



MONITORING YEAR 4 ANNUAL REPORT

Final

LONE HICKORY MITIGATION SITE

Yadkin County, NC
DEQ Contract No. 6897
DMS Project No. 97135
DWR No. 20161044
USACE Action ID No. SAW-2017-00100
Yadkin River Basin
HUC 03040101

Data Collection Period: February – November 2022
Draft Submission Date: November 30, 2022
Final Submission Date: January 9, 2023

PREPARED FOR:



NC Department of Environmental Quality
Division of Mitigation Services
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January 9, 2023

Mr. Paul Wiesner
Western Regional Supervisor
NCDEQ – Division of Mitigation Services
Asheville Regional Office
2090 U.S. 70 Highway
Swannanoa, N.C. 28778-8211

RE: Lone Hickory Mitigation Site – Monitoring Year 4 Report Draft
Yadkin River Basin – CU# 03040101 – Yadkin County
DMS Project ID No. 97135
Contract # 6897

Dear Mr. Wiesner:

Wildlands Engineering, Inc. (Wildlands) has reviewed the Division of Mitigation Services' (DMS) comments from the Draft Monitoring Year (MY) 4 report for the Lone Hickory Mitigation Site. DMS' comments are noted below in **bold**. Wildlands' responses to those comments are noted in *italics*.

DMS' comment: General: Per the 12/8/2017 IRT approved mitigation plan; "If a gage does not meet the performance standard for a given monitoring year, rainfall patterns will be analyzed and the hydrograph will be compared to that of the reference wetlands to assess whether atypical weather conditions occurred during the monitoring period." Based on a review of the draft report, reference wetland gauge data for the site has not been collected since November 2020 (MY2). As documented in the MY4 (2022) report, please make every effort to reestablish a functional reference wetland gauge for the site prior to the start of MY5 (2023). The reestablishment and location of the reference gauge should be documented in the MY5 (2023) report.

Wildlands' response: Wildlands will continue to make every effort to reestablish a functional reference wetland gauge and will document efforts in the MY5 (2023) report.

DMS' comment: General: The Vegetation Condition Assessment Table (Table 7) indicates that no conservation easement encroachment areas were identified on the project site. In the comment response letter, please confirm that the entire project boundary was walked and assessed by Wildlands staff as part of the MY4 (2022) monitoring effort and no conservation easement encroachments currently exist on the site.

Wildlands' response: The entire project boundary was walked by Wildlands staff as part of the MY4 (2022) monitoring effort and no conservation easements encroachments currently exist on the site.

DMS' comment: Section 1: Project Overview: This section notes; "Tables 11a – 11d in Appendix 4 present the pre-restoration conditions in detail." These tables are not provided in this year's monitoring report. Please update the report text accordingly.

Wildlands' response: The text in Section 1 has been updated.



DMS' comment: Section 1.2.4 Wetland Assessment: In the report text, please indicate that GWG 11, GWG 12, GWG 13, and GWG 14 were installed on 4/22/2022.

Wildlands' response: The text in Section 1.2.4 has been updated.

DMS' comment: Section 1.2.5 Areas of Concern and Management Activities: Please include the wetland indicator status for the species in the February 2022 supplemental planting list.

Wildlands' response: The wetland indicator status has been added for the species in the supplemental planting list.

DMS' comment: CCPV Maps: Please show the two (2) established soil temperature probes on the applicable CCPV map sheets and update the digital support files accordingly.

Wildlands' response: The locations of the two soil temperatures probes have been added to the applicable CCPV figures. The digital GIS files have been updated to include the soil temperature probe feature class.

DMS' comment: Stream Photos MY4 (2022) – The March 14, 2022 photos for UT2B indicate that the channel likely has flow more than 11 consecutive days per year. DMS recommends checking the flow gauge before the start on MY5 (2023) to confirm there are no monitoring equipment or calibration issues. A game camera should also be considered on this reach to document the 30 days of consecutive flow.

Wildlands' response: The photo points taken along UT2B on March 14, 2022 showing flow in the upper portions of the channel are consistent with the stream gage plot that documented consecutive flow between March 9, 2022 and March 18, 2022. Wildlands will be sure to check the stream gage to confirm no issues are present before the start of MY5 (2023) and will consider adding a game camera to document consecutive flow as well.

DMS' comment: Appendix 6 – Table 16: Please add a foot note to the table indicating that GWG 11, GWG 12, GWG 13, and GWG 14 were installed on 4/22/2022.

Wildlands' response: A foot note has been added to Table 16.

Digital Support File Comments:

DMS' comment: None

Wildlands' response: Noted

Two (2) hard copies of the Final Year 4 Monitoring Report and a full electronic submittal on a USB drive have been mailed to the DMS Western Field Office. Wildlands received a confirmation of approval of the monitoring bond on 1/6/2023 by Kristie Corson at DMS. Therefore, we are requesting approval from DMS to invoice for the completion of Task 10. Please contact me at 704-332-7754 x106 if you have any questions.

Sincerely,

A handwritten signature in cursive script, appearing to read "Emily Reinicker".

Emily Reinicker, PE, CFM
Project Manager

EXECUTIVE SUMMARY

Wildlands Engineering, Inc. (Wildlands) implemented a full-delivery stream and wetland mitigation project at the Lone Hickory Mitigation Site (Site) for the North Carolina Department of Environmental Quality (DEQ) Division of Mitigation Services (DMS). The project restored and preserved a total of 12,621 linear feet (LF) of perennial and intermittent stream and restored 9.5 acres of riparian wetland in Yadkin County, NC. The Site is located within the DMS targeted watershed for the Yadkin River Basin Hydrologic Unit Code (HUC) 03040101130020 and the NC Division of Water Resources (NCDWR) Subbasin 03-07-02. The project is providing 13,164.574 stream mitigation units (SMUs) and 9.500 wetland mitigation units (WMUs) for the Yadkin River Basin HUC 03040101 (Yadkin 01).

