Monitoring Report

Stanley's Slough Stream and Wetland Restoration Site
DMS Contract 004635
DMS Project Number 95356

Stanley's II Wetland Restoration Site
DMS Contract 5151
DMS Project Number 95838

Northampton County, NC
CU# 03010204
DWR# 2013-0596
SAW# 2012-01918

Monitoring Year 07

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

Construction Completed: April 2014
Data Collection: 2020
Submitted: December 2020

Mitigation Project Name	**Stanleys Slough Stream and Wetland Site**	**USACE Action ID**	**2012-01918**
DMS ID	**95356**	**DWR Permit**	**2013-0596**
River Basin	**Chowan**	**Date Project Instituted**	**3/24/2020**
Cataloging Unit	**03010204**	**Date Prepared**	**4/21/2020**
County	**Northampton**	**Stream/Wet. Service Area**	**Chowan 03010204**

Todd J Tugwell 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%	1,282.200	0.000	1,282.200	2014	7/2/2014
3 - Year 1 Monitoring	10.00%	10.00%	427.400	0.000	427.400	2015	4/23/2015
4 - Year 2 Monitoring	10.00%	10.00%	427.400	0.000	427.400	2016	4/28/2016
5 - Year 3 Monitoring	10.00%	10.00%	427.400	0.000	427.400	2017	4/3/2017
6 - Year 4 Monitoring	5.00%	5.00%	213.700	0.000	213.700	2018	4/25/2018
7 - Year 5 Monitoring	10.00%	10.00%	427.400	0.000	427.400	2019	4/26/2019
8 - Year 6 Monitoring	5.00%	5.00%	213.700	0.000	213.700	2020	4/21/2020
9 - Year 7 Monitoring	10.00%					2021	
Stream Bankfull Standard	10.00%	10.00%	427.400	0.000	427.400	2017	4/3/2017
			Totals	0.000	3,846.600		

Total Gross Credits	4,274.000
Total Unrealized Credits to Date	0.000
Total Released Credits to Date	3,846.600
Total Percentage Released	90.00%
Remaining Unreleased Credits	427.400

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%	0.936	0.000	0.940	2014	7/2/2014
3 - Year 1 Monitoring	10.00%	10.00%	0.312	0.000	0.312	2015	4/23/2015
4 - Year 2 Monitoring	10.00%	10.00%	0.312	0.000	0.312	2016	4/28/2016
5 - Year 3 Monitoring	15.00%	15.00%	0.468	0.000	0.470	2017	4/3/2017
6 - Year 4 Monitoring	5.00%	5.00%	0.156	0.000	0.156	2018	4/25/2018
7 - Year 5 Monitoring	15.00%	15.00%	0.468	0.000	0.468	2019	4/26/2019
8 - Year 6 Monitoring	5.00%	5.00%	0.156	0.000	0.156	2020	4/21/2020
9 - Year 7 Monitoring	10.00%					2021	
Stream Bankfull Standard	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Totals	0.000	2.814		

Total Gross Credits	3.120
Total Unrealized Credits to Date	0.000
Total Released Credits to Date	2.814
Total Percentage Released	90.19%
Remaining Unreleased Credits	0.306

Notes

Contingencies (if any)

Project Quantities

Mitigation Type	Restoration Type	Physical Quantity
Warm Stream	Restoration	4,274.000
Riparian	Restoration	3.600

Debits

							Stream Restoration Credits	Riparian Restoration
Beginning Balance (mitigation credits)							**4,274.000**	**3.120**
Released Credits							**3,846.600**	**2.814**
Unrealized Credits							**427.400**	**0.306**
Owning Program	**Req. Id**	**TIP #**	**Project Name**	**USACE Permit #**	**DWR Permit #**	**DCM Permit #**		
Total Credits Debited							**0.000**	**0.000**
Remaining Available balance (Released credits)							**3,846.600**	**2.814**
Remaining balance (Unreleased credits)							**427.400**	**0.306**

Mitigation Project Name	**Stanley's II**	**USACE Action ID**	**2012-01918**
DMS ID	**95838**	**DWR Permit**	**2013-0596**
River Basin	**Chowan**	**Date Project Instituted**	**4/17/2013**
Cataloging Unit	**03010204**	**Date Prepared**	**4/21/2020**
County	**Northampton**	**Stream/Wet. Service Area**	**Chowan 03010204**

Todd J Tugwell 9/21/2020

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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	**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%	2.082	0.000	2.082	2014	7/2/2014
3 - Year 1 Monitoring	10.00%	10.00%	0.694	0.000	0.694	2015	4/23/2015
4 - Year 2 Monitoring	10.00%	10.00%	0.694	0.000	0.694	2016	4/28/2016
5 - Year 3 Monitoring	15.00%	15.00%	1.041	0.000	1.041	2017	10/20/2017
6 - Year 4 Monitoring	5.00%	5.00%	0.347	0.000	0.347	2018	4/25/2018
7 - Year 5 Monitoring	15.00%	15.00%	1.041	0.000	1.041	2019	4/26/2019
8 - Year 6 Monitoring	5.00%	5.00%	0.347	0.000	0.347	2020	4/21/2020
9 - Year 7 Monitoring	10.00%					2021	
Stream Bankfull Standard	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Totals	0.000	6.246		

Total Gross Credits	6.940
Total Unrealized Credits to Date	0.000
Total Released Credits to Date	6.246
Total Percentage Released	90.00%
Remaining Unreleased Credits	0.694

Notes

Contingencies (if any)

Project Quantities

Mitigation Type	**Restoration Type**	**Physical Quantity**
Riparian	Restoration	7.600

Mitigation Project Name	**Stanley's II**	**USACE Action ID**	**2012-01918**
DMS ID	**95838**	**DWR Permit**	**2013-0596**
River Basin	**Chowan**	**Date Project Instituted**	**4/17/2013**
Cataloging Unit	**03010204**	**Date Prepared**	**4/21/2020**
County	**Northampton**	**Stream/Wet. Service Area**	**Chowan 03010204**

Debits							**Riparian Restoration**
Beginning Balance (mitigation credits)							**6.940**
Released Credits							**6.246**
Unrealized Credits							**0.000**
Owning Program	**Req. Id**	**TIP #**	**Project Name**	**USACE Permit #**	**DCM Permit #**	**DWR Permit #**	
Statewide Stream & Wetland ILF Program	REQ-007034		Atlantic Coast Pipeline	2014-01558			1.987
Total Credits Debited							**1.987**
Remaining Available balance (Released credits)							**4.259**
Remaining balance (Unreleased credits)							**0.694**

Design and Monitoring Firm

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Suite 400
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Project Contact: Tim Morris
Email: tim.morris@kci.com
KCI Project No: 20122005

KCI ASSOCIATES OF NORTH CAROLINA, PA

ENGINEERS • SCIENTISTS • SURVEYORS • CONSTRUCTION MANAGERS

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

MEMORANDUM

Date: February 2, 2021
To: Lindsay Crocker, DMS Project Manager
From: Tim Morris, Project Manager
KCI Associates of North Carolina, PA
Subject: MY-07 Monitoring Report Comments
Stanley's Slough IMS#95356, Contract 004635
Stanley's Slough II, IMS#95838, Contract 005151
Chowan River Basin CU 03010204
Northampton County, North Carolina

Please find below our responses in italics to the MY-07 Monitoring Report comments from NCDMS received on January 22, 2020, for the Stanley's Slough/Stanley's II Restoration Sites.

1. The Mitigation Plan states that height will be monitored in MY7. Please provide height data for vegetation plots.
KCI Response: The average height across all the planted stems on site was 11.4 feet. This information has been added to the report. A spreadsheet containing all of the measured heights by plot and species has also been added to the digital deliverables.

2. The around Gauge 20 was previously evaluated in the field by KCI and the IRT. Provide explanation for this gauge not meeting if there is one.
KCI Response: It is unclear why this gauge did not meet the success criteria. A discussion of the gauge and the area around it has been added to the report.

3. Section 2.3 describes the visual indicators required for headwater stream success (scour, sediment deposition and sorting, multiple flow events, wrack lines and flow over vegetation, leaf litter, or water staining). Please provide some additional verbiage to characterize if and how the site stream is performing specific to those visual indicators. It is noted that there are some photos to show flow paths in the report, but any recent additional dormant season photos could be helpful.
KCI Response: Additional pictures from December 2020 have been added to the report. A description of the visual indicators noted on site has also been added to the report.

4. Submit the features that characterize the photo points in the CCPV.
KCI Response: This shapefile has been added to the digital deliverables.

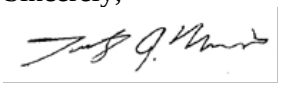
5. Please review the submitted CVS minidatabase. Upon opening, all that is visible are queries.
KCI Response: A repaired version of this database has been included in the digital deliverables.

6. Please provide a shapefile containing features for all groundwater gauges.
KCI Response: This shapefile has been added to the digital deliverables

7. It looks like the report may have mislabeled the Stream Gauge 5 graph as 18. Please review this figure in the report.
   KCI Response: Gauge 18 was correctly labeled but the Stream Gauge 5 hydrograph was accidentally left out of the report. This error has been corrected.

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

Sincerely,



Tim Morris
Project Manager

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1.0 EXECUTIVE SUMMARY / PROJECT ABSTRACT

The Stanley's Slough Stream and Wetland Restoration Site (SSS) was completed in April 2014 and restored a total of 4,274 linear feet of headwater stream along with restoring 3.6 acres of riparian wetlands. The SSS is a headwater stream and riparian wetland system in the Chowan River Basin (03010204 8-digit HUC) in northern Northampton County, North Carolina, that had been substantially modified to maximize agricultural production. The Stanley's II Wetland Restoration Site (SII) is located directly adjacent to SSS and was also completed in April 2014, restoring a total of 7.6 acres of riparian wetland. The completed SII project restored, enhanced, and protected wetlands within a productive headwater stream/wetland system.

The SSS is protected by a 17.6-acre permanent conservation easement, while SII is protected by a 9.4-acre permanent conservation easement, both held by the State of North Carolina. Both sites are located on two parcels located off of Margarettsville Road, approximately 0.3 mile north of Margarettsville, North Carolina. The project sites are bounded by NC 186 to the south and by agricultural land on all other sides. The sites have a long history of hydrologic modification in order to allow for farming to take place on the property.

The Chowan River Basin Restoration Priorities state the goals for the SSS and SII's 14-digit HUC are to protect and improve water quality throughout the basin by reducing sediment and nutrient inputs into streams and rivers and to support efforts to restore local watersheds (NCDENR EEP, 2009). The project goals for SSS and SII are in line with the basin priorities and include the following:

- Restore streams and riparian buffers to provide shade and temperature control and increase instream woody debris for habitat.
- Restore and protect sensitive aquatic resources to improve habitat and species diversity through the restoration of wetlands, streams, and riparian buffers.
- Implement wetland and stream restoration projects that reduce sources of nutrient pollution and surface runoff by restoring hydrology and vegetation, stabilizing banks, and restoring natural geomorphology where appropriate.

Additional goals for the project include:

- Increase the local hydroperiod by encouraging both surface and subsurface storage and retention.
- Restore and establish a functional and diverse headwater stream/wetland community.

The project goals will be addressed through the following objectives:

- Restore a headwater stream/wetland vegetation community through maintenance and germination of volunteer wetland vegetation from adjacent seed sources, planting of native trees and shrubs, and incorporation of a custom native seed mix.
- Elevate the local groundwater table through the elimination of lateral drainage ditches and modification of existing channelized streams.
- Reconnect site hydrology to historic flow paths.

The mitigation at SSS included approximately 4,274 linear feet of stream restoration, 3.6 acres of riparian wetland restoration, and 0.5 acre of wetland preservation for a total of 4,274 Stream Mitigation Units and 3.1 Wetland Mitigation Units. The mitigation at SII included approximately 7.6 acres of riparian wetland restoration for a total of 6.9 Wetland Mitigation Units.

2.0 MONITORING RESULTS

2.1 Vegetation Monitoring Results

The vegetation monitoring success criterion for the planted mitigation area is a density of 320 stems/acre after the third year of monitoring and an allowance for 10% mortality in the following years for a stem density of 288 stems/acre after four years, 260 stems/acre after five years, and 210 stems/acre after seven years to be considered successful. To determine the success of the planted mitigation area, twenty permanent vegetation monitoring plots (10 by 10 meters) have been established in the mitigation area at locations that represent all site conditions. Eleven of these plots are in SSS and nine of these are in SII. In April 2016, KCI performed a supplemental planting of the site to address areas of low stem density due to prolonged inundation. Gallon and bare root size *Taxodium distichum* and bare root size *Nyssa biflora* were planted throughout the stream rehabilitation portion of the site in areas that have extended periods of standing water.

The site's average density for MY07 was 991 planted stems/acre. All twenty of the vegetation monitoring plots had greater than 210 stems/acre. Including volunteers the site average 1,999 stems/acre. The average height of the planted stems across all of the plots is 11.4 feet. Overall the site is very well vegetated and has well exceeded the success criteria.

2.2 Hydrology Monitoring Results

Twelve groundwater monitoring gauges were installed in the wetland mitigation areas to measure soil saturation and any surface ponding at the site. Four of these gauges are in SSS and eight of these are in SII. The growing season begins March 11 and ends November 20 (255 days). The success criteria for the site states that the water table of the restored wetlands must be within 12" of the soil surface continuously for at least 9% (23 days) of the 255-day growing season during normal weather conditions. A "normal" year is based on NRCS climatological data for Northampton County, and using the 30th to 70th percentile thresholds as the range of normal, as documented in the USACE Technical Report "Accessing and Using Meteorological Data to Evaluate Wetland Hydrology" (Sprecher and Warne, 2000). At the beginning of the 2018 growing season, KCI installed three additional groundwater monitoring gauges in the SSII area of the site.

The daily rainfall data was obtained from a local weather station in Emporia, VA; provided by the NC State Climate Office. For the 2020-year, the months of February, May, August, September October, and November experienced above average rainfall, while January, April, and June, experienced average rainfall. The months of March and July recorded below average rainfall for the site. Overall, the area experienced above average rainfall during the 2020 growing season.

During the site's seventh growing season, fourteen of the fifteen gauges met the success criterion. The gauge that did not meet the success criteria was Gauge 20, which is in the SII portion of the site. Gauge 20 had wetland hydrology for over 5% of the growing season. This gauge met the criteria last year. The area around this gauge does not appear any different from the rest of the site in vegetation, soils or visible hydrology and all four of the gauges surrounding Gauge 20 met the criteria this year. It is unclear why Gauge 20 did not meet the success criteria this year but KCI believes that the area of lower hydrology that this gauge represents is very small and localized.

During the first growing season, March 28 to November 7 were incorrectly used as the growing season dates for the calculations of gauge success. This error was repeated throughout the monitoring years until it was discovered during MY06. Gauge success has since been recalculated for all years using the growing season dates from the approved mitigation plan (March 11 to November 20). In most cases this resulted in a minor change from what was reported in previous

years for the number of days and percentage of the growing season that gauges were within 12 inches of the surface. In six cases, however, this resulted in a change in whether success criteria was achieved or not. These instances include Gauge 7 in MY02, Gauge 17 in MY03, and Gauges 6, 10, 12, and 14 in MY04. Correcting the growing season to the approved dates in the mitigation plan does not significantly change the status or trend of the hydrology at any of these gauge locations. See Table 8 in Appendix D for the corrected hydrology results for all years.

2.3 Headwater Stream Performance

SSS will also be monitored to document the development of the headwater stream system. The success criteria for the headwater stream states that it will have continuous surface water flow within the valley, for at least 30 consecutive days annually. Additionally, the stream must show signs of supporting the restored channel form as documented with photos. These indicators may include evidence of scour, sediment deposition and sorting, multiple flow events, wrack lines and flow over vegetation, leaf litter, or water staining. At a meeting with the IRT in 2018, it was requested that the relic berm along the stream in the wooded portion of SSS be broken up more than it already was, in order to encourage the continued development of a braided system. This work was completed in November 2019 during a period when the stream was completely dry. See Appendix B – Visual Assessment Data for more information.

In the headwater stream, six automatic recording gauges were installed to document the presence of surface water within the restored channel. Weirs were constructed just downstream of three (Gauges 2, 3 and Gauge 18) of these gauges to provide a known elevation at which the stream could be considered flowing. Using these elevations as the basis for flow, all three gauges achieved at least 30 consecutive days of flow. Gauges 2 and 3 (on T1) averaged 125 consecutive days of flow between them and Gauge 18 (on T2) achieved 96 consecutive days of flow. See Appendix D, Photo 2 for an example of these weirs.

Visual monitoring of the development of the headwater stream system showed many signs of it being a well-developed system. Abundant evidence of wrack lines, sediment deposition and sorting, and multiple flow paths are present throughout the site. Please see Appendix D – Hydrologic Data for more information.

Summary information/data related to the occurrence of items such as encroachment and statistics related to performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the Baseline Monitoring Report and in the Mitigation Plan documents available on the DMS website. All raw data supporting the tables and figures in the appendices are available from DMS upon request.

