIL 2020

SCALE: GRAPHIC

SITE PLAN

REACH: T7, T9 & UTHC

SHEET 8 OF 14



NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

PROJECT ENGINEER

PROJECT SURVEYOR

NO.	DESCRIPTION	DATE
	REVISIONS	

NCDEQ – DIVISION OF MITIGATION SERVICES

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4505 FALLS OF NEUSE ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27609

MILL DAM CREEK
STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020
SCALE: GRAPHIC

SITE PLAN

REACH: UTHC

SHEET 9 OF 14

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

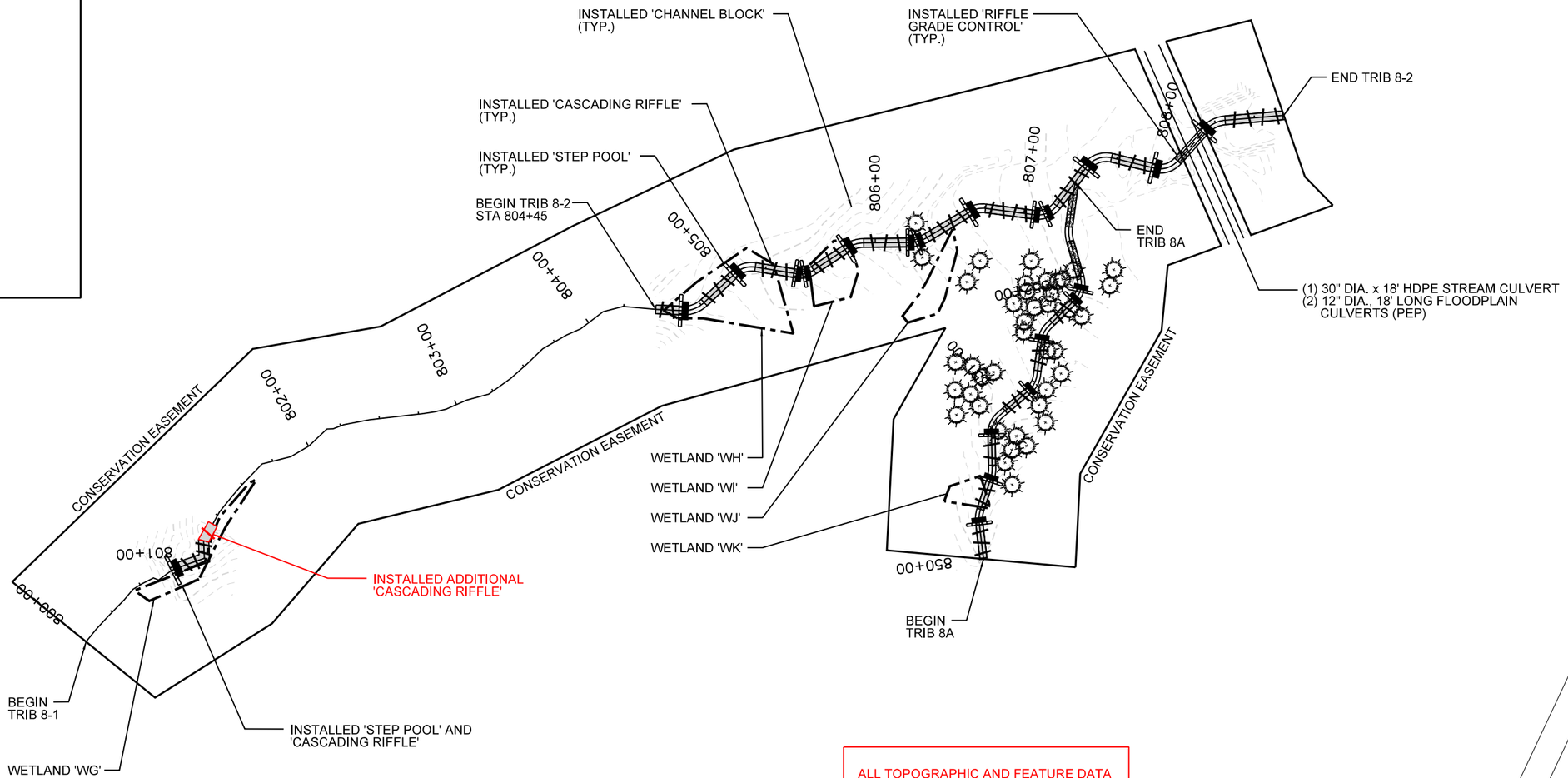
PROJECT ENGINEER

PROJECT SURVEYOR

NC GRID NAD 83

–40′ –20′ 0′ 40′ 80′

GRAPHIC SCALE



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SYM.	DESCRIPTION	DATE
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MILL DAM CREEK
STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020
SCALE: GRAPHIC