The watershed has a long history of agricultural activity and most of the stressors to stream functions are related to this historic and recent land use practices. The major stream stressors for the Site were concentrated agricultural runoff inputs, active stream incision and head cutting, lack of stabilizing streamside vegetation, extensive agricultural manipulation through ditching, and a lack of bedform diversity. The effects of these stressors resulted in degraded water quality and habitat throughout the watershed of the Site when compared to reference conditions. The project approach for the Site focused on evaluating the existing functional condition, potential for recovery, and need for intervention.

The project goals defined in the Mitigation Plan (Wildlands, 2017) were established with careful consideration of 2009 Upper Yadkin Pee Dee River Basin Restoration Priorities (RBRP) goals and objectives to address stressors identified in the watershed. The established project goals include:

- Improve stream channel stability,
- Reconnect channels with historic floodplains and re-establish wetland hydrology and function in relic wetland areas,
- Improve instream habitat,
- Reduce sediment and nutrient input from adjacent farm fields,
- Restore and enhance native floodplain and wetland vegetation, and
- Permanently protect the project site from harmful uses.

The Site construction and as-built surveys were completed in April 2019. Monitoring Year (MY) 4 is a reduced monitoring year, so vegetation plot and cross-section data were not collected. Assessments and site visits were completed between February and November 2022 to evaluate the current conditions of the project.

The Site is meeting most of the required stream, vegetation, and hydrology success criteria for MY4. While vegetation plots were not assessed this year, the Site is expected to meet the interim MY5 requirement of 260 stems per acre. At least one bankfull event was documented along UT1 Reach 3, UT2 Reach 2, UT2A, and UT3 Reach 3 in MY4. Eleven of the thirteen groundwater gages installed on the Site met or exceeded the hydrologic success criteria for MY4. The MY4 visual assessment identified a few areas of concern including pockets of invasive species populations and isolated areas of bed/bank scour. Wildlands will continue to monitor these areas and adaptive management actions will be implemented as necessary throughout the seven-year monitoring period to maintain the ecological health of the Site.



LONE HICKORY MITIGATION SITE
Monitoring Year 4 Annual Report

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| | |
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*Content not required for Monitoring Year 4 Report



Section 1: PROJECT OVERVIEW

The Lone Hickory Mitigation Site (Site) is located in Yadkin County approximately 3.5 miles south of the town of Yadkinville, NC in the Yadkin River Basin Hydrologic Unit Code (HUC) 03040101130020 and NCDWR Subbasin 03-07-02 (Figure 1). The project watershed is dominated by agricultural and forested land and located in the Inner Piedmont lithotectonic belt within the Piedmont physiographic province (NCGS, 1985).

The Site contains two valleys, separated by a ridge that runs north to south through the project limits. South Deep Creek flows along the northern boundary of the project. On the east side of the ridge (herein referenced as the East Side), UT1 flows through a steep, narrow valley that gradually widens and flattens in slope as it flows downstream to the South Deep Creek floodplain. UT1 is joined by UT1A and UT1B within the Site limits before flowing offsite to join South Deep Creek. On the west side of the ridge (herein referenced as the West Side), UT2 and UT3 flow out of steep, narrow valleys into the broad, flat floodplain of South Deep Creek. UT2B begins downstream of BMP4 and flows into UT2. UT2A and UT2 join UT3 before the stream's confluence with South Deep Creek. The East Side of the Site drains 0.44 square miles, and the West Side of the Site drains 0.87 square miles of rural land.

The Site was historically used for crop production and dairy farming which collectively contributed to degraded in-stream habitat and sediment erosion. On the East Side, streams were manipulated through ditching, impoundments, and land use changes. The West Side streams were ditched and re-routed within the adjacent floodplain which was previously altered for agricultural uses. The riparian buffers on both sides of the Site lacked stabilizing streamside vegetation due to agricultural practices.

Construction activities were completed in April 2019 by KBS Earthworks, Inc. Turner Land Surveying, PLLC. completed the as-built survey in April 2019. Planting was completed following construction in the spring of 2019 by Bruton Natural Systems, Inc. A conservation easement has been recorded and is in place on 103 acres. The project is providing 13,164.574 Stream Mitigation Units (SMUs) and 9.500 Wetland Mitigation Units (WMUs) for the Yadkin River Basin 03040101 HUC (Yadkin 01). Annual monitoring will be conducted for seven years with close-out anticipated to commence in 2026 given the success criteria are met.

Directions and a map of the Site are provided in Figure 1 and project components are illustrated for the Site in Figure 2.

1.1 Project Goals and Objectives

The Site is providing numerous ecological benefits within the Yadkin Valley Basin. The project goals were established with careful consideration to address stressors that were identified in the NCDWR 2008 Yadkin River Basinwide Plan (NCDWR, 2008) and the RBRP (EEP, 2009).