3.0 REFERENCES

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

NCDENR, Ecosystem Enhancement Program. 2009. Chowan River Basin Restoration Priorities 2009. Raleigh, NC. http://www.nceep.net/services/restplans/FINAL_RBRP_Chowan_2009.pdf

Sprecher, S. W., and Warne, A. G. (2000). "Accessing and Using Meteorological Data to Evaluate Wetland Hydrology," ERDC/EL TR-WRAP-00-1, U.S. Army Engineer Research and Development Center, Vicksburg, MS.USACE. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

USACE. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

United States Department of Agriculture. 1994. Soil Survey of Northampton County, North Carolina. USDA, NCDENR, SCS. http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/north_carolina/NC131/0/northampton.pdf

Appendix A

Project Vicinity Map and Background Tables

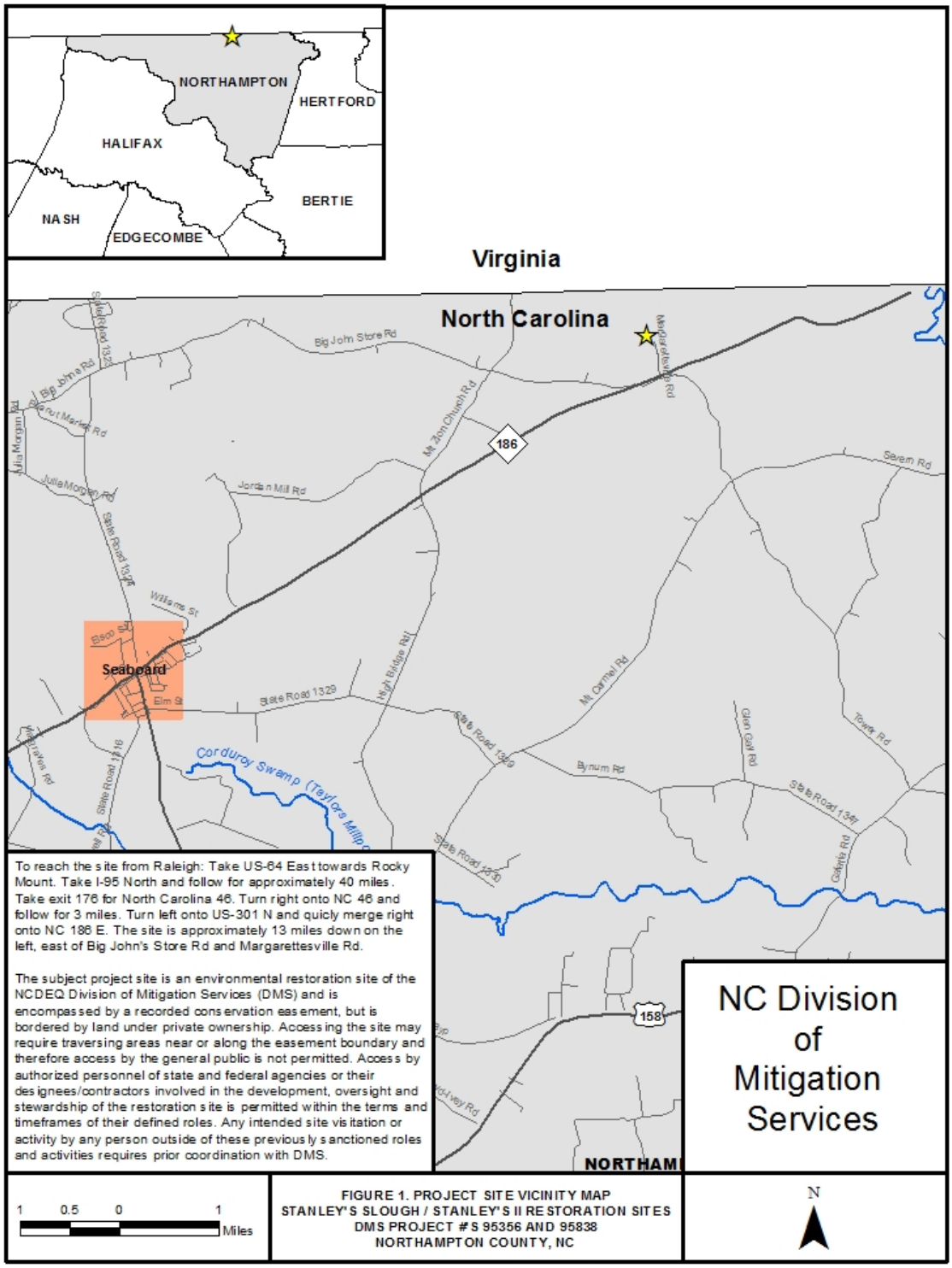

NORTHAMPTON
HERTFORD
HALIFAX
BERTIE
NASH
EDGECOMBE
Virginia
North Carolina
Big John Store Rd
Big John's Rd
Peanut Market Rd
Julia Morgan Rd
Jordan Mill Rd
Mt Zion Church Rd
Margarettsville Rd
186
Salem Rd
State Road 1329
Williams St
Seaboard
Elm St
High Bridge Rd
Mt Carmel Rd
State Road 1349
Bynum Rd
Glen Gary Rd
Town Rd
State Road 1345
Gobers Rd
State Road 1316
Corduroy Swamp (Taylors Mill
158
To reach the site from Raleigh: Take US-64 East towards Rocky Mount. Take I-95 North and follow for approximately 40 miles. Take exit 176 for North Carolina 46. Turn right onto NC 46 and follow for 3 miles. Turn left onto US-301 N and quicly merge right onto NC 186 E. The site is approximately 13 miles down on the left, east of Big John's Store Rd and Margarettesville Rd.
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 timeframes of their defined roles. Any intended site visitation or activity by any person outside of these previously sanctioned roles and activities requires prior coordination with DMS.
NC Division of Mitigation Services
1 0.5 0 1
Miles
FIGURE 1. PROJECT SITE VICINITY MAP
STANLEY'S SLOUGH / STANLEY'S II RESTORATION SITES
DMS PROJECT # S 95356 AND 95838
NORTHAMPTON COUNTY, NC
N

Table 1a. Project Components and Mitigation Credits
Stanley's Slough Restoration Site, DMS Project #95356

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Length	4,274		3.600						
Credits	4,274		3.120						
TOTAL CREDITS	4,274		3.120						

Project Components

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage/Acreage	Mitigation Ratio
T1	10+00 – 41+55	2,600	Headwater Stream Valley	Restoration	3,054	1:1
T2	50+00 – 62+85	1,220	N/A	Restoration	1,220	1:1
Wetland Reestablishment				Restoration	2.800	1:1
Wetland Rehabilitation				Restoration	0.800	2.5:1
Wetland Preservation				N/A	0.500	NA

Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetlands (Acres)	Non-Riparian Wetlands (Acres)	Buffer (square feet)	Upland (Acres)
Restoration	4,274	3.600			
Enhancement I					
Enhancement II					
TOTAL SMU	**4,274**				
TOTAL WMU		**3.120**			

Table 1b. Project Components and Mitigation Credits
Stanley's Slough II Restoration Site, DMS Project #95838

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Length			7.600						
Credits			6.940						
TOTAL CREDITS									

Project Components

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage/Acreage	Mitigation Ratio
Wetland Reestablishment				Restoration	6.500	1:1
Wetland Rehabilitation				Restoration	1.110	2.5:1

Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetlands (Acres)		Non-Riparian Wetlands (Acres)	Buffer (square feet)	Upland (Acres)	
		Riverine	Non-Riverine				
Restoration		-	7.600				
Enhancement I							
Enhancement II							
TOTAL WMU			**6.940**				

Table 2. Project Activity & Reporting History Stanley's Slough & Stanley's II Restoration Sites		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Mitigation Plan		Aug 2013
Final Design - Construction Plans		Oct 2013
Construction		April 2014
Planting		April 2014
Baseline Monitoring/Report	May 2014	May 2014
Vegetation Monitoring	May 19, 2014	
Photo Points	April 17, 2014	
Year 1 Monitoring	Nov 2014	Dec 2014
Vegetation Monitoring	Oct 23, 2014	
Photo Points	Nov 20, 2014	
Gauge Downloads	Nov 24, 2014	
Year 2 Monitoring	Nov 2015	Dec 2015
Vegetation Monitoring	July 10, 2015	
Photo Points	July 10, 2015	
Gauge Downloads	Nov 10, 2015	
Supplemental Planting		April 2016
Year 3 Monitoring	Dec 2016	Dec 2016
Vegetation Monitoring	July 27, 2016	
Photo Points	Aug 19, 2016	
Gauge Downloads	Dec 13, 2016	
Year 4 Monitoring	Dec 2017	Jan 2018
Photo Points	Dec 12, 2017	
Gauge Downloads	Nov 27, 2017	
Year 5 Monitoring	Dec 2018	Dec 2018
Vegetation Monitoring	July 17, 2018	
Photo Points	Aug 31, 2018	
Gauge Downloads	Dec. 6, 2018	
Year 6 Monitoring	Nov 2019	Dec 2019
Photo Points	Nov 15, 2019	
Gauge Downloads	Nov 15, 2019	
Berm along stream in wooded area removed		Nov 14, 2019
Year 7 Monitoring	Nov 2020	Dec 2020
Vegetation Monitoring	July 7, 2020	
Photo Points	Aug 31, 2020	
Gauge Downloads	Dec 14, 2020	

Table 3. Project Contacts **Stanley's Slough & Stanley's Slough II Restoration Sites**	
Design Firm	KCI Associates of North Carolina, PA 4505 Falls of Neuse Rd. Suite 400 Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512 Fax: (919) 783-9266
Construction Contractor	Wright Contracting, LLC 160 Walker Road Lawndale, NC 28090 Contact: Mr. Stephen James Phone: (704) 692-4633
Planting Contractor	Forestree Management Co. 1280 Maudis Road Bailey, NC 27807 Contact: Mr. Tony Cortez Phone: (252) 243-2513
Monitoring Performers	
	KCI Associates of North Carolina, PA 4505 Falls of Neuse Rd. Suite 400 Raleigh, NC 27609 Contact: Mr. Adam Spiller Phone: (919) 278-2514 Fax: (919) 783-9266

Table 4a. Project Information			
Stanley's Slough Restoration Site, DMS Project #95356			
Project Name	Stanley's Slough Restoration Site		
County	Northampton County		
Project Area (acres)	17.6 acres		
Project Coordinates (lat. and long.)	36.539006 N, -77.348222 W		
Project Watershed Summary Information			
Physiographic Province	Coastal Plain		
River Basin	Chowan		
USGS Hydrologic Unit 8-digit	03010204	**USGS Hydrologic Unit 14-digit**	03010204180040
DWQ Sub-basin	03-01-02		
Project Drainage Area (acres)	113 acres		
Project Drainage Area Percentage of Impervious Area	<1%		
CGIA Land Use Classification	43.7% forested land, 33.8% rangeland, 22.5% agriculture		

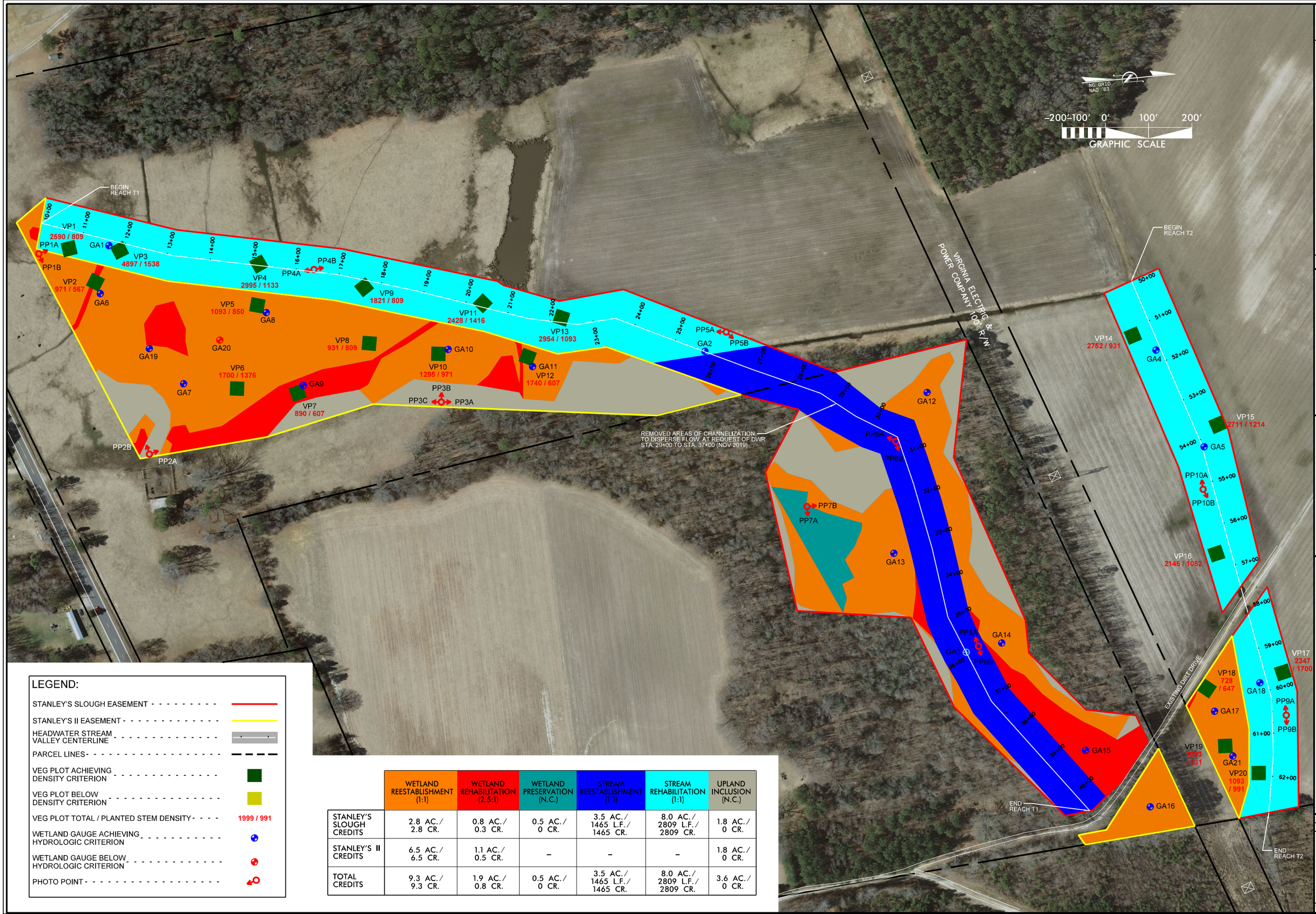
Reach Summery Information (Post Restoration)		
Parameters	**T1**	**T2**
Length of reach (linear feet)	3,054	1,220
Valley classification	Valley Type X	Valley Type X
Drainage area (acres)	84 acres	29 acres
NCDWQ Water Quality Classification	Project Reach Not Classified; Receiving water = Meherrin River (C; NSW)	Project Reach Not Classified; Receiving water = Meherrin River (C; NSW)
Morphological Description (stream type)	Headwater Stream Valley	Headwater Stream Valley
Evolutionary trend	Channelized	Channelized
Mapped Soil Series	Tomotley, Roanoke, Altavista, Wehadkee	Altavista, Roanoke
Drainage class	Poorly drained, poorly drained, moderately well drained, poorly drained	Moderately well drained, poorly drained
Soil Hydric status	Hydric	Hydric
Slope	0.2%	0.06%
FEMA classification	Zone X, parts in Zone AE(backwater of Meherrin River)	Zone X, parts in Zone AE (backwater of Meherrin River)
Native vegetation community	Headwater Forest Community	Headwater Forest Community
Percent composition of exotic invasive vegetation	0%	0%

Wetland Summary Information (Post Restoration)	
Parameters	
Size of Wetland (acres)	3.6 acres
Wetland Type	Riparian
Mapped Soil Series	Roanoke and Tomotley
Drainage class	Poorly drained
Soil Hydric Status	Hydric
Source of Hydrology	Hillside seepage and precipitation
Hydrologic Impairment	Ditching and Cattle damage
Native vegetation community	Headwater Forest Community
Percent composition of exotic invasive vegetation	0%

Table 4b. Project Information			
Stanley's II Restoration Site, DMS Project #95838			
Project Name	Stanley's II Restoration Site		
County	Northampton County		
Project Area (acres)	9.4 acres		
Project Coordinates (lat. and long.)	34.922569 N , -77.319871 W		
Project Watershed Summary Information			
Physiographic Province	Coastal Plain		
River Basin	Chowan		
USGS Hydrologic Unit 8-digit	03010204	**USGS Hydrologic Unit 14-digit**	03010204180040
DWQ Sub-basin	03-01-02		
Project Drainage Area (acres)	80 acres		
Project Drainage Area Percentage of Impervious Area	<1%		
CGIA Land Use Classification	53.0% forested land, 34.9% rangeland, 12.1% agriculture		
Wetland Summary Information (Post Restoration)			
Parameters			
Size of Wetland (acres)	7.6 acres		
Wetland Type	Riparian		
Mapped Soil Series	Tomotley, Roanoke		
Drainage class	Poorly Drained		
Soil Hydric Status	Hydric		
Source of Hydrology	Hillside seepage and precipitation		
Hydrologic Impairment	Ditching and Crops		
Native vegetation community	Headwater Forest Community		
Percent composition of exotic invasive vegetation	0%		

Appendix B

Visual Assessment Data



LEGEND:

- STANLEY'S SLOUGH EASEMENT
- STANLEY'S II EASEMENT
- HEADWATER STREAM VALLEY CENTERLINE
- PARCEL LINES
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- VEG PLOT TOTAL / PLANTED STEM DENSITY — 1999 / 991
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION
- PHOTO POINT

	WETLAND REESTABLISHMENT (1:1)	WETLAND REHABILITATION (2.5:1)	WETLAND PRESERVATION (N.C.)	STREAM REESTABLISHMENT (1:1)	STREAM REHABILITATION (1:1)	UPLAND INCLUSION (N.C.)
STANLEY'S SLOUGH CREDITS	2.8 AC./ 2.8 CR.	0.8 AC./ 0.3 CR.	0.5 AC./ 0 CR.	3.5 AC./ 1465 L.F./ 1465 CR.	8.0 AC./ 2809 L.F./ 2809 CR.	1.8 AC./ 0 CR.
STANLEY'S II CREDITS	6.5 AC./ 6.5 CR.	1.1 AC./ 0.5 CR.	–	–	–	1.8 AC./ 0 CR.
TOTAL CREDITS	9.3 AC./ 9.3 CR.	1.9 AC./ 0.8 CR.	0.5 AC./ 0 CR.	3.5 AC./ 1465 L.F./ 1465 CR.	8.0 AC./ 2809 L.F./ 2809 CR.	3.6 AC./ 0 CR.

REVISIONS

STA.	DESCRIPTION	DATE

NCDEQ DIVISION OF MITIGATION SERVICES

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

STANLEY'S SLOUGH / STANLEY'S II RESTORATION SITES

DMS PROJECT #95356 & 95838
NORTHAMPTON COUNTY, NORTH CAROLINA

MONITORING YEAR 07

DATE: DEC 2020
SCALE: GRAPHIC

CURRENT CONDITION PLAN VIEW

SHEET 1 OF 1

Table 5a. Vegetation Condition Assessment
Stanley's Slough Restoration Site, DMS Project #95356

Planted Acreage 8.74 **Easement Acreage 17.6**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acre	Pattern and Color	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acre	Pattern and Color	0	0.00	0.0%
			Total	0	0.00	0.0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acre	Pattern and Color	0	0.00	0.0%
			Cumulative Total	0	0.00	0.0%
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1,000 SF	Pattern and Color	0	0.00	0.0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	Pattern and Color	0	0.00	0.0%

Table 5b. Vegetation Condition Assessment
Stanley's II Restoration Site, DMS Project #95838

Planted Acreage 8.57 **Easement Acreage 9.4**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acre	Pattern and Color	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acre	Pattern and Color	0	0.00	0.0%
			Total	0	0.00	0.0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acre	Pattern and Color	0	0.00	0.0%
			Cumulative Total	0	0.00	0.0%
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1,000 SF	Pattern and Color	0	0.00	0.0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	Pattern and Color	0	0.00	0.0%

Vegetation Monitoring Plot Photos

Plot 1 – MY-07 – 07/28/20

Plot 2 – MY-07 – 07/28/20

Plot 3 – MY-07 – 07/28/20

Plot 4 – MY-07 – 07/28/20

Plot 5 – MY-07 – 07/28/20

Plot 6 – MY-07 – 07/28/20

Plot 7 – MY-07 – 07/30/20

Plot 8 – MY-07 – 07/30/20

Plot 9 – MY-07 – 07/30/20

Plot 10 – MY-07 – 07/30/20

Plot 11 – MY-07 – 07/30/20

Plot 12 – MY-07 – 07/30/20

Plot 13 – MY-07 – 07/30/20

Plot 14 – MY-07 – 07/07/20

Plot 15 – MY-07 – 07/07/20

Plot 16 – MY-07 – 07/07/20

Plot 17 – MY-07 – 07/07/20

Plot 18 – MY-07 – 08/31/20

Plot 19 – MY-07 – 08/31/20

Plot 20 – MY-07 – 08/31/20

Photo Reference Points

PP1a – MY-00 – 4/17/14

PP1a – MY-07 – 8/31/20

PP1b – MY-00 – 4/17/14

PP1b – MY-07 – 8/31/20

PP2a – MY-00 – 4/17/14

PP2a – MY-07 – 8/31/20

PP2b – MY-00 – 4/17/14

PP2b – MY-07 – 8/31/20

PP3a – MY-00 – 4/17/14

PP3a – MY-07 – 8/31/20

PP3b – MY-00 – 4/17/14

PP3b – MY-07 – 8/31/20

PP3c – MY-00 – 4/17/14

PP3c – MY-07 – 8/31/20

PP4a – MY-00 – 4/17/14

PP4a – MY-07 – 8/31/20

PP4b – MY-00 – 4/17/14

PP4b – MY-07 – 8/31/20

PP5a – MY-00 – 4/17/14

PP5a – MY-07 – 8/31/20

PP5b – MY-00 – 4/17/14

PP5b – MY-07 – 8/31/20

PP6a – MY-00 – 4/17/14

PP6a – MY-07 – 8/31/20

PP6b – MY-00 – 4/17/14

PP6b – MY-07 – 8/31/20

PP7a – MY-00 – 4/17/14

PP7a – MY-07 – 8/31/20

PP7b – MY-00 – 4/17/14

PP7b – MY-07 – 8/31/20

PP8a – MY-00 – 4/17/14

PP8a – MY-07 – 8/31/20

PP8b – MY-00 – 4/17/14

PP8b – MY-07 – 8/31/20

PP9a – MY-00 – 4/17/14

PP9a – MY-07 – 8/31/20

PP9b – MY-00 – 4/17/14

PP9b – MY-07 – 8/31/20

PP10a – MY-00 – 4/17/14

PP10a – MY-07 – 8/31/20

PP10b – MY-00 – 4/17/14

PP10b – MY-07 – 8/31/20

Relic Berm Removal Photos

STA 31+00 – Before berm removal 8/31/18

STA 31+00 Right after berm removal before water had returned to stream – 11/15/19

