MONITORING YEAR 6 ANNUAL REPORT

Final

AGONY ACRES MITIGATION SITE

Guilford County, NC
NCDEQ Contract 004949
DMS Project Number 95716
USACE Action ID Number 2012-1909
NCDWR Project Number 2013-1305

Data Collection Period: March 2020 – October 2020
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PREPARED FOR:

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Hey Jeremiah, see below for responses to your comments.

Jason Lorch, GISP *Senior Environmental Scientist*
O: 919.851.9986 x107 **M**: 919.413.1214

Wildlands Engineering, Inc.
312 West Millbrook Road, Suite 225
Raleigh, NC 27609

From: Dow, Jeremiah J <jeremiah.dow@ncdenr.gov>
Sent: Monday, December 07, 2020 2:18 PM
To: Jason Lorch <jlorch@wildlandseng.com>
Subject: Agony Acres

Hey Jason,
I reviewed Agony Acres MY6 report and it didn't generate enough comments to merit a formal letter, but I did have a few questions I hoped you could quickly address:

- UT2 has 5 log sill showing minor piping, but Table 5d states that 3 of 5 structures are not exhibiting piping. Could the other 3 log sills not accounted for here fit into another category somehow, or does Wildlands believe the piping isn't severe enough to include in the Table? Our intent is to convey there are 2 constructed riffles that each have 3 logs in them, some of which are piping. During as-built reporting, in Table 5d these were not counted as stand-alone log sill structures, but part of the constructed riffle. In one riffle all three of the logs are piping, and in the other riffle two of the three logs are piping. We were not sure which category to list this under but decided on the piping category since the entire constructed riffle has not failed. We reported it as 2 of the 5 structures are piping in Table 5d since it is only 2 constructed riffles. The IRT saw this area on the site walk last year so they are aware that a few logs are piping in UT2. If you feel we should report this in a different category on Table 5d let me know and we can update it.
- Do you have any photos of the logs on UT2 where piping is occurring, the perched culvert on UT1A, or the erosion on UT1? If so, it would be helpful to include in the photo log. Photos of these areas have been added to Appendix 2 of the report.
- What caused the culvert to become perched? Most likely the rock used at the culvert outlet was too small for large storm events, such as hurricanes. We will seek larger stone when repairing this.

Thank you,

Jeremiah Dow
NC DEQ Division of Mitigation Services
217 West Jones St.
Raleigh, NC 27603
(919) 707-8280 office
(919) 218-0226 cell

EXECUTIVE SUMMARY

Wildlands Engineering, Inc. (Wildlands) completed a full delivery project at the Agony Acres Mitigation Site (Site) for the North Carolina Division of Mitigation Services (DMS) to restore, enhance, and preserve a total of 9,052 linear feet (LF) of perennial and intermittent stream and restore 3.0 acres of riparian buffer in Guilford County, NC. The Site provides 6,468.3 Stream Mitigation Units (SMUs) and 3.0 Buffer Mitigation Units (BMUs). The Site is located in the Reedy Fork Watershed within Cape Fear River Basin Hydrologic Unit Code (HUC) 03030002 (Cape Fear 02) near Ossipee, NC (Figure 1). The streams are all unnamed tributaries (UT) to Reedy Fork and are referred to herein as UT1, UT1A, UT1B, and UT2. The buffer restoration component closed out in July 2020 and is adjacent to Reedy Fork and lower UT1.

The Site is located within the Jordan Lake Water Supply Watershed which has been designated as a Nutrient Sensitive Water. The Site's watershed is within Cape Fear local watershed HUC 03030002020070, which was not identified as a Cape Fear 02 Targeted Local Watershed (TLW) in DMS's 2009 Cape Fear River Basin Restoration Priority (RBRP) plan; however, this local watershed was later designated as a Targeted Resource Area (TRA) in the 2011 Request for Proposals (RFP) in the Cape Fear 02. The Site fully supports the Cataloging Unit (CU)-wide functional objectives stated in the 2011 RFP to reduce and control nutrient inputs, reduce and control sediment inputs, and protect and augment Significant Natural Heritage Areas in the Cape Fear 02 River Basin. The Site will contribute to meeting the CU-wide Functional Improvement Objectives by establishing the following project goals:

- 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 phosphorous inputs through removing cattle from streams and establishing and augmenting a forested riparian corridor;
- Protect existing high quality streams and forested buffers; and
- Improve and protect hydrologic inputs to the adjacent Reedy Fork Aquatic Habitat Significant Natural Heritage Area.

The project is helping meet the goals for the watershed outlined in the RBRP and provides numerous ecological benefits within the Cape Fear River Basin. While many of these benefits are limited to the Agony Acres project area, others, such as pollutant removal, reduced sediment loading, and improved aquatic and terrestrial habitat, have farther-reaching effects.

Stream restoration and enhancement construction efforts were completed in September 2014. Baseline as-built monitoring activities (MY0) were completed between October and December 2014. A conservation easement is in place on 30.74 acres of stream and riparian corridors to protect them in perpetuity.

Monitoring Year 6 (MY6) site visits and assessments were completed between the months of March and October 2020 to visually assess the conditions of the project and collect stream hydrology data. Detailed monitoring and analysis of vegetation, substrate, and channel cross-sectional dimensions were 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 hydrology meet success criteria for MY6. Vegetation appears to be performing adequately to attain the terminal success criteria of 210 stems per acre at the end of monitoring year seven. Visual observation indicated that stream channels have remained geomorphically stable during MY6 except for minor structure problems and one area of

isolated erosion. Persistent flow and multiple bankfull events were recorded on all streams during MY6. Beavers and a dam were removed from the Site, but it does not appear that damage occurred to the stream channel or vegetation community. Identified invasive vegetation has been treated or is scheduled to be treated in the spring of 2021.

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APPENDICES

*Content omitted from Monitoring Year 6 Report

Section 1: PROJECT OVERVIEW

The Agony Acres Mitigation Site (Site) is located in northeastern Guilford County, north of Gibsonville (Figure 1). From Gibsonville take NC 61 north 5.5 miles. Turn right on Sockwell Road and travel 1.4 miles. The project site is located north of Sockwell Road and is bound on the north by Reedy Fork. The Site is located in the Carolina Slate Belt of the Piedmont Physiographic Province. The project watershed is classified as approximately 65% managed herbaceous cover, 30% mixed upland hardwoods, 3% cultivated, 2% southern yellow pine, and the remaining 1% is low intensity development. The drainage area for the Site is 358 acres.

The Site is located in the Reedy Fork Watershed within the Jordan Lake Water Supply Watershed which has been designated a Nutrient Sensitive Water. The project streams flow directly into Reedy Fork which flows into the Haw River and eventually into the Jordan Lake Reservoir. The Site's watershed is within Hydrologic Unit Code (HUC) 03030002020070 which was not identified as a Cape Fear 02 Targeted Local Watershed (TLW) in DMS's 2009 Cape Fear River Basin Restoration Priority (RBRP) plan; however, this HUC was later designated as a Targeted Resource Area (TRA) in the 2011 Request for Proposals (RFP) in the Cape Fear 02. The Site connects to Reedy Fork and three separate but connected Significant Natural Heritage areas. Reedy Fork Aquatic Habitat, Reedy Fork Slopes at NC 61, and Altamahaw Alluvial Forest are all listed on the NC Natural Heritage GIS database and are immediately adjacent to the Site. There are also records for several state threatened, special concern, and significantly rare mussel species in Reedy Fork.

North Carolina Division of Mitigation Services (DMS) funded a Local Watershed Plan (LWP) in 2008 on the HUC immediately downstream which begins at the confluence of Reedy Fork and the Haw River and includes Travis and Tickle Creeks. The Site is located less than one mile outside of the LWP area and has a very similar land use pattern. The LWP identified nutrient inputs from agriculture and stream bank erosion in altered reaches as major stressors within this TLW. The Site was identified as a stream and buffer restoration and cattle exclusion opportunity to improve water quality and buffers within the TRA.

The Site consists of four tributaries to Reedy Fork which are located within the North Carolina Division of Water Resources (NCDWR) subbasin 03-06-02 of the Cape Fear River Basin. The project stream reaches include UT1, UT1A, UT1B, and UT2.

Mitigation work within the Site included restoration, enhancement, and preservation of 9,052 linear feet (LF) of perennial and intermittent stream channel and 3.0 acres (ac) of riparian buffer restoration. The Site provides 6,468.6 Stream Mitigation Units (SMUs) and 3.0 Buffer Mitigation Units (BMUs). The stream areas were also planted with native vegetation to improve habitat and protect water quality.

The final mitigation plan was submitted and accepted by the DMS in March 2014. Construction activities were completed by Land Mechanic Designs, Inc. in September 2014. The planting was completed by Bruton Natural Systems, Inc. in December 2014. The baseline as-built survey was completed by Kee Mapping and Surveying, in October 2014. Annual monitoring will be conducted for seven years with the close-out anticipated to occur in 2022 given the success criteria are met. The riparian buffer restoration component of the site closed out in July 2022. Appendix 1 provides detailed project activity, history, contact information, directions, and watershed/site background information.

1.1 Project Goals and Objectives

Prior to construction activities, the stream channels exhibited varying degrees of degradation across the Site. The Site was used as agricultural and pasture land and most of the buffers had been reduced to

narrow corridors. Cattle had free access to the streams, which resulted in sporadic degraded stream banks and poor bed forms.

The restored stream channels on the Site were previously incised and overwidened in many locations, likely as a result of historic channelization. The alterations of the Site to promote cattle grazing and farming resulted in elimination of many of the ecological functions of this small stream complex. Specifically, functional losses at the Site included degraded aquatic habitat, altered hydrology (related to loss of floodplain connection and lowered water table), and a reduction of the quality and quantity of riparian wetland habitats and related water quality benefits. Ongoing bank erosion was also occurring at some locations due to high, overly steep banks, and lack of bank vegetation. Table 4 in Appendix 1 and Tables 10a-d in Appendix 4 present the pre-restoration conditions in detail.

The mitigation 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 more far-reaching effects. Expected improvements to water quality and ecological processes are outlined below as project goals and objectives. These project goals were established and completed with careful consideration of goals and objectives that were described in the RBRP and to meet DMS's mitigation needs while maximizing the ecological and water quality uplift within the watershed.

The following project specific goals established in the Agony Acres 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 important to sensitive species within and adjacent to the project site;
- Reduce fecal coliform, nitrogen, and phosphorous inputs through removing cattle from streams and establishing and augmenting a forested riparian corridor;
- Protect existing high quality streams and forested buffers that provide habitat important to sensitive species within and adjacent to the project site;
- Improve and protect hydrologic inputs to the adjacent Reedy Fork Aquatic Habitat Significant Natural Heritage Area; and
- Improve and protect hydrologic inputs to Reedy Fork, which is listed as impaired on the 2012 NC 303(d) list for impaired aquatic life and for elevated fecal coliform levels.