The following project specific goals and objectives outlined in the Mitigation Plan (Wildlands, 2017) include:



| Goals | Objectives |
|--|---|
| Improve stream channel stability. | Restore stream channels that will maintain a stable pattern and profile considering the hydrologic and sediment inputs to the system, the landscape setting, and the watershed conditions. Create stable tie-ins for tributaries joining restored channels. Add bank revetments and in-stream structures to protect restored streams. |
| Reconnect channels with historic floodplains and re-establish wetland hydrology and function in relic wetland areas. | Remove man-made impoundments, remove culvert crossings, and restore historic valley profile. Remove historic overburden from farm fields. Reconstruct stream channels with bankfull dimensions relative to the floodplain. Restore stream plan form to promote development of mutually beneficial stream/wetland complex. |
| Improve instream habitat. | Remove man-made impoundments and culvert crossings within easement. Install habitat features such as constructed riffles, cover logs, and brush toes into restored/enhanced streams. Add woody materials to channel beds. Construct pools of varying depth. |
| Reduce sediment and nutrient input from adjacent farm fields. | Construct two step pool stormwater conveyance and three dry detention BMPs to slow and treat runoff from farm fields before entering Site streams. |
| Restore and enhance native floodplain and wetland vegetation. | Plant native tree and understory species in riparian zone where currently insufficient. |
| Permanently protect the project site from harmful uses. | Establish a conservation easement on the Site. |

1.2 Monitoring Year 4 Data Assessment

Annual monitoring was conducted between February and November 2022 to assess the condition of the project. The stream, vegetation, and hydrologic success criteria for the Site follows the approved success criteria presented in the Lone Hickory Mitigation Plan (Wildlands, 2017).

1.2.1 Vegetation Assessment

MY4 is a reduced monitoring year that does not require detailed vegetation inventory and analysis. Visual assessments reveal that herbaceous cover is becoming well established and planted bare roots and live stakes appear healthy. Previously noted areas of low stem density are improving and discussed further in Section 1.2.5. Please refer to Appendix 2 for visual assessment tables and Current Condition Plan View (CCPV) Figures 3.0-3.5.

1.2.2 Stream Assessment

MY4 is a reduced monitoring year that does not require morphological surveys; therefore, the stream cross-section surveys were not performed this year. Visual assessments reveal that project streams are functioning as designed. Refer to Appendix 2 for the visual stability assessment tables, CCPV figures, and reference photographs.

1.2.3 Stream Hydrology Assessment

At the end of the seven-year monitoring period, four or more bankfull events must have occurred in separate years within the restoration reaches. At least one bankfull event was recorded on UT1 Reach 3, UT2 Reach 2, UT2A, and UT3 Reach 3 in MY4 using stream gage pressure transducers. UT3 Reach 3 has recorded four bankfull events in separate years, while UT1 Reach 3, UT2 Reach 2, UT2A, and UT2B have recorded three bankfull events in separate years thus far. Currently, the Site is on track to meet the hydrologic success criteria for bankfull events, and the criteria has been met for UT3 Reach 3.

Consistent flow must be documented in the restored intermittent or low flow channels (UT1 Reach 1, UT2A, and UT2B) at the Site. Under periods of normal rainfall, stream flow must be documented to occur every year for at least 30 consecutive days during the seven-year monitoring period. In MY4, UT1 Reach 1 and UT2A exceeded the success criteria for stream flow with 304 and 123 consecutive days documented, respectively. UT2B was short of meeting the success criteria with 11 consecutive days of flow documented in MY4; however, UT2B did exceed success criteria in MY3 with 43 consecutive days recorded. Please refer to CCPV figures in Appendix 2 for the stream gage locations and Appendix 5 for hydrology summary data and plots.

1.2.4 Wetland Assessment

Nine groundwater monitoring gages (GWGs) were initially installed during baseline monitoring within the wetland re-establishment area using In-situ Level TROLL® 100 pressure transducers. Following recommendations from the August 19, 2019 IRT site walk, an additional gage (GWG 10) was installed adjacent to GWG 4, outside of the former ditch location, at the end of October 2019. Reporting for GWG 10 began in MY2 to replace GWG 4. Monitoring for GWG 4 ended in MY2. On April 22, 2022, GWG 11 and GWG 12 were installed to capture groundwater hydrology data within the wetland re-establishment area, and GWG 13 and GWG 14 were installed to document potential additional wetland areas along UT2 Reach 1 that have been created by the project. All monitoring gages are downloaded on a quarterly basis and maintained as needed. Calibration was checked by manually measuring water levels on all gages to validate the recorded data from the pressure transducers. Two soil temperature probes were installed on the Site during baseline monitoring near GWGs 5 and 6. The Site does not contain a rainfall gage; instead, the daily precipitation data was collected from the nearest NC Climate Retrieval and Observations Network of the Southeast Database (NC CRONOS) Station, Yadkinville 0.2 E, NC.

A reference gage was originally established in a nearby reference wetland to compare the hydrologic response within the restored wetland areas at the Site. In MY3, Wildlands made multiple attempts to contact the new landowner and obtain permission to access the gage but were unsuccessful. In MY4, Wildlands made several attempts to establish a new functional reference wetland gage within other nearby properties, but unfortunately landowners were unwilling to allow access. Wildlands will continue to make efforts to re-establish a reference wetland gage in MY5.

The original performance standard for wetland hydrology from the Mitigation Plan (Wildlands, 2017) is the presence of groundwater within 12 inches of the ground surface for 19 consecutive days (9.2%) of the defined growing season for Yadkin County (April 4 through October 27) under typical precipitation conditions. Of the thirteen GWGs (GWG 1 – 3 and 5 – 14), eleven met or exceeded the success criteria for MY4 with the percentage of consecutive days of the growing season ranging from 9.2 to 56.3%. GWG



6 and GWG 7 did not meet the success criteria this year with a result of 7.3% of the growing season for both. Daily rainfall data was obtained from the nearby Yadkinville 0.2 E station (CoCoRaHS NCYD004) which is located approximately 2 miles from the Site. Monthly rainfall data in 2022 indicated lower than normal rainfall amounts in April and June, while higher than normal amounts occurred in February, May, July, and August. The remaining months' (January, March, September, and October) rainfall amounts fell between the 30th and 70th percentiles for Yadkin County. Please refer to CCPV figures in Appendix 2 for the groundwater gage locations and Appendix 5 for hydrology data and plots.

