

MONITORING YEAR 6 ANNUAL REPORT FINAL

FOUST CREEK MITIGATION SITE

Alamance County, NC

NCDEQ Contract 004954

DMS Project Number 95715

USACE Action ID Number 2012-01908

NCDWR Project Number 13-1295

Data Collection Period: March 2020 – November 2020

Draft Submission Date: November 30, 2020

Final Submission Date: December 10, 2020

PREPARED FOR:



NC Department of Environmental Quality

Division of Mitigation Services

1652 Mail Service Center

Raleigh, NC 27699-1652

Mitigation Project Name	Foust Creek Mitigation Site	USACE Action ID	2012-01908
DMS ID	95715	DWR Permit	2013-1295
River Basin	Cape Fear	Date Project Instituted	12/4/2012
Cataloging Unit	03030002	Date Prepared	4/20/2020
County	Alamance	Stream/Wet. Service Area	Cape Fear 03030002

Todd J. [Signature] 9/21/2020

Signature & Date of Official Approving Credit Release

1 - For NCDMS, no credits are released during the first milestone
 2 - For NCDMS projects, the initial credit release milestone occurs automatically when the as-built report (baseline monitoring report) has been made available to the IRT by posting it to the DMS portal, provided the following have been met:

- 1) Approved of Final Mitigation Plan
- 2) Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property.
- 3) Completion of all physical and biological improvements to the mitigation site pursuant to the mitigation plan.
- 4) Receipt of necessary DA permit authorization or written DA approval for projects where DA permit issuance is not required.
- 3 - A 10% reserve of credits is to be held back until the bankfull event performance standard has been met.

Credit Release Milestone	Warm Stream Credits						
Project Credits	Scheduled Releases %	Proposed Releases %	Proposed Released #	Not Approved # Releases	Approved Credits	Anticipated Release Year	Actual Release Date
1 - Site Establishment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2 - Year 0 / As-Built	30.00%	30.00%	1,430.880	0.000	1,430.880	2015	5/14/2015
3 - Year 1 Monitoring	10.00%	10.00%	476.960	0.000	476.960	2016	4/25/2016
4 - Year 2 Monitoring	10.00%	10.00%	476.960	0.000	476.960	2017	4/3/2017
5 - Year 3 Monitoring	10.00%	10.00%	476.960	0.000	476.960	2018	4/25/2018
6 - Year 4 Monitoring	5.00%	5.00%	238.480	0.000	238.480	2019	4/26/2019
7 - Year 5 Monitoring	10.00%	10.00%	476.960	0.000	476.960	2020	4/20/2020
8 - Year 6 Monitoring	5.00%					2021	
9 - Year 7 Monitoring	10.00%					2022	
Stream Bankfull Standard	10.00%	10.00%	476.960	0.000	476.960	2017	4/3/2017
			Totals		4,054.160		

Total Gross Credits	4,769.600
Total Unrealized Credits to Date	0.000
Total Released Credits to Date	4,054.160
Total Percentage Released	85.00%
Remaining Unreleased Credits	715.440

Credit Release Milestone	Riparian Credits						
Project Credits	Scheduled Releases %	Proposed Releases %	Proposed Released #	Not Approved # Releases	Approved Credits	Anticipated Release Year	Actual Release Date
1 - Site Establishment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2 - Year 0 / As-Built	30.00%	30.00%	1.202	0.000	1.202	2015	5/14/2015
3 - Year 1 Monitoring	10.00%	10.00%	0.401	0.000	0.401	2016	4/25/2016
4 - Year 2 Monitoring	10.00%	10.00%	0.401	0.000	0.401	2017	4/3/2017
5 - Year 3 Monitoring	15.00%	15.00%	0.601	0.100	0.501	2018	4/25/2018
6 - Year 4 Monitoring	5.00%	5.00%	0.200	0.000	0.200	2019	4/26/2019
7 - Year 5 Monitoring	15.00%	15.00%	0.601	0.000	0.601	2020	4/20/2020
8 - Year 6 Monitoring	5.00%					2021	
9 - Year 7 Monitoring	10.00%					2022	
Stream Bankfull Standard	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Totals		3.306		

Total Gross Credits	4.007
Total Unrealized Credits to Date	0.100
Total Released Credits to Date	3.306
Total Percentage Released	82.51%
Remaining Unreleased Credits	0.601

Mitigation Project Name Foust Creek Mitigation Site
DMS ID 95715
River Basin Cape Fear
Cataloging Unit 03030002
County Alamance

USACE Action ID 2012-01908
DWR Permit 2013-1295
Date Project Instituted 12/4/2012
Date Prepared 4/20/2020
Stream/Wet. Service Area Cape Fear 03030002

Notes

4/25/2018: Riparian wetland credits in the area of gauge 9 were marked unrealized and will never be released.

Contingencies (if any)

Project Quantities

Mitigation Type	Restoration Type	Physical Quantity
Warm Stream	Restoration	4,357.000
Warm Stream	Enhancement II	1,143.000
Riparian	Restoration	5.060

Debits

							Stream Restoration Credits	Riparian Restoration
Beginning Balance (mitigation credits)							4,769.600	4.007
Released Credits							4,054.160	0.100
Unrealized Credits							0.000	0.100
Owning Program	Req. Id	TIP #	Project Name	USACE Permit #	DWR Permit #	DCM Permit #		
NCDOT Stream & Wetland ILF Program	REQ-005957	R-2413A 2413B	R- NC 68 Connector	2013-00557	2013-0517		0.200	
NCDOT Stream & Wetland ILF Program	REQ-005957	R-2413A 2413B	R- NC 68 Connector	2013-00557	2013-0517		556.724	
NCDOT Stream & Wetland ILF Program	REQ-005957	R-2413A 2413B	R- NC 68 Connector	2013-00557	2013-0517		125.880	
NCDOT Stream & Wetland ILF Program	REQ-005957	R-2413A 2413B	R- NC 68 Connector	2013-00557	2013-0517		435.000	
NCDOT Stream & Wetland ILF Program	REQ-005957	R-2413A 2413B	R- NC 68 Connector	2013-00557	2013-0517		41.960	
NCDOT Stream & Wetland ILF Program	REQ-005994	R-2612B	US 421 Improvements	2013-01990	2013-0912		459.031	
NCDOT Stream & Wetland ILF Program	REQ-006028	U-2525B 2525C	U- Greensboro Eastern Loop	2005-21386	2013-0918		238.479	
NCDOT Stream & Wetland ILF Program	REQ-006028	U-2525B 2525C	U- Greensboro Eastern Loop	2005-21386	2013-0918		434.795	
NCDOT Stream & Wetland ILF Program	REQ-006028	U-2525B 2525C	U- Greensboro Eastern Loop	2005-21386	2013-0918		41.960	
NCDOT Stream & Wetland ILF Program	REQ-006185		SR 2354 - Bridge 248 - Division 7	2014-01930			64.000	
NCDOT Stream & Wetland ILF Program	REQ-006295		SR 2178 - Bridge 253 - Division 7	2015-00943			70.000	
NCDOT Stream & Wetland ILF Program	REQ-007139	I-5110	I-73 from NC 68 to Greensboro Western Loop	2011-00317			114.975	
NCDOT Stream & Wetland ILF Program	REQ-007139	I-5110	I-73 from NC 68 to Greensboro Western Loop	2011-00317			83.895	



December 10, 2020

Jeremiah Dow
N.C. Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

RE: Draft Monitoring Year 6 Annual Report Comments - Foust Creek Mitigation Site (DMS #95715)
Cape Fear River Basin 03030002, Alamance County
Contract No. 004954

Dear Mr. Dow,

We have reviewed the comments on the Monitoring Year 6 Report for the above referenced project dated December 8, 2020 and have revised the report based on these comments. The revised documents are submitted with this letter. Below are responses to each of your comments. For your convenience, the comments are reprinted with our response in italics.

1. Appendix 2
 - a. Table 6 – Recommend adding areas of tree fertilization and/or tree release to this table where appropriate.

A record was added to Table 6 to summarize areas that underwent tree fertilization and tree release treatments.

2. The 0.17 acres of re-establishment wetland around gage GW11 are considered credits at risk, likely to be unrealized. With the wetland RW6 credit reduction in MY3 of 0.10 WMUs and this year's reduction of 0.17 WMUs, the total functioning WMUs for the site are 3.74. DMS will adjust the debit ledger accordingly. If GW11 fails to meet in MY7, please adjust the asset table in the report to reflect a permanent WMU reduction.

The report and appendices were updated to indicate the wetland re-establishment area around GW11 is considered at risk. Table 1 was modified to account for the area at risk.

If you have any questions, please contact me by phone (919) 851-9986, or by email (jlorch@wildlandseng.com).



Sincerely,

A handwritten signature in black ink, appearing to read "Jason Lorch".

Jason Lorch, *Monitoring Coordinator*

PREPARED BY:



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Raleigh, NC 27609

Jason Lorch
jlorch@wildlandseng.com
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EXECUTIVE SUMMARY

Wildlands Engineering (Wildlands) completed a full delivery project for the North Carolina Department of Environmental Quality, Division of Mitigation Services (DMS) to restore and enhance a total of 5,500 linear feet (LF) of stream and rehabilitate and re-establish 4.96 acres of wetlands in Alamance County, NC. The Foust Creek Mitigation Site (Site) proposes to provide 4,770 Stream Mitigation Units (SMUs) and 3.91 Wetland Mitigation Units (WMUs). The project consists of Foust Creek, a second order perennial stream, and an unnamed, intermittent first order tributary to Foust Creek (UT1). At the downstream limits of the project the drainage area is 1,259 acres (1.97 square miles).

The Site is located in the southern portion of Alamance County, east of Snow Camp and approximately 15 miles southeast of the City of Burlington (Figure 1). The Site is located in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998). The Site is in the Jordan Lake Water Supply Watershed within the North Carolina Division of Water Resources (NCDWR) subbasin 03-06-04 of the Cape Fear River Basin and United States Geological Survey (USGS) Hydrologic Unit 03030002050050.

Prior to construction activities, streams and wetlands had been degraded by livestock access and agricultural practices. The primary objectives of the project were to promote wetland hydrology, restore a stream and wetland complex to mimic a naturally occurring ecosystem, restore a stream system to promote hydrologic connectivity with the floodplains and wetlands, stabilize stream banks, promote instream habitat and aeration, restore riparian buffers, and further improve water quality through removing existing agricultural practices. Figure 2 and Table 1 present the restoration and enhancement components/assets for the Site.

The following project goals were established to address the effects listed above from watershed and project site stressors:

- Reduce sediment inputs by removing cattle from streams and restoring degraded and eroding stream channels;
- Return a network of streams to a stable form that is capable of supporting biological functions;
- Reduce fecal coliform, nitrogen, and phosphorus inputs through removing cattle from streams and establishing and augmenting a forested riparian corridor; and
- Protect existing high quality streams and forested buffers.

Stream and wetland restoration and enhancement construction efforts were completed in February 2015. Baseline as-built monitoring activities (MY0) were completed in February 2015. A conservation easement is in place on 22.11 acres of the stream and wetland riparian corridors to protect them in perpetuity.

Monitoring Year 6 (MY6) site visits and assessments were completed between March and November 2020 to visually assess the conditions of the project and collect stream and wetland hydrology data. Detailed monitoring and analysis of vegetation, substrate, and channel cross-sectional dimensions are not required during MY6. Visual observations, hydrology data, and management practices are included in this report. To preserve the clarity and continuity of reporting structure, this report maintains section and appendix numbering from previous monitoring reports. Omitted sections are denoted in the table of contents.

Overall, Site performance for vegetation, stream geomorphology, and stream hydrology meet success criteria for MY6. Vegetation appears to be performing adequately to attain the final success criteria of 210 stems per acre at the end of MY7. Invasive vegetation identified to date has been removed and areas with tree growth rates limited by competition or nutrient deficiency were treated during MY6. Visual observations indicated that stream channels have remained geomorphically stable during MY6.



Persistent flows and multiple bankfull events were recorded on both Foust Creek and UT1. An additional groundwater gage was added during MY6 to assess hydrology in an area that exhibited minimal hydric soil development. Eight out of 10 groundwater gages met the success criterion of maintaining a free water surface within 12 inches of the soil surface for 8.5 percent of the growing season. The failure of two gauges to meet criterion may be related to below normal precipitation during the early part of the growing season. Credit generated by a 0.169 acre wetland re-establishment area surrounding groundwater gage 11 is considered at risk.



FOUST CREEK MITIGATION SITE
Monitoring Year 6 Annual Report

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*Content omitted from Monitoring Year 6 Report



Section 1: PROJECT OVERVIEW

The Foust Creek Mitigation Site; hereafter referred to as the Site, is located in southern Alamance County within the Cape Fear River Basin (USGS Hydrologic Unit 03030002) approximately 15 miles southeast of the City of Burlington. The Site is located upstream and downstream of the Snow Camp Road stream crossing immediately east of the town of Snow Camp. The Site is located in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998). The project watershed consists primarily of agricultural lands and forest. The drainage area for the project site is 1,259 acres (1.97 square miles) at the lower end of Foust Creek.

The project stream reaches include Foust Creek and UT1 and were improved through stream restoration and enhancement level II approaches. Mitigation work within the Site included restoration and enhancement of 5,500 linear feet (LF) of perennial and intermittent stream channel and rehabilitation and re-establishment of 4.96 acres (ac) of riparian wetland. The stream and wetland areas were also planted with native vegetation to improve habitat and protect water quality. The Site proposes to provide 4,770 Stream Mitigation Units (SMUs) and 3.91 Wetland Mitigation Units (WMUs). The Mitigation Plan (Wildlands, 2014) was submitted and accepted by the North Carolina Department of Environmental Quality, Division of Mitigation Services (DMS) in February of 2014. Construction activities were completed by Fluvial Solutions in February 2015. The planting was completed by Bruton Natural Systems, Inc. in February 2015 and baseline monitoring (MY0) was conducted in January and February 2015. Annual monitoring will be conducted for seven years with the close-out anticipated to commence in 2022 given the success criteria are met. Appendix 1 provides more detailed project activity, history, contact information, and watershed/site background information for this project.

A conservation easement has been recorded and is in place along the stream and wetland riparian corridors to protect them in perpetuity. The 22.11 acre easement (Deed Book 3278, Pages 935-944) is within four parcels. Directions and a map of the Site are provided in Figure 1 and project components are illustrated in Figure 2.