SITE PLAN

REACH:
T8 & T8A

SHEET 10 OF 14

STREAM ZONE :

STREAM ZONE
LIVE STAKES: 1.5' TO 2' LENGTHS, 1/2' TO 2" DIAMETER,
PLANT AT 3' SPACING, RANDOM SPECIES PLACEMENT.

COMMON NAME	SCIENTIFIC NAME
BLACK WILLOW	
SILKY WILLOW	
SILKY DOGWOOD	
COMMON ELDERBERRY	

NOTE: NO SINGLE LIVE STAKING SPECIES
SHALL COMPOSE MORE THAN 40% OF THE TOTAL
NUMBER OF LIVE STAKES TO BE INSTALLED.

RIPARIAN FOREST PLANTING:

PLANTING ZONE 1 = 25.7 ACRES

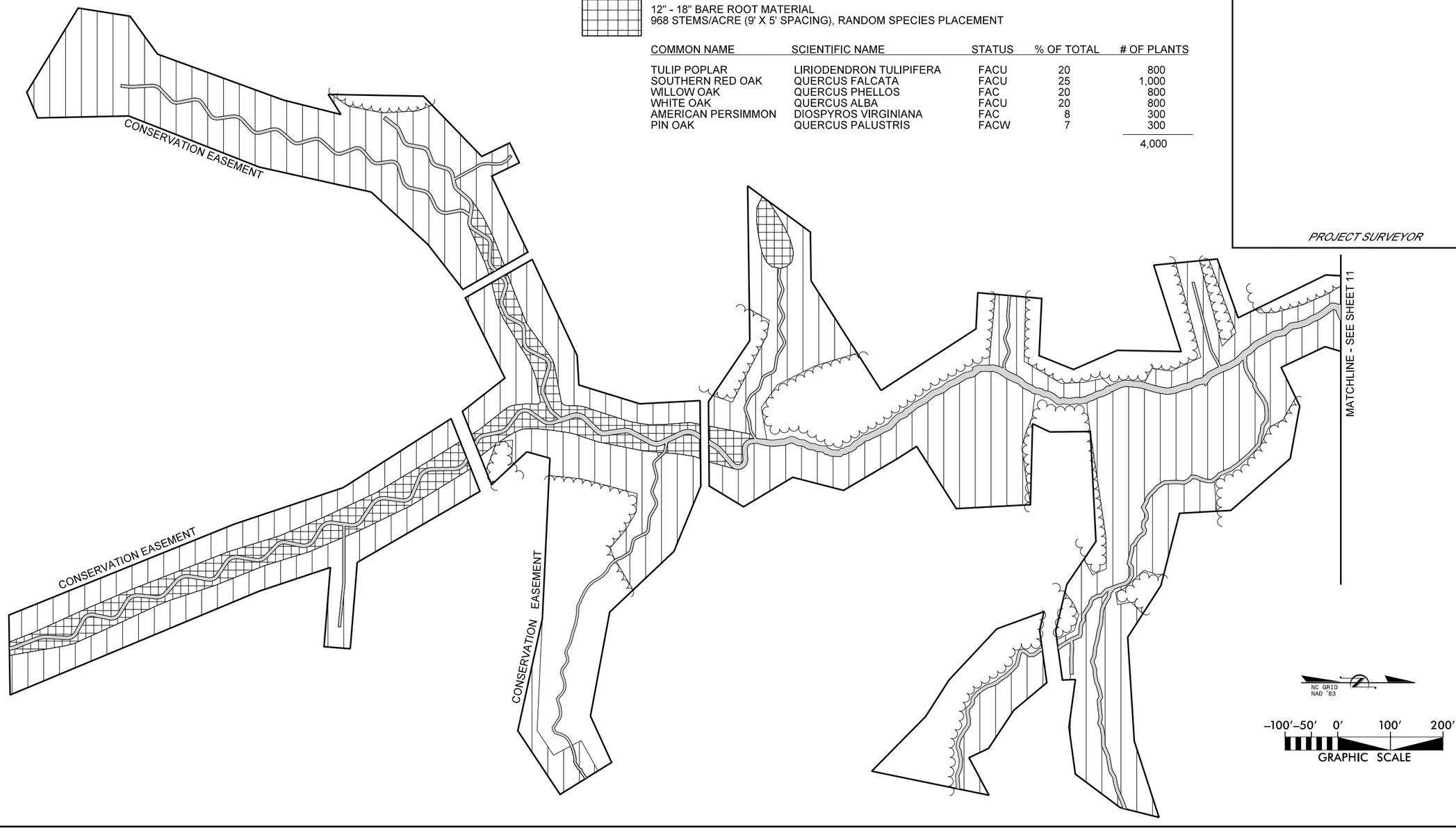
12" - 18" BARE ROOT MATERIAL
968 STEMS/ACRE (9' X 5' SPACING), RANDOM SPECIES PLACEMENT