In 2022, the soil temperature data from the onsite soil probes indicate soil temperatures consistently above 41 degrees Fahrenheit by the beginning of March 2022. This was similarly observed in 2021 as well. Onsite leaf out conditions were photo documented on March 30, 2022. Wildlands proposes the growing season be extended to begin a week earlier on March 28, 2022. A majority of the onsite leaves had visibly changed color by November 1, 2022; therefore, the modified growing season was not extended beyond the original end date. An analysis of the modified growing season concluded that of the thirteen GWGs, eleven would meet or exceed the success criteria. GWG 7 and GWG 12 were short of meeting the success criteria by only one day. GWG 12 was installed after the growing season had commenced on April 22, 2022, so it possibly would have met criteria at the beginning of the growing season. For comparison purposes, supplemental groundwater gage plots showing the modified growing season and soil temperature plots are provided in Appendix 6. Please refer to Appendix 2 for leaf out and leaf senescence photographs.

1.2.5 Areas of Concern and Management Activities

Vegetation

Invasive treatments have been successful in reducing previously noted areas of invasive species; MY4 visual assessments revealed that approximately 99% of the conservation easement is unaffected by invasive populations. However, when present, these species include kudzu (*Pueraria montana*), Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), princess tree (*Paulownia tomentosa*), and tree of heaven (*Ailanthus altissima*). Additional invasive treatments occurred in July and August 2022 and primarily focused on treating kudzu re-sprouts on the West Side and the other invasive species within the existing wood line along the East Side. Asian spiderwort (*Murdannia keisak*) was also chemically treated within the project streams in July and August 2022. Additional treatments will continue as needed to help manage and eliminate remaining invasive species populations on the Site.

Woody vegetation has become well established on over 99% of the planted acreage. Previously documented areas of low stem density (approximately 0.45 acres or 0.7% of the planted acreage) located around permanent vegetation plots 11 and 16 were supplementally planted in February 2022. See the table below for planting species and quantities. These areas were visually reassessed later in the growing season, and it appears that supplemental stems are surviving and healthy. Therefore, these areas are no longer of concern and should be on track to meet the MY5 density criteria. Soil amendments were also added to the floodplain between UT2A and UT2 to improve planted stem growth.



| Supplemental Planting List – February 2022 | | | | |
|--|---------------|-----------|--------------------------|----------|
| Scientific Name | Common Name | Source | Wetland Indicator Status | Quantity |
| <i>Betula Nigra</i> | River Birch | Bare root | FACW | 35 |
| <i>Cornus amomum</i> | Silky Dogwood | Bare root | FACW | 25 |
| <i>Diospyros virginiana</i> | Persimmon | Bare root | FAC | 25 |
| <i>Liriodendron tulipifera</i> | Tulip Poplar | Bare root | FACU | 15 |
| <i>Platanus occidentalis</i> | Sycamore | Bare root | FACW | 30 |
| <i>Quercus phellos</i> | Willow Oak | Bare root | FAC | 25 |

Vegetation has become well-established in areas throughout the Site previously identified with poor herbaceous cover, gully formation, and floodplain scour. In MY4, bare areas were seeded and amended to prevent gullies and rills from forming along the left valley of UT1.

Streams

Repairs were previously completed in MY2 and MY3 to address areas of bank and bed instability along UT3 Reach 1, isolated structure issues along UT1 Reach 1, and headcuts that had formed at the inlets/outlets of BMP3 and BMP4. Please refer to previous monitoring reports for more detailed repair plans and documentation. Visual assessments in MY4 reveal that these repair areas continue to appear stable and functioning as designed.

Beaver dams were removed in August 2022 along the very downstream portion of UT3 Reach 3 upstream of its confluence with South Deep Creek. The infrequent inundation caused by the beaver dams at the bottom of the Site has not appeared to have damaged floodplain vegetation or stream stability. Wildlands has contracted with USDA to manage beaver on the Site. Beaver activity will continue to be monitored and managed on the Site through closeout.

A few additional minor stream areas of concern are noted were noted in MY4. Some piping was observed at two structures along UT1 Reach 1 but these structures are continuing to hold grade and the majority of structures along this reach are functioning as designed. Three constructed riffles are experiencing some bed scour along UT1 Reach 3 at station 147+50 (XS10) and along UT2 Reach 1 at stations 202+75 (XS15) and 203+10. Log structures located at the end of these riffles are maintaining grade and protecting from additional degradation. The remaining areas of concern are considered minor and will continue to be monitored for signs of instability.

Quarterly site visits will continue to be conducted to monitor and address areas of concern. If necessary, future adaptive management will be implemented to improve herbaceous cover and woody stem densities, treat and control invasive plants, and address stream stability issues. Please refer to Appendix 2 for CCPV figures and stream stability and vegetation assessment tables.