1.1 Project Goals and Objectives

Prior to construction activities, both streams had been degraded by livestock access and agricultural practices. Impacts to the stream included direct access by livestock, trampling of the riparian vegetation and stream banks, channelization, eroding banks, floodplain ditching, and a lack of stabilizing riparian vegetation. The adjacent floodplain had been cleared for pasture and was grazed by livestock. The riparian vegetation was either absent, limited to the streambanks, or periodically disturbed. Table 4 in Appendix 1 presents the pre-restoration conditions in detail.

The Site was designed to meet the over-arching goals as described in the Mitigation Plan (Wildlands, 2014). The project is intended to provide numerous ecological benefits within the Cape Fear River Basin. While many of these benefits are limited to the Site, others, such as pollutant removal and improved aquatic and terrestrial habitat, have farther reaching effects. The following project specific goals established in the Mitigation Plan (Wildlands, 2014) include:

- Reduce sediment inputs by removing cattle from streams and restoring degraded and eroding stream channels;
- Return a network of streams to a stable form that is capable of supporting biological functions;
- Reduce fecal coliform, nitrogen, and phosphorus inputs through removing cattle from streams and establishing and augmenting a forested riparian corridor; and
- Protect existing high quality streams and forested buffers.



The project goals were addressed through the following project objectives:

- On-site nutrient inputs were decreased by removing cattle from streams, re-establishing floodplain connectivity, and filtering on-site runoff through buffer zones and wetlands. Off-site nutrient input is absorbed on-site by filtering flood flows through restored floodplain areas and riparian wetlands, where flood flow spreads through native vegetation. Vegetation uptakes excess nutrients.
- Stream bank erosion which contributes sediment load to the creeks was greatly reduced in the project area. Eroding stream banks were stabilized using bioengineering, natural channel design techniques, and grading to reduce bank angles and bank height. Storm flow containing grit and fine sediment is filtered through restored floodplain areas, where flow spreads through native vegetation. Spreading flood flows also reduce velocity and allow sediment to settle out. Sediment transport capacity of restored reaches was improved so that capacity balances more closely to load. Sediment load reduction will be monitored through assessing bank stability with cross section surveys and visual assessment through photo documentation which serves as an accepted surrogate for direct turbidity measurements.
- Restored riffle/pool sequences promote aeration of water and create deep water zones, helping to lower water temperature. Establishment and maintenance of riparian buffers creates long-term shading of the channel flow to minimize thermal heating. Lower water temperatures help maintain dissolved oxygen concentrations.
- In-stream structures were constructed to improve habitat diversity and trap detritus. Wood habitat structures were included in the stream as part of the restoration design. Such structures included log drops and rock structures that incorporate woody debris.
- Adjacent buffer and riparian habitats were restored with native vegetation as part of the project. Native vegetation provides cover and food for terrestrial creatures. Native plant species were planted and invasive species were treated. Eroding and unstable areas were also stabilized with vegetation as part of this project.
- The restored land is protected in perpetuity through a conservation easement.

The design streams and wetlands were restored to the appropriate type based on the surrounding landscape, climate, and natural vegetation communities but also with strong consideration to existing watershed conditions and trajectory. Specifically, the Site design was developed to restore a stream and wetland complex to mimic a naturally occurring ecosystem creating riparian habitat and improving water quality.

1.2 Monitoring Year 6 Data Assessment

Annual monitoring and quarterly site visits were conducted during monitoring year 6 (MY6) to visually assess the condition of the project and collect hydrology data. Per North Carolina Interagency Review Team (NCIRT) guidelines, detailed monitoring and analysis of vegetation, substrate, and channel cross-sectional dimensions is not required during MY6.

1.2.1 Vegetative Assessment

Detailed vegetation inventory and analysis is not required during MY6. Visual assessment during MY6 indicated that vegetation is performing adequately to attain the terminal success criteria of 210 planted stems per acre averaging ten feet in height.



1.2.2 Vegetation Areas of Concern

Concentrated populations of Japanese honeysuckle (*Lonicera japonica*) covering a total of 0.92 acres were treated during February 2020 using a foliar herbicide application. Scattered stems of Chinese privet (*Ligustrum sinense*) and autumn olive (*Elaeagnus umbellata*) were also treated throughout the Site during February 2020. Tree growth rates were limited by deficient soil nutrition within areas on the left side of Foust Creek Reach 1, the left side of Foust Creek Reach 2, left side of Foust Creek Reach 3a as well as on the right of Foust Creek Reach 3b totaling 2.28 acres. A mixture of humic organic matter and fertilizer was added around the base of planted stems within these areas during April 2020. Tree growth on the left side of Foust Creek Reach 1 was also suppressed by competition with tall fescue (*Schedonorus arundinaceus*). A tree release treatment was conducted in this area (0.80 acre) during August 2020 which included a herbicide treatment of competing vegetation within approximately 3 feet of desirable woody stems. During November 2020, vigorous new growth on trees within treated was observed (Figures 3.1-3.3, Table 6).

1.2.3 Stream Assessment

Detailed dimensional survey and analysis is not required during MY6. Visual monitoring indicated that the stream channel is performing as designed. No deposition or erosion exceeding approximate natural levels or indicators of channel instability were observed.

1.2.4 Stream Areas of Concern

There are no stream areas of concern for MY6.

1.2.5 Hydrology Assessment

At the end of the MY7, two or more bankfull events must have occurred during separate years in the restoration reaches. Multiple bankfull events were recorded on both Foust Creek and UT1 with automated crest gages during MY6 data collection. Both Foust Creek and UT1 recorded bankfull events during MY1, MY2, MY3, MY4, and MY5 (Table 13); therefore, the Site has met the bankfull frequency success criterion for the seven year monitoring period.

A pressure transducer was installed on UT1 to monitor flow within UT1 to document jurisdictional status. Baseflow must be present for at least some portion of the year (most likely in the winter/early spring) during years with normal rainfall conditions. UT1 flowed continuously from January 1 until July 2 (184 days). UT1 flowed a total of 37 total days between July 2 and September 17 before resuming continuous flow. Therefore, UT1 has met the flow duration success criterion for MY6. Refer to Appendix 5 for hydrologic data.

1.2.6 Wetland Assessment

Ten groundwater gages are monitored within the wetland rehabilitation and re-establishment zones. All gages were installed at appropriate locations such that the data collected provides an indication of groundwater levels throughout the Site. A soil temperature probe and barometric pressure gage was also installed to support wetland hydrology measurements. All monitoring gages were downloaded and maintained as needed. The success criterion for wetland hydrology is a free groundwater surface within 12 inches of the soil surface for a consecutive 8.5% of the growing season. During MY1 NRCS WETS Data was used to determine the growing season for the Site. After discussions with the United States Army Corps of Engineers (USACE), it was agreed to use on-site soil temperature data to determine the beginning of the growing season and use NRCS WETS data to determine the end of the growing season. The soil temperature probe is used to determine the beginning of the growing season based on soil temperatures staying above 41 degrees Fahrenheit at 12 inches below the soil surface, but the growing



season may not begin prior to March 1. Bud burst of elderberry (*Sambucus canadensis*) and black willow (*Salix nigra*) were observed in Alamance and adjacent counties during February 2020 further supporting a March 1 growing season start date. Well 11 was added during MY6 to assess hydrology in an area that exhibited minimal hydric soil development (0.169 acre) during an NCIRT site visit. Refer to Appendix 2 for the groundwater gage locations and Appendix 5 for groundwater hydrology data and plots.

Eight out of 10 groundwater gages (GW) met the success criterion during MY6. For GW3, the longest consecutive event of saturation within 12 inches of the soil surface was 2.4% of the growing season (6 days). This gage has recorded hydroperiods satisfying the success criterion in all previous monitoring years. The water table at GW3 was sustained at only one to two inches below the criterion threshold for the first 28 days of the growing season. At GW11, the longest consecutive event of saturation above the criterion threshold was 1.6% of the growing season (4 days). The water table generally receded to depths between 20 and 30 inches below the soil surface following precipitation during the growing season. Data indicates that precipitation quantities during the early part of the growing season were well below normal.

Given the success of GW3 during MY1 through MY5 and the unusually dry spring, it is likely that the wetland area surrounding GW3 is generally functioning as a wetland and providing ecological uplift as expected. It is likely that the water table elevation at GW11 was also affected by below normal precipitation, but recorded values are generally less supportive of a fully functioning wetland. Credit generated by the 0.169 acre wetland re-establishment area surrounding GW11 is considered at risk (Table 1, Figure 3.2).

1.2.7 Maintenance Plan

The Site will continue to be monitored and treated for invasive species as necessary. Areas treated for Japanese honeysuckle during MY6 are expected to require additional treatment during spring of 2021. Areas that had a tree growth enhancement treatment during MY6 will be observed in the spring to determine if additional management actions are necessary.

1.3 Monitoring Year 6 Summary

Survival and growth of planted trees appear to be on track meet interim success criteria. Invasive vegetation identified to date has been treated and additional treatment is expected during spring of 2021. Areas that had tree growth rates limited by competition or nutrient deficiency were treated during MY6 and appeared to show a positive growth response. Visual assessment indicated that all stream reaches within the Site are geomorphically stable and functioning as designed. Stream hydrology criteria for flow duration were met for MY6, and bankfull event frequency criteria have been satisfied for the duration of the monitoring period. Eight out of 10 groundwater gages met the success criterion of maintaining a free water surface within 12 inches of the soil surface for 8.5 percent of the growing season. The failure of two gauges to meet criterion may be related to below normal precipitation during the early part of the growing season. A 0.169 acre wetland re-establishment area is considered at risk. Overall, the Site is on track to meet success criteria for closeout in 2022.



Section 2: METHODOLOGY

All data collected for the Integrated Current Condition Mapping was recorded using a Trimble handheld GPS with sub-meter accuracy and processed using Pathfinder and ArcGIS software. Crest gages and pressure transducers were installed in surveyed riffle cross sections and monitored quarterly. Hydrology attainment installation and monitoring methods are in accordance with the USACE (2003) standards. Vegetation monitoring protocols followed the Carolina Vegetation Survey-NCDMS Level 2 Protocol (Lee et al., 2008). Summary information and data related to the success of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the Mitigation Plan documents available on DMS's website. All raw data supporting the tables and figures in the appendices are available from DMS upon request.



Section 3: REFERENCES

Lee, M.T., Peet, R.K., S.D., Wentworth, T.R. 2008. CVS-EEP Protocol for Recording Vegetation Version 4.2. Retrieved from <http://cvs.bio.unc.edu/protocol/cvs-eep-protocol-v4.2-lev1-5.pdf>.

United States Geological Survey (USGS). 1998. North Carolina Geology.
<http://www.geology.enr.state.nc.us/usgs/carolina.htm>

United States Army Corps of Engineers. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

Wildlands Engineering, Inc. 2014. Foust Creek Mitigation Plan. DMS, Raleigh, NC.



APPENDIX 1. General Tables and Figures

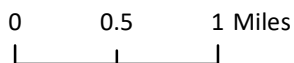
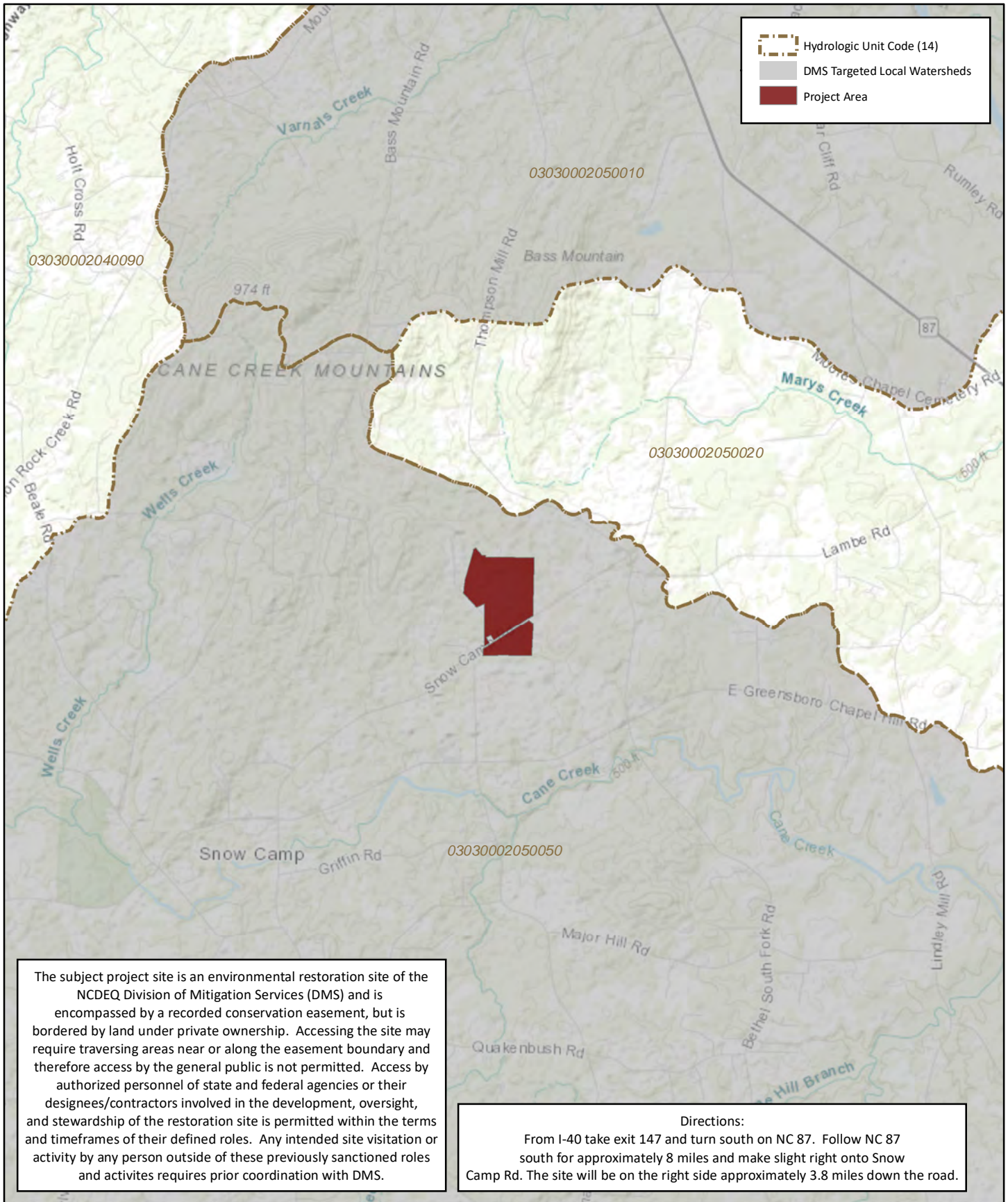