Stream after berm removal and after water had returned to the stream – 1/22/20

Stream after berm removal and after water had returned to the stream – 1/22/20

Appendix C

Vegetation Plot Data

Table 6. Vegetation Plot Criteria Attainment

Stanley's Slough & Stanley's Slough II Restoration Sites

Vegetation Plot ID	Vegetation Survival Threshold Met?	Monitoring Year 07 Planted Stem Density (stems/acre)	Monitoring Year 07 Total Stem Density (stems/acre)
Stanley's Slough			
1	Yes	809	2,590
3	Yes	1,538	4,897
4	Yes	1,133	2,995
9	Yes	809	1,821
11	Yes	1,416	2,428
13	Yes	1,093	2,954
14	Yes	931	2,752
15	Yes	1,214	2,711
16	Yes	1,052	2,145
17	Yes	1,700	2,347
20	Yes	769	1,093
Stanley's II			
2	Yes	567	971
5	Yes	850	1,093
6	Yes	1,376	1,700
7	Yes	607	890
8	Yes	809	931
10	Yes	971	1,295
12	Yes	607	1,740
18	Yes	647	728
19	Yes	931	1,902

Table 7. CVS Stem Count Total and Planted by Plot and Species
Stanley's Slough and Sttanley's Slough II Restoration Sites, DMS Project Number 95356/95838

			Current Plot Data (MY7 2020)																				
			95356-01-0001			95356-01-0002			95356-01-0003			95356-01-0004			95356-01-0005			95356-01-0006			95356-01-0007		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo	boxelder	Tree																					
Acer rubrum	red maple	Tree										1	1	1				6	6	6			1
Baccharis halimifolia	baccharis	Shrub																					
Betula nigra	river birch	Tree				5	5	5	4	4	4	2	2	2				5	5	5	2	2	2
Celtis laevigata	sugarberry	Tree																					
Diospyros virginiana	common persimmon	Tree				2	2	4															
Fraxinus pennsylvanica	green ash	Tree				2	2	2				20	20	22	11	11	12	13	13	13	4	4	4
Ilex opaca	American holly	Tree																					
Juniperus virginiana	eastern redcedar	Tree																					
Liquidambar styraciflua	sweetgum	Tree			23			5			36			22			5			5			6
Liriodendron tulipifera	tuliptree	Tree																					
Magnolia virginiana	sweetbay	Tree													1	1	1				1	1	1
Nyssa biflora	swamp tupelo	Tree	1	1	1	2	2	2	2	2	2												
Pinus taeda	loblolly pine	Tree			3						41			15									
Platanus occidentalis	American sycamore	Tree			4			2			1			6									
Populus deltoides	eastern cottonwood	Tree																					
Quercus falcata	southern red oak	Tree	2	2	2										1	1	1	3	3	3	1	1	1
Quercus laurifolia	laurel oak	Tree																					
Quercus michauxii	swamp chestnut oak	Tree							9	9	9										3	3	3
Quercus nigra	water oak	Tree																					
Quercus pagoda	cherrybark oak	Tree																					
Quercus phellos	willow oak	Tree			6	1	1	2			1			1	8	8	8	3	3	5	3	3	3
Quercus rubra	northern red oak	Tree																					
Rhus copallinum	flameleaf sumac	shrub																					
Salix nigra	black willow	Tree																					
Taxodium distichum	bald cypress	Tree	17	17	25	2	2	2	23	23	27	5	5	5				4	4	4	1	1	1
Ulmus alata	winged elm	Tree																					
Ulmus americana	American elm	Tree																		1			
Unknown		Shrub or Tree																					
		Stem count	20	20	64	14	14	24	38	38	121	28	28	74	21	21	27	34	34	42	15	15	22
		size (ares)	1			1			1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02		
		Species count	3	3	7	6	6	8	4	4	8	4	4	8	4	4	5	6	6	8	7	7	9
		Stems per ACRE	809	809	2590	567	567	971	1538	1538	4897	1133	1133	2995	850	850	1093	1376	1376	1700	607	607	890

Table 7. CVS Stem Count Total and Planted by Plot and Species
Stanley's Slough and Sttanley's Slough II Restoration Sites, DMS Project Number 95356/95838

			Current Plot Data (MY7 2020)																				
			95356-01-0008			95356-01-0009			95356-01-0010			95356-01-0011			95356-01-0012			95356-01-0013			95356-01-0014		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo	boxelder	Tree																					
Acer rubrum	red maple	Tree										3	3	3						2			
Baccharis halimifolia	baccharis	Shrub																					
Betula nigra	river birch	Tree	8	8	9	10	10	11	3	3	3	4	4	4							9	9	9
Celtis laevigata	sugarberry	Tree																					
Diospyros virginiana	common persimmon	Tree																					
Fraxinus pennsylvanica	green ash	Tree	6	6	6				7	7	7	5	5	5	9	9	9	1	1	1			
Ilex opaca	American holly	Tree									1												
Juniperus virginiana	eastern redcedar	Tree																					
Liquidambar styraciflua	sweetgum	Tree						8			4			5			20			4			15
Liriodendron tulipifera	tuliptree	Tree																					
Magnolia virginiana	sweetbay	Tree																					
Nyssa biflora	swamp tupelo	Tree				1	1	1				5	5	5				15	15	15			
Pinus taeda	loblolly pine	Tree						4			1			17			1			39			28
Platanus occidentalis	American sycamore	Tree						5	1	1	2				2	2	2				4	4	4
Populus deltoides	eastern cottonwood	Tree																					
Quercus falcata	southern red oak	Tree				2	2	2				2	2	2				1	1	1	1	1	1
Quercus laurifolia	laurel oak	Tree																2	2	2			
Quercus michauxii	swamp chestnut oak	Tree	3	3	3	4	4	4	2	2	2	2	2	2				3	3	4	6	6	6
Quercus nigra	water oak	Tree																					
Quercus pagoda	cherrybark oak	Tree																					
Quercus phellos	willow oak	Tree	3	3	3			1	11	11	11				4	4	4				2	2	2
Quercus rubra	northern red oak	Tree																					1
Rhus copallinum	flameleaf sumac	shrub																					
Salix nigra	black willow	Tree			2			6						1			7						
Taxodium distichum	bald cypress	Tree				3	3	3				14	14	16				5	5	5	1	1	1
Ulmus alata	winged elm	Tree									1												
Ulmus americana	American elm	Tree																					
Unknown		Shrub or Tree																					
		Stem count	20	20	23	20	20	45	24	24	32	35	35	60	15	15	43	27	27	73	23	23	67
		size (ares)	1			1			1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02		
		Species count	4	4	5	5	5	10	5	5	9	7	7	10	3	3	6	6	6	9	6	6	9
		Stems per ACRE	809	809	931	809	809	1821	971	971	1295	1416	1416	2428	607	607	1740	1093	1093	2954	931	931	2711

Table 7. CVS Stem Count Total and Planted by Plot and Species
Stanley's Slough and Sttanley's Slough II Restoration Sites, DMS Project Number 95356/95838

			Current Plot Data (MY7 2020)																	
			95356-01-0015			95356-01-0016			95356-01-0017			95356-01-0018			95356-01-0019			95356-01-0020		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo	boxelder	Tree																		
Acer rubrum	red maple	Tree			1															
Baccharis halimifolia	baccharis	Shrub																		
Betula nigra	river birch	Tree	3	3	3				7	7	7				5	5	5	2	2	2
Celtis laevigata	sugarberry	Tree																		
Diospyros virginiana	common persimmon	Tree																		
Fraxinus pennsylvanica	green ash	Tree	4	4	4	10	10	10	2	2	2	5	5	5	9	9	9	3	3	3
Ilex opaca	American holly	Tree																		
Juniperus virginiana	eastern redcedar	Tree															1			
Liquidambar styraciflua	sweetgum	Tree			3			18			3			1			13			5
Liriodendron tulipifera	tuliptree	Tree																		
Magnolia virginiana	sweetbay	Tree	1	1	1	4	4	4	1	1	1				1	1	1			
Nyssa biflora	swamp tupelo	Tree	2	2	2	4	4	4	1	1	1	2	2	2				7	7	7
Pinus taeda	loblolly pine	Tree			29			8									1			
Platanus occidentalis	American sycamore	Tree	1	1	1	2	2	2						1	2	2	7	1	1	2
Populus deltoides	eastern cottonwood	Tree																		
Quercus falcata	southern red oak	Tree				3	3	3	2	2	2							2	2	2
Quercus laurifolia	laurel oak	Tree																		2
Quercus michauxii	swamp chestnut oak	Tree	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	1	1	1
Quercus nigra	water oak	Tree																		
Quercus pagoda	cherrybark oak	Tree																		
Quercus phellos	willow oak	Tree	1	1	1	1	1	1			10	6	6	6	3	3	3	1	1	1
Quercus rubra	northern red oak	Tree						1									2			
Rhus copallinum	flameleaf sumac	shrub															1			
Salix nigra	black willow	Tree																		
Taxodium distichum	bald cypress	Tree	17	17	21				27	27	29							2	2	2
Ulmus alata	winged elm	Tree																		
Ulmus americana	American elm	Tree															1			
Unknown		Shrub or Tree									1									
		Stem count	30	30	67	26	26	53	42	42	58	16	16	18	23	23	47	19	19	27
		size (ares)	1			1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02		
		Species count	8	8	11	7	7	10	7	7	10	4	4	6	6	6	12	8	8	10
		Stems per ACRE	1214	1214	2711	1052	1052	2145	1700	1700	2347	647	647	728	931	931	1902	769	769	1093

Table 7. CVS Stem Count Total and Planted by Plot and Species
Stanley's Slough and Sttanley's Slough II Restoration Sites, DMS Project Number 95356/95838

			Annual Means																	
			MY7 (2020)			MY5 (2018)			MY3 (2016)			MY2 (2015)			MY1 (2014)			MY0 (2014)		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo	boxelder	Tree									1									
Acer rubrum	red maple	Tree	10	10	14	9	9	18	10	10	12	8	8	9	9	9	10	11	11	11
Baccharis halimifolia	baccharis	Shrub						1			1									
Betula nigra	river birch	Tree	69	69	71	69	69	70	68	68	68	67	67	67	67	67	67	73	73	73
Celtis laevigata	sugarberry	Tree												1			1			
Diospyros virginiana	common persimmon	Tree	2	2	4	2	2	4												
Fraxinus pennsylvanica	green ash	Tree	111	111	114	115	115	121	115	115	119	113	113	116	113	113	113	117	117	117
Ilex opaca	American holly	Tree			1			1												
Juniperus virginiana	eastern redcedar	Tree			1			1			1			1						
Liquidambar styraciflua	sweetgum	Tree			201			114			56			56			32			
Liriodendron tulipifera	tuliptree	Tree												1						
Magnolia virginiana	sweetbay	Tree	9	9	9	9	9	9	10	10	10	11	11	11	9	9	9	19	19	19
Nyssa biflora	swamp tupelo	Tree	42	42	42	47	47	50	54	54	54	41	41	41	42	42	42	46	46	46
Pinus taeda	loblolly pine	Tree			187			154			6			2			2			
Platanus occidentalis	American sycamore	Tree	13	13	39	13	13	34	13	13	27	13	13	24	15	15	27	19	19	19
Populus deltoides	eastern cottonwood	Tree						5			1									
Quercus falcata	southern red oak	Tree	20	20	20	19	19	20	23	23	23	22	22	22	27	27	27	30	30	30
Quercus laurifolia	laurel oak	Tree	2	2	4															
Quercus michauxii	swamp chestnut oak	Tree	44	44	45	46	46	46	48	48	49	56	56	56	57	57	57	50	50	50
Quercus nigra	water oak	Tree										1	1	1				1	1	1
Quercus pagoda	cherrybark oak	Tree						3												
Quercus phellos	willow oak	Tree	47	47	69	48	48	49	50	50	52	56	56	63	49	49	49	65	65	65
Quercus rubra	northern red oak	Tree			4															
Rhus copallinum	flameleaf sumac	shrub			1															
Salix nigra	black willow	Tree			16			31			17			22			23			
Taxodium distichum	bald cypress	Tree	121	121	141	121	121	146	128	128	132	32	32	36	32	32	32	33	33	33
Ulmus alata	winged elm	Tree			1															
Ulmus americana	American elm	Tree			2			4												
Unknown		Shrub or Tree			1	2	2	2	1	1	1	5	5	5	2	2	2	52	52	52
		Stem count	490	490	987	500	500	883	520	520	630	425	425	534	422	422	493	516	516	516
		size (ares)	20			20			20			20			20			20		
		size (ACRES)	0.49			0.49			0.49			0.49			0.49			0.49		
		Species count	12	12	22	12	12	21	11	11	18	12	12	18	11	11	15	12	12	12
		Stems per ACRE	991	991	1997	1012	1012	1787	1052	1052	1275	860	860	1081	854	854	998	1044	1044	1044

Appendix D

Hydrologic Data

Table 8. Verification of Support for the Restored Channel Stanley's Slough and Stanley's Slough II Restoration Sites, DMS Project Number 95356/95838		
Date of Data Collection	**Verification**	**Photo #**
11/20/14	Vegetation break, evidence of flow	1
11/11/15	Observation of flow, development of multiple channel threads	3
4/7/16	Observation of flow, development of multiple channel threads	4,5
11/15/19	Observation of flow, development of multiple channel threads	6
8/31/20	Vegetation break, evidence of multiple flow paths	7,8