COMMON NAME	SCIENTIFIC NAME	STATUS	% OF TOTAL	# OF PLANTS
RIVER BIRCH	BETULA NIGRA	FACW	20	5,000
~~GREEN ASH~~	~~FRAXINUS PENNSYLVANICA~~	~~FACW~~	~~20~~	~~5,000~~
SWAMP CHESTNUT OAK	QUERCUS MICHAUXII	FACW	20	5,000
WILLOW OAK	QUERCUS PHELLOS	FAC	20	5,000
AMERICAN SYCAMORE	PLATANUS OCCIDENTALIS	FACW	20	5,000
TULIP POPLAR	LIRIODENDRON TULIPIFERA	FACU	20	5,000
				25,000

PLANTING ZONE 2 = 3.8 ACRES

12" - 18" BARE ROOT MATERIAL
968 STEMS/ACRE (9' X 5' SPACING), RANDOM SPECIES PLACEMENT

COMMON NAME	SCIENTIFIC NAME	STATUS	% OF TOTAL	# OF PLANTS
TULIP POPLAR	LIRIODENDRON TULIPIFERA	FACU	20	800
SOUTHERN RED OAK	QUERCUS FALCATA	FACU	25	1,000
WILLOW OAK	QUERCUS PHELLOS	FAC	20	800
WHITE OAK	QUERCUS ALBA	FACU	20	800
AMERICAN PERSIMMON	DIOSPYROS VIRGINIANA	FAC	8	300
PIN OAK	QUERCUS PALUSTRIS	FACW	7	300
				4,000



NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

PROJECT ENGINEER

PROJECT SURVEYOR

NO.	DESCRIPTION	DATE
	REVISIONS	

NCDEQ – DIVISION OF MITIGATION SERVICES

KCI ASSOCIATES OF NC
ENGINEERS • PLANNERS • SCIENTISTS
4505 FALLS OF NEUSE ROAD, SUITE 400
RALEIGH, NORTH CAROLINA 27609

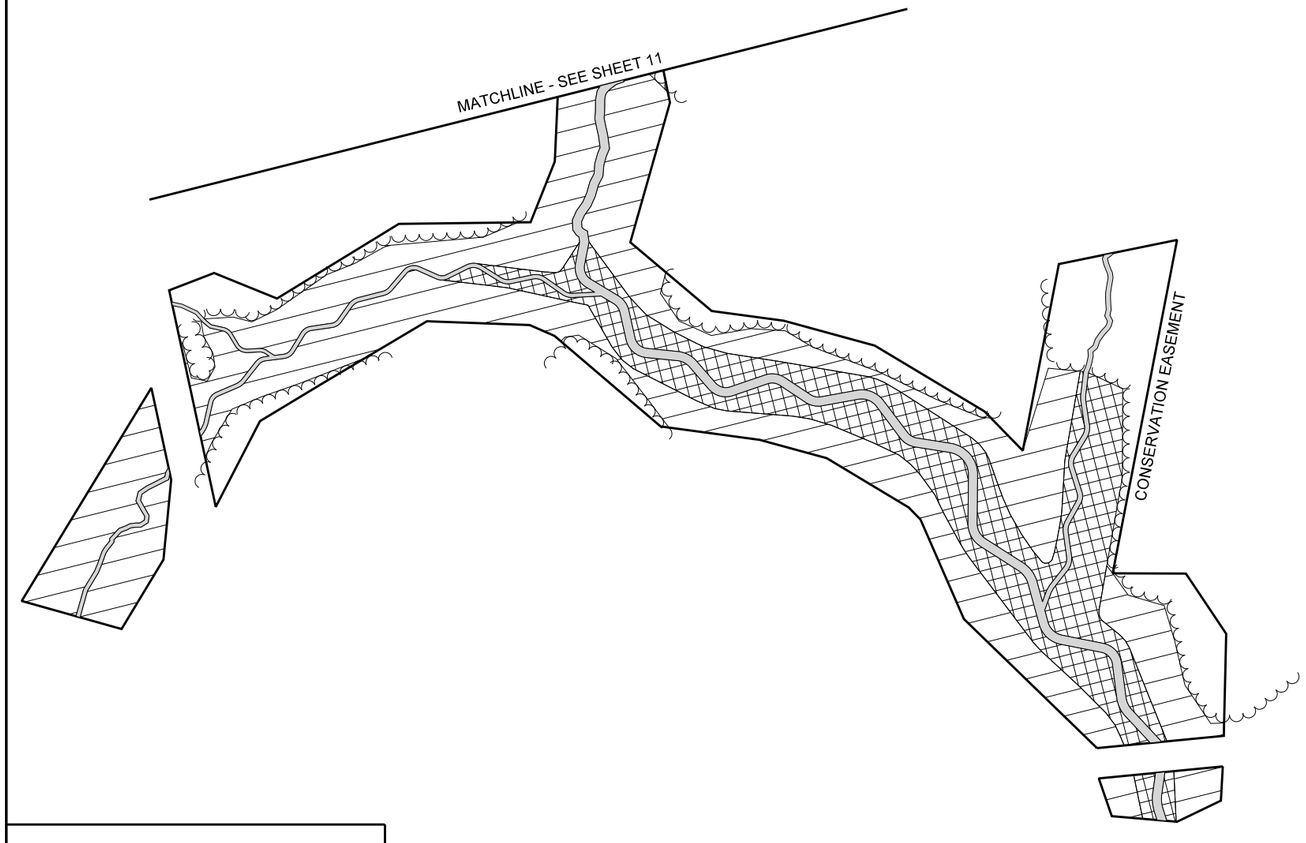
MILL DAM CREEK
STREAM RESTORATION SITE

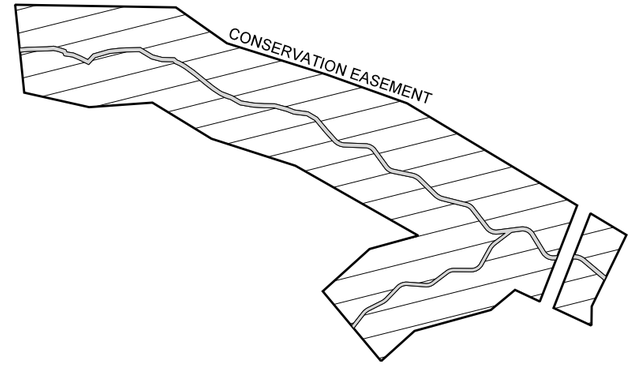
YADKIN COUNTY, NORTH CAROLINA

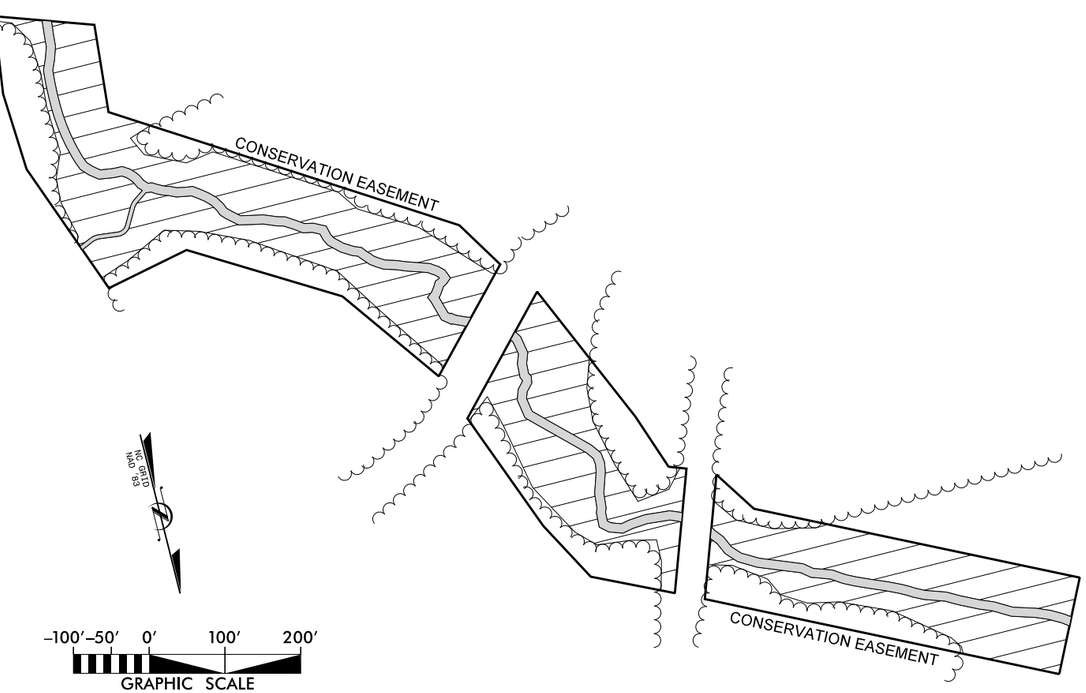
DATE: APRIL 2020
SCALE: GRAPHIC

PLANTING PLAN

SHEET 11 OF 14



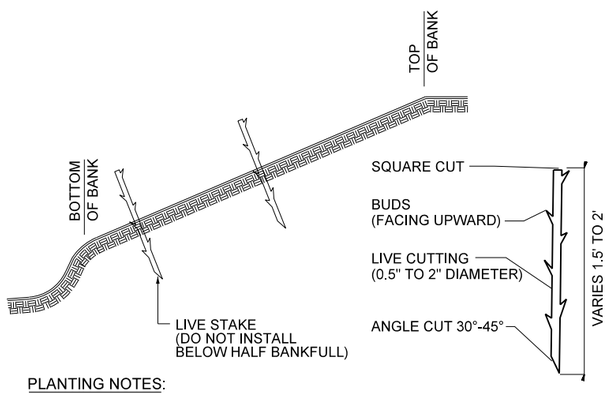




NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

PROJECT ENGINEER

PROJECT SURVEYOR



PLANTING NOTES:

UTHC:
RIFFLES - 2 ROWS OF LIVE STAKES ON BOTH SIDES OF CHANNEL.
POOLS - NO LIVE STAKES ON INNER BENDS, 2 ROWS ON OUTER BENDS.

ALL OTHER TRIBUTARIES:
RIFFLES - 1 ROW OF LIVE STAKES ON BOTH SIDES OF CHANNEL.
POOLS - NO LIVE STAKES ON INNER BENDS, 1 ROWS ON OUTER BENDS.

INSTALLED STAKES AT 3' SPACING.

LIVE STAKES

SCALE: NTS

NO.	DESCRIPTION	DATE
	REVISIONS	

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MILL DAM CREEK STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020
SCALE: GRAPHIC