Figure 1. Project Vicinity Map
 Foust Creek Mitigation Site
 DMS Project No. 95715
 Monitoring Year 6 - 2020
 Alamance County, NC

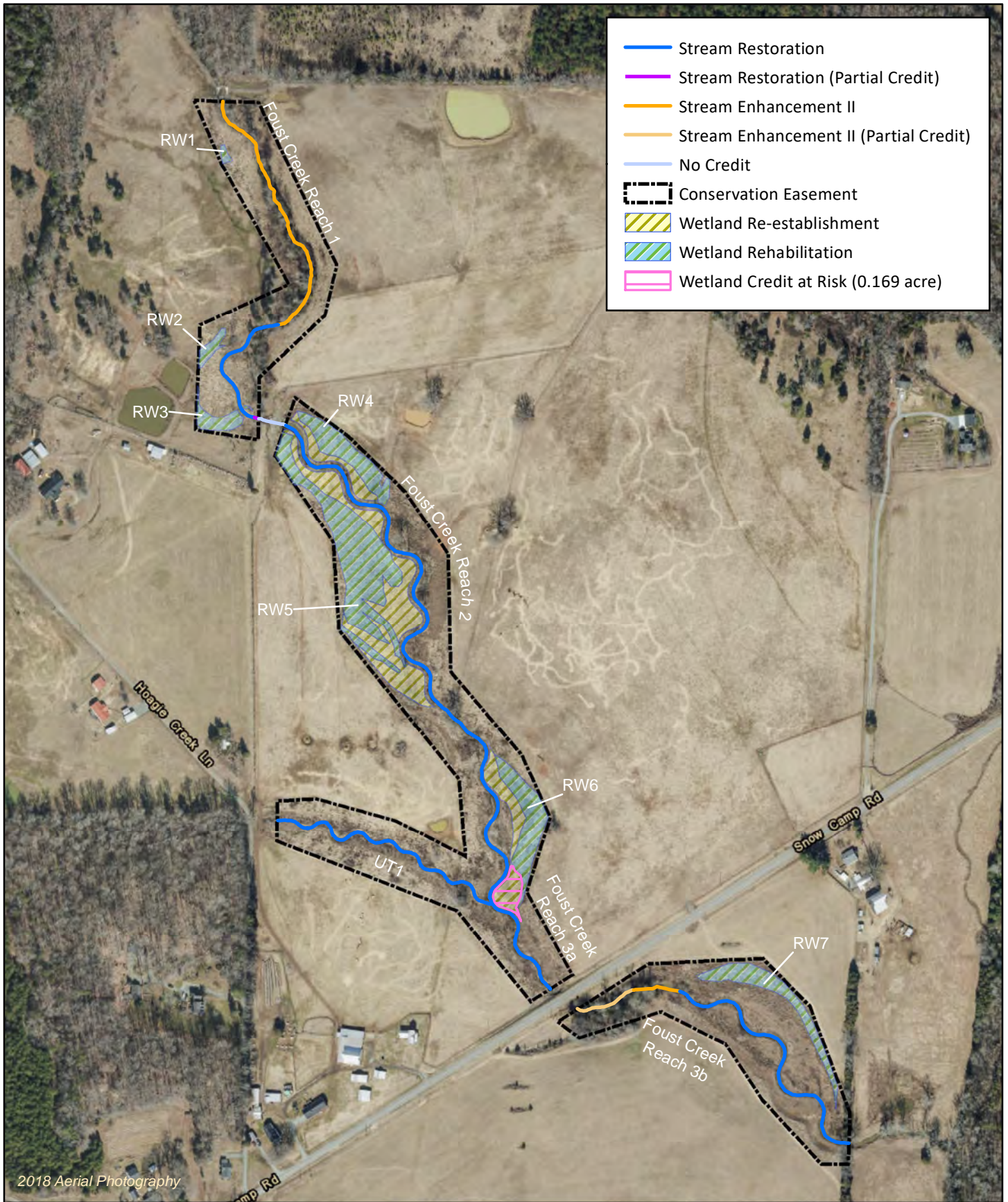


Figure 2. Project Component/Asset Map
Foust Creek Mitigation Site
DMS Project No. 95715
Monitoring Year 6 - 2020
Alamance County, NC

Table 1. Project Components and Mitigation Credits
 Foust Creek Mitigation Site (DMS Project No. 95715)
 Monitoring Year 6 - 2020

Mitigation Credits									
	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R-E ¹	RE ¹	R-E ¹	RE ¹			
Totals	4,770	N/A	1.631*	2.11	N/A	N/A			
Credits at Risk	0	0	0.169	0	N/A	N/A			
Project Components									
Reach ID	As-Built Stationing/ Location	Existing Footage/ Acreage	Approach	Restoration or Restoration Equivalent	Restoration Footage/ Acreage	Mitigation Ratio	Credits (SMU/ WMU)		
Streams									
Foust Creek – Reach 1	101+83 to 109+96	814	EII	Enhancement	813	2.5	325		
Foust Creek – Reach 2	109+96 to 114+21 & 115+19 to 134+84	2,356	P1	Restoration	2,390	1	2,390		
Foust Creek – Reach 2	114+21 to 114+35	31	P1	Restoration (Partial Credit)	14	2 ²	7		
Foust Creek – Reach 2 (Easement Break)	114+35 to 115+19	91	P1	Restoration (No Credit)	84	---	---		
Foust Creek – Reach 3A	134+84 to 138+01	307	P1/2	Restoration	317	1	317		
Foust Creek – Reach 3B	139+01 to 140+89	187	EII	Enhancement (Partial Credit)	188	5 ²	38		
Foust Creek – Reach 3B	140+89 to 142+31	142	EII	Enhancement	142	2.5	57		
Foust Creek – Reach 3B	142+31 to 150+74	684	P1/2	Restoration	843	1	843		
UT1 to Foust Creek	200+94 to 208+87	713	P1	Restoration	793	1	793		
Wetlands									
Riparian Wetland RW1	---	0.03	---	Rehabilitation	0.03	1.5	0.02		
Riparian Wetland RW2	---	0.08	---	Rehabilitation	0.08	1.5	0.05		
Riparian Wetland RW3	---	0.16	---	Rehabilitation	0.16	1.5	0.11		
Riparian Wetland RW4	---	0.45	---	Rehabilitation	0.45	1.5	0.30		
Riparian Wetland RW4	---	0.21	---	Re-Establishment	0.21	1.0	0.21		
Riparian Wetland RW5	---	1.46	---	Rehabilitation	1.46	1.5	0.97		
Riparian Wetland RW5	---	1.18	---	Re-Establishment	1.18	1.0	1.18		
Riparian Wetland RW6	---	0.52	---	Rehabilitation	0.52	1.5	0.35		
Riparian Wetland RW6	---	0.51	---	Re-Establishment	0.241*	1.0	0.241*		
Riparian Wetland RW7	---	0.46	---	Rehabilitation	0.46	1.5	0.31		
Credits at Risk (RW6)	---	0.169	---	Re-Establishment	0.169	1.0	0.169		
Component Summation									
Restoration Level	Stream (LF)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer (acres)	Upland (acres)			
		Riverine	Non-Riverine						
Restoration	4,357	-	-	-	-	-	-		
Enhancement		-	-	-	-	-	-		
Enhancement I		-	-	-	-	-	-		
Enhancement II	1,143	-	-	-	-	-	-		
Creation		-	-	-	-	-	-		
Preservation		-	-	-	-	-	-		
High Quality Preservation		-	-	-	-	-	-		
Re-Establishment		1.631*	-	-	-	-	-		
Rehabilitation		3.16	-	-	-	-	-		
Re-Establishment at Risk		0.169	-	-	-	-	-		

N/A: not applicable

1. R-E = Wetland Re-Establishment and RE = Wetland Rehabilitation per NCDENR July 30, 2013 Memorandum titled: Consistency between Federal and State Wetland Mitigation Requirements

2. A portion of Foust Creek Reach 2 and Reach 3B does not have a full 50' buffer from top of bank to the conservation easement boundary on the river left side. Therefore, mitigation credit is only included at a rate of half the normal crediting giving the restoration or restoration equivalent type.

* Wetland RW6 Re-Establishment credit calculations were updated for Monitoring Year 3 based on the performance of groundwater well 9. Credit at Risk was deducted from this value for MY6 Reporting.

Table 2. Project Activity and Reporting History

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 6 - 2020

Activity or Report		Date Collection Complete	Completion or Scheduled Delivery
Mitigation Plan		October 2013-February 2014	February 2014
Final Design - Construction Plans		April 2014-August 2014	August 2014
Construction		October 2014-February 2015	February 2015
Temporary S&E mix applied to entire project area ¹		February 2015	February 2015
Permanent seed mix applied to reach/segments		February 2015	February 2015
Bare root and live stake plantings for reach/segments		February 2015	February 2015
Baseline Monitoring Document (Year 0)	Stream Survey	February 2015	May 2015
	Vegetation Survey	February 2015	
Year 1 Monitoring	Stream Survey	September 2015	December 2015
	Vegetation Survey	September 2015	
Year 2 Monitoring	Stream Survey	March 2016	December 2016
	Vegetation Survey	June 2016	
Supplemental Planting			March 2017
Year 3 Monitoring	Stream Survey	March 2017	December 2017
	Vegetation Survey	August 2017	
Invasive Vegetation Treatment			September 2018
Year 4 Monitoring	Stream Survey	N/A	December 2018
	Vegetation Survey	N/A	
Supplemental Planting			January 2019
Invasive Vegetation Treatment			May 2019
Invasive Vegetation Treatment			October 2019
Year 5 Monitoring	Stream Survey	March 2019	December 2019
	Vegetation Survey	August 2019	
Year 6 Monitoring	Stream Survey	N/A	December 2020
	Vegetation Survey	N/A	
Invasive Vegetation Treatment			February 2020
Tree Fertilization			April 2020
Tree Release			August 2020
Year 7 Monitoring	Stream Survey	2021	December 2021
	Vegetation Survey	2021	

¹Seed and mulch is added as each section of construction is completed.

Table 3. Project Contacts Table

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 6 - 2020

Designer Angela Allen, PE	Wildlands Engineering, Inc. 312 West Millbrook Road, Suite 225 Raleigh, NC 27609 919.851.9986
Construction Contractor	Fluvial Solutions P.O. Box 28749 Raleigh, NC 27611
Planting Contractor	Bruton Natural Systems, Inc P.O. Box 1197 Fremont, NC 27830
Seeding Contractor	Fluvial Solutions P.O. Box 28749 Raleigh, NC 27611
Seed Mix Sources	Green Resource, LLC
Nursery Stock Suppliers	
Bare Roots	Dykes and Son Nursery
Live Stakes	Bruton Natural Systems, Inc
Monitoring Performers Monitoring, POC	Wildlands Engineering, Inc. Jason Lorch 919.851.9986, ext. 107

Table 4. Project Information and Attributes
 Foust Creek Mitigation Site (DMS Project No. 95715)
 Monitoring Year 6 - 2020

Project Information				
Project Name	Foust Creek Mitigation Site			
County	Alamance County			
Project Area	22.11 acres			
Planted Area	22.11 acres			
Project Coordinates (latitude and longitude)	35° 55' 0.12" N, 79° 24' 6.84" W			
Project Watershed Summary Information				
Physiographic Province	Carolina Slate Belt of the Piedmont Physiographic Province			
River Basin	Cape Fear River			
USGS Hydrologic Unit 8-digit	03030002			
USGS Hydrologic Unit 14-digit	03030002050050			
DWR Sub-basin	03-06-04			
Project Drainage Area (acres)	1,259 acres			
Project Drainage Area Percentage of Impervious Area	<1%			
CGIA Land Use Classification	78% Forested/ Scrubland, 21% Agriculture/ Managed Herbaceous, <1% Open Water, <1% Watershed Impervious Cover, <1% Developed			
Reach Summary Information				
Parameters	Foust Creek Reach 1	Foust Creek Reach 2	Foust Creek Reach 3	UT1
Length of reach (linear feet) - Post-Restoration	813	2,404	1,490	793
Drainage area (acres)	954	1,047	1,259	173
NCDWR stream identification score	41.5	41.5	44	28
NCDWR Water Quality Classification	WS-V	WS-V	WS-V	---
Morphological Description (stream type)	P	P	P	I
Evolutionary trend (Simon's Model) - Pre- Restoration	III/IV	N/A	III/IV	III
Underlying mapped soils	Georgeville silty clay loam, Local alluvial land, Orange silt loam			
Drainage class	---	---	---	---
Soil Hydric status	---	---	---	---
Slope	---	---	---	---
FEMA classification	AE	AE	AE	---
Native vegetation community	Piedmont bottomland forest			
Percent composition exotic invasive vegetation - Post - Restoration	0%			
Regulatory Considerations				
Regulation	Applicable?	Resolved?	Supporting Documentation	
Waters of the United States - Section 404	Yes	Yes	USACE Nationwide Permit No.27 and DWQ 401 Water Quality Certification No. 3885.	
Waters of the United States - Section 401	Yes	Yes		
Division of Land Quality (Dam Safety)	No	N/A	N/A	
Endangered Species Act	Yes	Yes	Foust Creek Mitigation Plan(2013); Wildlands determined "no effect" on Alamance County listed endangered species.	
Historic Preservation Act	Yes	Yes	No historic resources were found to be impacted (letter from SHPO dated 1/9/13).	
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A	
FEMA Floodplain Compliance	Yes	Yes	Foust Creek is located within the floodway and flood fringe (FEMA Zone AE, FIRM panels 8788 and 8879).	
Essential Fisheries Habitat	No	N/A	N/A	