The project goals will be 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. Off-site nutrient input will be absorbed on-site by filtering flood flows through restored floodplain areas, where flood flow will spread through native vegetation. Vegetation is expected to uptake excess nutrients.
- Stream bank erosion which contributes sediment load to the creeks was greatly reduced, if not eliminated, 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 will spread through native vegetation. Spreading flood flows also reduces velocity and allows 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 will 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 include log drops and rock structures that incorporate woody debris and native onsite rock.
- 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 treated. Eroding and unstable areas were stabilized with vegetation as part of this project.
- The restored land is protected in perpetuity through a conservation easement.

The design streams were restored to the appropriate form 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 small stream complex directly adjacent to Reedy Fork. Other key factors addressed in the design were to create stable habitats, improve riparian buffers, and restore in stream aquatic habitat. Figure 2 and Table 1 in Appendix 1 present the stream mitigation components for the Agony Acres Mitigation Site.

1.2 Monitoring Year 6 Data Assessment

Annual monitoring and quarterly site visits were conducted during MY6 to assess the condition of the project. The stream and buffer success criteria for the Site follow the approved success criteria presented in the Agony Acres Mitigation Plan (Wildlands, 2014).

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 terminal success criteria of 210 planted stems per acre averaging ten feet in height.

1.2.2 Vegetation Areas of Concern

Chinese privet (*Ligustrum sinense*) and Japanese honeysuckle (*Lonicera japonica*) occur in populations scattered about the Site with total coverage of 1.97 and 2.54 acres, respectively. Multiflora rose (*Rosa multiflora*) is present within a 0.94 acre area along lower UT2. There is also a 0.02 acre area of Japanese hops (*Clematis terniflora*) near the confluence of UT2 and Reedy Fork.

A 0.84 acre area of tree of heaven (*Ailanthus altissima*) and 0.13 acre area of Chinese privet located along lower UT1 Reach 2 was treated using the cut stump method. Two areas with total coverage of 1.14 acres along UT1 Reach 4 were treated for Japanese honeysuckle using a foliar application of herbicide. 0.28 acres of Japanese hops located around the confluence of UT1 and Reedy Fork were also treated with herbicide (Figure 3.1, Figure 3.2).

1.2.3 Stream Assessment

Detailed dimensional survey and analysis is not required during MY6. Visual monitoring indicated that the majority of the stream channel is performing as desired. No deposition or erosion exceeding approximate natural levels was observed. See Appendix 2 for stream photographs and visual assessment data.

1.2.4 Stream Areas of Concern

Four Beavers and a dam were removed from lower UT1 in August 2020 (Figure 3.2). The stream channel and vegetation did not appear to sustain permanent damage as a result of the beaver activity. The vegetation community in the impacted area was observed re-sprouting vigorously and the primary species affected was black willow (*Salix nigra*). The culvert at the crossing between UT1A reaches three and four is perched and needs repair. Five log sills within two constructed riffles on UT2 are showing minor signs of piping, but do not present risk of imminent failure, bank erosion, or channel instability (Figure 3.2). There is one local occurrence of bank erosion on the outside of a meander bend in lower UT1 (Figure 3.2).

1.2.5 Hydrology Assessment

Two bankfull flow events occurring in separate years must be documented on the restoration and enhancement reaches within the seven-year monitoring period. In addition, the presence of baseflow must be recorded along portions of UT1B constructed with a Priority I restoration approach. 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. While there is no stream flow criteria established in the mitigation plan for UT1A, gages were added during fall of 2018 (MY4) after observation that the lower portion of the channel had limited flow during late summer and early fall.

Multiple bankfull events were recorded during MY6 on all streams at the Site (Table 13). Bankfull events on all streams have been recorded during previous monitoring years; therefore, the Site has met the bankfull stream hydrology criterion for the duration of the project.

Continuous baseflow was recorded in UT1B at the upstream gage for all of MY6. The downstream UT1B gage malfunctioned during MY6 despite multiple repair attempts. Based on history of recorded persistent streamflow with only brief interruptions, lack of evidence that the stream loses flow below the upstream gage, visual observation, and the persistently discharging spring on the left floodplain just upstream of the gage, it is very likely the UT1B flowed continuously at the downstream gage location during MY6. UT1B has met baseflow criteria for MY1 through MY6. Each flow gage in UT1A shows the same general trend. The stream flows persistently until July at which time flow becomes intermittent through September. The reason for limited flows during this time is believed to be a result of different soils and geology. It is not apparent that flow loss is related to any aspect of the restoration design. Refer to Appendix 5 for hydrologic data and graphs.

1.2.6 Maintenance Plan

All areas of invasive vegetation are scheduled for treatment and removal in the spring of 2021. Repair of the perched culvert and piping log sills is expected during the winter of 2020. The localized area of bank erosion in lower UT1 reach 5 will be seeded and planted with live stakes during spring of 2021. This stabilization approach is intended to minimize impacts to existing vegetation.

1.3 Monitoring Year 6 Summary

Survival and growth of planted trees appears to be on track to achieve final success criteria. Invasive vegetation has been identified and treatments occurred in October 2020 with additional treatments planned for spring 2021. Visual assessment indicated that project streams are geomorphically stable and functioning as designed with only minor occurrences of structure failure and erosion. Hydrology criteria have been attained for MY6 and multiple bankfull events and persistent flows were recorded again during MY6.

Summary information and data related to the performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting

information formerly found in these reports can be found in the 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 2: METHODOLOGY

Geomorphic data was collected following the standards outlined in The Stream Channel Reference Site: An Illustrated Guide to Field Techniques (Harrelson et al., 1994) and in the Stream Restoration: A Natural Channel Design Handbook (Doll et al., 2003). All Integrated Current Condition Plan View Mapping was recorded using a Trimble handheld GPS with sub-meter accuracy and processed using Pathfinder and ArcView. Crest gages were installed in surveyed riffle cross sections and monitored quarterly. Hydrology attainment installation and monitoring methods are in accordance with the USACE (USACE, 2003) standards. Vegetation monitoring protocols followed the Carolina Vegetation Survey-DMS Level 2 Protocol (Lee et al., 2008). Reporting follows the DMS Monitoring Report Template and Guidance Version 1.3.

Section 3: REFERENCES

Doll, B.A., Grabow, G.L., Hall, K.A., Halley, J., Harman, W.A., Jennings, G.D., and Wise, D.E. 2003. Stream Restoration A Natural Channel Design Handbook.

Drostin, M. and Herrmann, M. 2009. Cape Fear River Basin Restoration Priorities 2009. North Carolina Ecosystem Enhancement Program.https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Cape_Fear_River_Basin/RBRP%20CapeFear%202009%20Revised%20032013.pdf

Harrelson, C. C; Rawlins, C.L.; Potyondy, J. P. 1994. *Stream Channel Reference Sites: An Illustrated Guide to Field Technique.* Gen. Tech. Rep. RM-245. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 61 p.

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.

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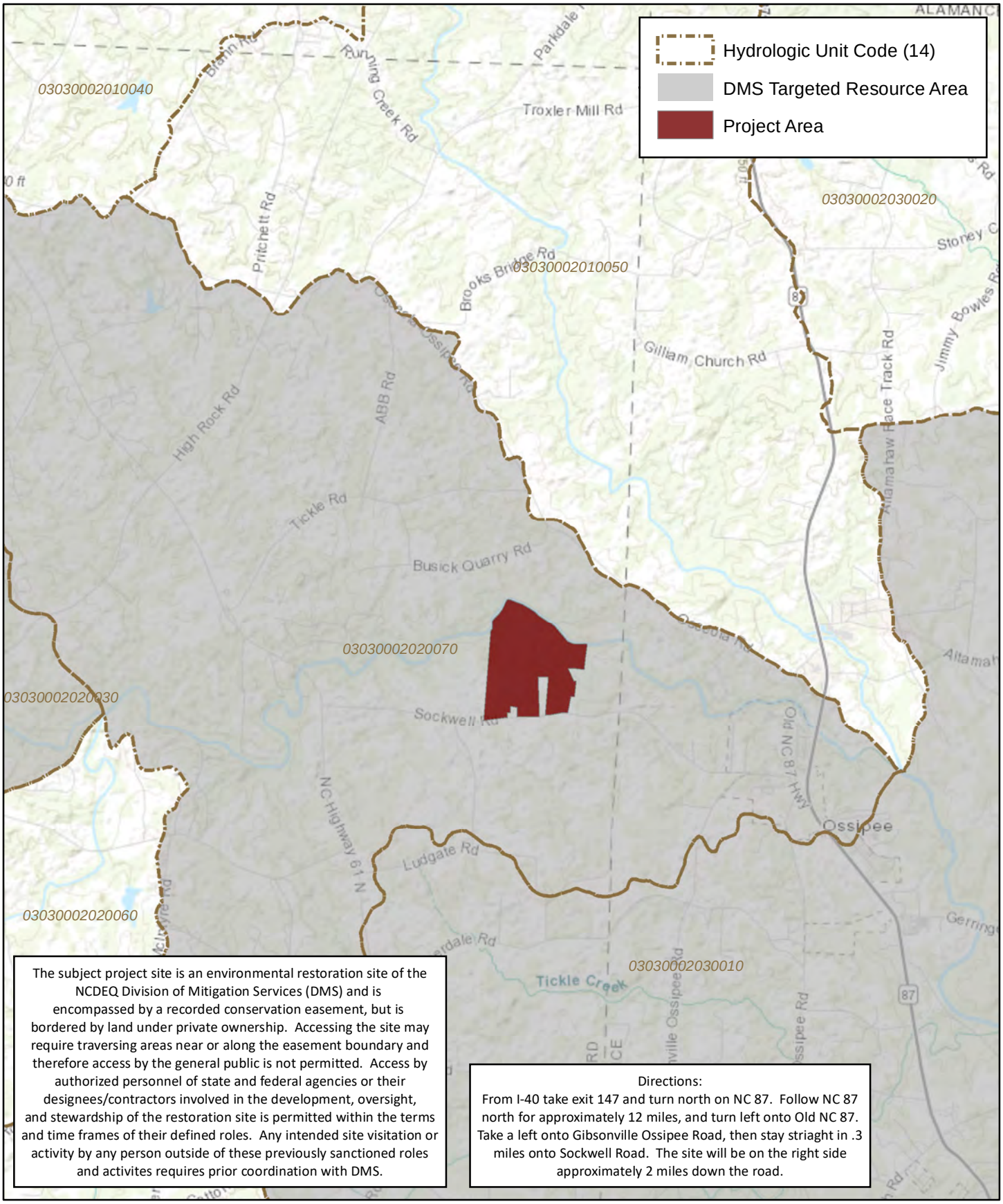
APPENDIX 1. General Tables and Figures