1.3 Monitoring Year 4 Summary

The Site is meeting most of the required stream, vegetation, and hydrology success criteria for MY4. While vegetation plots were not assessed this year, the Site is expected to meet the interim MY5 requirement of 260 stems per acre. At least one bankfull event was documented along UT1 Reach 3, UT2 Reach 2, UT2A, and UT3 Reach 3 in MY4. Eleven of the thirteen groundwater gages installed on the Site met or exceeded the hydrologic success criteria for MY4. The visual assessment identified a few areas of concern including pockets of invasive species populations and isolated areas of bed/bank scour. Wildlands will continue to monitor these areas and adaptive management actions will be implemented as necessary throughout the seven-year monitoring period to maintain the ecological health of the Site.



Section 2: METHODOLOGY

Geomorphic data were 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 Mapping was recorded using a Trimble handheld GPS with sub-meter accuracy and processed using Pathfinder and ArcGIS. Stream gages were installed in riffles and monitored quarterly. Monitoring methods are in accordance with the United States Army Corps of Engineers (USACE, 2016) standards for mitigation. Vegetation monitoring follows the Carolina Vegetation Survey-EEP Level 2 Protocol (Lee et al., 2008).



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.
- Ecosystem Enhancement Program (EEP), February 2009. Upper Yadkin Pee-Dee River Basin Restoration Priorities.
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- Wildlands Engineering, Inc (Wildlands), 2019. Lone Hickory Mitigation Site As-Built Baseline Monitoring Report. DMS, Raleigh, NC.



APPENDIX 1. General Figures and Tables

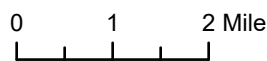
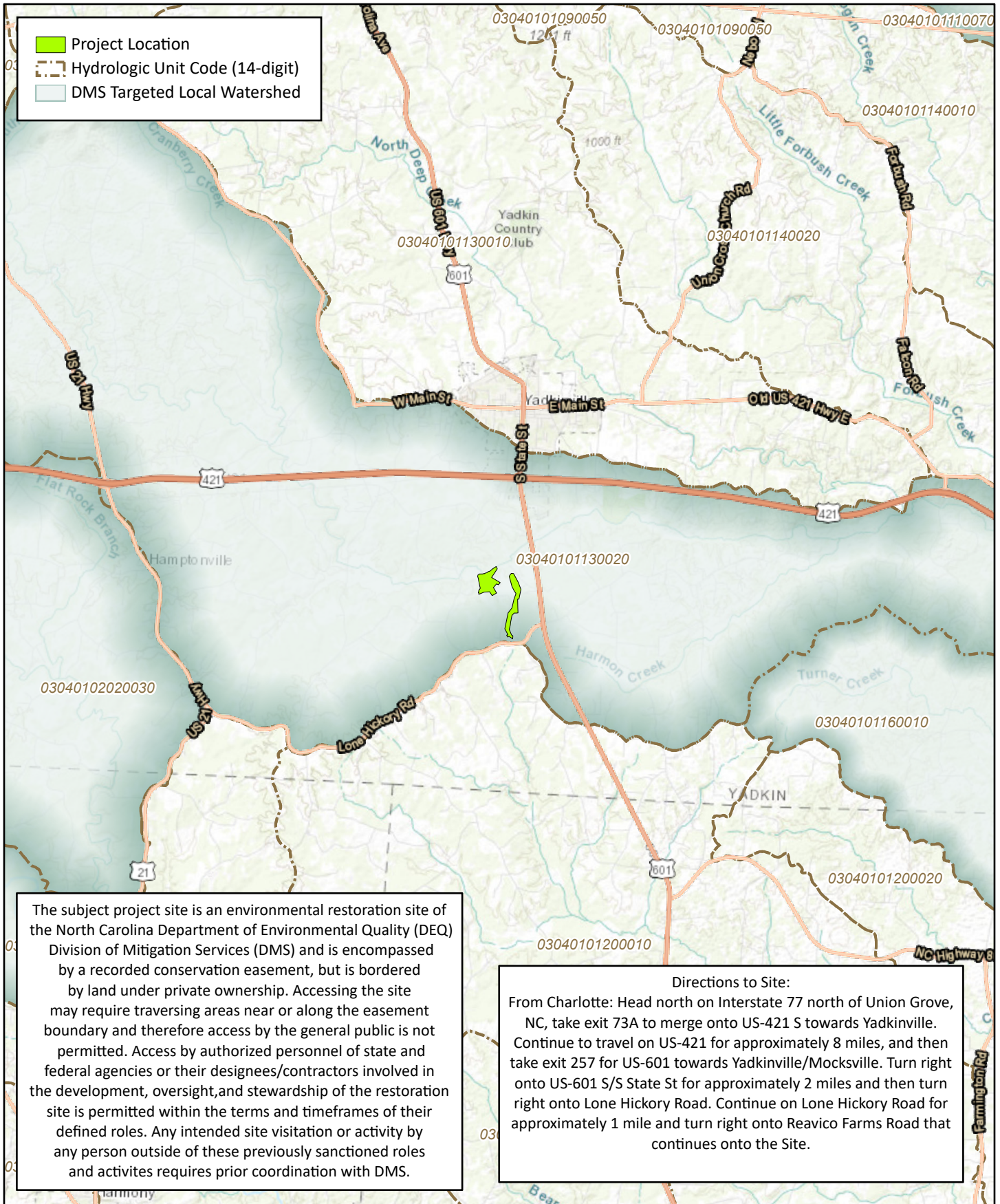


Figure 1 Project Vicinity Map
 Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