APPENDIX 2. Visual Assessment Data

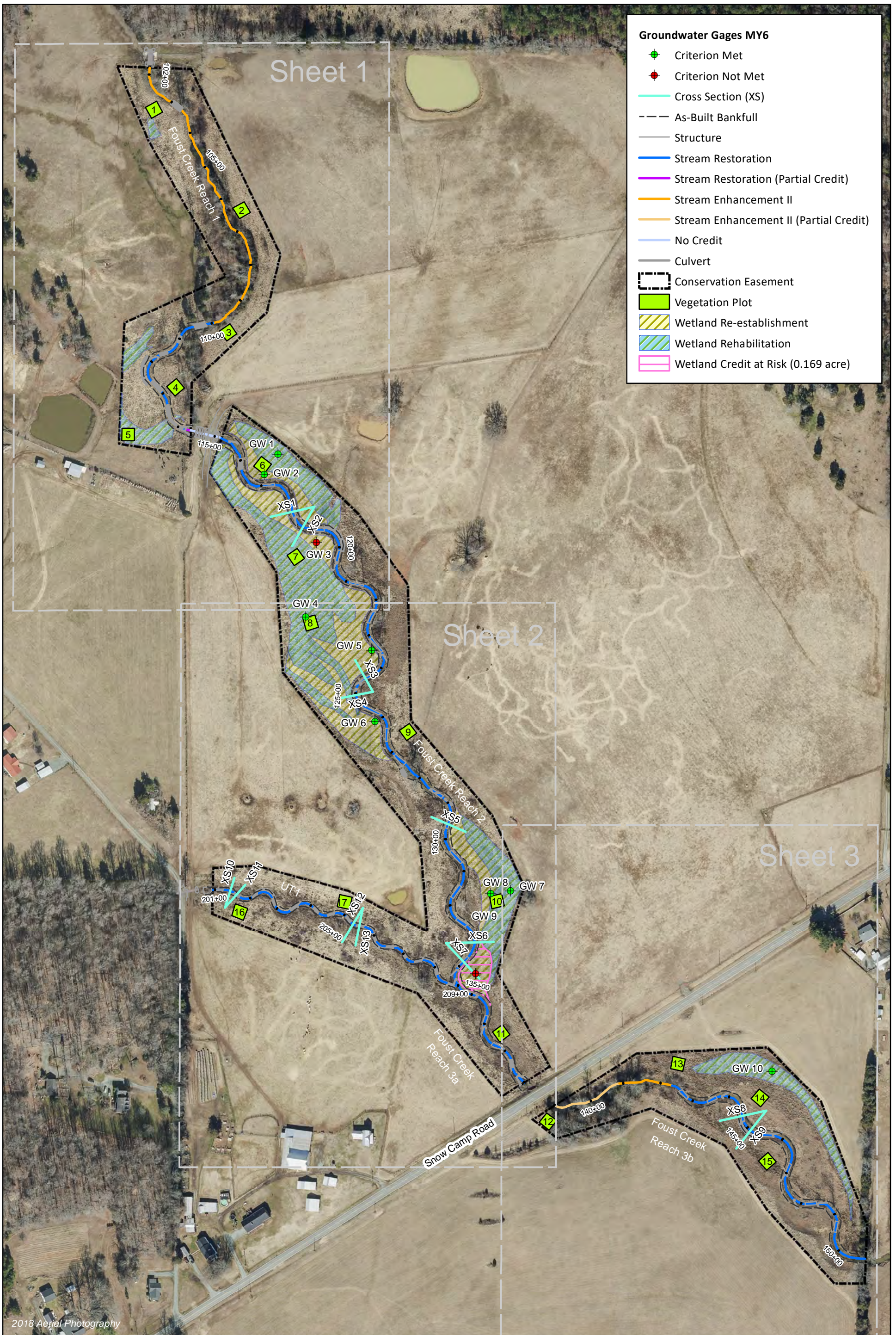
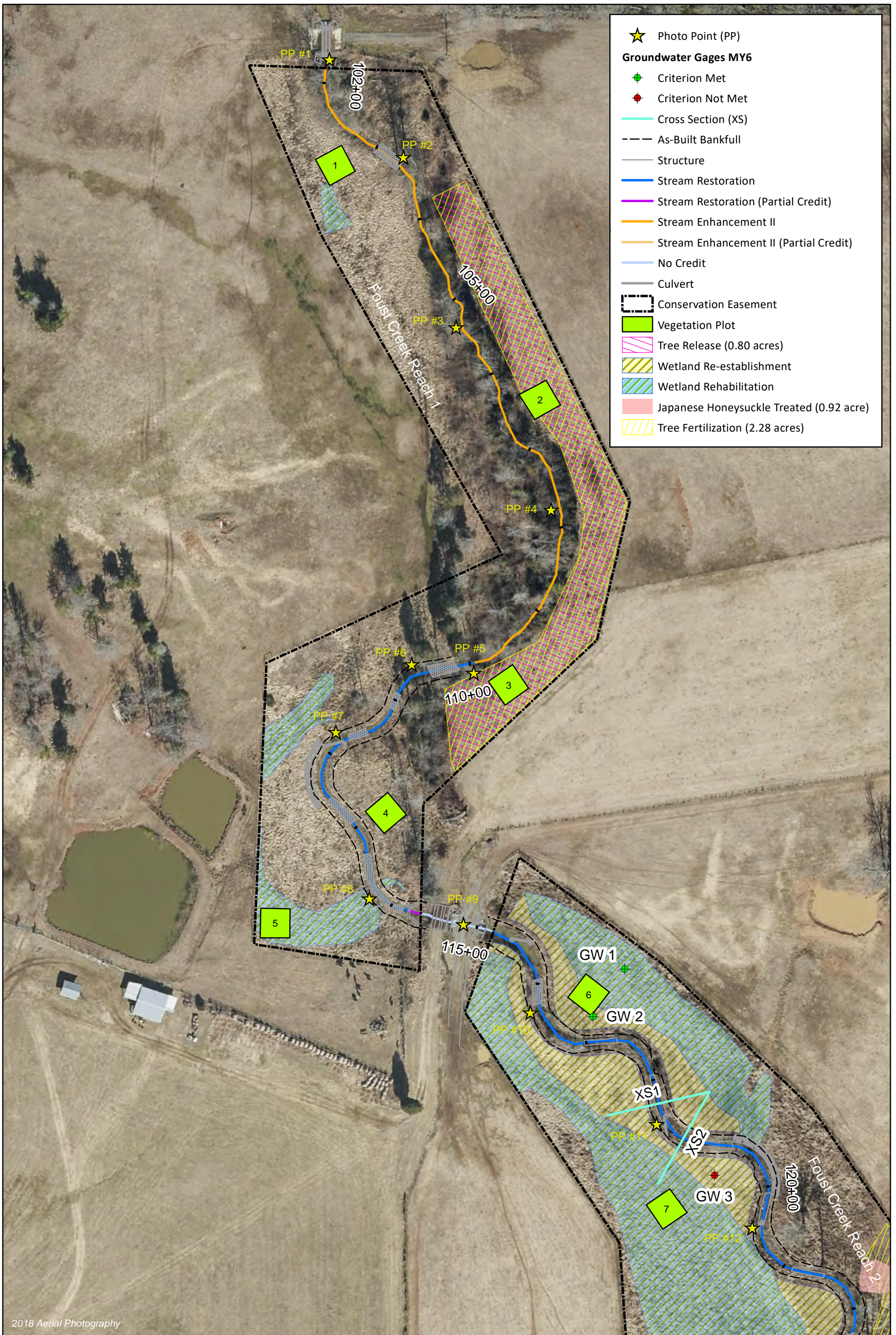


Figure 3.0 Integrated Current Condition Plan View (Key)

Foust Creek Mitigation Site
 DMS Project No. 95715
 Monitoring Year 6 - 2020

Alamance County, NC



- ★ Photo Point (PP)
- Groundwater Gages MY6**
- Criterion Met
- Criterion Not Met
- Cross Section (XS)
- - - As-Built Bankfull
- Structure
- Stream Restoration
- Stream Restoration (Partial Credit)
- Stream Enhancement II
- Stream Enhancement II (Partial Credit)
- No Credit
- Culvert
- - - Conservation Easement
- Vegetation Plot
- ▨ Tree Release (0.80 acres)
- ▨ Wetland Re-establishment
- ▨ Wetland Rehabilitation
- ▨ Japanese Honeysuckle Treated (0.92 acre)
- ▨ Tree Fertilization (2.28 acres)

2018 Aerial Photography



0 50 100 150 200 Feet



Figure 3.1 Integrated Current Condition Plan View
(Sheet 1 of 3)

Foust Creek Mitigation Site
DMS Project No. 95715
Monitoring Year 6 - 2020

Alamance County, NC

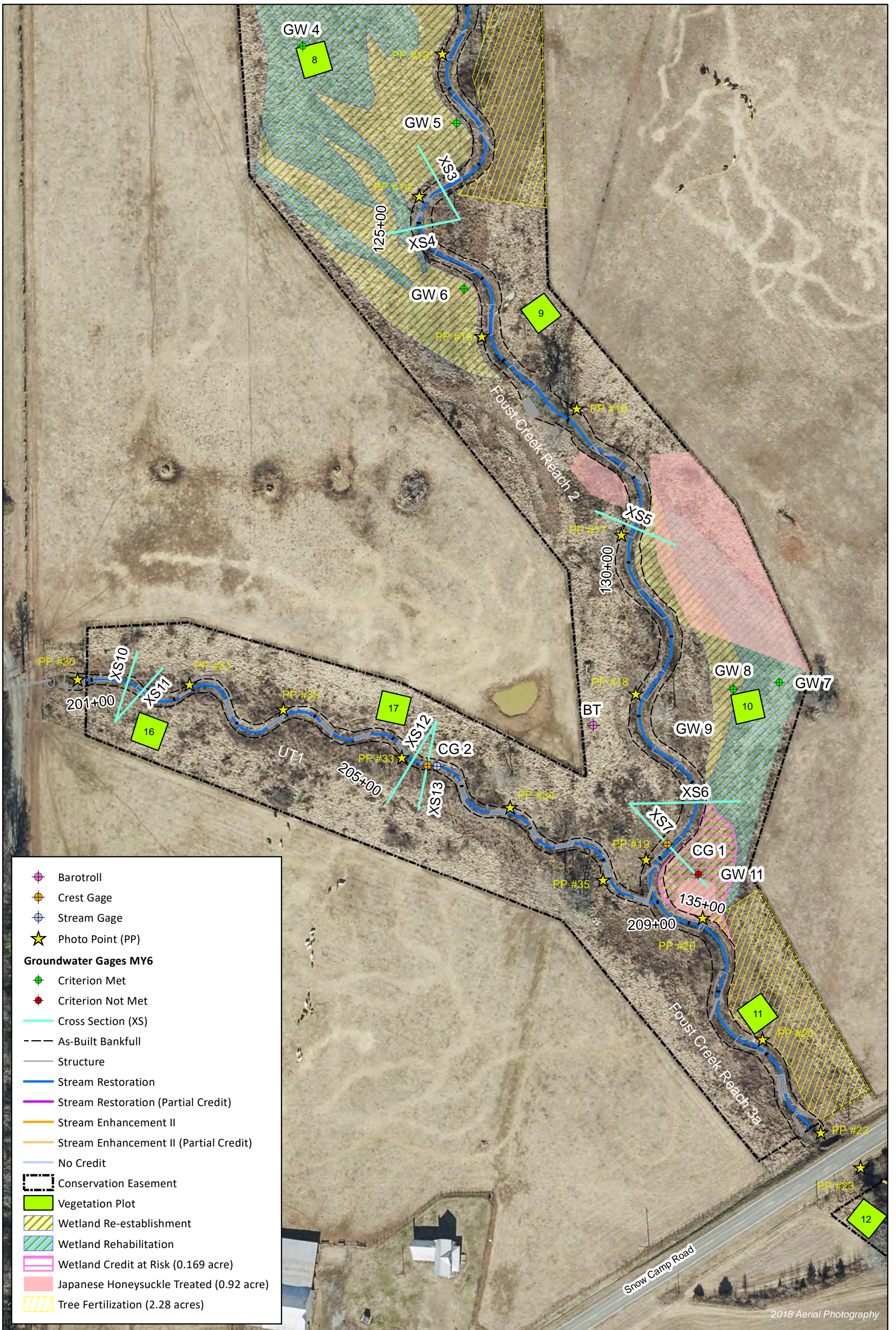
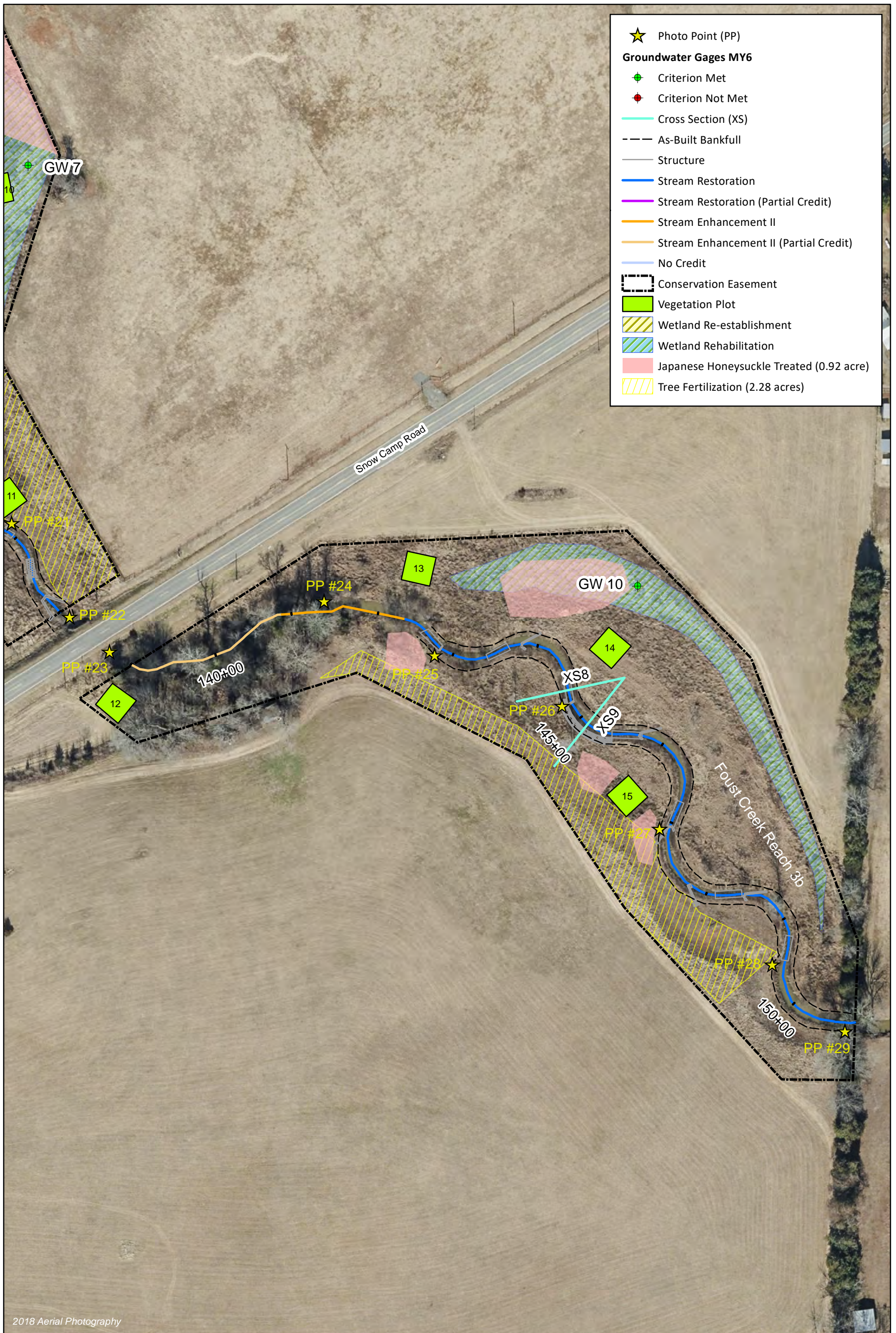