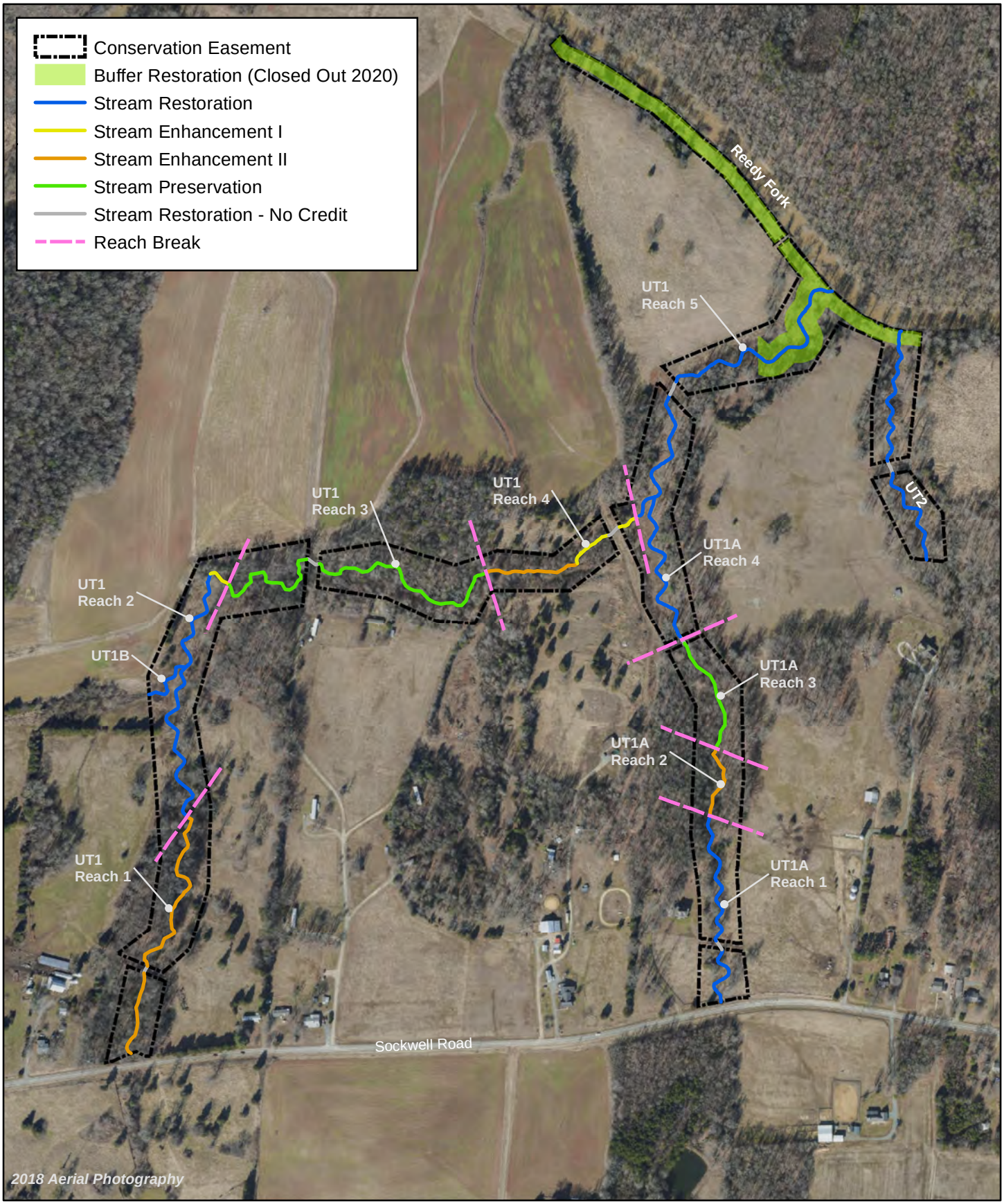
The subject project site is an environmental restoration site of the NCDEQ Division of Mitigation Services (DMS) and is encompassed by a recorded conservation easement, but is bordered by land under private ownership. Accessing the site may require traversing areas near or along the easement boundary and therefore access by the general public is not permitted. Access by authorized personnel of state and federal agencies or their designees/contractors involved in the development, oversight, and stewardship of the restoration site is permitted within the terms and time frames of their defined roles. Any intended site visitation or activity by any person outside of these previously sanctioned roles and activites requires prior coordination with DMS.

Directions:
From I-40 take exit 147 and turn north on NC 87. Follow NC 87 north for approximately 12 miles, and turn left onto Old NC 87. Take a left onto Gibsonville Ossipee Road, then stay striaght in .3 miles onto Sockwell Road. The site will be on the right side approximately 2 miles down the road.

WILDLANDS ENGINEERING

Figure 1. Project Vicinity Map
Agony Acres Mitigation Site
DMS Project No. 95716
Monitoring Year 6 - 2020

Guilford County, NC



WILDLANDS ENGINEERING

0 250 500 Feet

N

Figure 2. Project Component/Asset Map
Agony Acres Mitigation Site
DMS Project No. 95716
Monitoring Year 6 - 2020

Guilford County, NC

Table 1. Project Components and Mitigation Credits
Agony Acres Mitigation Site (DMS Project No.95716)
Monitoring Year 6 - 2020

MITIGATION CREDITS

	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	6,107.3**	361	N/A	N/A	N/A	N/A	130,680	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/BMU)
STREAMS							
UT1-Reach 1 (DOT ROW)	100+00 to 100+14	40**	EII	Enhancement (No Credit)	40**	---	---
UT1-Reach 1	100+14 to 103+62; 103+93 to 111+24	1,053**	EII	Enhancement	1,053**	2.5	421.2**
UT1-Reach 1 (Easement Break)	103+62 to 103+93	31	EII	Enhancement (No Credit)	31	---	---
UT1-Reach 2	111+24 to 122+38	1,039	P1	Restoration	1,114	1	1,114
UT1-Reach 2	122+38 to 123+31	93	EI	Enhancement	93	1.5	62
UT1-Reach 3	123+31 to 128+50; 129+06 to 137+37	1,350		Preservation	1,350	5	270
UT1-Reach 3 (Easement Break)	128+50 to 129+06	56		Preservation (No Credit)	56	---	---
UT1-Reach 4	137+37 to 140+92	355	EII	Enhancement	355	2.5	142
UT1-Reach 4	140+92 to 142+66; 143+20 to 144+06	260	EI	Enhancement	260	1.5	173
UT1-Reach 4 (Easement Break)	142+66 to 143+20	54	EI	Enhancement (No Credit)	54	---	---
UT1-Reach 5	144+06 to 149+65; 150+20 to 158+94	1,355	P1/2	Restoration	1,433	1	1,433
UT1-Reach 5 (Easement Break)	149+65 to 150+20	65	P1	Restoration (No Credit)	55	---	---
UT1A-Reach 1 (DOT ROW)	200+00 to 200+05	5	P1	Restoration (No Credit)	5	---	---
UT1A-Reach 1	200+05 to 202+64; 203+04 to 208+49	738	P1	Restoration	804	1	804
UT1A-Reach 1 (Easement Break)	202+64 to 203+04	32	P1	Restoration (No Credit)	40	---	---
UT1A-Reach 2	208+49 to 211+41	292	EII	Enhancement	292	2.5	117
UT1A-Reach 3	211+41 to 215+98	457		Preservation	457	5	91
UT1A-Reach 3 (Easement Break)	215+98 to 216+28	30	EII	Enhancement (No Credit)	30	---	---
UT1A-Reach 4	216+28 to 222+78	461	P1	Restoration	650	1	650
UT1B	300+00 to 302+19	243	P1	Restoration	219	1	219
UT2	400+00 to 404+16; 404+67 to 410+23	975	P1	Restoration	972	1	972
UT2 (Easement Break)	404+16 to 404+67	53	P1/2	Restoration (No Credit)	51	---	---
Riparian Buffer Area	---	---	---	Restoration	3.0 (130,680 ft^2)	1	130,680

COMPONENT SUMMATION

Restoration Level	Stream (LF)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer (acres)	Upland (acres)
		Riverine	Non-Riverine			
Restoration	5,192	-	-	-	3.0	-
Enhancement		-	-	-	-	-
Enhancement I	353					
Enhancement II	1,700**					
Creation		-	-	-		
Preservation	1,807	-	-	-		-
High Quality Preservation	-	-	-	-		-

N/A: not applicable
* Credit calculations were originally calculated along the as-built thalweg and updated to be calculated along stream centerlines as stated in the approved Mitigation Plan for Monitoring Year 3 after discusions with NC IRT.
**Values updated during MY4 to account for DOT culvert replacement project.

Table 2. Project Activity and Reporting History
Agony Acres Mitigation Site (DMS Project No.95716)
Monitoring Year 6 - 2020

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

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

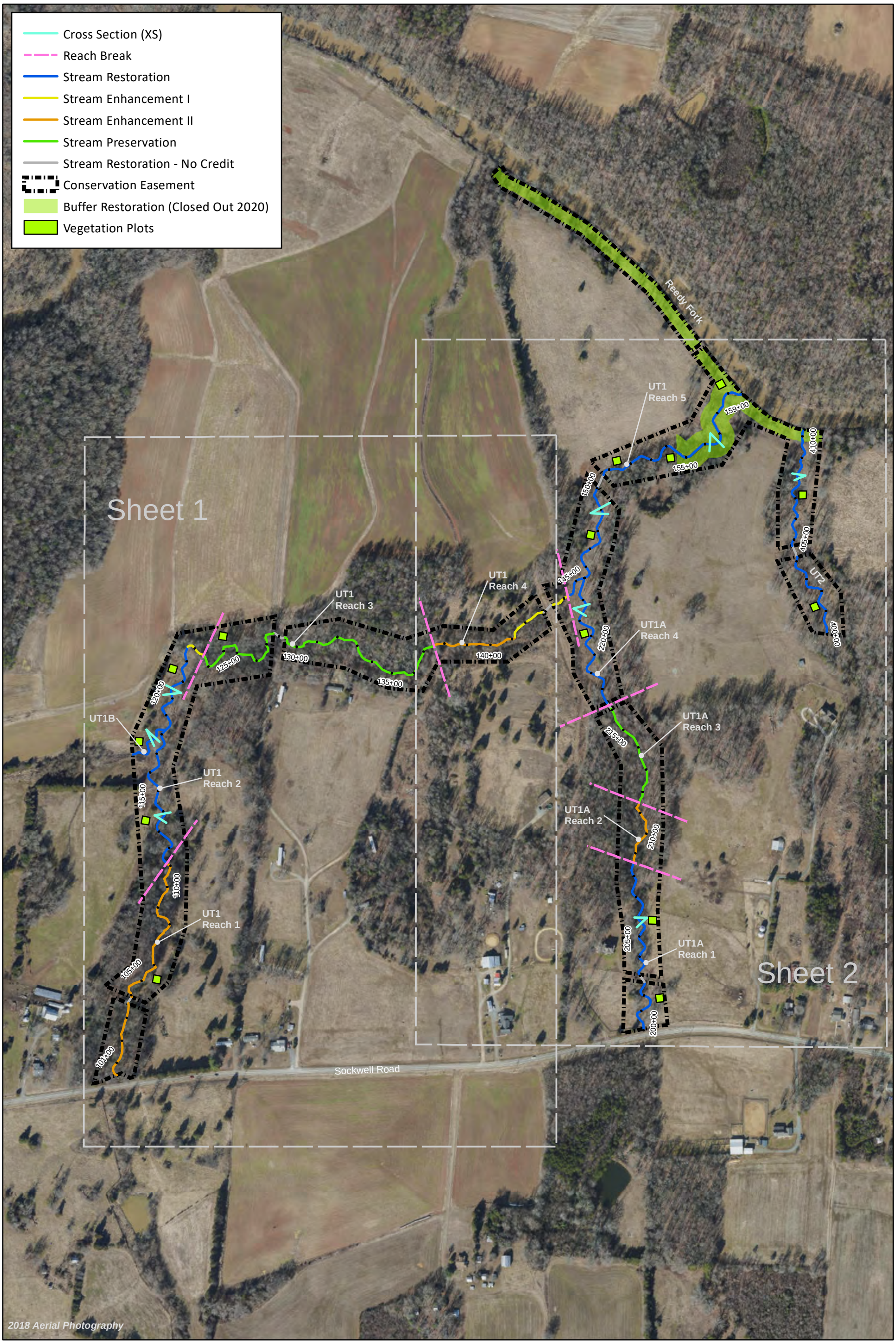
Table 3. Project Contact Table
Agony Acres Mitigation Site (DMS Project No.95716)
Monitoring Year 6 - 2020