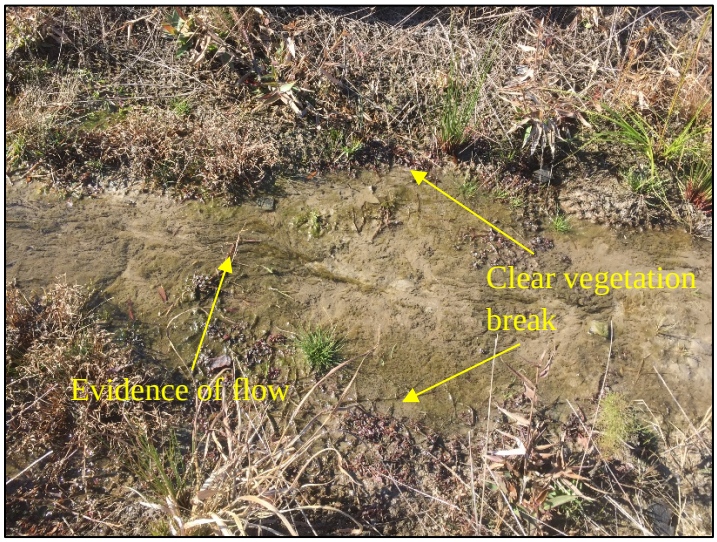


Photo 1. Evidence of flow in restored stream channel 11/20/14


Photo 2. Weir at Gauge 3 11/20/14

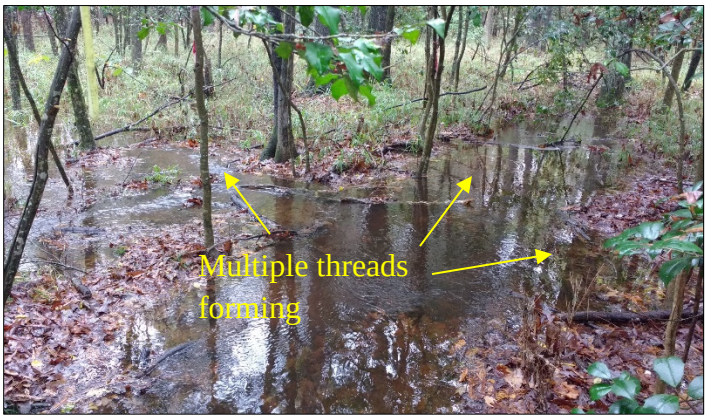


Photo 3. Development of multi-thread channel system 11/11/15

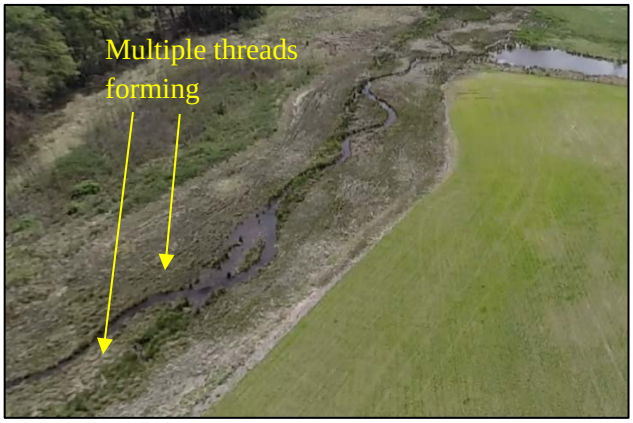


Photo 4. Development of multi-thread channel on T1 4/7/16

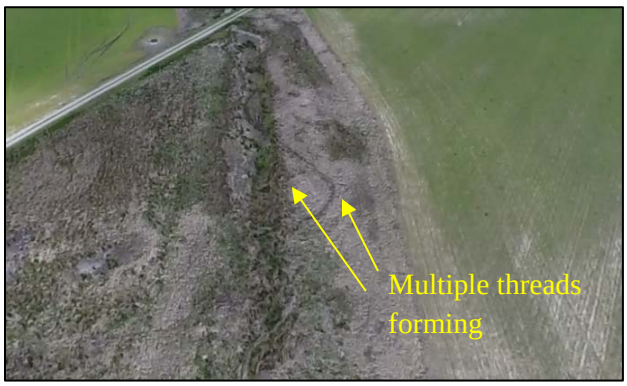


Photo 5. Development of multi thread channel on T2 4/7/16

Photo 6. Development of multi-thread channel on T2 11/15/19

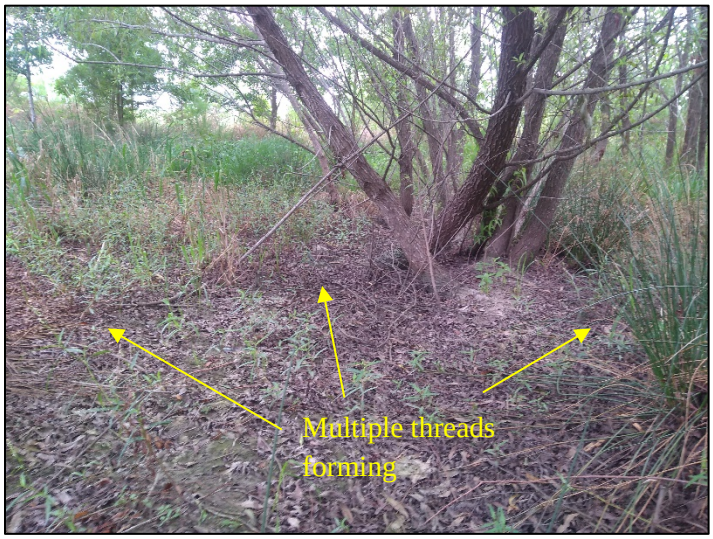


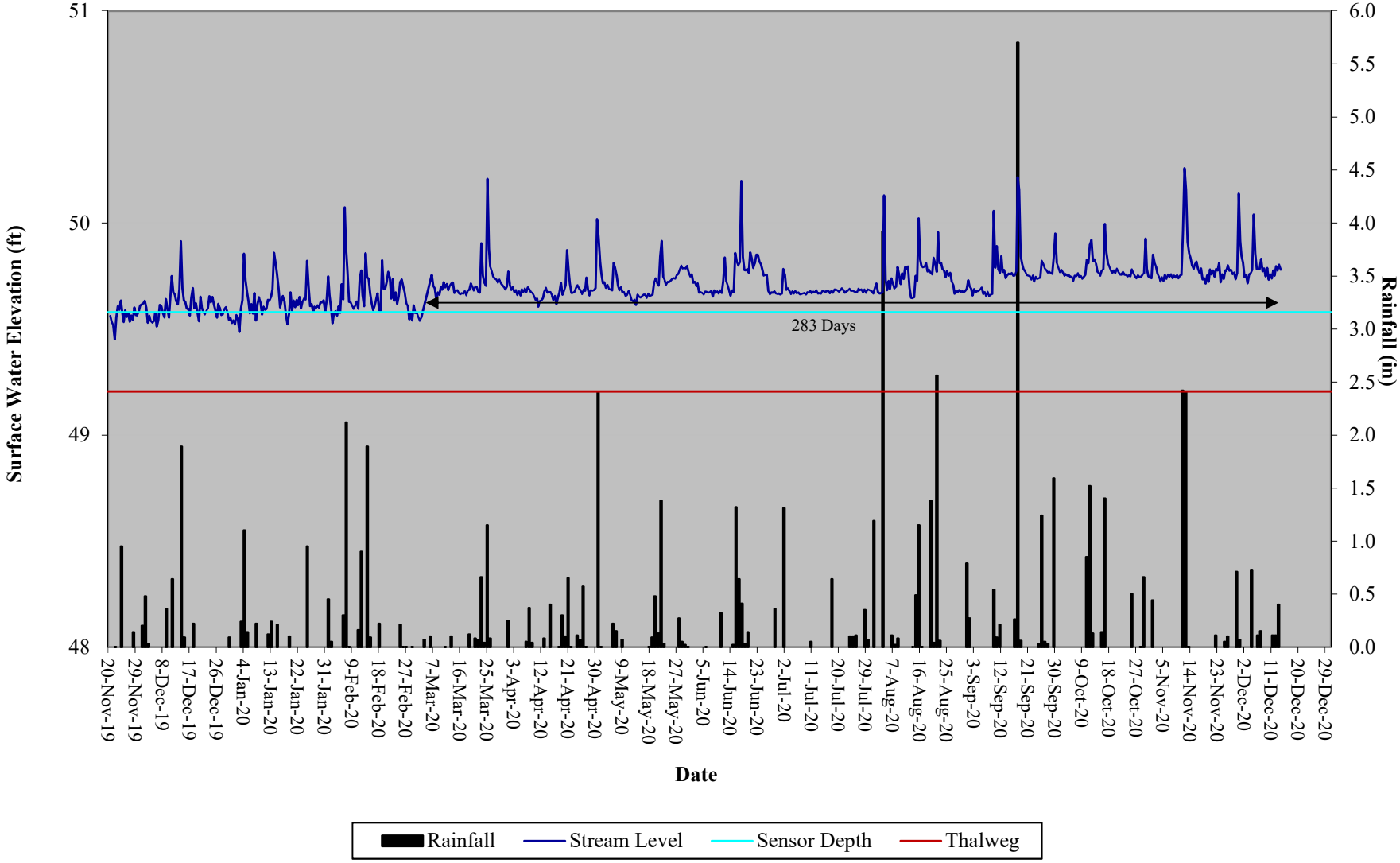
Photo 7. Development of multi-thread channel on T2 8/31/20

Photo 8. Development of multi-thread channel on T1 8/31/20

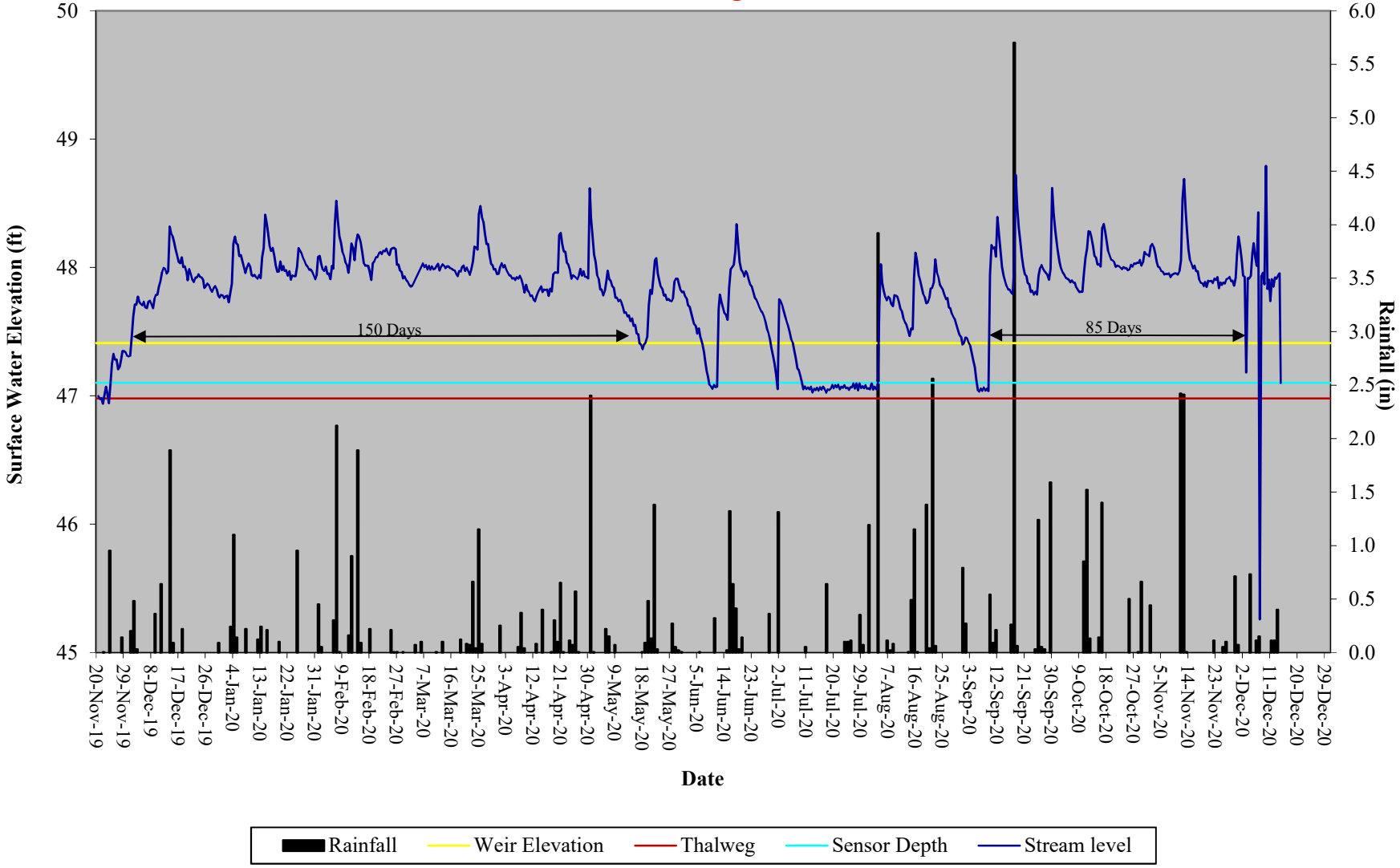
Photo 9. Development of multi-thread channel on T1 12/14/20

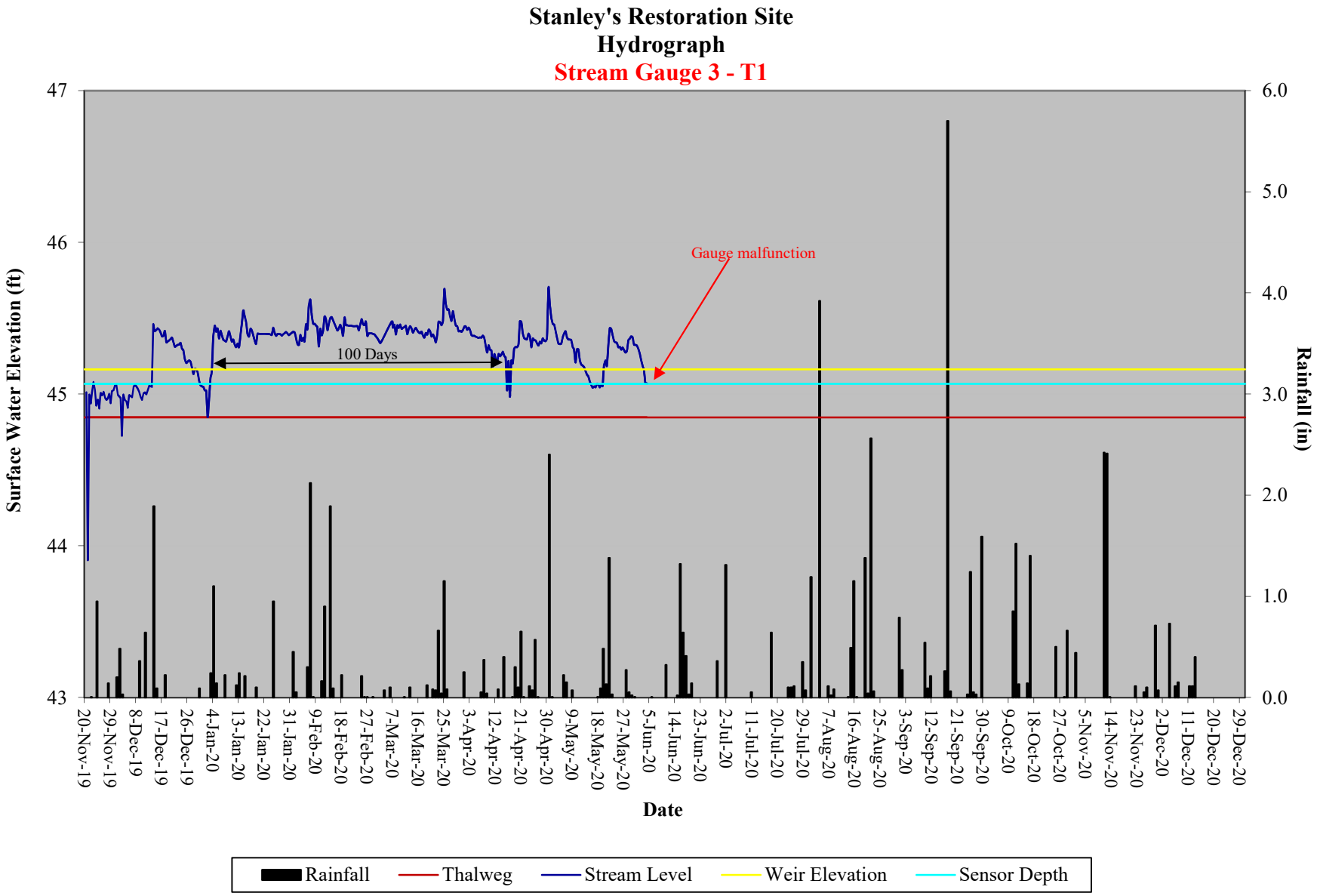
Photo 10. Development of multi-thread channel on T2 12/14/20

Stanley's Restoration Site
Hydrograph
Stream Gauge 1 - T1

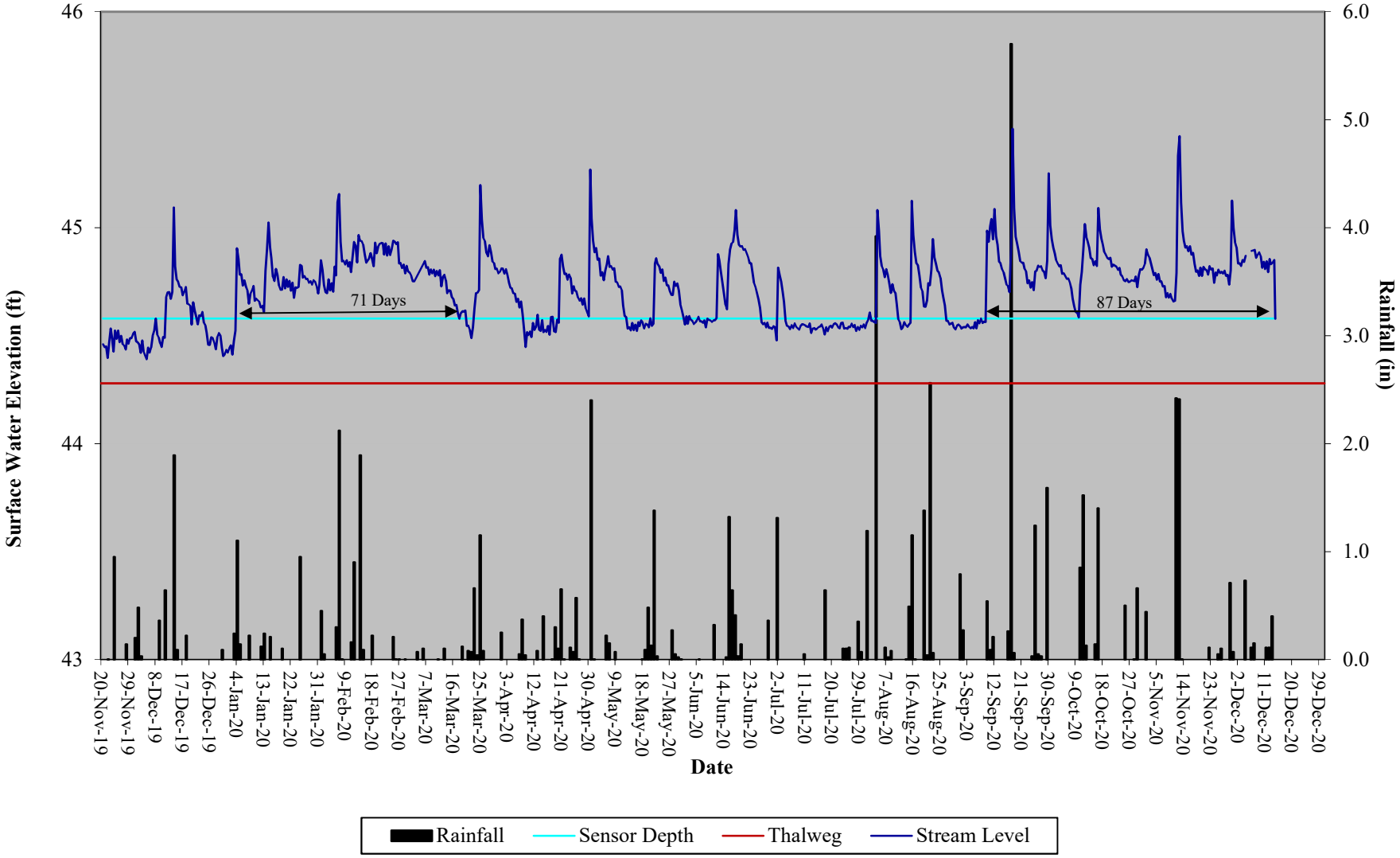


Stanley's Restoration Site
Hydrograph
Stream Gauge 2 - T1

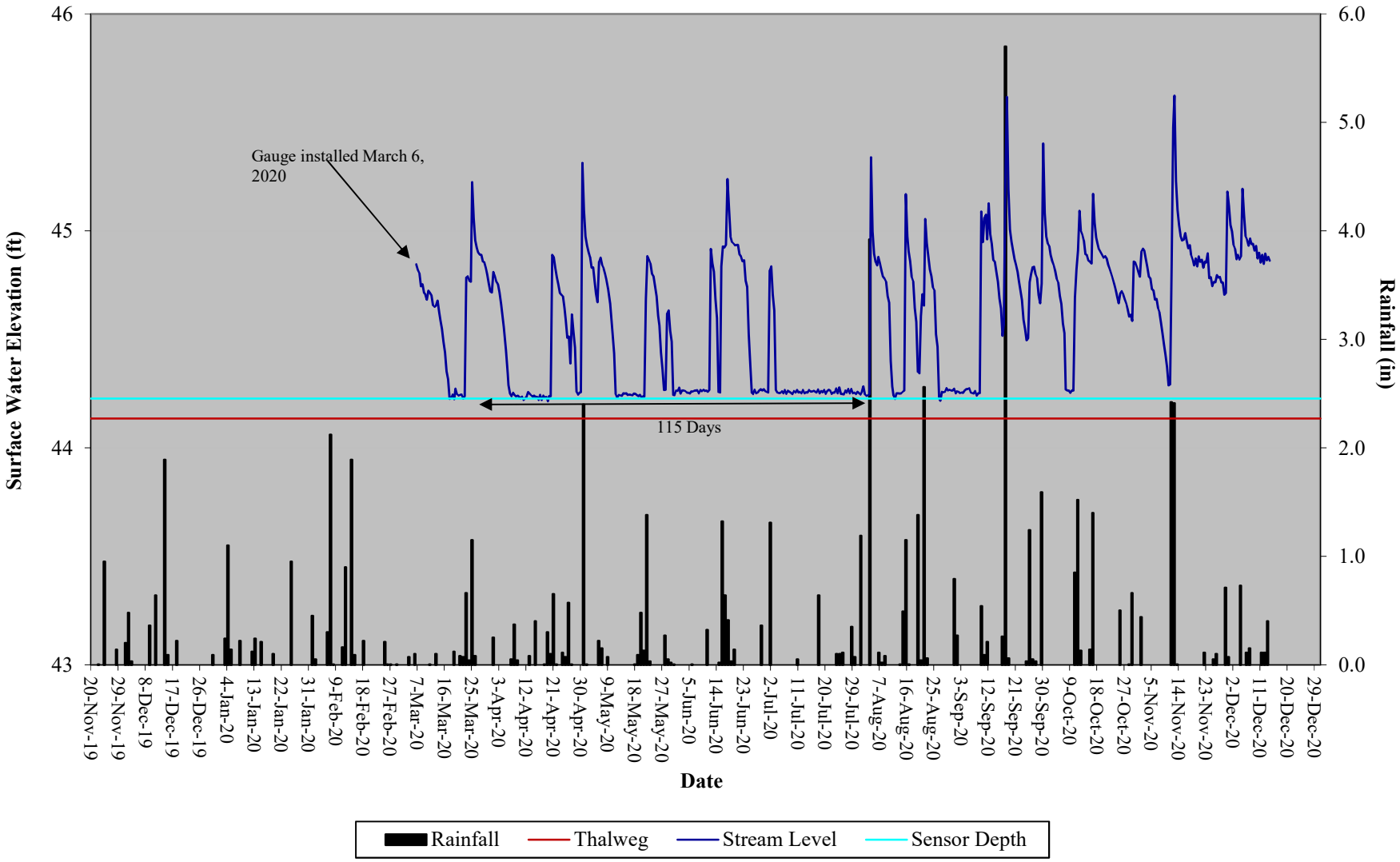



Stanley's Restoration Site
Hydrograph
Stream Gauge 3 - T1
Surface Water Elevation (ft)
Rainfall (in)
Gauge malfunction
100 Days
Date
Rainfall
Thalweg
Stream Level
Weir Elevation
Sensor Depth