PLANTING PLAN

EASEMENT BOUNDARY MARKING

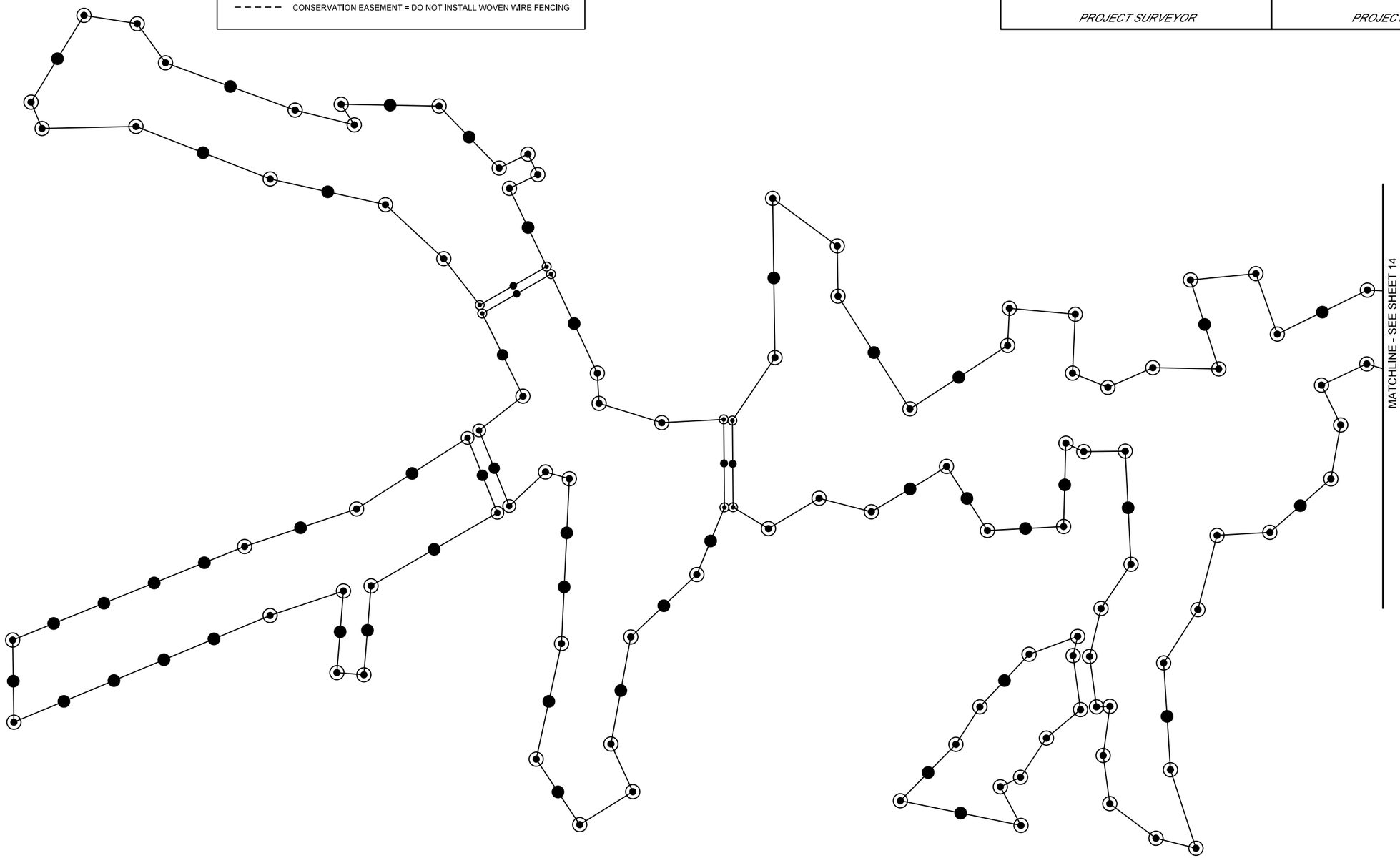
EASEMENT BOUNDARY MARKED WITH METAL POSTS AND CONSERVATION EASEMENT SIGNS AT THE CORNERS AND AT A MINIMUM OF 100' INTERVALS ALONG THE BOUNDARY.

⊙	6-FOOT TALL DURABLE WITNESS POSTS AND 5/8" REBAR 30" IN LENGTH WITH 3-1/4" ALUMINUM CAPS ON ALL EASEMENT CORNERS. CAPS SHALL MEET DMS SPECIFICATIONS (BERNSTEN RBD5325 IMPRINTED WITH NC STATE LOGO #B9087 OR EQUIVALENT). AFTER INSTALLATION, CAPS SHALL BE STAMPED WITH THE CORRESPONDING NUMBER.
●	6-FOOT TALL DURABLE WITNESS POST ALONG BOUNDARY OF CONSERVATION EASEMENT. POSTS SHALL BE MADE OF MATERIAL THAT WILL LAST A MINIMUM OF 20 YEARS. THE PROVIDER SHALL ATTACH A CONSERVATION EASEMENT SIGN TO EACH WITNESS POST AND PLACE ADDITIONAL SIGNS AT NO MORE THAN 100-FOOT INTERVALS ON BOUNDARY LINES.
———	CONSERVATION EASEMENT = INSTALLED WOVEN WIRE FENCING
- - - - -	CONSERVATION EASEMENT = DO NOT INSTALL WOVEN WIRE FENCING