Designer Nicole Macaluso, PE, CFM	**Wildlands Engineering, Inc.** 312 West Millbrook Road, Suite 225 Raleigh, NC 27609 919.851.9986
Construction Contractor	**Land Mechanic Designs, Inc.** 126 Circle G Lane Willow Spring, NC 27592
Planting Contractor	**Bruton Natural Systems, Inc** P.O. Box 1197 Fremont, NC 27830
Seeding Contractor	**Land Mechanic Designs, Inc.** 126 Circle G Lane Willow Spring, NC 27592
Seed Mix Sources	**Green Resource, LLC**
Nursery Stock Suppliers **Bare Roots** **Live Stakes**	 **Dykes and Son Nursery** **Bruton Natural Systems, Inc**
Monitoring Performers Monitoring, POC	**Wildlands Engineering, Inc.** Jason Lorch 919.851.9986, ext. 107

Table 4. Project Information and Attributes
Agony Acres Mitigation Site (DMS Project No.95716)
Monitoring Year 6 - 2020

PROJECT INFORMATION						
Project Name	Agony Acres Mitigation Site					
County	Guilford County					
Project Area	30.74 acres					
Planted Area	18.4 acres					
Project Coordinates (latitude and longitude)	36° 10' 40" N, 79° 33' 02" W					
PROJECT WATERSHED SUMMARY INFORMATION						
Physiographic Province	Piedmont					
River Basin	Cape Fear River					
USGS Hydrologic Unit 8-digit	03030002					
USGS Hydrologic Unit 14-digit	03030002020070					
DWR Sub-basin	03-06-02					
Project Drainiage Area (acres)	358 acres					
Project Drainage Area Percentage of Impervious Area	<1%					
CGIA Land Use Classification	65% Managed Herbaceous Cover, 30% Mixed Upland Hardwoods, 3% Cultivated, 2% Southern Yellow Pine, <1% Low Intensity Development					
REACH SUMMARY INFORMATION						
Parameters	**UT1 - Reaches 1 -3**	**UT1 - Reaches 4 & 5**	**UT1A**	**UT1B**	**UT2**	
Length of reach (linear feet) - Post-Restoration	3,711	2,157	2,278	219	1,023	
Drainage area (acres)	228	358	103	61	61	
NCDWR stream identification score	42.5	46.5	41	29.25	32.25	
NCDWR Water Quality Classification	WS-V					
Morphological Desription (stream type)	P	P	P/I	P	P	
Evolutionary trend (Simon's Model) - Pre- Restoration	I, III	III, IV	I, II/III	II/III	II/III	
Underlying mapped soils	Cecil sandy loam, Congaree loam, Coronaca clay loam, Enon fine sandy loam, Enon clay loam, Madison clay loam, Mecklenburg sandy clay loam, Wehadkee loam					
Drainage class	---	---	---	---	---	---
Soil Hydric status	---	---	---	---	---	---
Slope	---	---	---	---	---	---
FEMA classification	N/A					
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	Agony Acres Mitigation Plan; Wildlands determined "no effect" on Guilford County listed endangered species.			
Historic Preservation Act	Yes	Yes	No historic resources were found to be impacted (letter from SHPO dated 1/15/13).			
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A			
FEMA Floodplain Compliance	N/A	N/A	The project streams do not have an associated regulatory floodplain; however portions of UT1, UT1A, and UT2 are located within the floodway and flood fringe of Reedy Fork (FEMA Zone AE, FIRM panels 8838 and 8848).			
Essential Fisheries Habitat	No	N/A	N/A			

APPENDIX 2. Visual Assessment Data



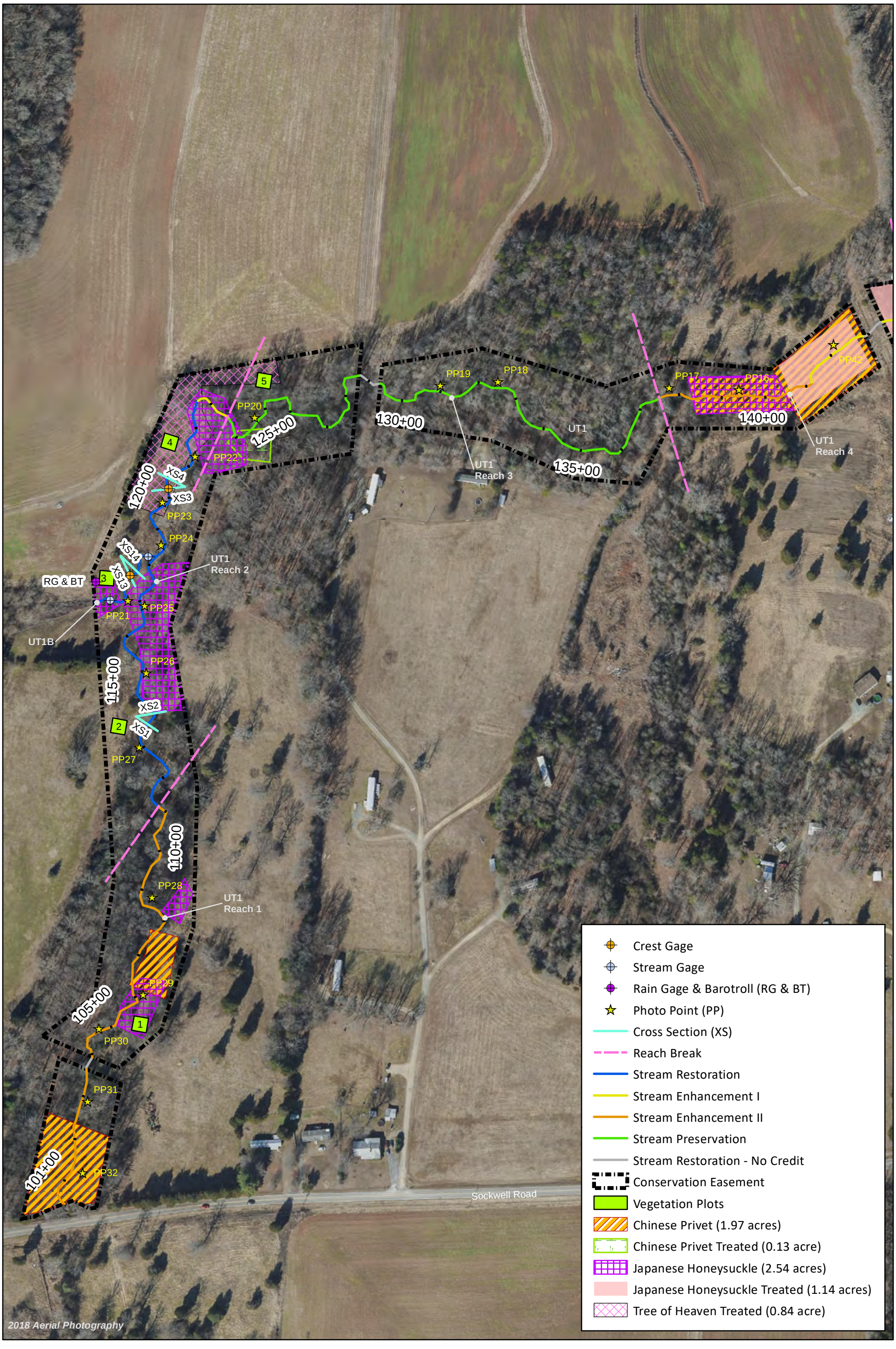
WILDLANDS ENGINEERING

0 250 500 Feet

N

Figure 3.0 Integrated Current Condition Plan View (Key)
Agony Acres Mitigation Site
DMS Project No. 95716
Monitoring Year 6 - 2020