Stanley's Restoration Site
Hydrograph
Stream Gauge 4 - T2



Stanley's Restoration Site
Hydrograph
Stream Gauge 5 - T2



Stanley's Restoration Site
Hydrograph
Stream Gauge 18 - T2

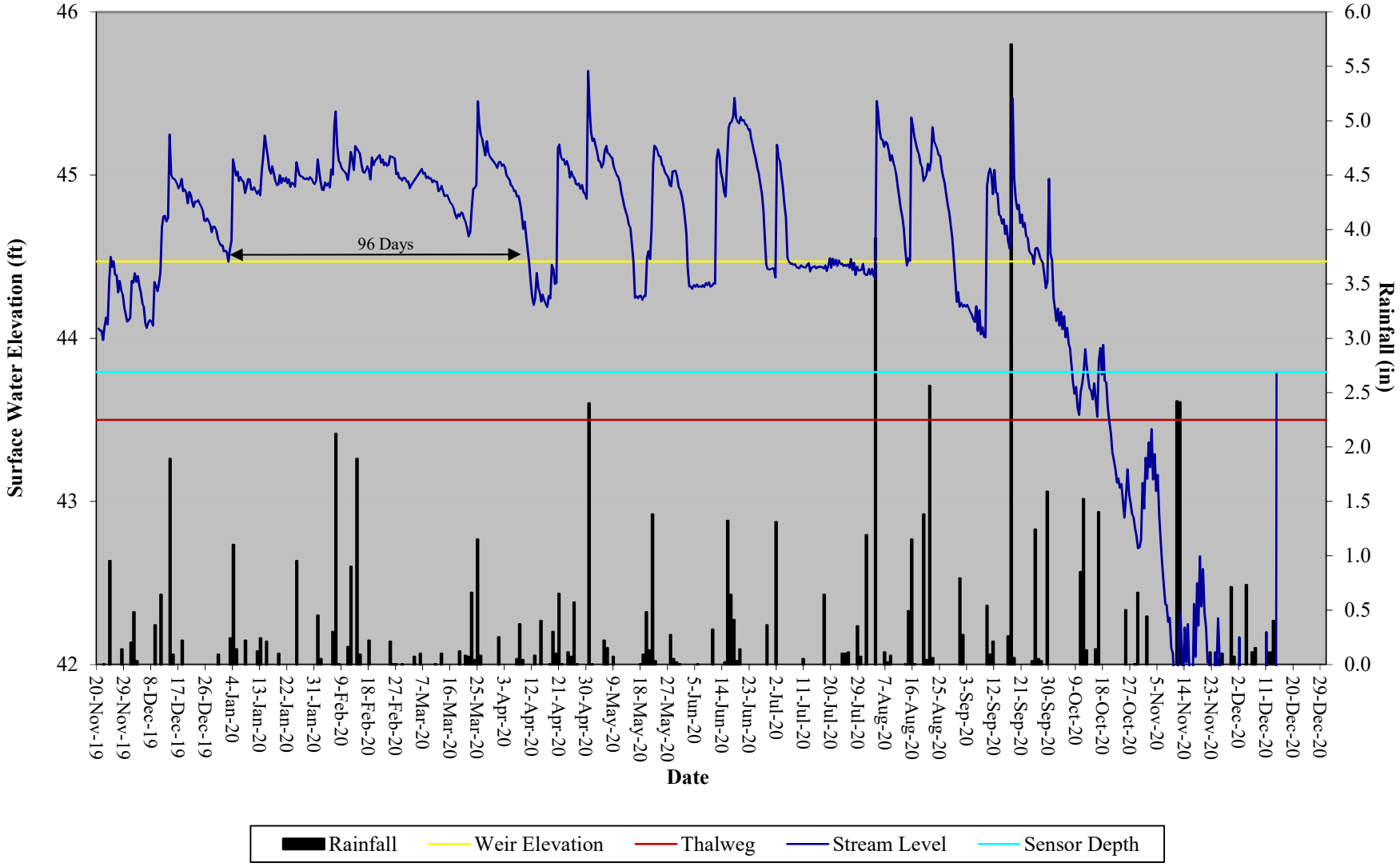
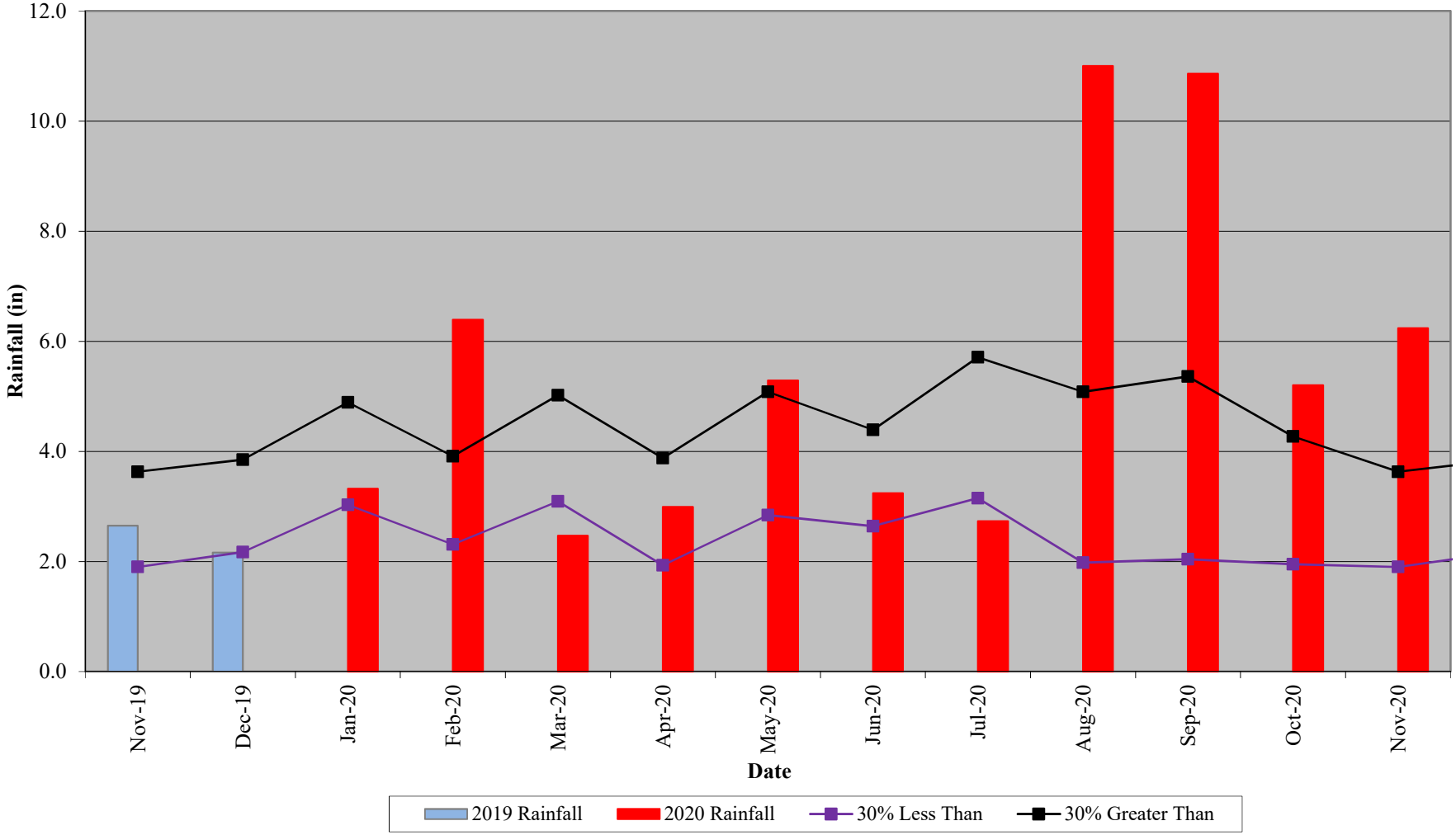


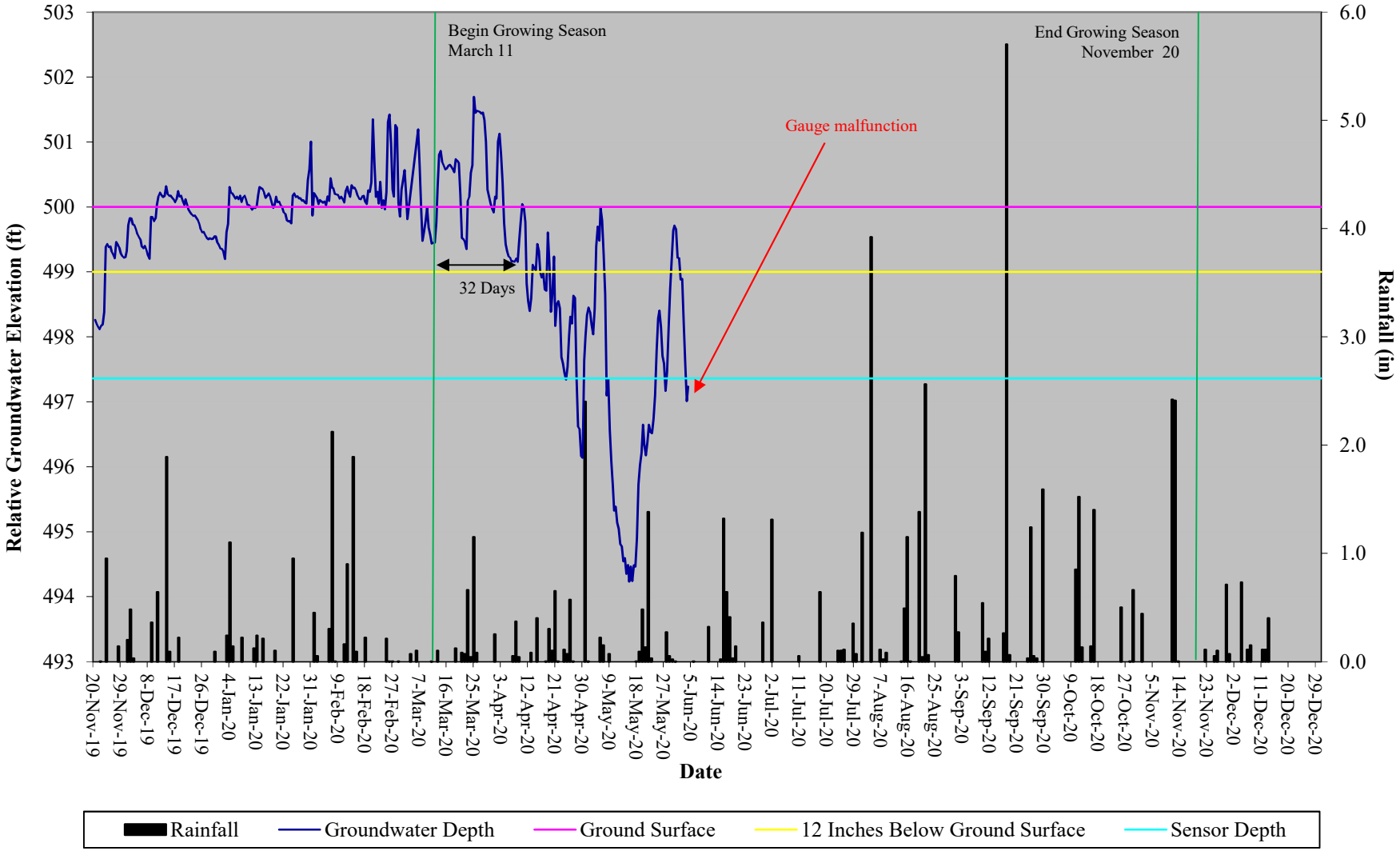
Table 9. Wetland Hydrology Criteria Attainment Stanley's Slough and Stanley's Slough II Restoration Sites, DMS Project Number 95356/95838								
		Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)						
Location	Gauge	MY01 (2014)	MY02 (2015)	MY03 (2016)	MY04 (2017)	MY05 (2018)	MY06 (2019)	MY07 (2020)
SII Res.	6	No/10 (3.7%)	Yes/56 (24.8%)	Yes/34 (13.3%)	Yes/30 (11.8%)	Yes/42 (16.3%)	Yes/49 (19.0%)	Yes/32 (12.4%)
SII Res.	7	No/12 (4.5%)	Yes/25 (9.8%)	Yes/33 (12.7%)	No/14 (5.3%)	No/18 (7.1%)	Yes/39 (15.1%)	Yes/65 (25.3%)
SII Res.	8	Yes/44 (17.3%)	Yes/60 (26.6%)	Yes/61 (23.9%)	Yes/68 (26.7%)	Yes/55 (21.4%)	Yes/51 (20.0%)	Yes/42 (16.5%)
SII Reh.	9	Yes/61 (23.9%)	Yes/97 (43.3%)	Yes/96 (37.5%)	Yes/85 (33.3%)	Yes/90 (35.1%)	Yes/69 (27.1%)	Yes/73 (28.4%)
SII Res.	10	Yes/48 (18.8%)	Yes/64 (28.6%)	Yes/67 (26.3%)	Yes/36 (13.9%)	Yes/53 (20.8%)	Yes/50 (19.4%)	Yes/42 (16.3%)
SII Res.	11	Yes/44 (17.3%)	Yes/45 (20.1%)	Yes/40 (15.7%)	No/10 (3.9%)	Yes/41 (15.9%)	Yes/44 (17.1%)	Yes/31 (12.0%)
SSS Res.	12	Yes/45 (17.5%)	Yes/55 (24.3%)	Yes/42 (16.5%)	Yes/32 (12.5%)	Yes/54 (21.2%)	Yes/49 (19.0%)	Yes/73 (28.4%)
SSS Res.	13	Yes/58 (22.7%)	Yes/63 (27.9%)	Yes/78 (30.4%)	Yes/53 (20.8%)	Yes/54 (21.2%)	Yes/54 (21.0%)	Yes/73 (28.4%)
SSS Res.	14	Yes/44 (17.3%)	Yes/54 (24.1%)	Yes/40 (15.5%)	Yes/31 (12.2%)	Yes/42 (16.5%)	Yes/48 (18.6%)	Yes/41 (16.1%)
SSS Reh.	15	Yes/62 (24.1%)	Yes/69 (30.6%)	Yes/133 (52.2%)	Yes/97 (37.8%)	Yes/99 (38.8%)	Yes/65 (25.5%)	Yes/91 (35.7%)
SII Res.	16	Yes/56 (22.0%)	Yes/64 (28.3%)	Yes/97 (37.8%)	Yes/69 (26.9%)	Yes/62 (24.3%)	Yes/54 (21.0%)	Yes/73 (28.4%)
SII Res.	17	Yes/47 (18.4%)	Yes/56 (24.8%)	Yes/30 (11.8%)	No/11 (4.1%)	Yes/25 (9.8%)	Yes/47 (18.4%)	Yes/42 (16.5%)
SII Res.	19	-	-	-	-	Yes/26 (10.0%)	Yes/49 (19.0%)	Yes/29 (11.2%)
SII Res.	20	-	-	-	-	No/18 (7.1%)	Yes/25 (9.6%)	No/13 (5.1%)
SII Res.	21	-	-	-	-	Yes/30 (11.8%)	Yes/51 (20.0%)	Yes/27 (10.6%)
Reference	Reference	-	Yes/43 (16.9%)	Yes/77 (30.2%)	Yes/37 (14.3%)	Yes/54 (21.0%)	Yes/49 (19.0%)	Yes/30 (11.6%)

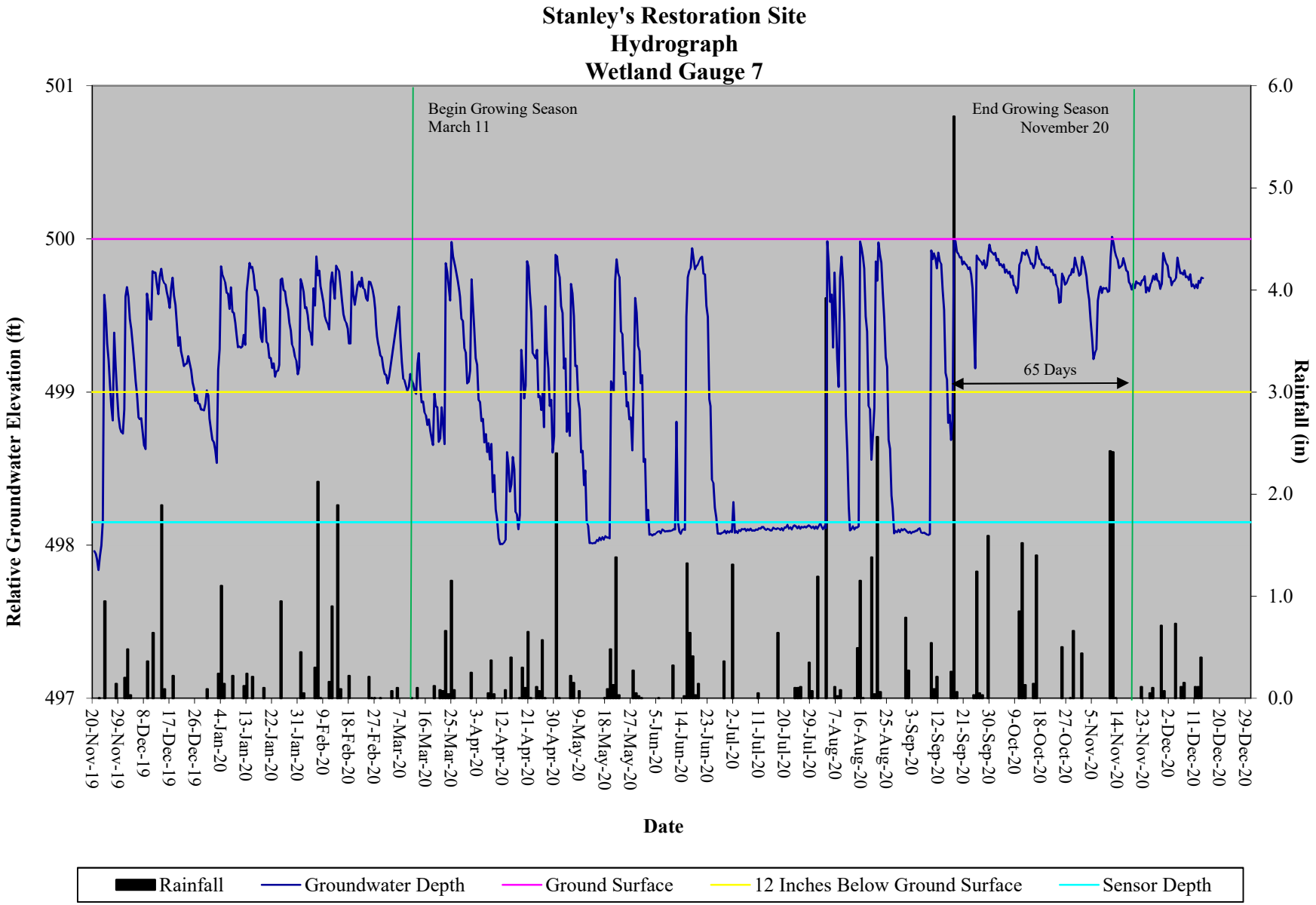
Res. = Wetland Reestablishment, Reh. = Wetland Rehabilitation