Figure 3.2 Integrated Current Condition Plan View (Sheet 2 of 3)

Foust Creek Mitigation Site
DMS Project No. 95715
Monitoring Year 6 - 2020

Alamance County, NC



- ★ Photo Point (PP)
- Groundwater Gages MY6**
- Criterion Met
- Criterion Not Met
- Cross Section (XS)
- - - As-Built Bankfull
- Structure
- Stream Restoration
- Stream Restoration (Partial Credit)
- Stream Enhancement II
- Stream Enhancement II (Partial Credit)
- No Credit
- Conservation Easement
- Vegetation Plot
- ▨ Wetland Re-establishment
- ▨ Wetland Rehabilitation
- Japanese Honeysuckle Treated (0.92 acre)
- ▨ Tree Fertilization (2.28 acres)

2018 Aerial Photography

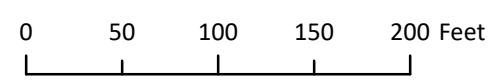


Figure 3.3 Integrated Current Condition Plan View
 (Sheet 3 of 3)
 Foust Creek Mitigation Site
 DMS Project No. 95715
 Monitoring Year 6 - 2020
 Alamance County, NC

Table 5a. Visual Stream Morphology Stability Assessment Table

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 6 - 2020

Foust Creek Reach 1 (813 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	n/a	n/a			n/a			
	3. Meander Pool Condition	Depth Sufficient	n/a	n/a			n/a			
		Length Appropriate	n/a	n/a			n/a			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	n/a	n/a			n/a			
Thalweg centering at downstream of meander bend (Glide)		n/a	n/a	n/a						
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
TOTALS					0	0	100%	n/a	n/a	n/a
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	n/a	n/a			n/a			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	n/a	n/a			n/a			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms	n/a	n/a			n/a			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	n/a	n/a			n/a			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	n/a	n/a			n/a			

Table 5b. Visual Stream Morphology Stability Assessment Table

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 6 - 2020

Foust Creek Reach 2 (2,404 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	10	10			100%			
	3. Meander Pool Condition	Depth Sufficient	9	9			100%			
		Length Appropriate	9	9			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	9	9			100%			
Thalweg centering at downstream of meander bend (Glide)		9	9	100%						
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
TOTALS					0	0	100%	n/a	n/a	n/a
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	2	2			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	1	1			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms	1	1			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	2	2			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	1	1			100%			

Table 5c. Visual Stream Morphology Stability Assessment Table

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 6 - 2020

Foust Creek Reach 3 (1,490 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	11	11		100%				
	3. Meander Pool Condition	Depth Sufficient	11	11		100%				
		Length Appropriate	11	11		100%				
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	11	11		100%				
Thalweg centering at downstream of meander bend (Glide)		11	11	100%						
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
TOTALS					0	0	100%	n/a	n/a	n/a
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	5	5			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	3	3			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms	3	3			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	3	3			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	1	1			100%			

Table 5d. Visual Stream Morphology Stability Assessment Table

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 6 - 2020

UT1 (793 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	15	15			100%			
	3. Meander Pool Condition	Depth Sufficient	14	14			100%			
		Length Appropriate	14	14			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	15	15			100%			
Thalweg centering at downstream of meander bend (Glide)		14	14	100%						
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
TOTALS					0	0	100%	n/a	n/a	n/a
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	13	13			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	13	13			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms	13	13			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	13	13			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	3	3			100%			

Table 6. Vegetation Condition Assessment Table
 Foust Creek Mitigation Site (DMS Project No. 95715)
 Monitoring Year 6 - 2020

Planted Acreage 22

Vegetation Category	Definitions	Mapping Threshold (Ac)	Number of Polygons	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material	0.1	0	0	0.0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1	0	0.0	0.0%
			Total	0	0.0%
Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 Ac	0	0	0%
			Cumulative Total	0	0.0%

Easement Acreage 22

Vegetation Category	Definitions	Mapping Threshold (SF)	Number of Polygons	Combined Acreage	% of Planted Acreage
Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1,000	0	0	0.0%
Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	0	0	0%
Tree Growth Enhancement Areas	Areas that received soil ammendment or competition release treatment to promote tree growth.	none	5	3.08	14%

STREAM PHOTOGRAPHS
Monitoring Year 6



PHOTO POINT 1 Foust Creek R1 – looking downstream (4/7/2020)



PHOTO POINT 2 Foust Creek R1 – looking upstream (4/7/2020)



PHOTO POINT 2 Foust Creek R1 – looking downstream (4/7/2020)



PHOTO POINT 3 Foust Creek R1 – looking upstream (4/7/2020)



PHOTO POINT 3 Foust Creek R1 – looking downstream (4/7/2020)





PHOTO POINT 4 Foust Creek R1 – looking upstream (4/7/2020)



PHOTO POINT 4 Foust Creek R1 – looking downstream (4/7/2020)



PHOTO POINT 5 Foust Creek R1 – looking upstream (4/7/2020)



PHOTO POINT 5 Foust Creek R1 – looking downstream (4/7/2020)



PHOTO POINT 6 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 6 Foust Creek R2 – looking downstream (4/7/2020)





PHOTO POINT 7 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 7 Foust Creek R2 – looking downstream (4/7/2020)



PHOTO POINT 8 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 8 Foust Creek R2 – looking downstream (4/7/2020)



PHOTO POINT 9 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 9 Foust Creek R2 – looking downstream (4/7/2020)





PHOTO POINT 10 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 10 Foust Creek R2 – looking downstream (4/7/2020)



PHOTO POINT 11 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 11 Foust Creek R2 – looking downstream (4/7/2020)



PHOTO POINT 12 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 12 Foust Creek R2 – looking downstream (4/7/2020)





PHOTO POINT 13 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 13 Foust Creek R2 – looking downstream (4/7/2020)



PHOTO POINT 14 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 14 Foust Creek R2 – looking downstream (4/7/2020)

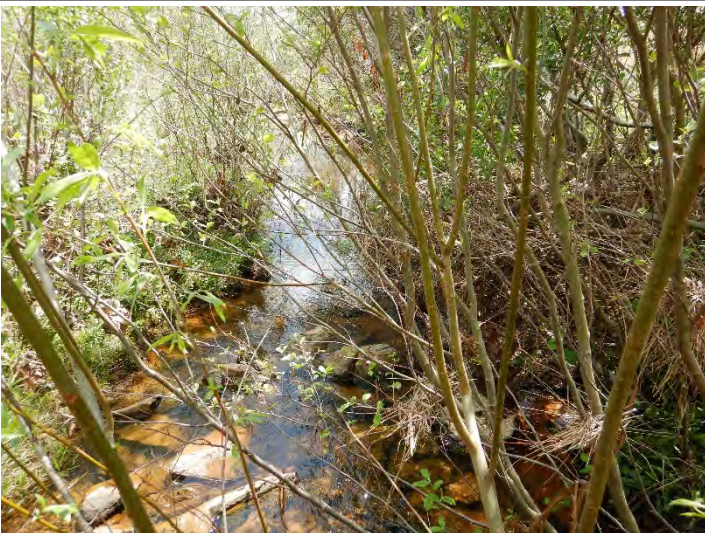


PHOTO POINT 15 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 15 Foust Creek R2 – looking downstream (4/7/2020)





PHOTO POINT 16 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 16 Foust Creek R2 – looking downstream (4/7/2020)



PHOTO POINT 17 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 17 Foust Creek R2 – looking downstream (4/7/2020)



PHOTO POINT 18 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 18 Foust Creek R2 – looking downstream (4/7/2020)





PHOTO POINT 19 Foust Creek R2 – looking upstream (4/7/2020)



PHOTO POINT 19 Foust Creek R2 – looking downstream (4/7/2020)



PHOTO POINT 20 Foust Creek R3a – looking upstream (4/7/2020)



PHOTO POINT 20 Foust Creek R3a – looking downstream (4/7/2020)



PHOTO POINT 21 Foust Creek R3a – looking upstream (4/7/2020)



PHOTO POINT 21 Foust Creek R3a – looking downstream (4/7/2020)





PHOTO POINT 22 Foust Creek R3a – looking upstream (4/7/2020)



PHOTO POINT 23 Foust Creek R3b – looking downstream (4/7/2020)



PHOTO POINT 24 Foust Creek R3b – looking upstream (4/7/2020)



PHOTO POINT 24 Foust Creek R3b – looking downstream (4/7/2020)



PHOTO POINT 25 Foust Creek R3b – looking upstream (4/7/2020)



PHOTO POINT 25 Foust Creek R3b – looking downstream (4/7/2020)





PHOTO POINT 26 Foust Creek R3b – looking upstream (4/7/2020)



PHOTO POINT 26 Foust Creek R3b – looking downstream (4/7/2020)



PHOTO POINT 27 Foust Creek R3b – looking upstream (4/7/2020)



PHOTO POINT 27 Foust Creek R3b – looking downstream (4/7/2020)



PHOTO POINT 28 Foust Creek R3b – looking upstream (4/7/2020)



PHOTO POINT 28 Foust Creek R3b – looking downstream (4/7/2020)





PHOTO POINT 29 Foust Creek R3b – looking upstream (4/7/2020)



PHOTO POINT 29 Foust Creek R3b – looking downstream (4/7/2020)



PHOTO POINT 30 UT1 – looking downstream (4/7/2020)



PHOTO POINT 31 UT1– looking upstream (4/7/2020)



PHOTO POINT 31 UT1 – looking downstream (4/7/2020)





PHOTO POINT 32 UT1 – looking upstream (4/7/2020)



PHOTO POINT 32 UT1 – looking downstream (4/7/2020)



PHOTO POINT 33 UT1 – looking upstream (4/7/2020)



PHOTO POINT 33 UT1 – looking downstream (4/7/2020)



PHOTO POINT 34 UT1 – looking upstream (4/7/2020)



PHOTO POINT 34 UT1 – looking downstream (4/7/2020)





PHOTO POINT 35 UT1 – looking upstream (4/7/2020)



PHOTO POINT 35 UT1 – looking downstream (4/7/2020)



VEGETATION PHOTOGRAPHS
Monitoring Year 6



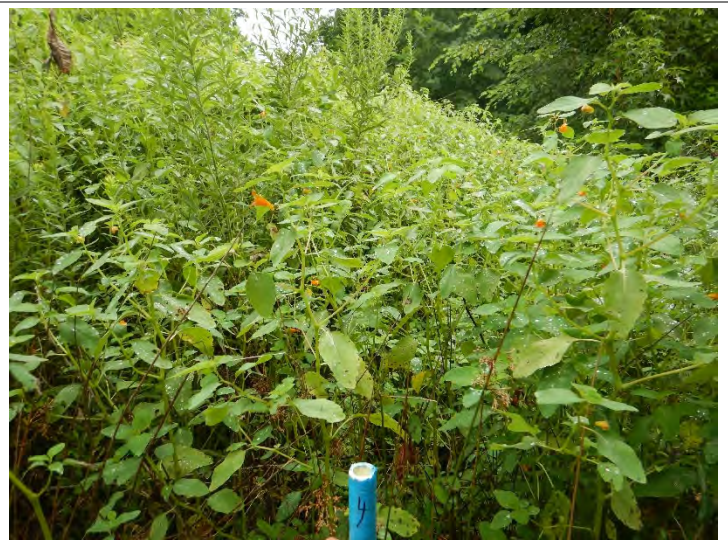
VEG PLOT 1 (8/6/2020)



VEG PLOT 2 (8/6/2020)



VEG PLOT 3 (8/6/2020)



VEG PLOT 4 (8/6/2020)



VEG PLOT 5 (8/6/2020)



VEG PLOT 6 (8/6/2020)





VEG PLOT 7 (8/6/2020)



VEG PLOT 8 (8/6/2020)



VEG PLOT 9 (8/6/2020)



VEG PLOT 10 (8/6/2020)



VEG PLOT 11 (8/6/2020)



VEG PLOT 12 (8/6/2020)





VEG PLOT 13 (8/6/2020)



VEG PLOT 14 (8/6/2020)



VEG PLOT 15 (8/6/2020)



VEG PLOT 16 (8/6/2020)



VEG PLOT 17 (8/6/2020)