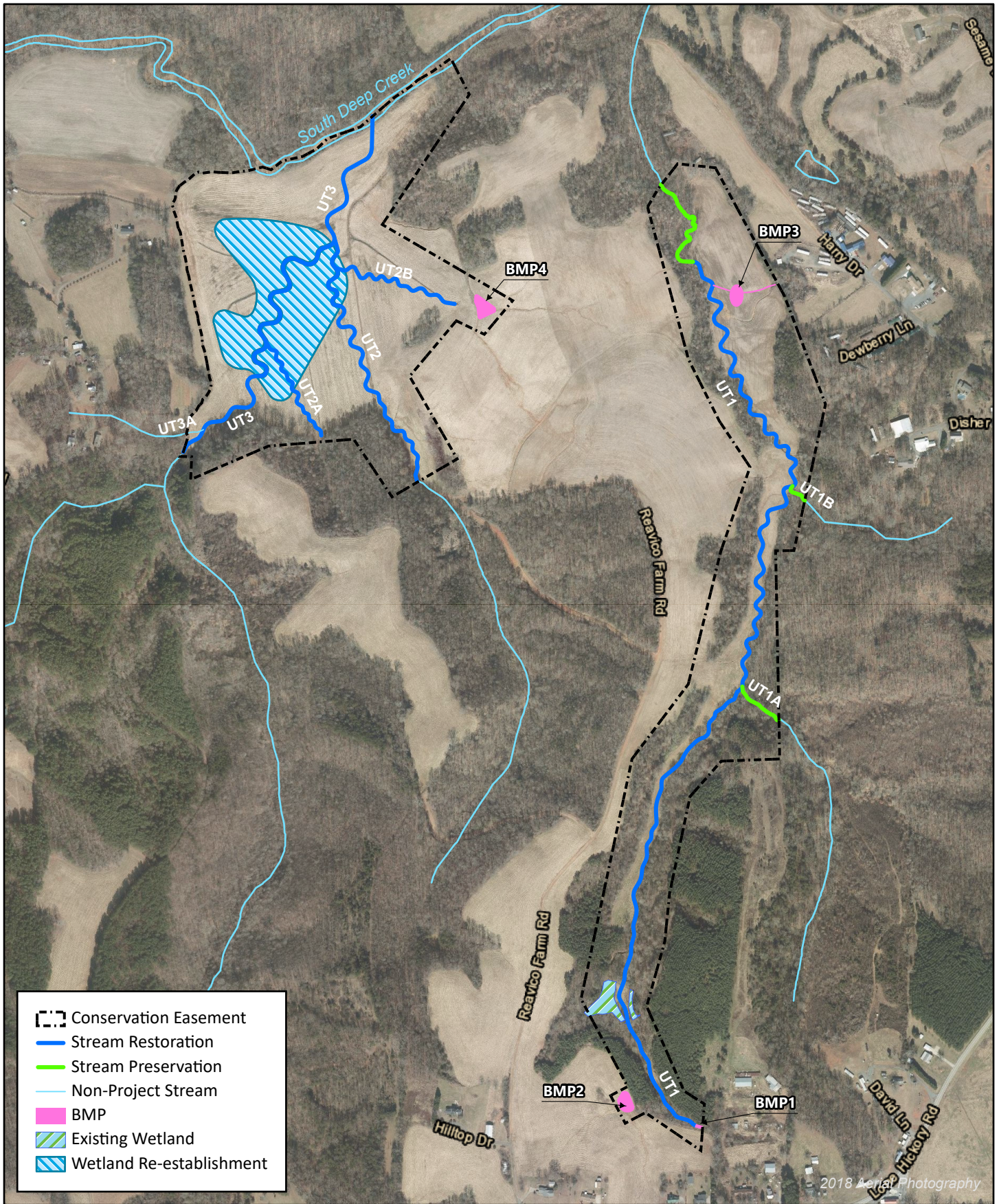


Figure 2 Project Component/Asset Map
 Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022



0 350 700 Feet



Table 1. Mitigation Assets and Components

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

| Project Components | | | | | | | | |
|-----------------------|----------------------------------|---------------------------------|---------------------|-------------------|----------------|------------------------|--------------------------|-------------------------------|
| Project Area/Reach | Existing Footage (LF) or Acreage | Mitigation Plan Footage/Acreage | Mitigation Category | Restoration Level | Priority Level | Mitigation Ratio (X:1) | As-Built Footage/Acreage | Project Credit ^{1,2} |
| UT1, R1, R2a, R2b, R3 | 6,015 | 5,721 | Warm | Restoration | P1, P2 | 1.000 | 5,721 | 6,698.044 |
| UT1 R4 | 659 | 659 | Warm | Preservation | P4 | 10.000 | 659 | 65.900 |
| UT1A | 230 | 282 | Warm | Preservation | N/A | 10.000 | 282 | 28.200 |
| UT1B | 48 | 124 | Warm | Preservation | N/A | 10.000 | 123 | 12.400 |
| UT2 R1, R2 | 2,527 | 1,703 | Warm | Restoration | P1, P2 | 1.000 | 1,703 | 1,933.009 |
| UT2A | 1,184 | 655 | Warm | Restoration | P1 | 1.000 | 655 | 699.002 |
| UT2B | 699 | 784 | Warm | Restoration | P1, P2 | 1.000 | 776 | 893.000 |
| UT3 R1, R2, R3 | 2,008 | 2,702 | Warm | Restoration | P1, P2 | 1.000 | 2,702 | 2,835.019 |
| West Side Wetlands | N/A | 9.5 | Warm | Re-establishment | | 1.000 | 9.5 | 9.500 |

| Project Credits | | | | | | | |
|-------------------|-------------------|------------|------------|------------------|------------|----------------------|---------------|
| Restoration Level | Stream | | | Riparian Wetland | | Non-Riparian Wetland | Coastal Marsh |
| | Warm | Cool | Cold | Riverine | Non-Riv | | |
| Restoration | 13,058.074 | N/A | N/A | N/A | N/A | N/A | N/A |
| Re-establishment | | | | 9.500 | N/A | N/A | N/A |
| Rehabilitation | | | | N/A | N/A | N/A | N/A |
| Enhancement | | | | N/A | N/A | N/A | N/A |
| Enhancement I | N/A | N/A | N/A | | | | |
| Enhancement II | N/A | N/A | N/A | | | | |
| Creation | | | | N/A | N/A | N/A | N/A |
| Preservation | 106.500 | N/A | N/A | N/A | N/A | N/A | |
| Totals | 13,164.574 | N/A | N/A | 9.500 | N/A | N/A | N/A |