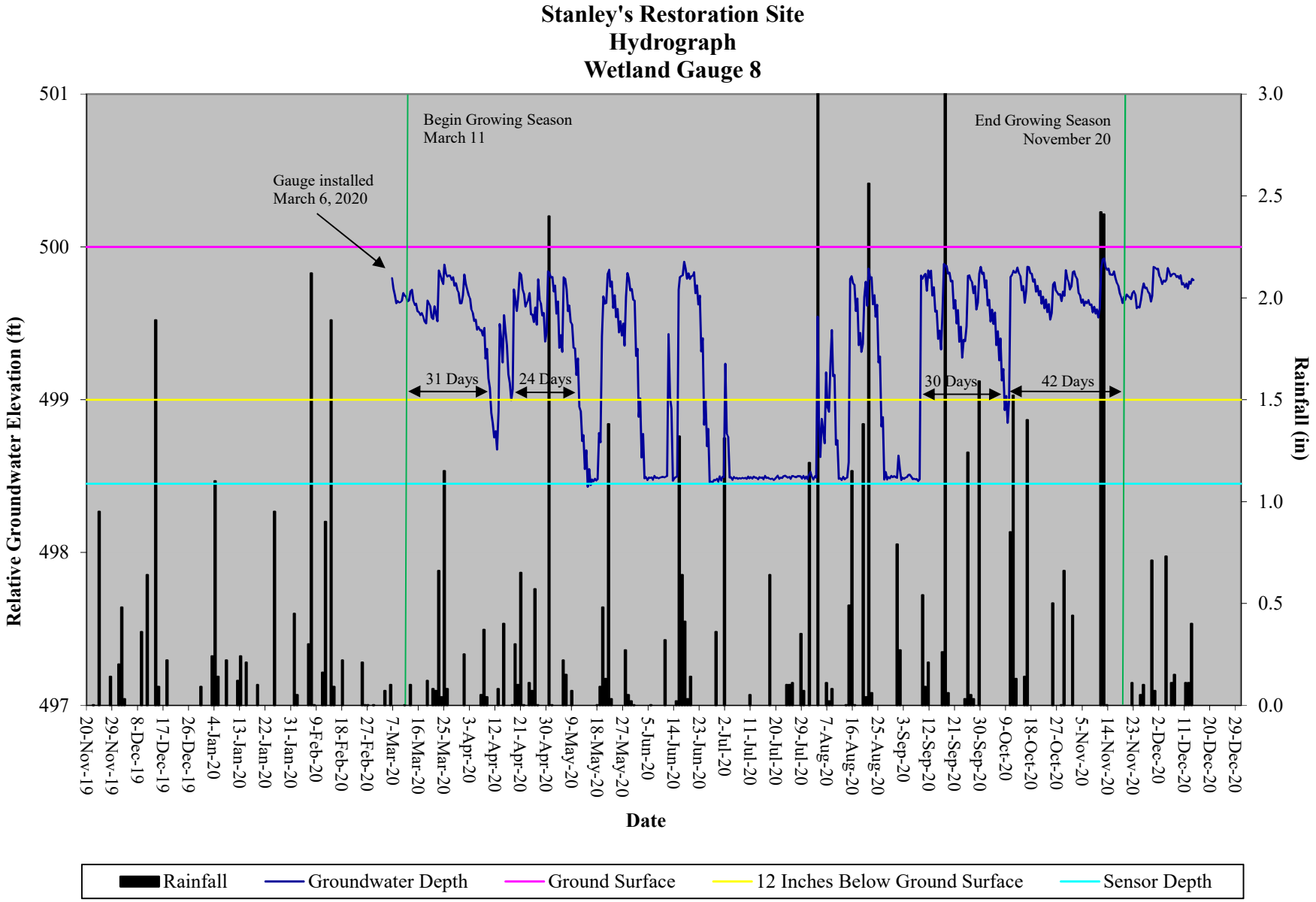
Stanley's Slough/Stanley's II Restoration Site
30-70 Percentile Graph
WETS Station Name: Emporia Greensville Regional Airport

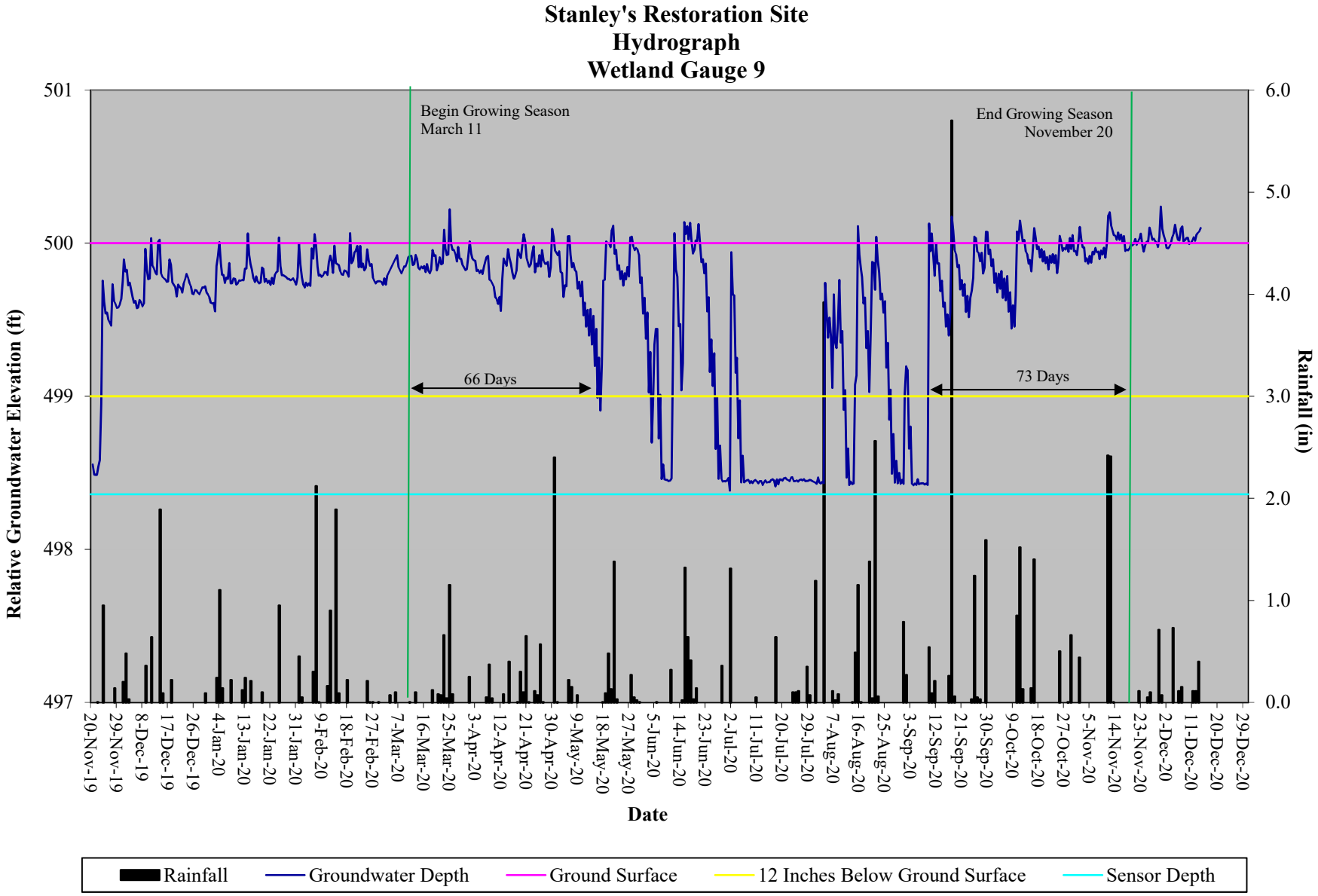


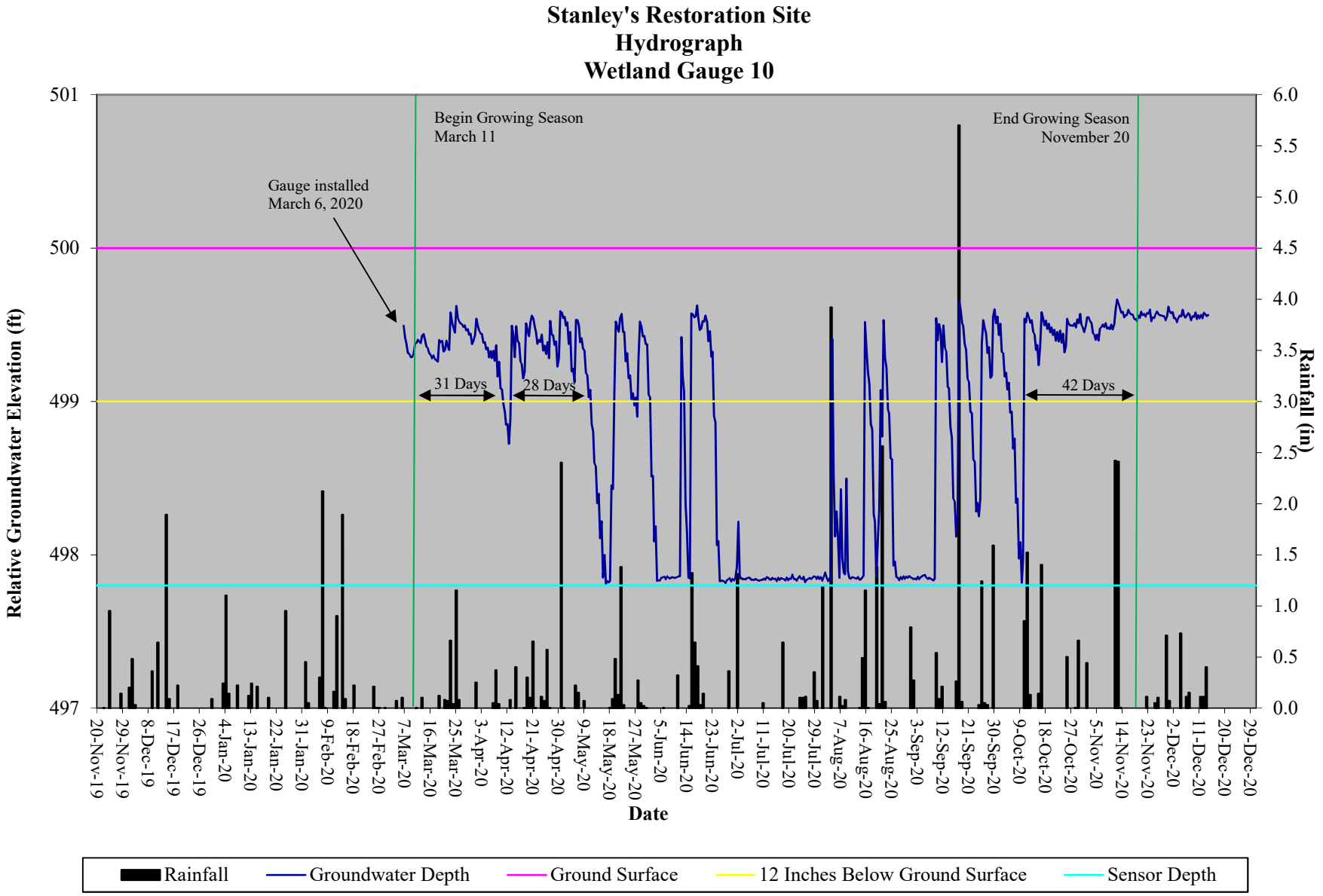
Stanley's Restoration Site
Hydrograph
Wetland Gauge 6

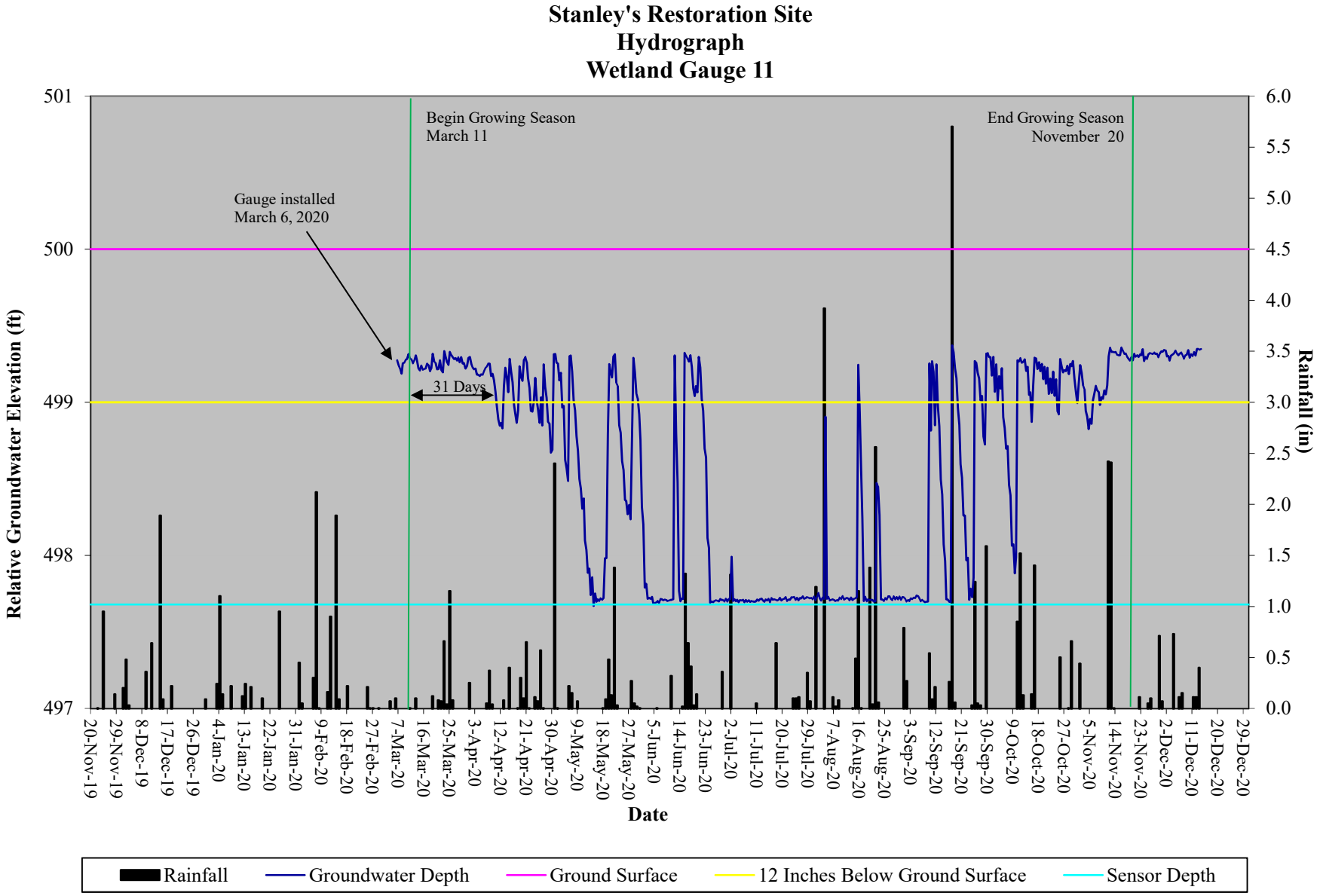


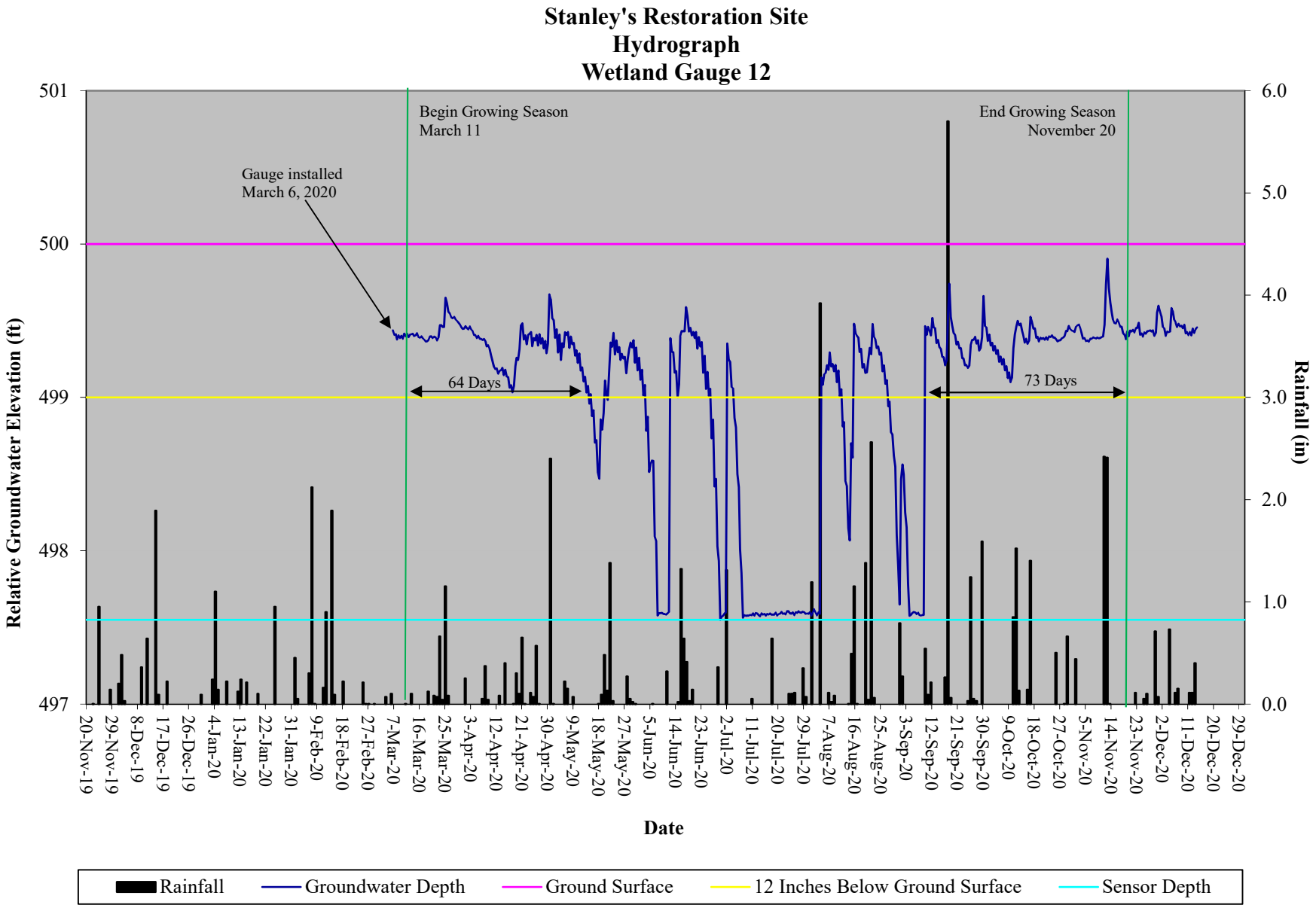

Stanley's Restoration Site
Hydrograph
Wetland Gauge 7
Begin Growing Season
March 11
End Growing Season
November 20
65 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
501
500
499
498
497
6.0
5.0
4.0
3.0
2.0
1.0
0.0
20-Nov-19
29-Nov-19
8-Dec-19
17-Dec-19
26-Dec-19
4-Jan-20
13-Jan-20
22-Jan-20
31-Jan-20
9-Feb-20
18-Feb-20
27-Feb-20
7-Mar-20
16-Mar-20
25-Mar-20
3-Apr-20
12-Apr-20
21-Apr-20
30-Apr-20
9-May-20
18-May-20
27-May-20
5-Jun-20
14-Jun-20
23-Jun-20
2-Jul-20
11-Jul-20
20-Jul-20
29-Jul-20
7-Aug-20
16-Aug-20
25-Aug-20
3-Sep-20
12-Sep-20
21-Sep-20
30-Sep-20
9-Oct-20
18-Oct-20
27-Oct-20
5-Nov-20
14-Nov-20
23-Nov-20
2-Dec-20
11-Dec-20
20-Dec-20
29-Dec-20
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