NC GRID
NAD '83

–100′ –50′ 0′ 100′ 200′

GRAPHIC SCALE



PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

PROJECT ENGINEER

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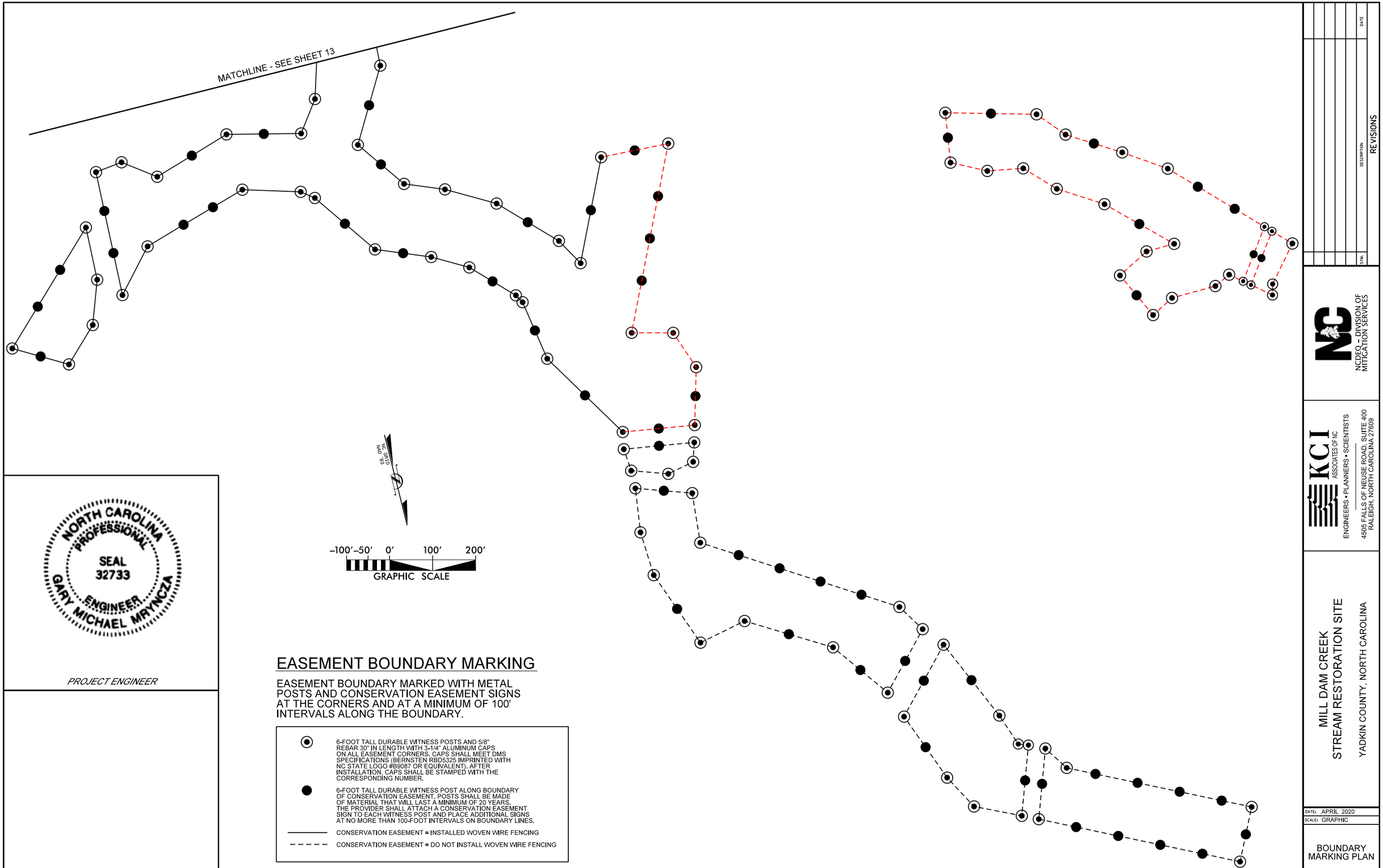
MILL DAM CREEK
STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020
SCALE: GRAPHIC

BOUNDARY MARKING PLAN

SHEET 13 OF 14



EASEMENT BOUNDARY MARKING

EASEMENT BOUNDARY MARKED WITH METAL POSTS AND CONSERVATION EASEMENT SIGNS AT THE CORNERS AND AT A MINIMUM OF 100' INTERVALS ALONG THE BOUNDARY.