APPENDIX 3. Vegetation Plot Data

Vegetation inventory and analysis not required during MY6

APPENDIX 4. Morphological Summary Data and Plots

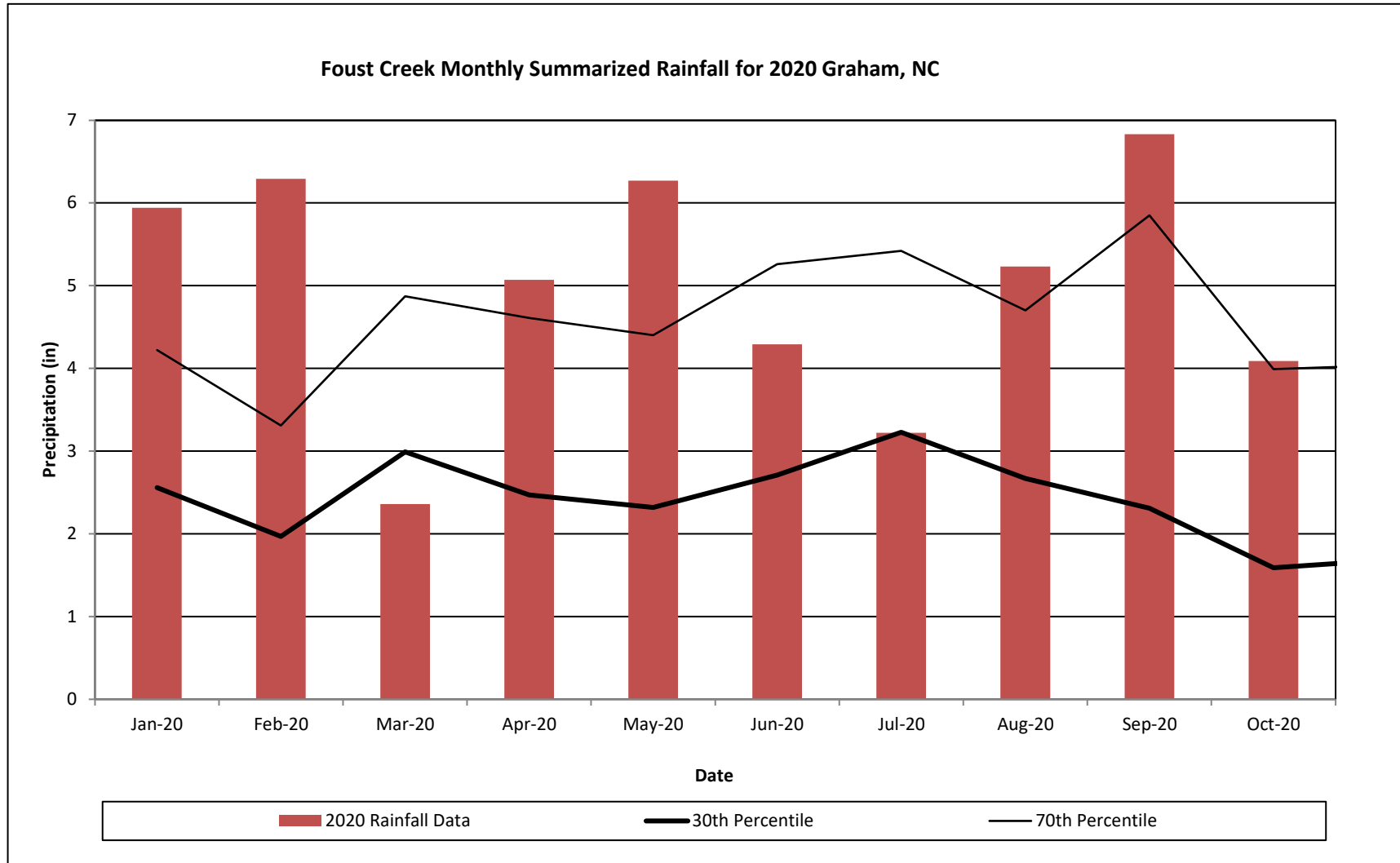
Morphological survey and analysis not required during MY6

APPENDIX 5. Hydrology Summary Data and Plots

Monthly Summarized Rainfall Data

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 6 - 2020



¹ 2020 monthly rainfall collected from weather station 3135555, Graham 2 ENE, NC

² 30th and 70th percentile rainfall data collected from weather station 313555, Graham 2 ENE, NC.

Table 13. Verification of Bankfull Events

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 6 - 2020

Reach	Monitoring Year	Date of Data Collection	Date of Occurrence	Method		
Foust Creek	MY1	10/6/2015	7/2015-10/2015	Cork Crest Gage		
		3/8/2016	1/2016-3/2016			
	MY2	8/2/2016	6/7/2016	Crest Gage/Pressure Transducer		
		10/10/2016	10/8/2016			
		6/27/2017	4/24/2017 6/20/2017			
	MY3	7/6/2018	4/25/2018			
		10/23/2018	8/20/2018 9/18/2018			
		1/30/2019	10/11/2018			
			11/5/2018			
			11/12/2018			
	MY4	12/20/2018	2/23/2019			
		5/2/2019	4/12/2019			
			4/17/2019			
	MY5		3/2/2020		1/24/2020	
		2/6/2020				
		8/6/2020	5/21/2020			
	UT1	MY1	10/6/2015		7/2015-10/2015	Cork Crest Gage
			12/4/2015		10/2015-12/2015	
MY2		3/8/2016	1/2016-3/2016			
		MY3	6/27/2017		4/24/2017	
6/20/2017						
MY4		3/20/2018	4/25/2018			
			10/23/2018	9/17/2018		
		1/30/2019	11/12/2018			
			12/20/2018			
MY5		1/30/2019	1/16/2019			
		5/2/2019	4/13/2019			
MY 6		3/2/2020	1/24/2020			
			2/6/2020			
			2/15/2020			
		4/28/2020	4/13/2020			
		8/6/2020	5/21/2020			
8/6/2020		6/11/2020				

Table 14. In-Stream Flow Gage Attainment Summary

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 6 - 2020

Summary of In-Stream Flow Gage Results for Monitoring Years 1 through 7							
Reach	Max Consecutive Days/Total Days Meeting Success Criteria						
	Year 1 (2015)	Year 2(2016)	Year 3(2017)	Year 4 (2018)	Year 5 (2019)	Year 6 (2020)*	Year 7 (2021)
UT1	342 Days/ 343 Days	106 Days/ 249 Days	56 Days/ 165 Days	77 Days/ 264 Days	109 Days/ 209 Days	184 Days/ 273 Days	

*Data collected through 11/10/2020 for MY6

Table 15. Wetland Gage Attainment Summary

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 6 - 2020

Summary of Groundwater Gage Results for Monitoring Years 1 through 7							
Gage	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)						
	Year 1 (2015)	Year 2 (2016)	Year 3 (2017)	Year 4 (2018)	Year 5 (2019)	Year 6 (2020)	Year 7 (2021)
1	Yes/93 Days (40.2%)	Yes/143 Days (57.0%)	Yes/134 Days (53.0%)	Yes/132 Days (52.0%)	Yes/121 Days (47.6%)	Yes/138 Days (54.3%)	
2	Yes/46 Days (20.0%)	Yes/49 Days (19.5%)	Yes/44 Days (17.4%)	Yes/35 Days (12.8%)	Yes/61 Days (24.0%)	Yes/31 Days (12.2%)	
3	Yes/57 Days (24.6%)	Yes/91 Days (36.3%)	Yes/23 Days (9.1%)	Yes/94 Days (37.0%)	Yes/62 Days (24.4%)	No/6 Days (2.4%)	
4	Yes/63 Days (27.2%)	Yes/86 Days (34.3%)	Yes/132 Days (52.2%)	Yes/74 Days (29.1%)	Yes/78 Days (30.7%)	Yes/28 Days (11.0%)	
5	Yes/124 Days (53.7%)	Yes/196 Days (78.1%)	Yes/153 Days (60.5%)	Yes/39 Days (15.4%)	Yes/97 Days (38.2%)	Yes/48 Days (18.9%)	
6	Yes/47 Days (20.2%)	Yes/49 Days (19.5%)	Yes/45 Days (17.8%)	Yes/84 Days (33.1%)	Yes/64 Days (25.2%)	Yes/46 Days (18.1%)	
7	Yes/152 Days (66.1%)	Yes/218 Days (86.9%)	Yes/202 Days (79.8%)	Yes/237 Days (93.3%)	Yes/187 Days (73.6%)	Yes/254 Days (100%)	
8	Yes/51 Days (22.0%)	Yes/74 Days (29.5%)	Yes/23 Days (9.1%)	Yes/37 Days (14.6%)	Yes/63 Days (24.8%)	Yes/33 Days (13.0%)	
10	Yes/ 119 Days (51.7%)	Yes/179 Days (71.3%)	Yes/144 Days (56.9%)	Yes/124 Days (48.8%)	Yes/123 Days (48.4%)	Yes/189 Days 74.4%	
11 ²						No/4 Days (1.6%)	

¹Wetland Re-establishment area surrounding groundwater well 9 eliminated during MY3

²Well 11 installed during MY6

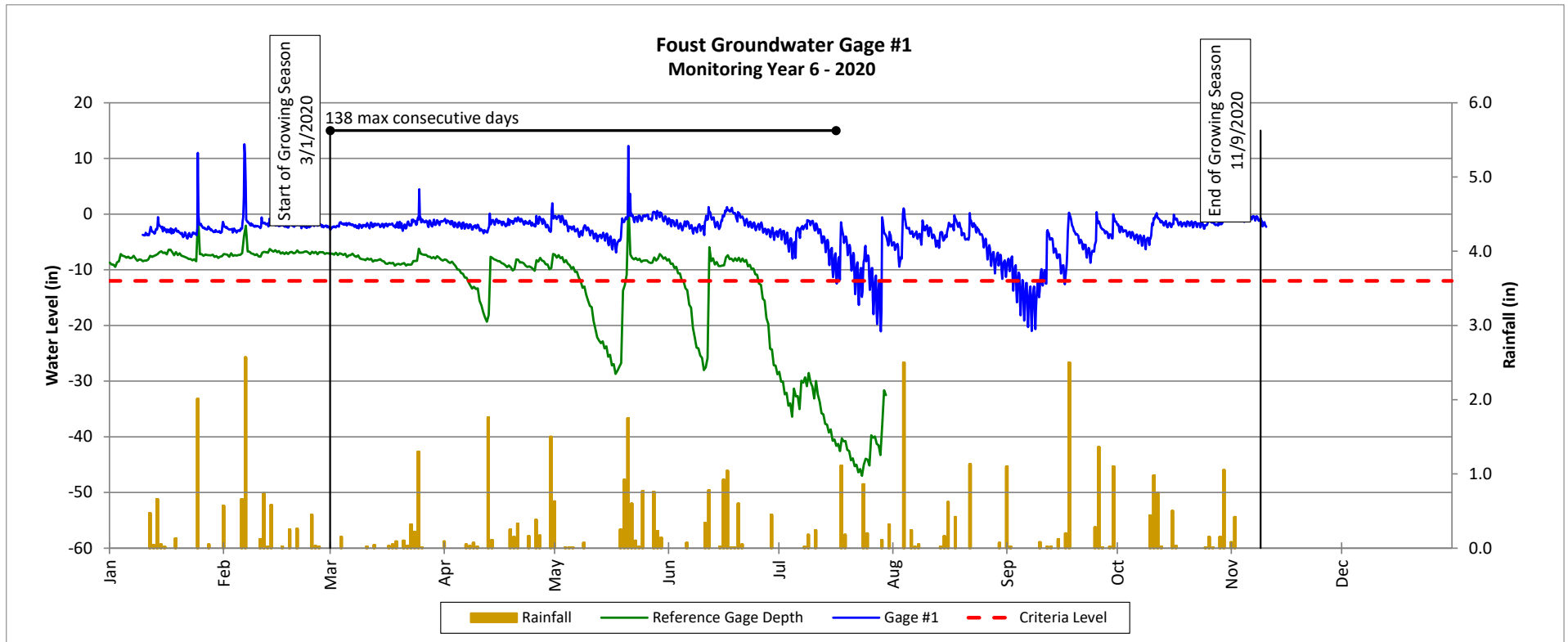
Criterion is that a free groundwater must be present within 12 inches of the soil surface for a consecutive 8.5% of the growing season.