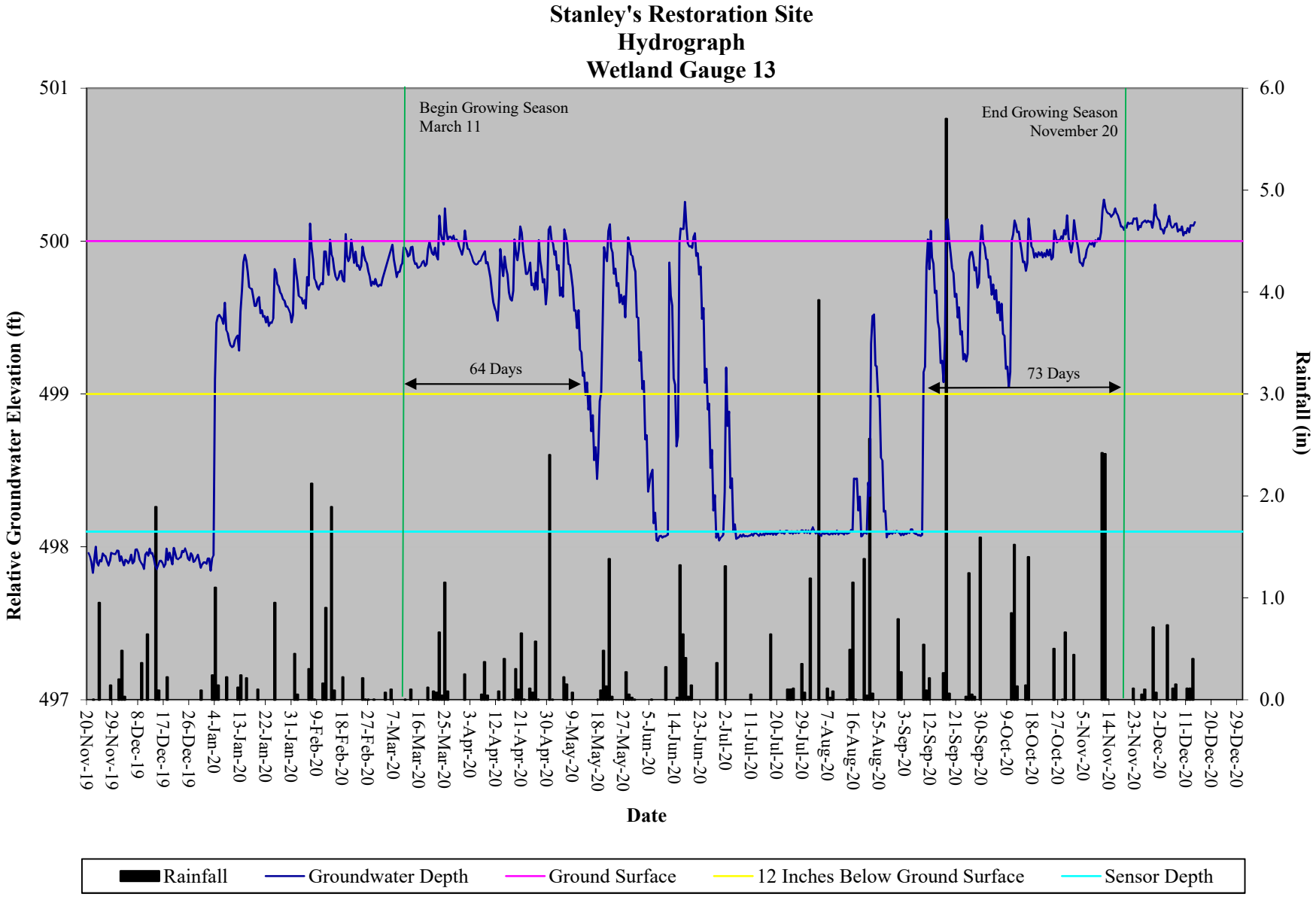

Stanley's Restoration Site
Hydrograph
Wetland Gauge 8
Begin Growing Season
March 11
End Growing Season
November 20
Gauge installed
March 6, 2020
31 Days
24 Days
30 Days
42 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 9
Begin Growing Season
March 11
End Growing Season
November 20
66 Days
73 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
501
500
499
498
497
6.0
5.0
4.0
3.0
2.0
1.0
0.0
20-Nov-19
29-Nov-19
8-Dec-19
17-Dec-19
26-Dec-19
4-Jan-20
13-Jan-20
22-Jan-20
31-Jan-20
9-Feb-20
18-Feb-20
27-Feb-20
7-Mar-20
16-Mar-20
25-Mar-20
3-Apr-20
12-Apr-20
21-Apr-20
30-Apr-20
9-May-20
18-May-20
27-May-20
5-Jun-20
14-Jun-20
23-Jun-20
2-Jul-20
11-Jul-20
20-Jul-20
29-Jul-20
7-Aug-20
16-Aug-20
25-Aug-20
3-Sep-20
12-Sep-20
21-Sep-20
30-Sep-20
9-Oct-20
18-Oct-20
27-Oct-20
5-Nov-20
14-Nov-20
23-Nov-20
2-Dec-20
11-Dec-20
20-Dec-20
29-Dec-20
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

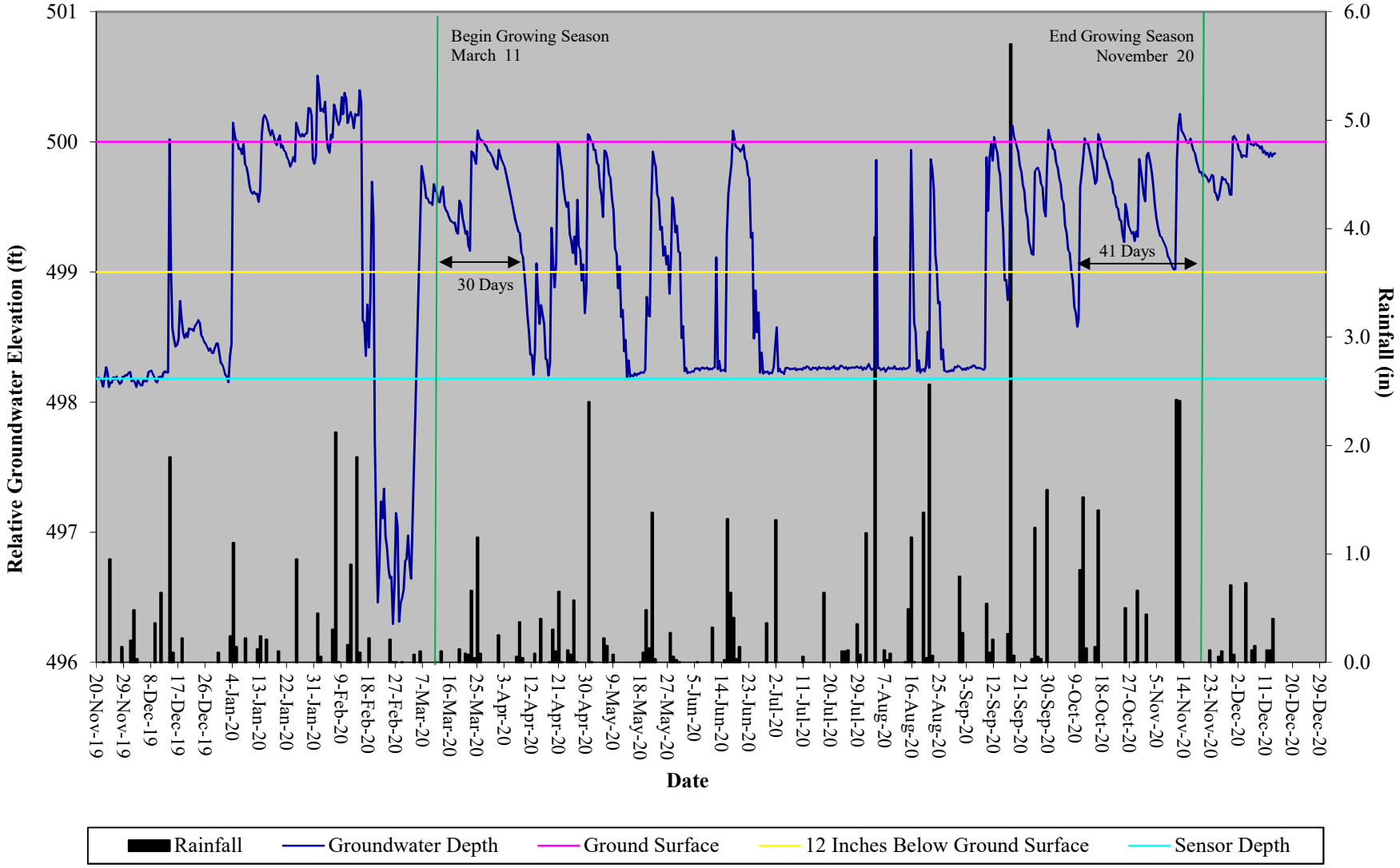

Stanley's Restoration Site
Hydrograph
Wetland Gauge 10
Begin Growing Season
March 11
End Growing Season
November 20
Gauge installed
March 6, 2020
31 Days
28 Days
42 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
501
500
499
498
497
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
20-Nov-19
29-Nov-19
8-Dec-19
17-Dec-19
26-Dec-19
4-Jan-20
13-Jan-20
22-Jan-20
31-Jan-20
9-Feb-20
18-Feb-20
27-Feb-20
7-Mar-20
16-Mar-20
25-Mar-20
3-Apr-20
12-Apr-20
21-Apr-20
30-Apr-20
9-May-20
18-May-20
27-May-20
5-Jun-20
14-Jun-20
23-Jun-20
2-Jul-20
11-Jul-20
20-Jul-20
29-Jul-20
7-Aug-20
16-Aug-20
25-Aug-20
3-Sep-20
12-Sep-20
21-Sep-20
30-Sep-20
9-Oct-20
18-Oct-20
27-Oct-20
5-Nov-20
14-Nov-20
23-Nov-20
2-Dec-20
11-Dec-20
20-Dec-20
29-Dec-20
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

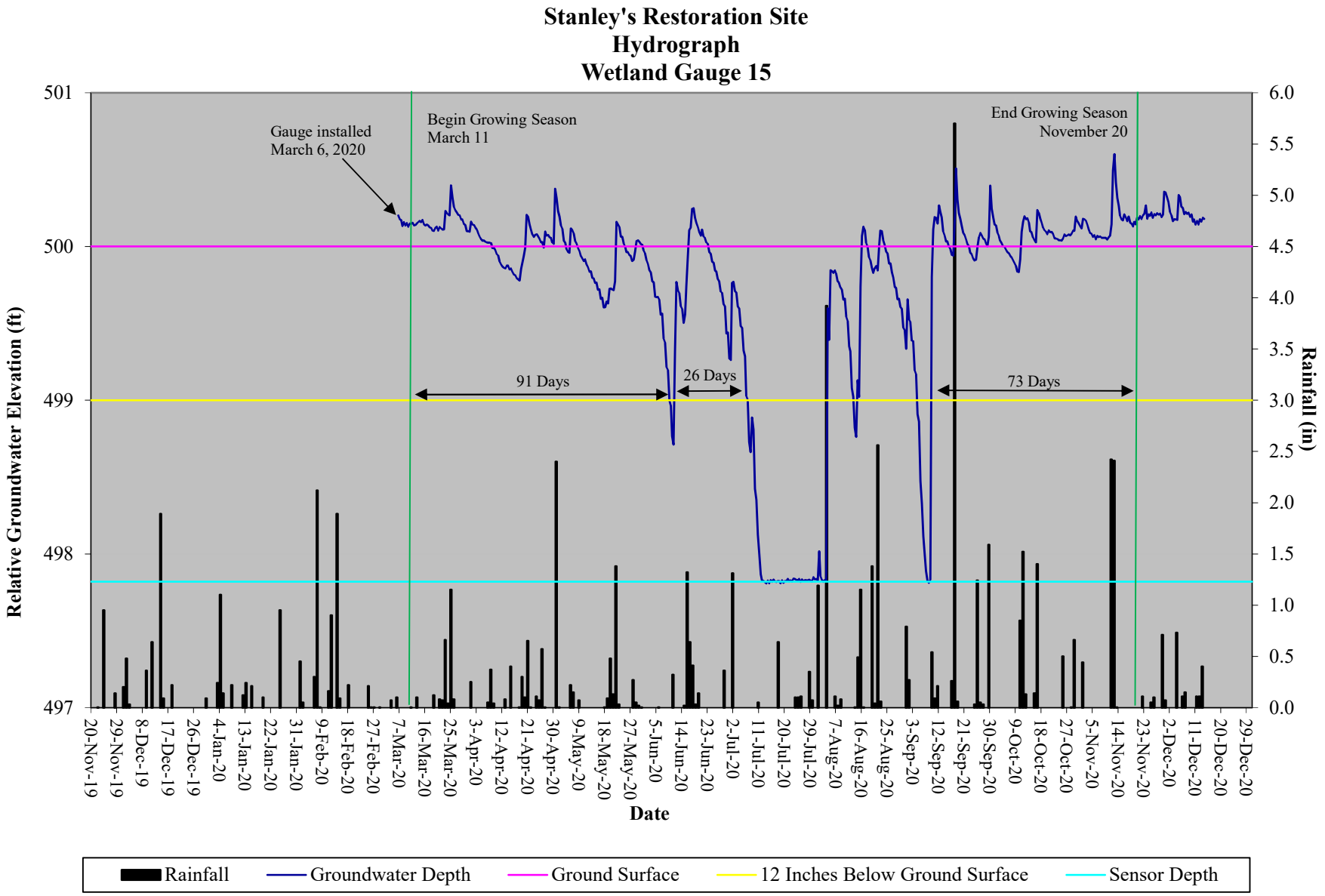

Stanley's Restoration Site
Hydrograph
Wetland Gauge 11
Begin Growing Season
March 11
End Growing Season
November 20
Gauge installed
March 6, 2020
31 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
501
500
499
498
497
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
20-Nov-19
29-Nov-19
8-Dec-19
17-Dec-19
26-Dec-19
4-Jan-20
13-Jan-20
22-Jan-20
31-Jan-20
9-Feb-20
18-Feb-20
27-Feb-20
7-Mar-20
16-Mar-20
25-Mar-20
3-Apr-20
12-Apr-20
21-Apr-20
30-Apr-20
9-May-20
18-May-20
27-May-20
5-Jun-20
14-Jun-20
23-Jun-20
2-Jul-20
11-Jul-20
20-Jul-20
29-Jul-20
7-Aug-20
16-Aug-20
25-Aug-20
3-Sep-20
12-Sep-20
21-Sep-20
30-Sep-20
9-Oct-20
18-Oct-20
27-Oct-20
5-Nov-20
14-Nov-20
23-Nov-20
2-Dec-20
11-Dec-20
20-Dec-20
29-Dec-20
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

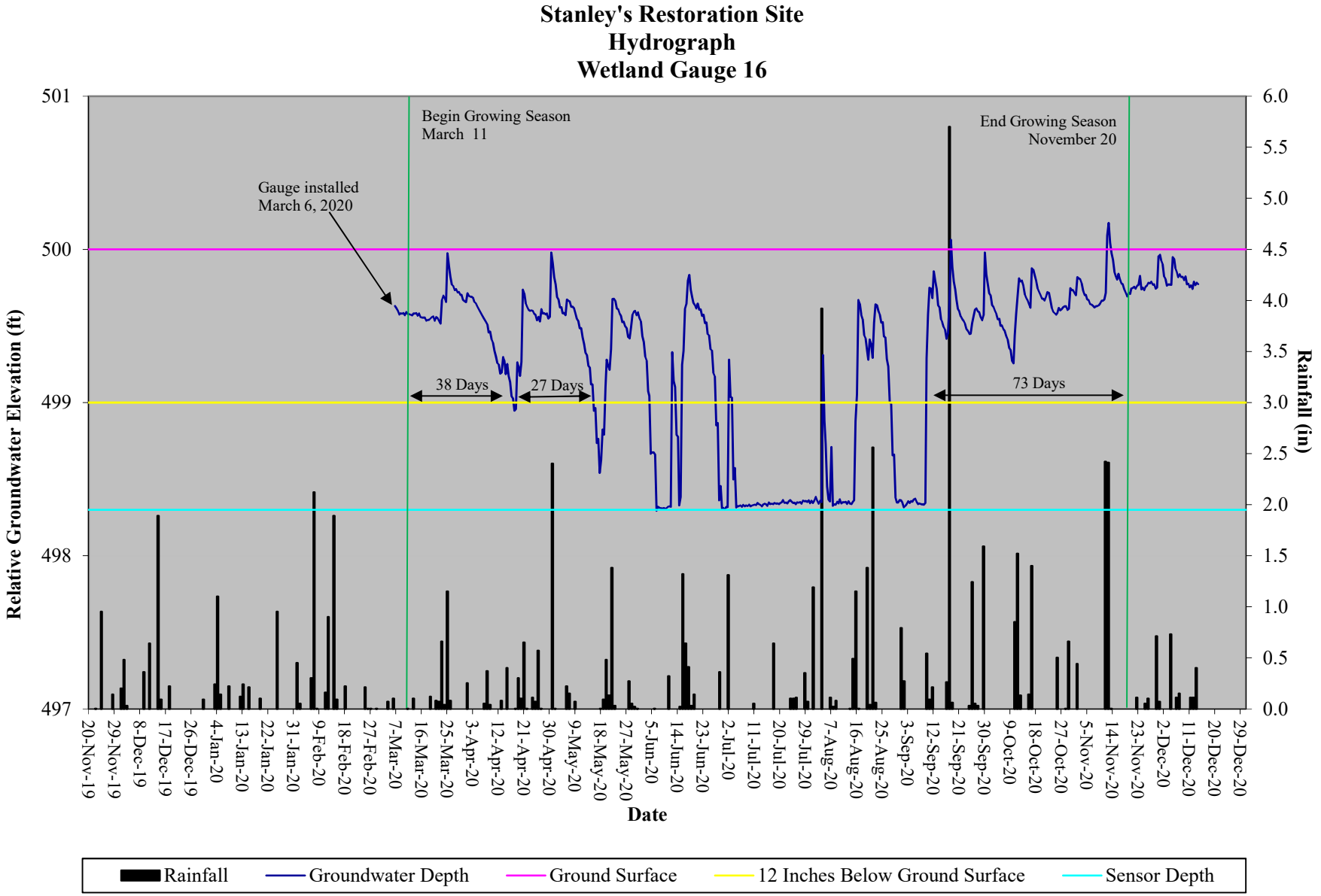

Stanley's Restoration Site
Hydrograph
Wetland Gauge 12
Begin Growing Season
March 11
End Growing Season
November 20
Gauge installed
March 6, 2020
64 Days
73 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
501
500
499
498
497
6.0
5.0
4.0
3.0
2.0
1.0
0.0
20-Nov-19
29-Nov-19
8-Dec-19
17-Dec-19
26-Dec-19
4-Jan-20
13-Jan-20
22-Jan-20
31-Jan-20
9-Feb-20
18-Feb-20
27-Feb-20
7-Mar-20
16-Mar-20
25-Mar-20
3-Apr-20
12-Apr-20
21-Apr-20
30-Apr-20
9-May-20
18-May-20
27-May-20
5-Jun-20
14-Jun-20
23-Jun-20
2-Jul-20
11-Jul-20
20-Jul-20
29-Jul-20
7-Aug-20
16-Aug-20
25-Aug-20
3-Sep-20
12-Sep-20
21-Sep-20
30-Sep-20
9-Oct-20
18-Oct-20
27-Oct-20
5-Nov-20
14-Nov-20
23-Nov-20
2-Dec-20
11-Dec-20
20-Dec-20
29-Dec-20
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