Guilford County, NC



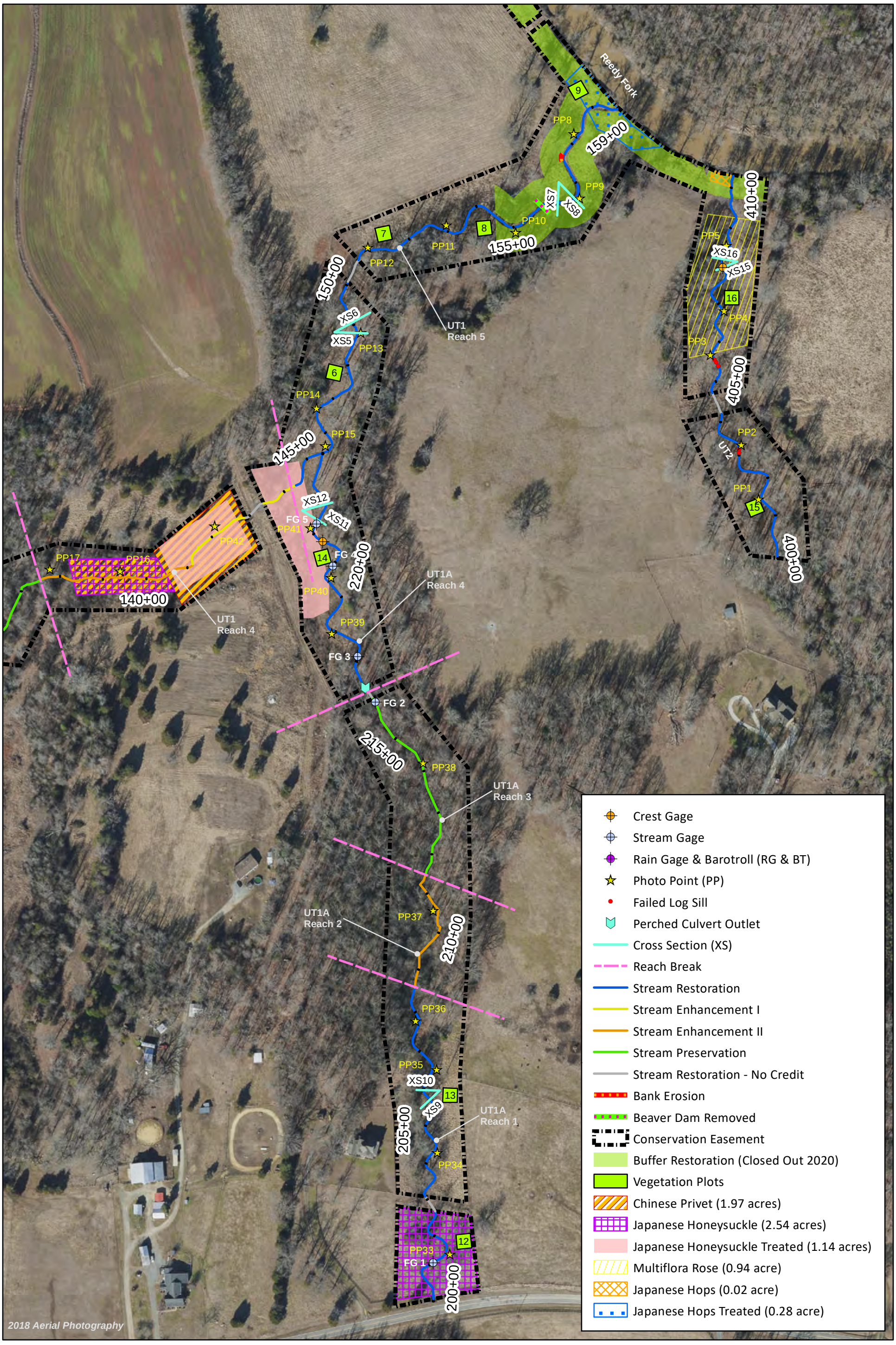
WILDLANDS ENGINEERING

0 250 500 Feet

N

Figure 3.1. Integrated Current Condition Plan View
(Sheet 1 of 2)
Agony Acres Mitigation Site
DMS Project No. 95716
Monitoring Year 6 - 2020

Guilford County, NC



WILDLANDS ENGINEERING

0 250 500 Feet

N

Figure 3.2. Integrated Current Condition Plan View
(Sheet 2 of 2)
Agony Acres Mitigation Site
DMS Project No. 95716
Monitoring Year 6 - 2020

Guilford County, NC

Table 5a. Visual Stream Morphology Stability Assessment Table

Agony Acres Mitigation Site (DMS Project No. 95716)

Monitoring Year 6 - 2020

UT1

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	42	42			100%			
	3. Meander Pool Condition	Depth Sufficient	39	39			100%			
		Length Appropriate	39	39			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	39	39			100%			
		Thalweg centering at downstream of meander bend (Glide)	39	39			100%			
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			1	18	99.8%	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	99.9%	n/a	n/a	n/a
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	16	16			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	16	16			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms	16	16			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	16	16			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	16	16			100%			

Table 5b. Visual Stream Morphology Stability Assessment Table

Agony Acres Mitigation Site (DMS Project No. 95716)

Monitoring Year 6 - 2020

UT1A

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	26	26			100%			
	3. Meander Pool Condition	Depth Sufficient	26	26			100%			
		Length Appropriate	26	26			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	26	26			100%			
		Thalweg centering at downstream of meander bend (Glide)	26	26			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	3	3			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	3	3			100%			

Table 5c. Visual Stream Morphology Stability Assessment Table

Agony Acres Mitigation Site (DMS Project No. 95716)

Monitoring Year 6 - 2020

UT1B

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	6	6			100%			
	3. Meander Pool Condition	Depth Sufficient	5	5			100%			
		Length Appropriate	5	5			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	5	5			100%			
		Thalweg centering at downstream of meander bend (Glide)	5	5			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	1	1			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	1	1			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms	1	1			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	1	1			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

Agony Acres Mitigation Site (DMS Project No. 95716)

Monitoring Year 6 - 2020

UT2

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	20	20			100%			
	3. Meander Pool Condition	Depth Sufficient	21	21			100%			
		Length Appropriate	21	21			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	21	21			100%			
		Thalweg centering at downstream of meander bend (Glide)	21	21			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	5	5			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms	3	5			60%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	5	5			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	5	5			100%			

Table 6. Vegetation Condition Assessment Table
Agony Acres Mitigation Site (DMS Project No. 95716)
Monitoring Year 6 - 2020

Planted Acreage **18**

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**	**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**	**0%**

Easement Acreage **31**

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	11	5.47	17.8%
Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	0	0	0%

STREAM PHOTOGRAPHS
Monitoring Year 6

	
PHOTO POINT 1 UT2 – looking upstream *(04/17/2020)*	**PHOTO POINT 1 UT2** – looking downstream *(04/17/2020)*
	
PHOTO POINT 2 UT2 – looking upstream *(04/17/2020)*	**PHOTO POINT 2 UT2** – looking downstream *(04/17/2020)*
	
PHOTO POINT 3 UT2 – looking upstream *(04/17/2020)*	**PHOTO POINT 3 UT2** – looking downstream *(04/17/2020)*

	
PHOTO POINT 4 UT2 – looking upstream *(04/17/2020)*	**PHOTO POINT 4 UT2** – looking downstream *(04/17/2020)*
	
PHOTO POINT 5 UT2 – looking upstream *(04/17/2020)*	**PHOTO POINT 5 UT2** – looking downstream *(04/17/2020)*
	
PHOTO POINT 8 UT1 R5 – looking upstream (*04/17/2020*)	**PHOTO POINT 8 UT1 R5 –** looking downstream (*04/17/2020*)

	
PHOTO POINT 9 UT1 R5 – looking upstream (*04/17/2020*)	**PHOTO POINT 9 UT1 R5 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 10 UT1 R5 – looking upstream (*04/17/2020*)	**PHOTO POINT 10 UT1 R5 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 11 UT1 R5 – looking upstream (*04/17/2020*)	**PHOTO POINT 11 UT1 R5 –** looking downstream (*04/17/2020*)

	
PHOTO POINT 12 UT1 R5 – looking upstream (*04/17/2020*)	**PHOTO POINT 12 UT1 R5 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 13 UT1 R5 – looking upstream (*04/17/2020*)	**PHOTO POINT 13 UT1 R5 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 14 UT1 R5 – looking upstream (*04/17/2020*)	**PHOTO POINT 14 UT1 R5 –** looking downstream (*04/17/2020*)

	
PHOTO POINT 15 UT1 R5 – looking upstream (*04/17/2020*)	**PHOTO POINT 15 UT1 R5 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 16 UT1 R4 – looking upstream *(04/17/2020)*	**PHOTO POINT 16 UT1 R4** – looking downstream *(04/17/2020)*
	
PHOTO POINT 17 UT1 R4 – looking upstream *(04/17/2020)*	**PHOTO POINT 17 UT1 R4** – looking downstream *(04/17/2020)*

PHOTO POINT 42 UT1 R4 – looking upstream *(04/17/2020)*

PHOTO POINT 42 UT1 R4 – looking downstream *(04/17/2020)*

PHOTO POINT 18 UT1 R3 – looking upstream *(04/17/2020)*

PHOTO POINT 18 UT1 R3 – looking downstream *(04/17/2020)*

PHOTO POINT 19 UT1 R3 – looking upstream *(04/17/2020)*

PHOTO POINT 19 UT1 R3 – looking downstream *(04/17/2020)*

PHOTO POINT 20 UT1 R3 – looking upstream *(04/17/2020)*

PHOTO POINT 20 UT1 R3 – looking downstream *(04/17/2020)*

PHOTO POINT 21 UT1B – looking upstream *(04/17/2020)*

PHOTO POINT 21 UT1B – looking downstream *(04/17/2020)*

PHOTO POINT 22 UT1 R2 – looking upstream (*08/06/2020*)

PHOTO POINT 22 UT1 R2 – looking downstream (*04/17/2020*)

	
PHOTO POINT 23 UT1 R2 – looking upstream (*04/17/2020*)	**PHOTO POINT 23 UT1 R2 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 24 UT1 R2 – looking upstream (*04/17/2020*)	**PHOTO POINT 24 UT1 R2 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 25 UT1 R2 – looking upstream (*04/17/2020*)	**PHOTO POINT 25 UT1 R2 –** looking downstream (*04/17/2020*)

	
PHOTO POINT 26 UT1 R2 – looking upstream (*04/17/2020*)	**PHOTO POINT 26 UT1 R2 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 27 UT1 R2 – looking upstream (*04/17/2020*)	**PHOTO POINT 27 UT1 R2 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 28 UT1 R1 – looking upstream (*04/17/2020*)	**PHOTO POINT 28 UT1 R1 –** looking downstream (*04/17/2020*)

	
PHOTO POINT 29 UT1 R1 – looking upstream (*04/17/2020*)	**PHOTO POINT 29 UT1 R1 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 30 UT1 R1 – looking upstream (*04/17/2020*)	**PHOTO POINT 30 UT1 R1 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 31 UT1 R1 – looking upstream (*04/17/2020*)	**PHOTO POINT 31 UT1 R1 –** looking downstream (*04/17/2020*)

	
PHOTO POINT 32 UT1 R1 – looking upstream (*04/17/2020*)	**PHOTO POINT 32 UT1 R1 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 33 UT1A R1 – looking upstream *(04/17/2020)*	**PHOTO POINT 33 UT1A R1** – looking downstream *(04/17/2020)*
	
PHOTO POINT 34 UT1A R1 – looking upstream *(04/17/2020)*	**PHOTO POINT 34 UT1A R1** – looking downstream *(04/17/2020)*

PHOTO POINT 35 UT1A R1 – looking upstream *(04/17/2020)*

PHOTO POINT 35 UT1A R1 – looking downstream *(04/17/2020)*

PHOTO POINT 36 UT1A R1 – looking upstream *(04/17/2020)*

PHOTO POINT 36 UT1A R1 – looking downstream *(04/17/2020)*

PHOTO POINT 37 UT1A R2 – looking upstream (*04/17/2020*)

PHOTO POINT 37 UT1A R2 – looking downstream (*04/17/2020*)

	
PHOTO POINT 38 UT1A R3 – looking upstream (*04/17/2020*)	**PHOTO POINT 38 UT1A R3 –** looking downstream (*04/17/2020*)
	
PHOTO POINT 39 UT1A R4 – looking upstream *(04/17/2020)*	**PHOTO POINT 39 UT1A R4** – looking downstream *(04/17/2020)*
	
PHOTO POINT 40 UT1A R4 – looking upstream *(04/17/2020)*	**PHOTO POINT 40 UT1A R4** – looking downstream *(04/17/2020)*

	
PHOTO POINT 41 UT1A R4 – looking upstream *(04/17/2020)*	**PHOTO POINT 41 UT1A R4** – looking downstream *(04/17/2020)*

VEGETATION PHOTOGRAPHS
Agony Acres
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 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)*

STREAM AREAS OF CONCERN PHOTOGRAPHS
Monitoring Year 6

	
UT1 Bank erosion – *(09/23/2020)*	**UT1A Perched Culvert** – *(04/17/2020)*
	
UT2 Piping Log Sills – *(04/17/2020)*	**UT2 Piping Log Sills** – *(04/17/2020)*

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

Table 13. Verification of Bankfull Events
Agony Acres Mitigation Site (DMS Project No. 95716)
Monitoring Year 6 - 2020