Notes:

1. No direct credit for BMPs.
2. Credits reported have been adjusted based on buffer width deviations from standard 50-foot buffer width.

Table 2. Project Activity and Reporting History

Lone Hickory Mitigation Site
 DMS Project No. 97135
Monitoring Year 4 - 2022

| Activity or Report | | Data Collection Complete | Completion or Delivery |
|--|-------------------|-------------------------------|------------------------|
| 404 Permit | | April 2018 | April 2018 |
| Mitigation Plan | | July - December 2016 | December 2017 |
| Final Design - Construction Plans | | June 2018 | June 2018 |
| Construction | | Oct 2018 - April 2019 | Oct 2018 - April 2019 |
| Temporary S&E mix applied to entire project area ¹ | | Oct 2018 - April 2019 | Oct 2018 - April 2019 |
| Permanent seed mix applied to reach/segments | | Oct 2018 - April 2019 | Oct 2018 - April 2019 |
| Bare root and live stake plantings for reach/segments | | February 2019 - April 2019 | April 2019 |
| Baseline Monitoring Document (Year 0) | | February 2019 - May 2019 | June 2019 |
| Invasive Species Treatment | | September 2019 - October 2019 | October 2019 |
| Supplemental seeding applied to UT3 floodplain | | September 2019 - October 2019 | October 2019 |
| Year 1 Monitoring | Stream Survey | October 2019 | November 2019 |
| | Vegetation Survey | October 2019 | |
| Stream Repair | | April 2020 | April 2020 |
| Supplemental seeding, herbaceous plug, and live stake planting | | June 2020 - August 2020 | August 2020 |
| Invasive Species Treatment | | May, August, & September 2020 | September 2020 |
| Year 2 Monitoring | Stream Survey | July 2020 | November 2020 |
| | Vegetation Survey | August 2020 | |
| Stream repair | | April 2021 | April 2021 |
| Vegetation management (invasive species, soil amendments) | | July 2021 | July 2021 |
| Beaver maintenance | | June - August 2021 | August 2021 |
| Year 3 Monitoring | Stream Survey | July 2021 | November 2021 |
| | Vegetation Survey | October 2021 | |
| Invasive Species Treatment | | July & August 2022 | August 2022 |
| Supplemental soil amendments, seeding, and bare root planting | | February 2022 | February 2022 |
| Beaver maintenance | | August 2022 | August 2022 |
| Year 4 Monitoring | Stream Survey | N/A | November 2022 |
| | Vegetation Survey | N/A | |
| Year 5 Monitoring | Stream Survey | 2023 | November 2023 |
| | Vegetation Survey | 2023 | |
| Year 6 Monitoring | Stream Survey | 2024 | November 2024 |
| | Vegetation Survey | 2024 | |
| Year 7 Monitoring | Stream Survey | 2025 | November 2025 |
| | Vegetation Survey | 2025 | |

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

Table 3. Project Contact Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
Monitoring Year 4 - 2022

| | |
|--|--|
| Designers Emily Reinicker, PE, CFM | Wildlands Engineering, Inc. 1430 South Mint Street, Suite 104 Charlotte, NC 28203 704.332.7754 |
| Construction Contractors | KBS Earthworks, Inc. 5616 Coble Church Road Julian, NC 27283 |
| Planting Contractor | Bruton Natural Systems, Inc. PO Box 1197 Freemont, NC 27830 |
| Seeding Contractor | KBS Earthworks, Inc. |
| Seed Mix Sources | KBS Earthworks, Inc. |
| Nursery Stock Suppliers Bare Roots Live Stakes Herbaceous Plugs | Bruton Natural Systems, Inc. |
| Monitoring Performers | Wildlands Engineering, Inc. Kristi Suggs 704.332.7754 ext. 110 |