Groundwater Gage Plots

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

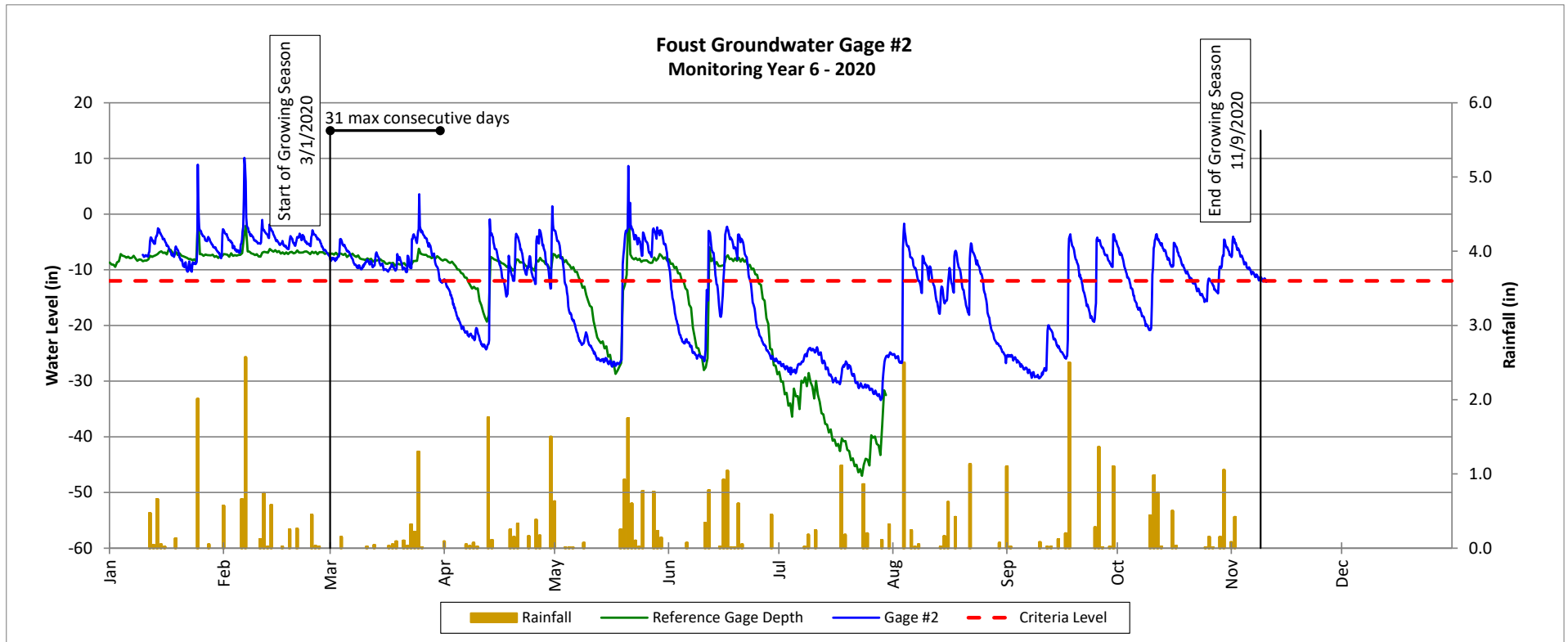


Groundwater Gage Plots

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

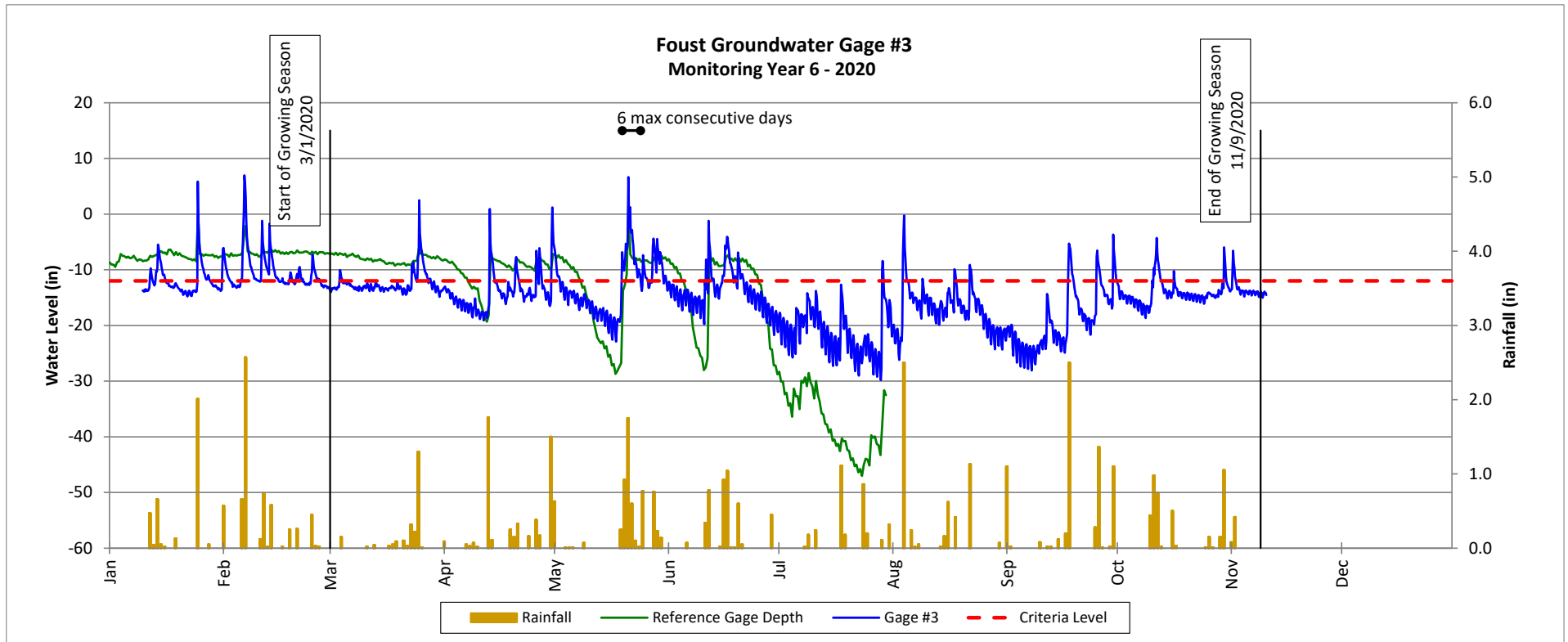


Groundwater Gage Plots

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

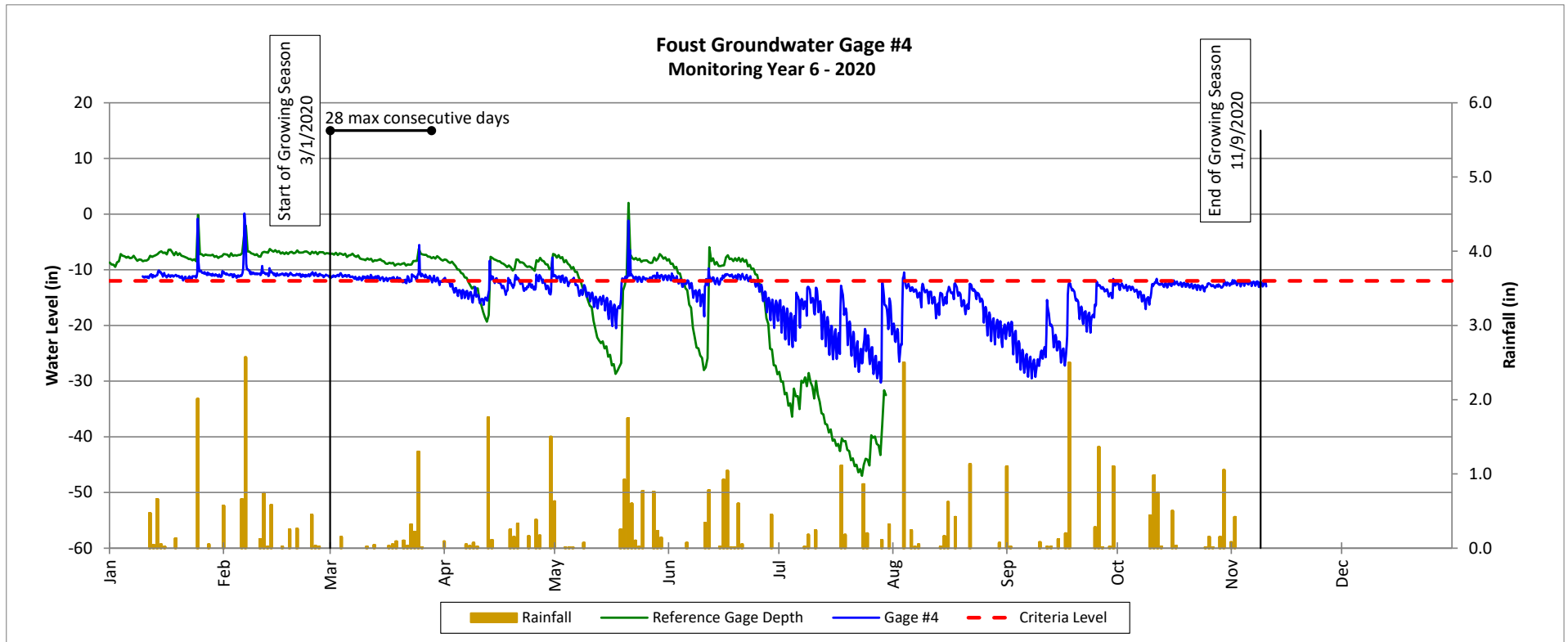


Groundwater Gage Plots

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

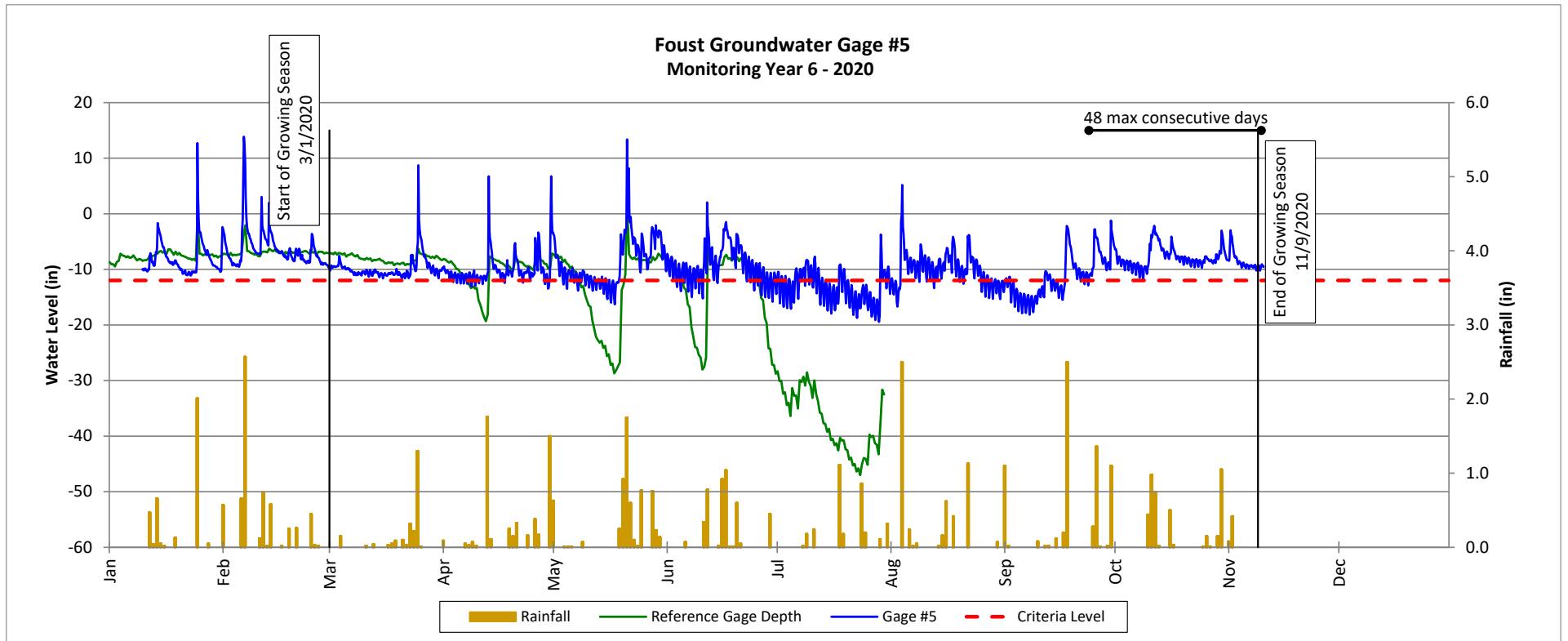


Groundwater Gage Plots

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

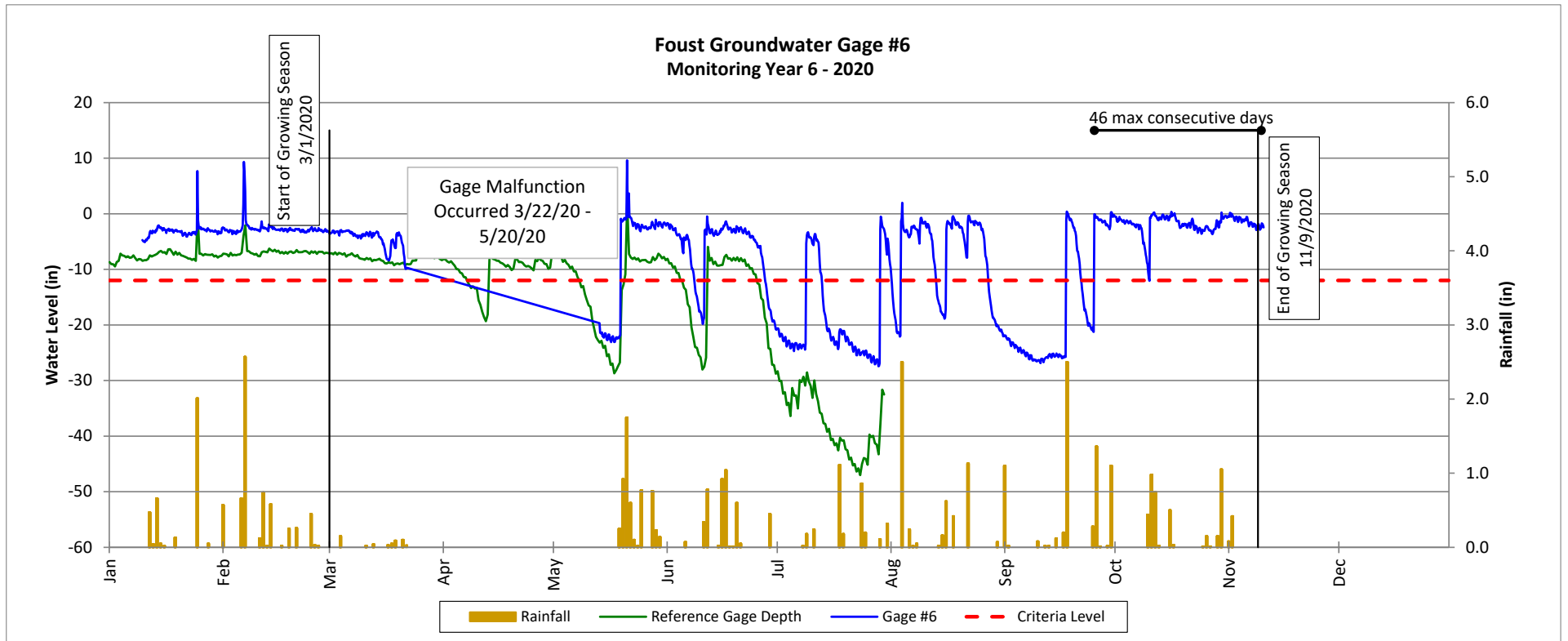


Groundwater Gage Plots

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

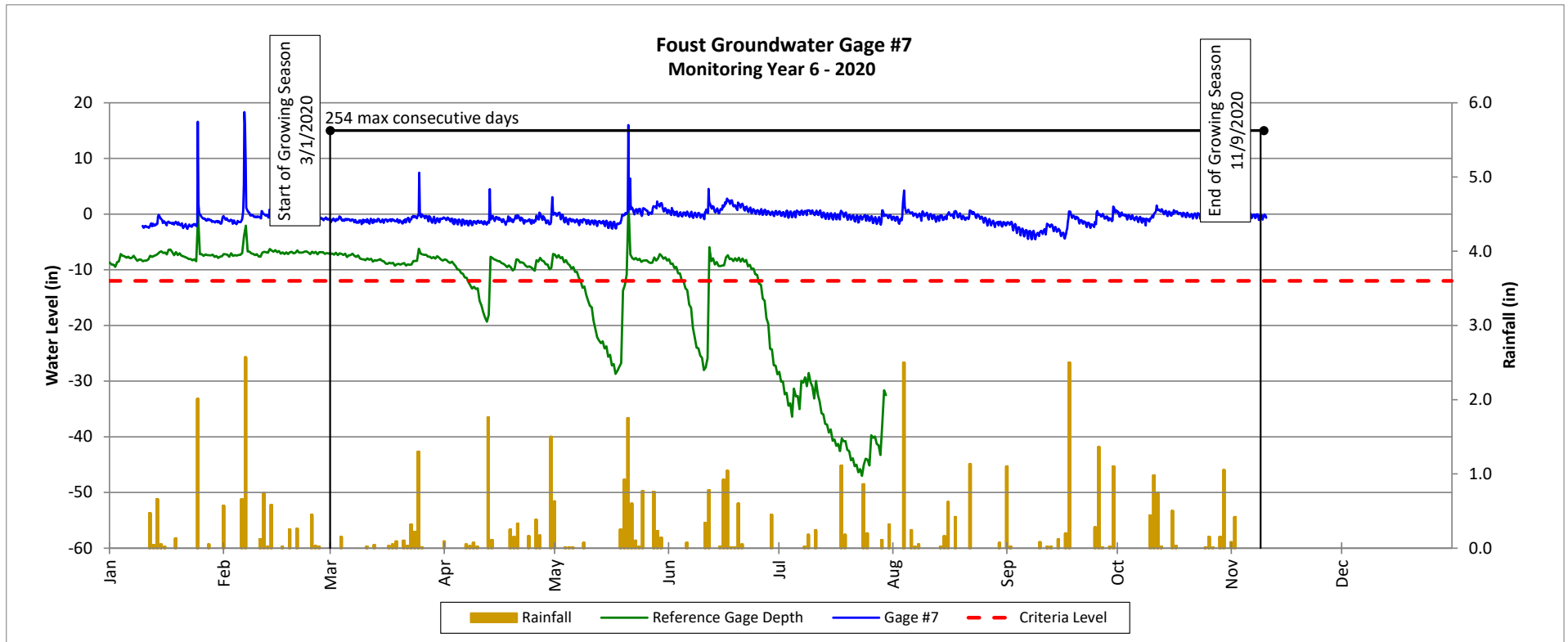