Reach	Monitoring Year	Date of Data Collection	Date of Occurrence	Method
UT1	MY1	10/5/2015	10/3/2015	Crest Gage/ Pressure Transducer
	MY2	3/14/2016	2/16/2016	
	MY3	8/1/2017	4/24/2017	
			5/23/2017	
			6/19/2017	
		10/24/2017	9/1/2017	
	MY4	2/26/2018	2/6/2018	
		10/9/2018	4/27/2018	
			8/3/2018	
			8/20/2018	
			9/17/2018	
			10/1/2018	
		2/6/2019	10/26/2018	
			11/28/2018	
			12/6/2018	
			12/11/2018	
			12/18/2018	
			12/23/2018	
	MY5	2/6/2019	1/21/2019	
			1/24/2019	
			2/1/2019	
		6/27/2019	2/18/2019	
			2/23/2019	
			3/1/2019	
			3/7/2019	
			3/21/2019	
			4/19/2019	
		2/25/2020	11/14/2019	
			12/6/2019	
			12/22/2019	
	MY6	2/25/2020	1/22/2020	
			2/6/2020	
			2/15/2020	
			2/22/2020	
		8/6/2020	5/21/2020	
			5/24/2020	
			6/19/2020	
		9/23/2020	9/17/2020	

Table 13. Verification of Bankfull Events
Agony Acres Mitigation Site (DMS Project No. 95716)
Monitoring Year 6 - 2020

Reach	Monitoring Year	Date of Data Collection	Date of Occurrence	Method
UT1A	MY1	10/5/2015	10/3/2015	Crest Gage/ Pressure Transducer
	MY2	3/14/2016	2/16/2016	
	MY3	8/1/2017	4/24/2017	
			5/23/2017	
			6/19/2017	
	MY4	2/26/2018	2/4/2018	
		10/9/2018	8/20/2018	
			9/17/2018	
		2/6/2019	10/11/2018	
			10/26/2018	
			11/12/2018	
			11/24/2018	
			12/20/2018	
	MY5	2/6/2019	1/21/2019	
			1/24/2019	
		6/27/2019	2/18/2019	
			2/23/2019	
			3/1/2019	
			3/21/2019	
			4/19/2019	
		2/25/2020	10/31/2019	
	MY6	2/25/2020	1/24/2020	
			2/6/2020	
		8/6/2020	5/21/2020	
			6/19/2020	
		9/23/2020	9/17/2020	
UT1B	MY1	10/5/2015	10/3/2015	
	MY2	3/14/2016	2/16/2016	
		8/30/2016	5/3/2016	
	MY3	8/1/2017	4/24/2017	
			5/23/2017	
			6/19/2017	
		10/24/2017	9/1/2017	
	MY4	10/9/2018	8/20/2018	
			9/1/2018	
			9/17/2018	
		2/6/2019	10/11/2018	
			11/13/2018	
	MY5	2/6/2019	1/4/2019	
			1/13/2019	
			1/20/2019	
			1/24/2019	
		6/27/2019	2/18/2019	
			2/23/2019	
			3/1/2019	
			3/21/2019	
			4/19/2019	
	MY6	2/25/2020	2/6/2020	
		8/6/2020	5/21/2020	
			6/19/2020	
		9/23/2020	9/17/2020	

Table 13. Verification of Bankfull Events

Agony Acres Mitigation Site (DMS Project No. 95716)

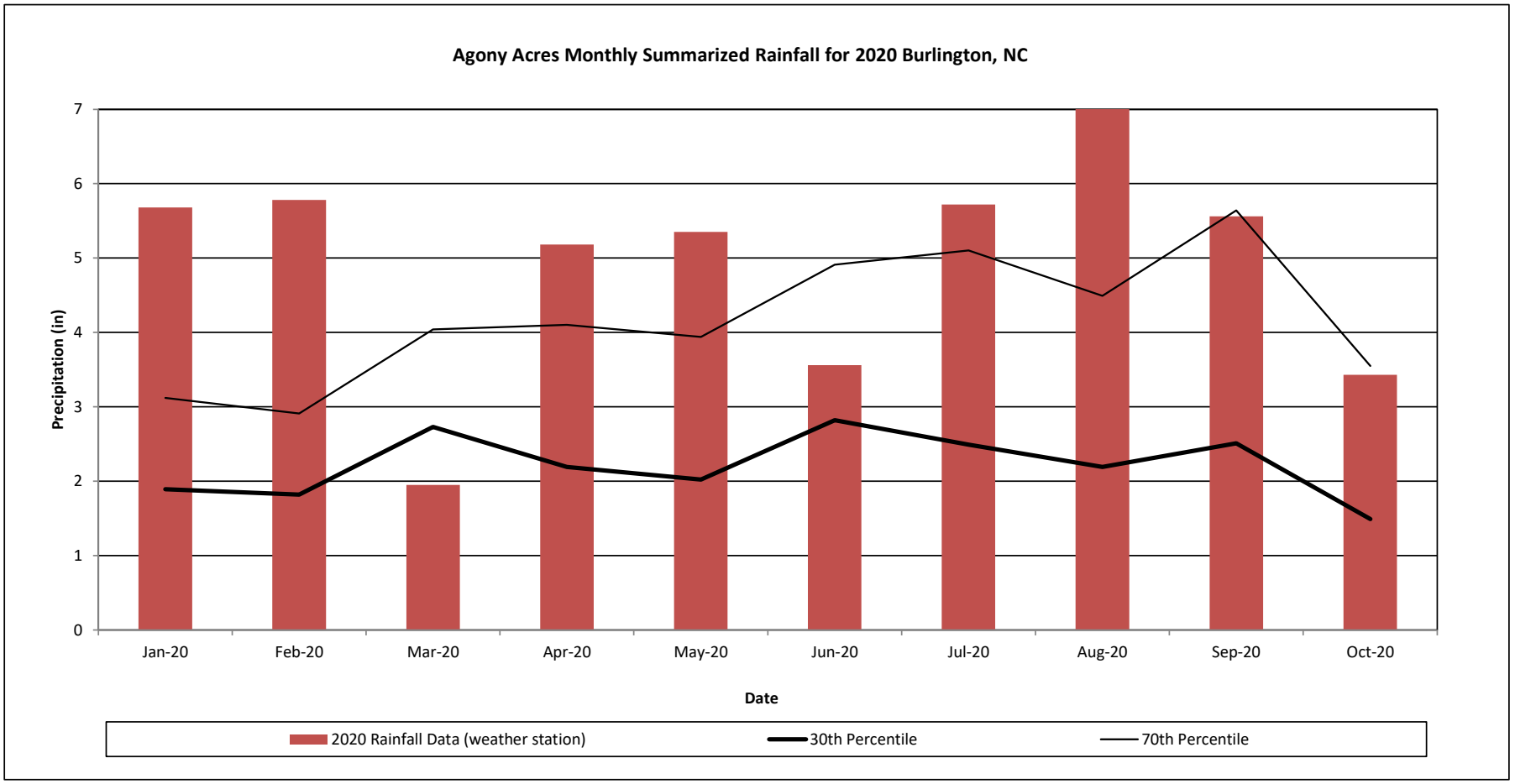
Monitoring Year 6 - 2020

Reach	Monitoring Year	Date of Data Collection	Date of Occurrence	Method
UT2	MY1	10/5/2015	10/3/2015	Crest Gage/ Pressure Transducer
	MY2	3/14/2016	2/16/2016	
		8/30/2016	5/3/2016	
	MY3	8/1/2017	4/24/2017	
			5/23/2017	
			6/19/2017	
		2/26/2018	12/11/2017	
	MY4	2/26/2018	1/7/2018	
		10/9/2018	4/24/2018	
			8/3/2018	
			9/17/2018	
		2/6/2019	10/11/2018	
			10/27/2018	
			11/12/2018	
			12/15/2018	
			12/20/2018	
	MY5	2/6/2019	1/21/2019	
			1/24/2019	
		6/27/2019	2/18/2019	
			2/23/2019	
			6/8/2019	
		10/29/2019	8/1/2019	
	MY6	2/25/2020	2/6/2020	
		6/27/2020	5/22/2020	
			6/19/2020	

Monthly Summarized Rainfall Data

Agony Acres Mitigation Site (DMS Project No. 95716)

Monitoring Year 6 - 2020



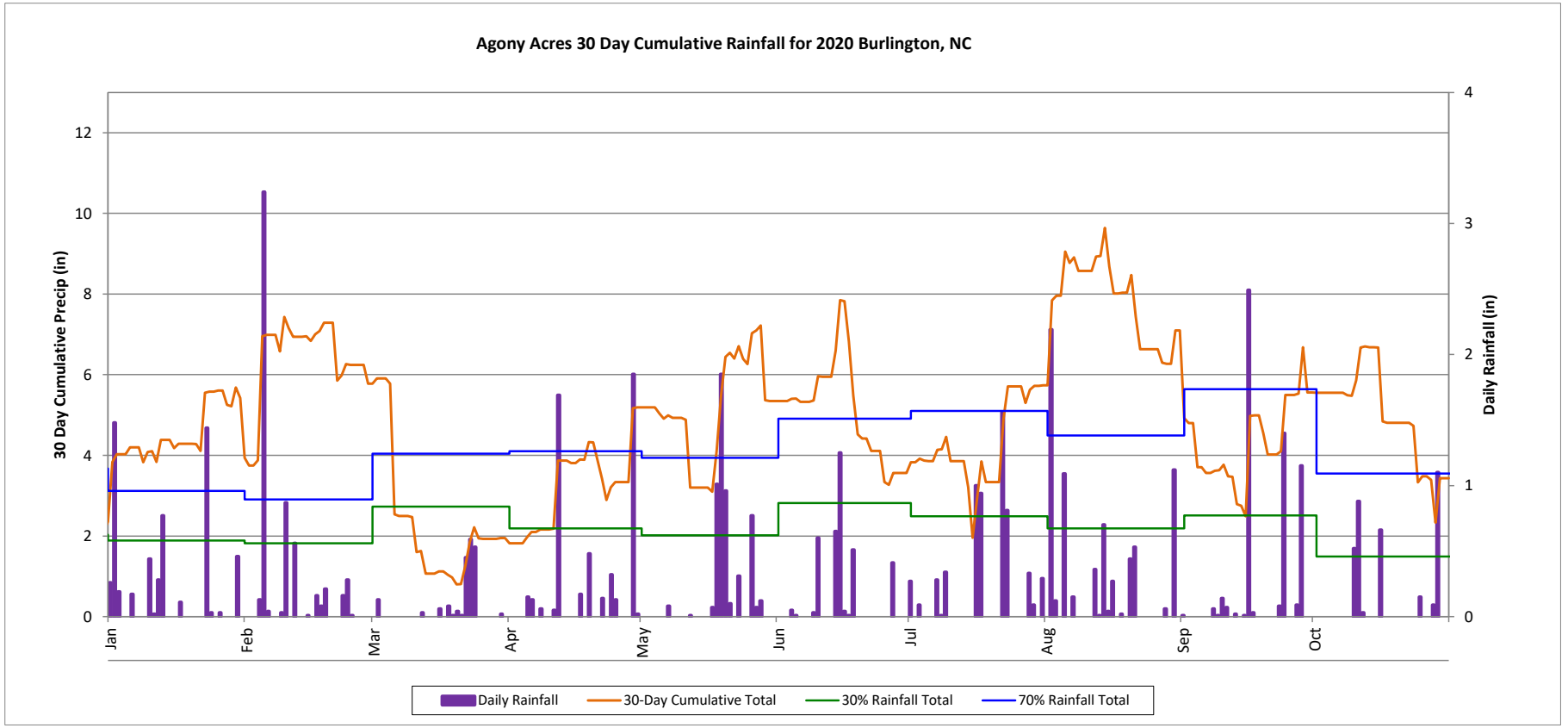
1 2020 monthly rainfall collected at Burlington Alamance Regional AP, NC.