- 6-FOOT TALL DURABLE WITNESS POSTS AND 5/8" REBAR 30" IN LENGTH WITH 3-1/4" ALUMINUM CAPS ON ALL EASEMENT CORNERS. CAPS SHALL MEET DMS SPECIFICATIONS (BERNSTEN RBD5325 IMPRINTED WITH NC STATE LOGO #B9087 OR EQUIVALENT). AFTER INSTALLATION, CAPS SHALL BE STAMPED WITH THE CORRESPONDING NUMBER.
- 6-FOOT TALL DURABLE WITNESS POST ALONG BOUNDARY OF CONSERVATION EASEMENT. POSTS SHALL BE MADE OF MATERIAL THAT WILL LAST A MINIMUM OF 20 YEARS. THE PROVIDER SHALL ATTACH A CONSERVATION EASEMENT SIGN TO EACH WITNESS POST AND PLACE ADDITIONAL SIGNS AT NO MORE THAN 100-FOOT INTERVALS ON BOUNDARY LINES.
- CONSERVATION EASEMENT = INSTALLED WOVEN WIRE FENCING
- CONSERVATION EASEMENT = DO NOT INSTALL WOVEN WIRE FENCING

NORTH CAROLINA PROFESSIONAL SEAL 32733 ENGINEER GARY MICHAEL MRYNCZA

PROJECT ENGINEER

PROJECT SURVEYOR

REVISIONS		
SYM.	DESCRIPTION	DATE

NCDEQ – DIVISION OF MITIGATION SERVICES

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4505 FALLS OF NEUSE ROAD, SUITE 400
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MILL DAM CREEK
STREAM RESTORATION SITE

YADKIN COUNTY, NORTH CAROLINA

DATE: APRIL 2020
SCALE: GRAPHIC

BOUNDARY MARKING PLAN

SHEET 14 OF 14

APPENDIX F

Additional Information

Tommy Seelinger

From: Adam Spiller
Sent: Thursday, March 12, 2020 10:34 AM
To: Tommy Seelinger
Cc: Tim Morris
Subject: FW: Request to Extend Planting Window - Mill Dam Creek (Yadkin 01)

Tommy,

DMS wants us to include this documentation in the MY0 report. Can you make sure this email is copied into the MY0 folder and we include it as an appendix in the Mill Dam MY0 report?

Thanks,
adam

-----Original Message-----
From: Tim Morris <Tim.Morris@kci.com>
Sent: Thursday, March 12, 2020 10:02 AM
To: Adam Spiller <Adam.Spiller@kci.com>
Subject: FW: Request to Extend Planting Window - Mill Dam Creek (Yadkin 01)

-----Original Message-----
From: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>
Sent: Thursday, March 12, 2020 9:53 AM
To: Tim Morris <Tim.Morris@kci.com>
Cc: Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>; Haupt, Mac <mac.haupt@ncdenr.gov>; Reid, Matthew <matthew.reid@ncdenr.gov>; Kevin O'Briant <Kevin.OBriant@kci.com>
Subject: RE: Request to Extend Planting Window - Mill Dam Creek (Yadkin 01)

Tim, that's fine. You are not the only provider to have to plant late this spring. I don't see this as a concern provided that you can still meet the 180 day timeframe for monitoring. For the upcoming guidance, I believe we will also state that if planting is not complete by April 30th, the growing season cannot count toward the required years of monitoring, so just make sure you get all the plants in by that deadline.
Thanks,
Todd

-----Original Message-----
From: Tim Morris [mailto:Tim.Morris@kci.com]
Sent: Thursday, March 12, 2020 9:25 AM
To: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>
Cc: Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>; Haupt, Mac <mac.haupt@ncdenr.gov>; Reid, Matthew <matthew.reid@ncdenr.gov>; Kevin O'Briant <Kevin.OBriant@kci.com>
Subject: [Non-DoD Source] Request to Extend Planting Window - Mill Dam Creek (Yadkin 01)

Hey Todd,

We finished construction on our Mill Dam project in late fall of this year and were planning tree planting for the second week of February. The big storms (6" in 30 hrs) in the first week of February hit the site hard and we had to remobilize for some repairs. We should complete the repairs this week, and intend to seed and stabilize early next week. We had a good amount of floodplain scour where we had to import topsoil to stabilize portions of the floodplain again so the decision was made to hold off on planting the site until the repairs were completed and topsoil was in place. This work will extend our planting period past the March 15 date that is included in the 2016 guidelines. Our planting contractor is currently scheduled to plant the week of March 23rd. I believe the growing season based on the Surry County Soil Survey starts on April 6th, so hopefully this is not an issue. Planting should take 3 days. This email is intended to inform the IRT of our request to extend the planting period outside the March 15th window. We will not start monitoring the site until a minimum of 180 days post-planting.

Let me know your thoughts. I did not copy the entire IRT, just Corps and DWR. Please feel free to pass along as needed.

Regards,

Timothy J. Morris

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