Groundwater Gage Plots

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

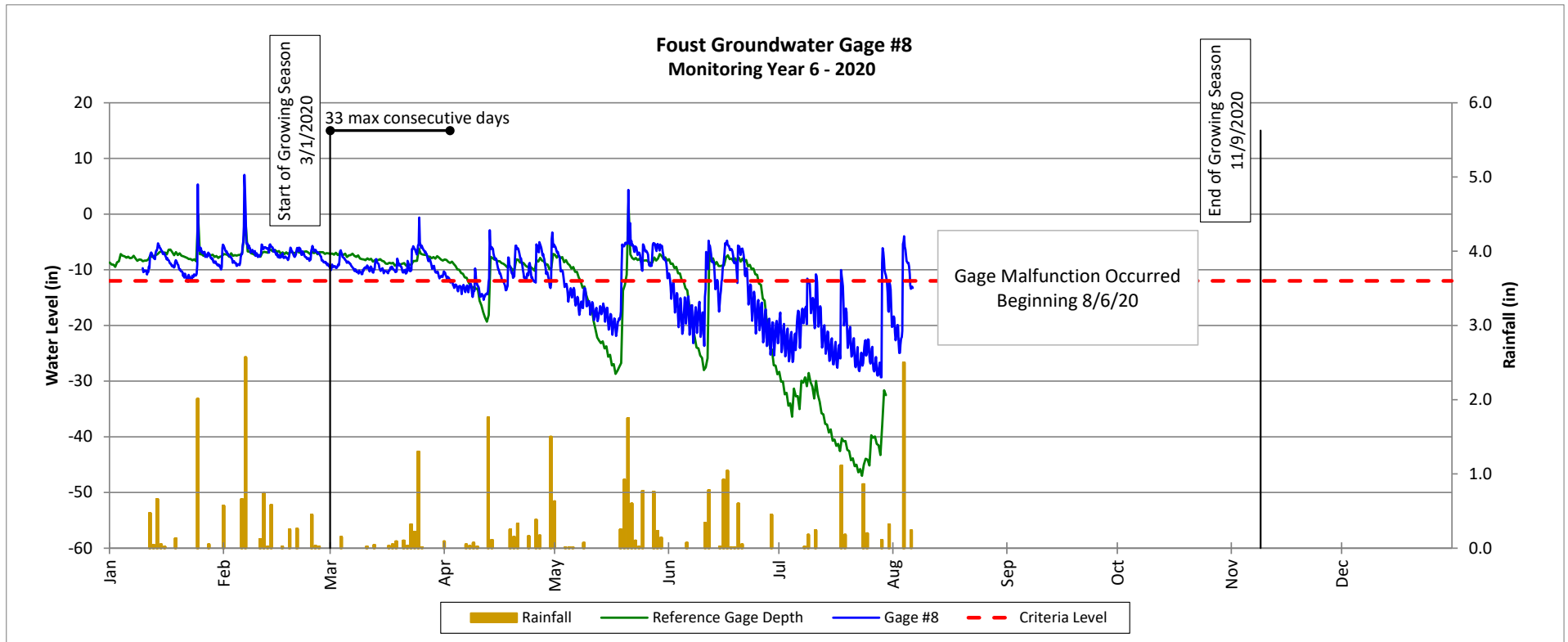


Groundwater Gage Plots

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

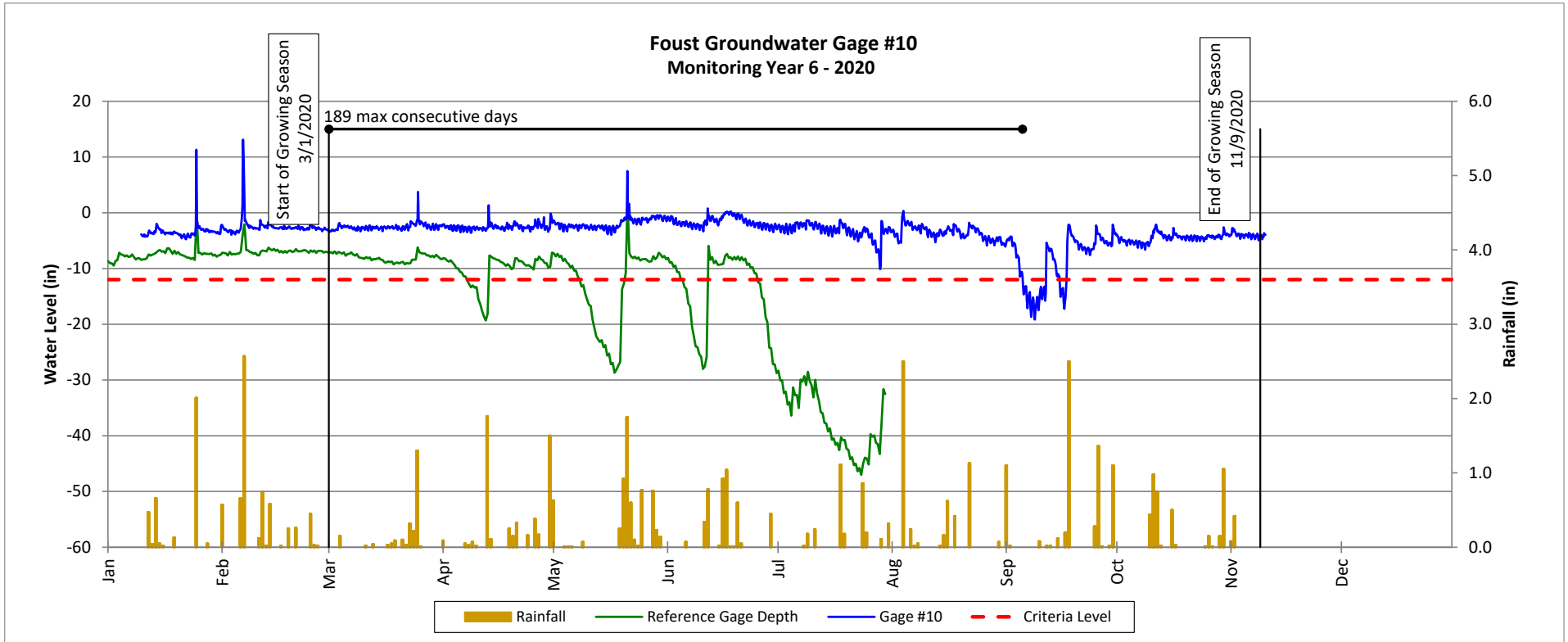


Groundwater Gage Plots

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

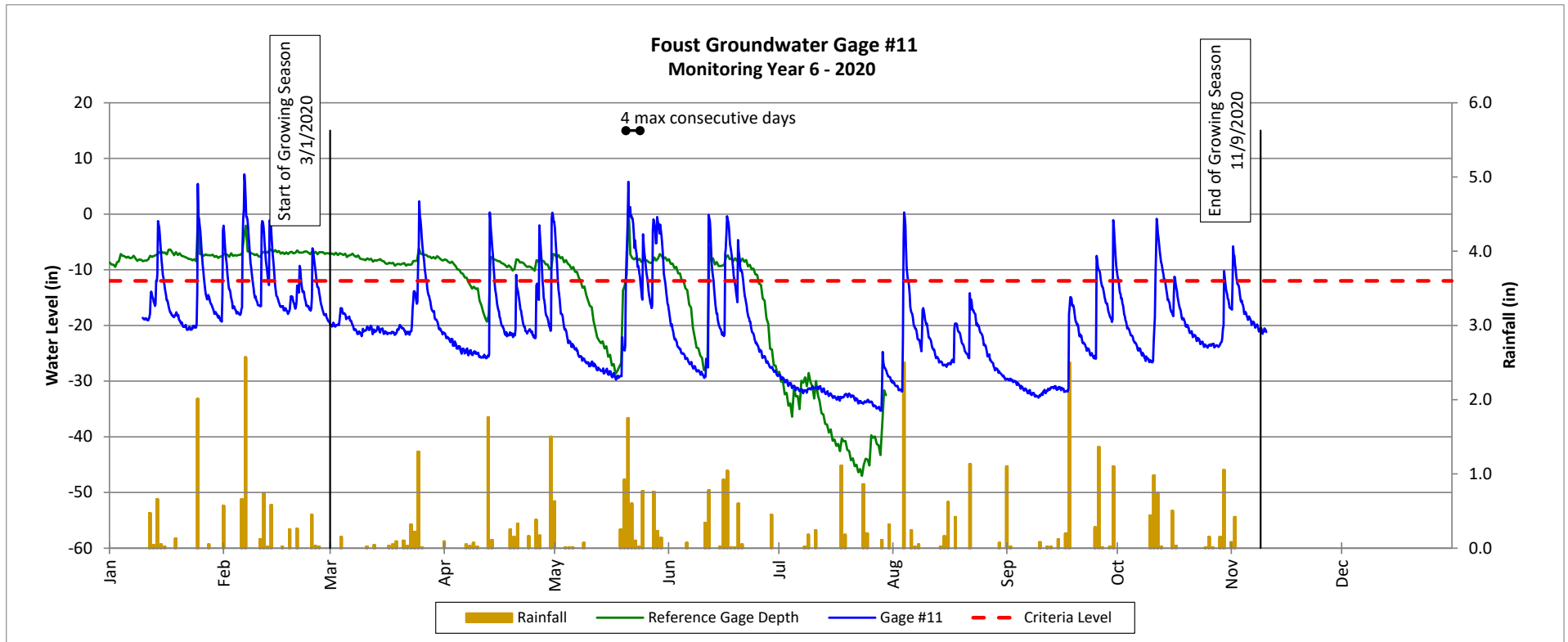


Groundwater Gage Plots

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

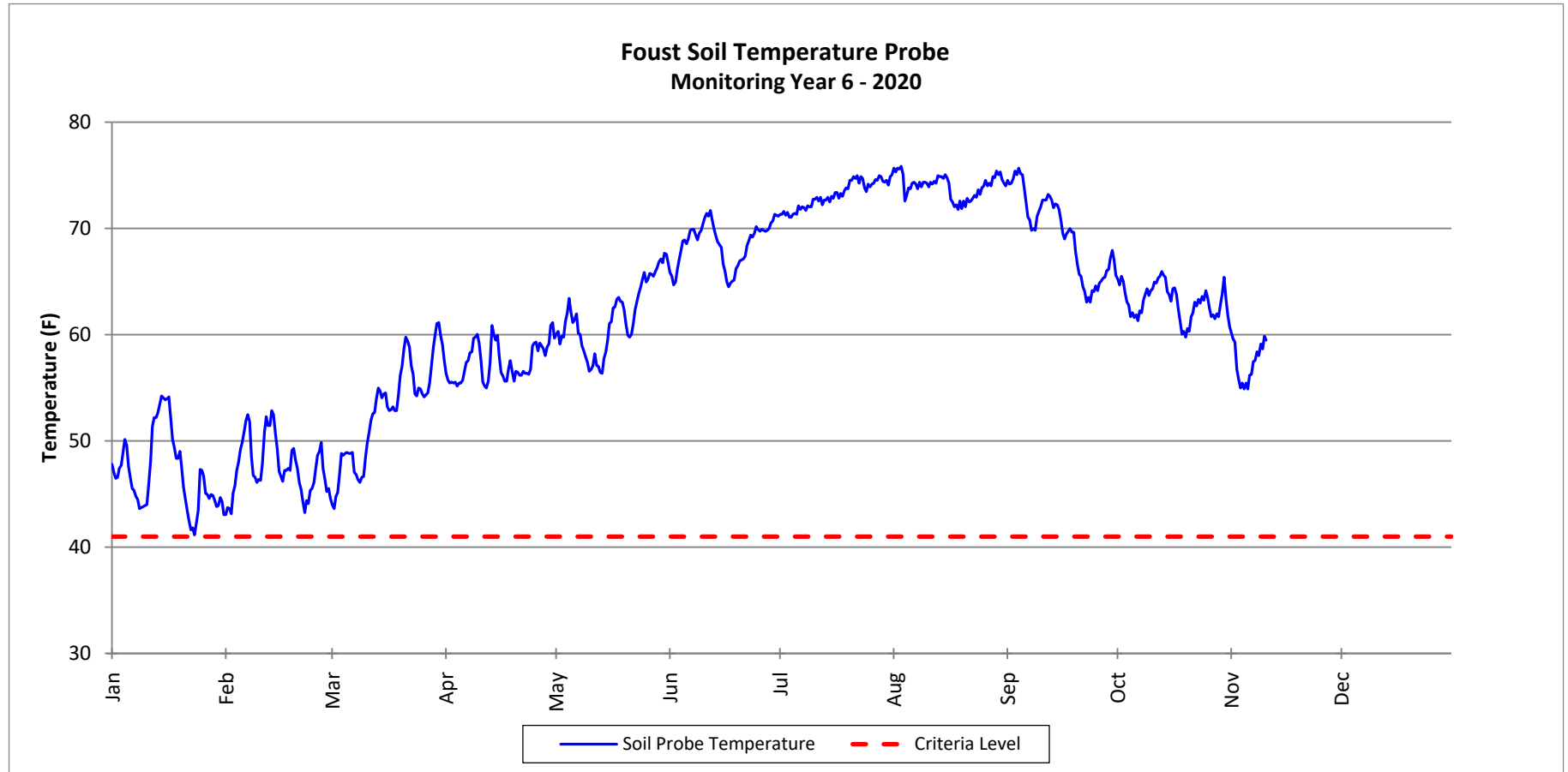


Soil Temperature Probe Plot

Foust Creek Mitigation Site

(DMS Project No. 95715)

Monitoring Year 6 - 2020



Recorded In-Stream Flow Events

Foust Creek Mitigation Site

DMS Project No. 95715

Monitoring Year 6 - 2020