2 30th and 70th percentile rainfall data collected from Burlington Alamance Regional AP, NC.

30 Day Cumulative Rainfall Data

Agony Acres Mitigation Site (DMS Project No. 95716)

Monitoring Year 6 - 2020



[1] 2020 monthly rainfall collected at Burlington Alamance Regional AP, NC.

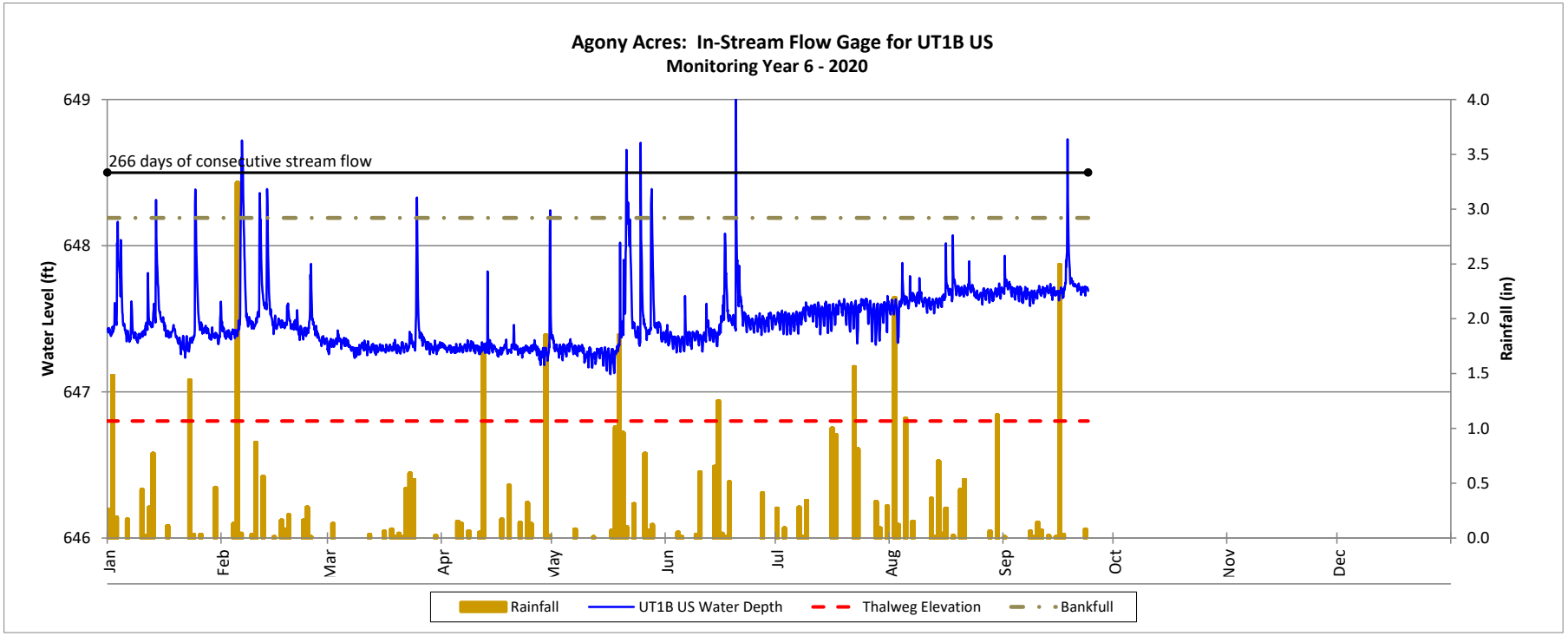
[2] 30th and 70th percentile rainfall data collected from Burlington Alamance Regional AP, NC.