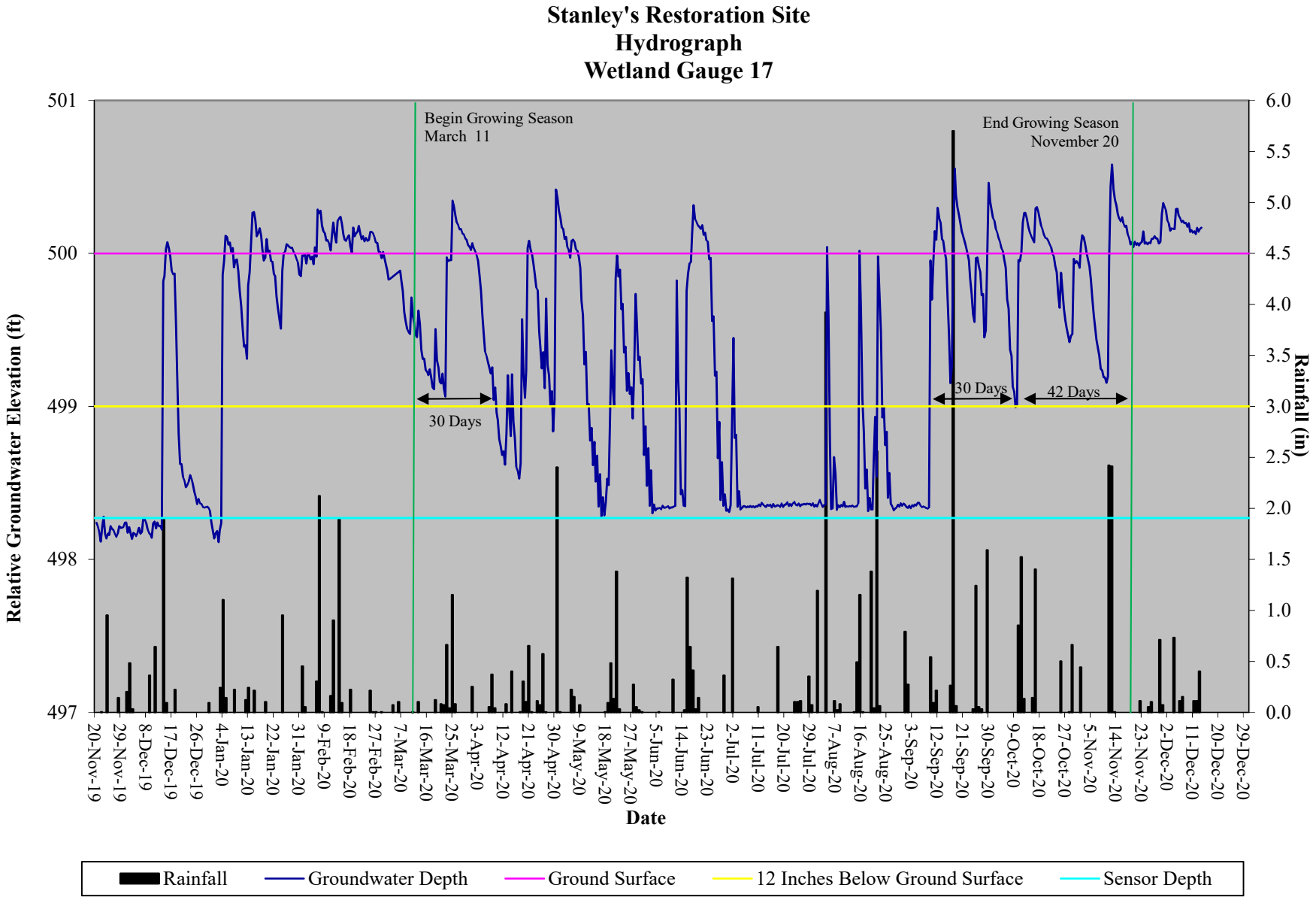

Stanley's Restoration Site
Hydrograph
Wetland Gauge 13
Begin Growing Season
March 11
End Growing Season
November 20
64 Days
73 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
501
500
499
498
497
6.0
5.0
4.0
3.0
2.0
1.0
0.0
20-Nov-19
29-Nov-19
8-Dec-19
17-Dec-19
26-Dec-19
4-Jan-20
13-Jan-20
22-Jan-20
31-Jan-20
9-Feb-20
18-Feb-20
27-Feb-20
7-Mar-20
16-Mar-20
25-Mar-20
3-Apr-20
12-Apr-20
21-Apr-20
30-Apr-20
9-May-20
18-May-20
27-May-20
5-Jun-20
14-Jun-20
23-Jun-20
2-Jul-20
11-Jul-20
20-Jul-20
29-Jul-20
7-Aug-20
16-Aug-20
25-Aug-20
3-Sep-20
12-Sep-20
21-Sep-20
30-Sep-20
9-Oct-20
18-Oct-20
27-Oct-20
5-Nov-20
14-Nov-20
23-Nov-20
2-Dec-20
11-Dec-20
20-Dec-20
29-Dec-20
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

Stanley's Restoration Site
Hydrograph
Wetland Gauge 14

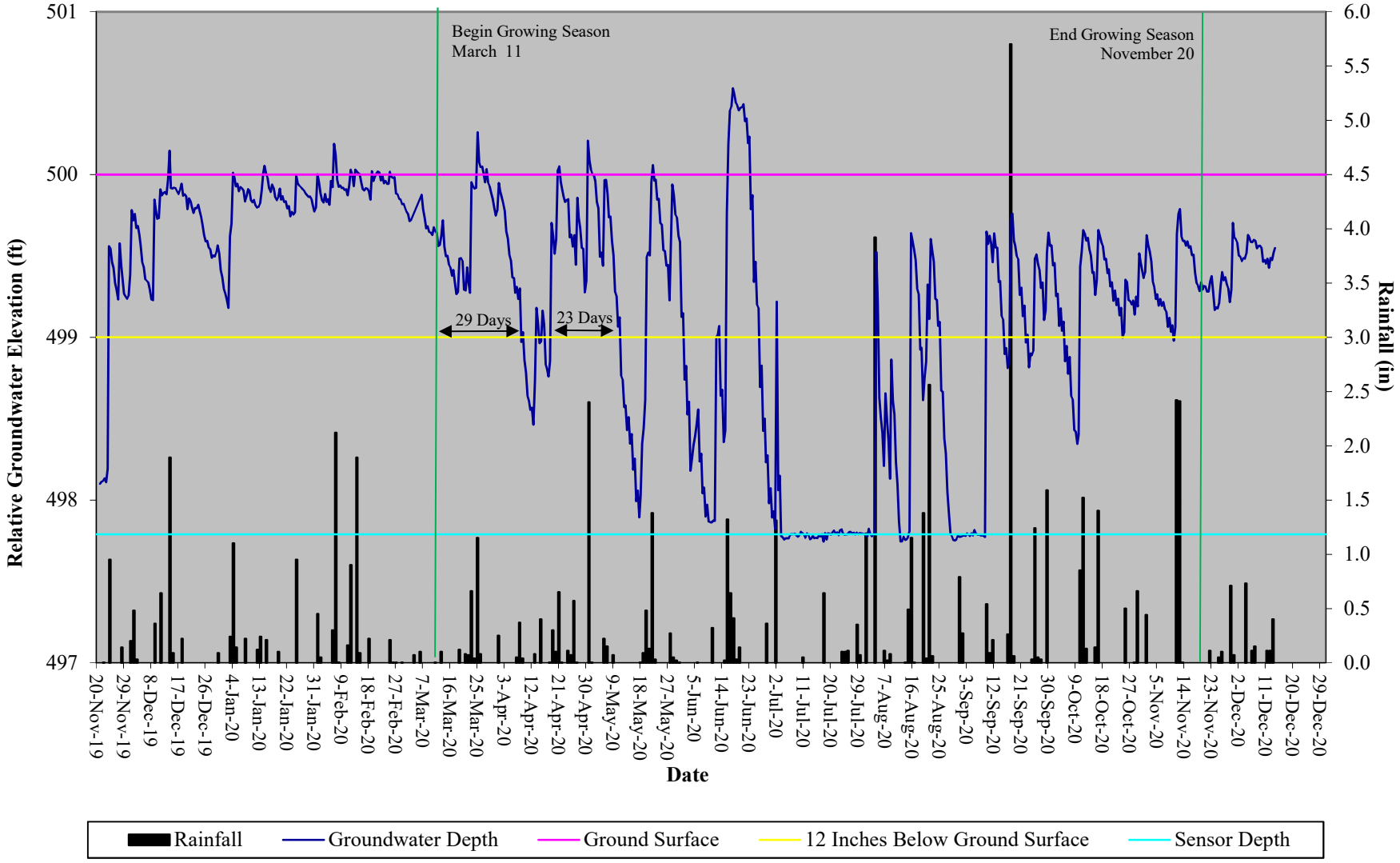


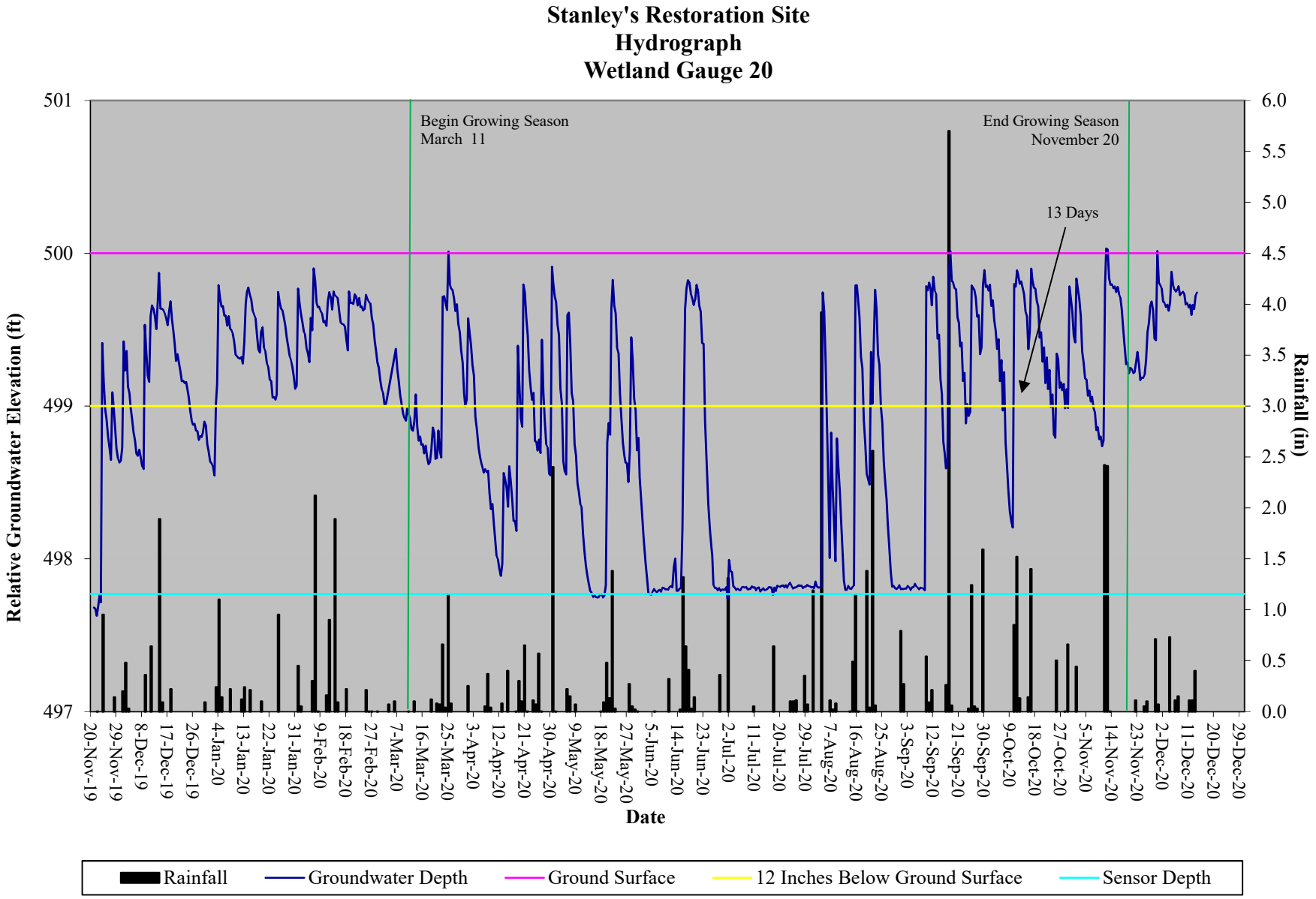

Stanley's Restoration Site
Hydrograph
Wetland Gauge 15
Gauge installed
March 6, 2020
Begin Growing Season
March 11
End Growing Season
November 20
91 Days
26 Days
73 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

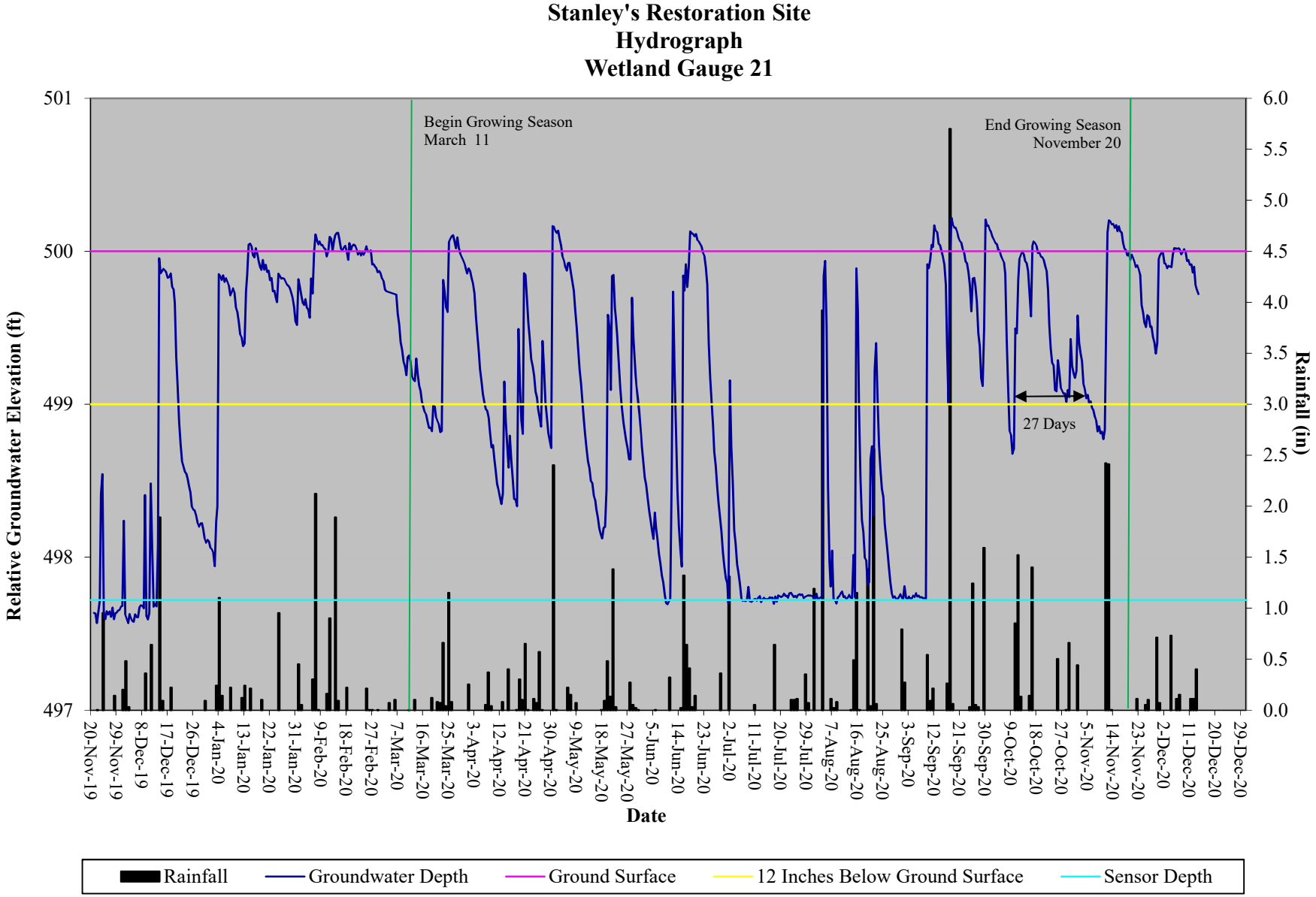

Stanley's Restoration Site
Hydrograph
Wetland Gauge 16
Begin Growing Season
March 11
End Growing Season
November 20
Gauge installed
March 6, 2020
38 Days
27 Days
73 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 17
Begin Growing Season
March 11
End Growing Season
November 20
30 Days
30 Days
42 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
501
500
499
498
497
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
20-Nov-19
29-Nov-19
8-Dec-19
17-Dec-19
26-Dec-19
4-Jan-20
13-Jan-20
22-Jan-20
31-Jan-20
9-Feb-20
18-Feb-20
27-Feb-20
7-Mar-20
16-Mar-20
25-Mar-20
3-Apr-20
12-Apr-20
21-Apr-20
30-Apr-20
9-May-20
18-May-20
27-May-20
5-Jun-20
14-Jun-20
23-Jun-20
2-Jul-20
11-Jul-20
20-Jul-20
29-Jul-20
7-Aug-20
16-Aug-20
25-Aug-20
3-Sep-20
12-Sep-20
21-Sep-20
30-Sep-20
9-Oct-20
18-Oct-20
27-Oct-20
5-Nov-20
14-Nov-20
23-Nov-20
2-Dec-20
11-Dec-20
20-Dec-20
29-Dec-20
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

Stanley's Restoration Site
Hydrograph
Wetland Gauge 19




Stanley's Restoration Site
Hydrograph
Wetland Gauge 20
Begin Growing Season
March 11
End Growing Season
November 20
13 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
501
500
499
498
497
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
20-Nov-19
29-Nov-19
8-Dec-19
17-Dec-19
26-Dec-19
4-Jan-20
13-Jan-20
22-Jan-20
31-Jan-20
9-Feb-20
18-Feb-20
27-Feb-20
7-Mar-20
16-Mar-20
25-Mar-20
3-Apr-20
12-Apr-20
21-Apr-20
30-Apr-20
9-May-20
18-May-20
27-May-20
5-Jun-20
14-Jun-20
23-Jun-20
2-Jul-20
11-Jul-20
20-Jul-20
29-Jul-20
7-Aug-20
16-Aug-20
25-Aug-20
3-Sep-20
12-Sep-20
21-Sep-20
30-Sep-20
9-Oct-20
18-Oct-20
27-Oct-20
5-Nov-20
14-Nov-20
23-Nov-20
2-Dec-20
11-Dec-20
20-Dec-20
29-Dec-20
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth


Stanley's Restoration Site
Hydrograph
Wetland Gauge 21
Begin Growing Season
March 11
End Growing Season
November 20
27 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
501
500
499
498
497
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
20-Nov-19
29-Nov-19
8-Dec-19
17-Dec-19
26-Dec-19
4-Jan-20
13-Jan-20
22-Jan-20
31-Jan-20
9-Feb-20
18-Feb-20
27-Feb-20
7-Mar-20
16-Mar-20
25-Mar-20
3-Apr-20
12-Apr-20
21-Apr-20
30-Apr-20
9-May-20
18-May-20
27-May-20
5-Jun-20
14-Jun-20
23-Jun-20
2-Jul-20
11-Jul-20
20-Jul-20
29-Jul-20
7-Aug-20
16-Aug-20
25-Aug-20
3-Sep-20
12-Sep-20
21-Sep-20
30-Sep-20
9-Oct-20
18-Oct-20
27-Oct-20
5-Nov-20
14-Nov-20
23-Nov-20
2-Dec-20
11-Dec-20
20-Dec-20
29-Dec-20
Rainfall
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth

Stanley's Restoration Site
Hydrograph
Reference Wetland Gauge