Recorded In-Stream Flow Events

Agony Acres Mitigation Site

DMS Project No. 95716

Monitoring Year 6 - 2020

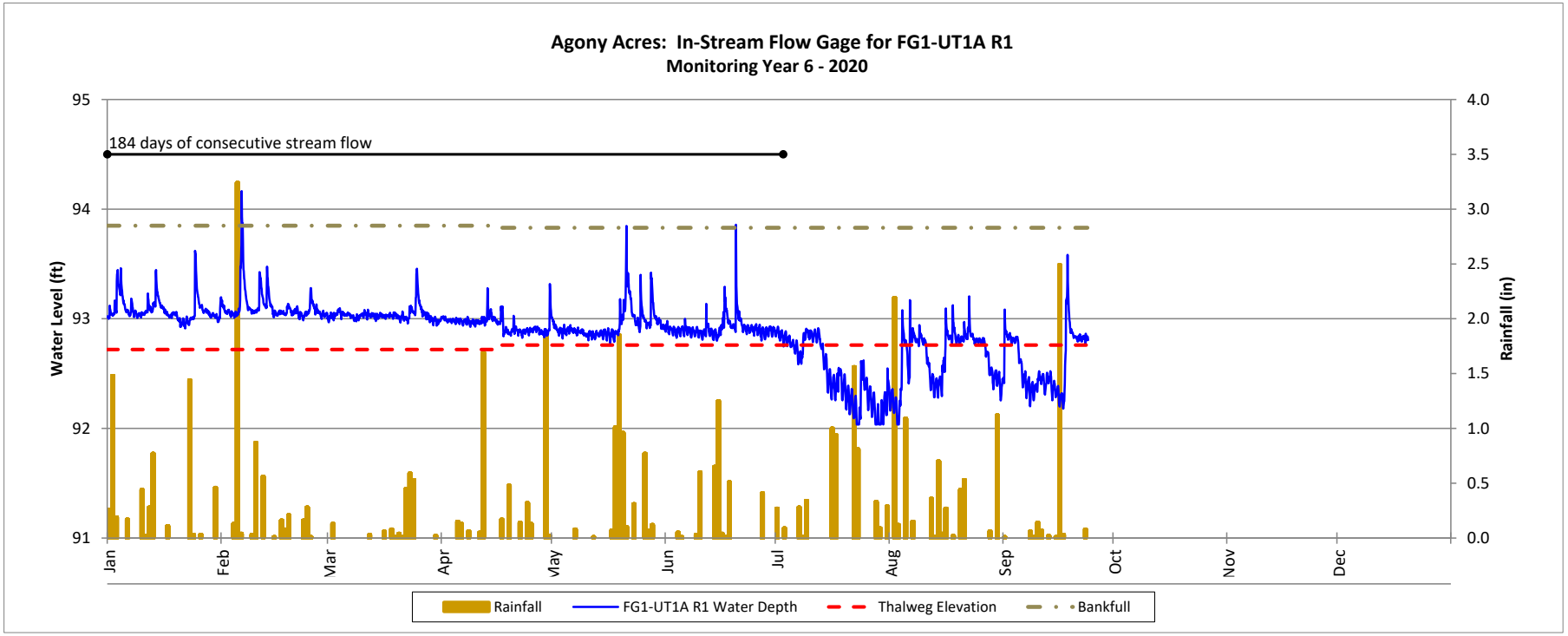


Recorded In-Stream Flow Events

Agony Acres Mitigation Site

DMS Project No. 95716

Monitoring Year 6 - 2020

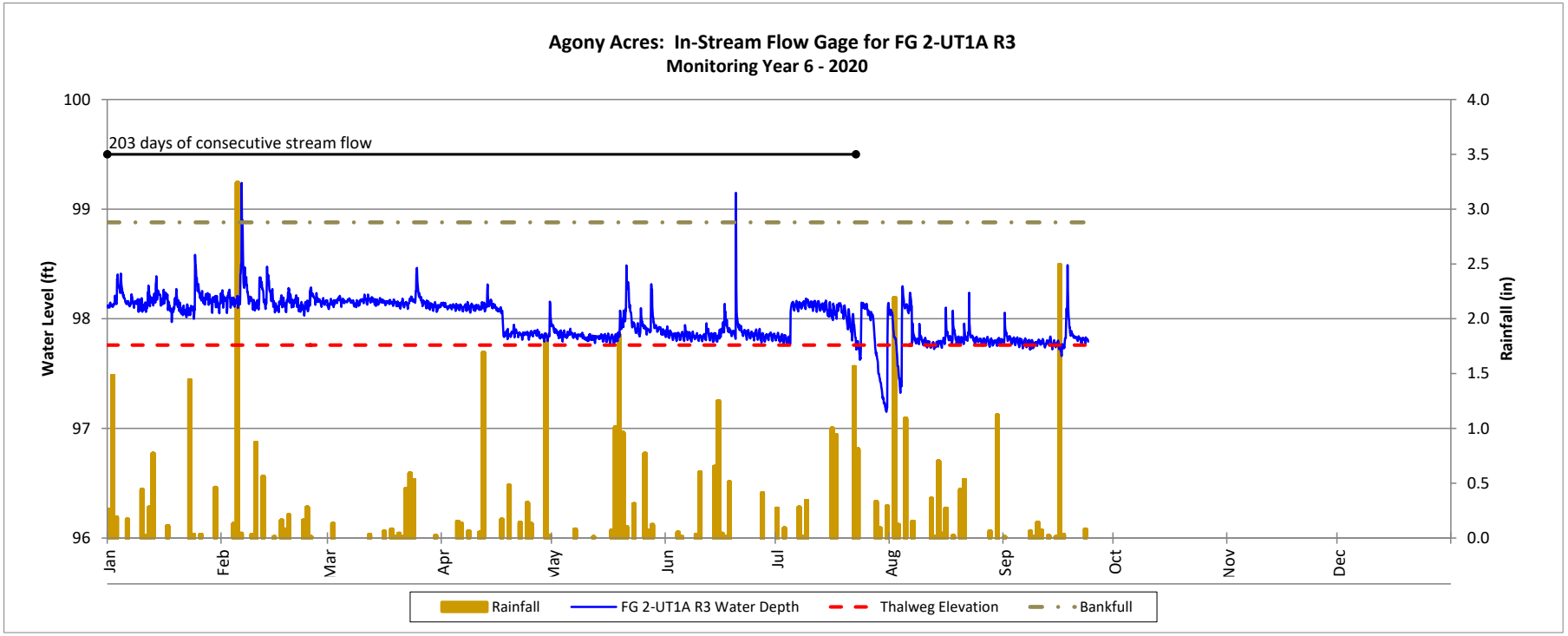


Recorded In-Stream Flow Events

Agony Acres Mitigation Site

DMS Project No. 95716

Monitoring Year 6 - 2020

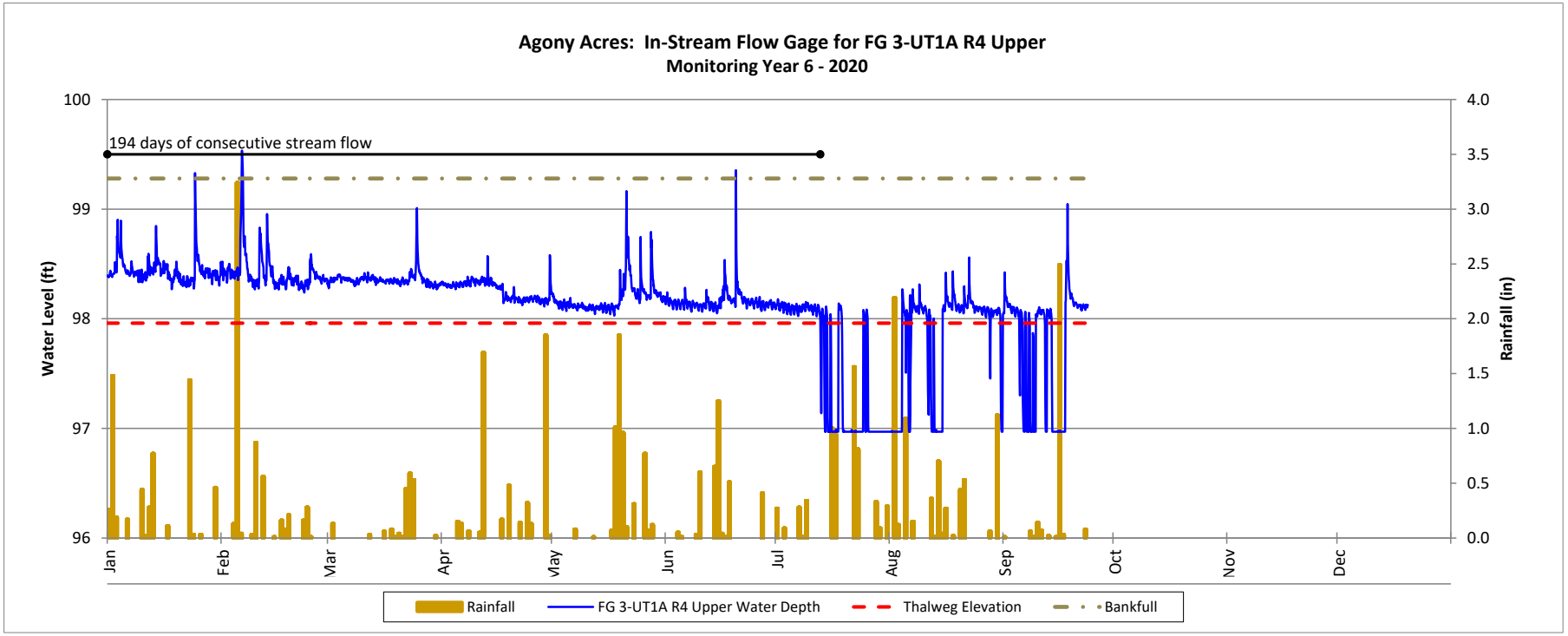


Recorded In-Stream Flow Events

Agony Acres Mitigation Site

DMS Project No. 95716

Monitoring Year 6 - 2020

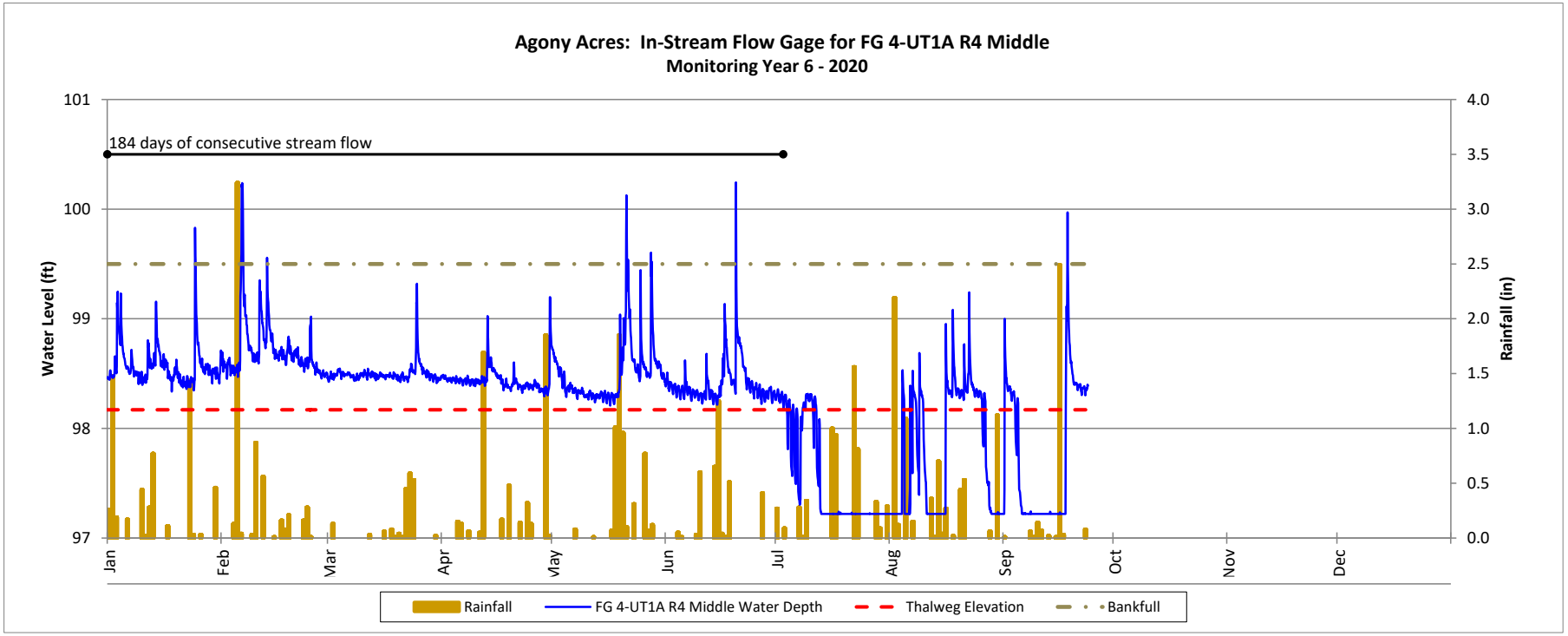


Recorded In-Stream Flow Events

Agony Acres Mitigation Site

DMS Project No. 95716

Monitoring Year 6 - 2020



Recorded In-Stream Flow Events

Agony Acres Mitigation Site

DMS Project No. 95716

Monitoring Year 6 - 2020

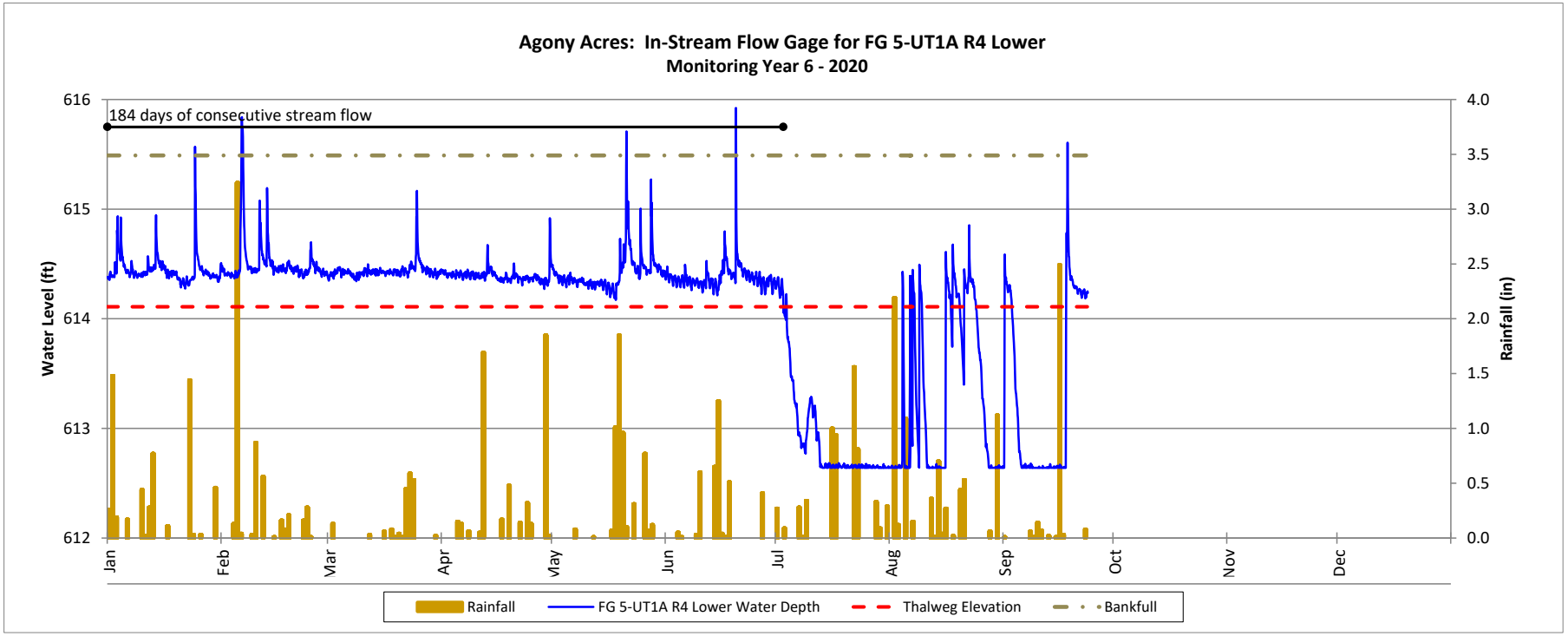


Table 14. In-Stream Flow Gage Attainment Summary
Agony Acres Mitigation Site (DMS Project No. 95716)
Monitoring Year 6 - 2020

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)**
UT1A R1	UT1A flow gauges installed during fall of MY4 for informational purposes only.				**148 Days/244 Days**	**184 Days/217 Days**	
UT1A R3					**194 Days/302 Days**	**203 Days/254 Days**	
UT1A R4 Upper					**178 Days/257 Days**	**194 Days/235 Days**	
UT1A R4 Middle					**147 Days/233 Days**	**184 Days/ 212 Days**	
UT1A R4 Lower					**145 Days/207 Days**	**184 Days/200 Days**	
UT1B US	**100 Days/333 Days**	**240 Days/331 Days**	**364 Days/364 Days**	**200 Days/363 Days**	**254 Days/333 Days**	**266 Days/266 Days**	
UT1B DS	**176 Days/363 Days**	**364 Days/364 Days**	**364 Days/364 Days**	**363 Days/364 Days**	**312 Days/361 Days**	Gage Malfunctioned During MY6	

*Data for MY6 recorded through 9/23/2020