Table 4. Project Information and Attributes

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

| Project Information | | | | | | | | | | | | | |
|---|---|---------------------------------|---|-----|----------|----------|---|-------|------------|------------|-----------------------------------|-------|-----|
| Project Name | Lone Hickory Mitigation Site | | | | | | | | | | | | |
| | Yadkin County | | | | | | | | | | | | |
| Project Area (acres) | 103.000 | | | | | | | | | | | | |
| Project Coordinates (latitude and longitude) | 36° 5' 39.16"N 80° 40' 2.14"W | | | | | | | | | | | | |
| Planted Acreage (Acre of Woody Stems Planted) | 99.000 | | | | | | | | | | | | |
| Project Watershed Summary Information | | | | | | | | | | | | | |
| Physiographic Province | Piedmont Physiographic Province | | | | | | | | | | | | |
| River Basin | Yadkin River | | | | | | | | | | | | |
| USGS Hydrologic Unit 8-digit | 03040101 | | | | | | | | | | | | |
| USGS Hydrologic Unit 14-digit | 03040101130020 | | | | | | | | | | | | |
| DWR Sub-basin | 03-07-02 | | | | | | | | | | | | |
| Project Drainage Area (acres) | 286 (East Side), 170 (UT2 - West Side), 392 (UT3 - West Side) | | | | | | | | | | | | |
| Project Drainage Area Percentage of Impervious Area | 3% (UT1 - East Side), 1% (UT2 - West Side), 2% (UT3 - West Side) | | | | | | | | | | | | |
| 2011 NLCD Land Use Classification | UT1 - East Side: Forest (39%), Cultivated (42%), Grassland (4%), Shrubland (7%), Urban (8%), Open Water (0%) UT2 - West Side: Forest (31%), Cultivated (40%), Grassland (9%), Shrubland (10%), Urban (0%), Open Water (10%) UT3 - West Side: Forest (57%), Cultivated (22%), Grassland (5%), Shrubland (10%), Urban (3%), Open Water (3%) | | | | | | | | | | | | |
| Reach Summary Information | | | | | | | | | | | | | |
| Parameters | UT1 | | | | UT1A | UT1B | UT2 | | UT2A | UT2B | UT3 | | |
| | R1 | R2A/R2B | R3 | R4 | | | R1 | R2 | | | R1 | R2 | R3 |
| Length of reach (linear feet) - Post-Restoration | 966 | 3,114 | 1,641 | 659 | 282 | 123 | 623 | 1,080 | 655 | 776 | 779 | 1,159 | 764 |
| Valley confinement (Confined, moderately confined, unconfined) | Confined | Confined to moderately confined | | | Confined | Confined | Moderately confined to unconfined | | Unconfined | Unconfined | Moderately confined to unconfined | | |
| Drainage area (acres) | 286 | | | | 92 | 31 | 170 | | 27 | 6 | 392 | | |
| Perennial, Intermittent, Ephemeral | I/P | P | P | P | P | P | P | | I/P | P | P | | |
| NCDWR Water Quality Classification | WS-III | | | | WS-III | WS-III | WS-III | | WS-III | WS-III | WS-III | | |
| Morphological Description (stream type) - Pre-Restoration | G, Straigthened E/G | | | | - | - | G | G | G | G | G | G | G |
| Morphological Description (stream type) - Post-Restoration | A | B | C | - | - | - | B | C | C | C/Cb | Bc | C | C |
| Evolutionary trend (Simon's Model) - Pre-Restoration | III/IV/V | | | | VI | VI | III/IV/V | | III/IV/V | IV/V | IV/V | | |
| FEMA classification | Last 400LF in Zone AE backwater from South Deep | | | | None | None | Zone AE backwater from South Deep Creek | | | | | | |
| Wetland Summary Information | | | | | | | | | | | | | |
| Parameters | West Side Wetlands | | | | | | | | | | | | |
| Size of Wetland (acres) | 9.5 | | | | | | | | | | | | |
| Wetland Type | Riparian Riverine | | | | | | | | | | | | |
| Mapped Soil Series | Codorus loam/Dan River and Cornus soils | | | | | | | | | | | | |
| Drainage class | Somewhat poorly drainage/well drained | | | | | | | | | | | | |
| Soil Hydric Status | Yes/No | | | | | | | | | | | | |
| Source of Hydrology | Groundwater | | | | | | | | | | | | |
| Restoration or enhancement method (hydrologic, vegetative etc.) | Re-establishment | | | | | | | | | | | | |
| 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. 4134. | | | | | | | | | | |
| Waters of the United States - Section 401 | Yes | Yes | USACE Action ID #SAW-2017-00100 | | | | | | | | | | |
| Division of Land Quality (Erosion and Sediment Control) | Yes | Yes | NPDES Construction Stormwater General Permit NCG010000 | | | | | | | | | | |
| Endangered Species Act | Yes | Yes | Categorical Exclusion Document in Mitigation Plan | | | | | | | | | | |
| Historic Preservation Act | Yes | Yes | Categorical Exclusion Document in Mitigation Plan | | | | | | | | | | |
| Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA) | No | N/A | N/A | | | | | | | | | | |
| FEMA Floodplain Compliance | Yes | Yes | Yadkin County Floodplain Development Permit #2017-4. | | | | | | | | | | |
| Essential Fisheries Habitat | No | N/A | N/A | | | | | | | | | | |

Table 5a. Monitoring Component Summary

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

East Side

| Parameter | Monitoring Feature | Quantity / Length by Reach | | | | | | Frequency | Notes |
|--------------------------------|--|-----------------------------|-------------|-------------|-------------|------|------|------------------------|-------|
| | | UT1 Reach 1 | UT1 Reach 2 | UT1 Reach 3 | UT1 Reach 4 | UT1A | UT1B | | |
| Dimension | Riffle Cross-Section | 1 | 4 | 2 | N/A | N/A | N/A | Year 1, 2, 3, 5, and 7 | 1 |
| | Pool Cross-Section | 1 | 3 | 2 | N/A | N/A | N/A | | |
| Pattern | Pattern | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2 |
| Profile | Longitudinal Profile | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| Substrate | Reach Wide (RW) Pebble Count | 1 RW | 1 RW | 1 RW | N/A | N/A | N/A | Year 1, 2, 3, 5, and 7 | 3 |
| Hydrology | Crest Gage (CG) and or/Transducer (SG) | 1 SG | 1 SG | | | | | Semi-Annual | 4 |
| Vegetation | CVS Level 2/Mobile plots | 15 (10 permanent, 5 mobile) | | | | | | Year 1, 2, 3, 5, and 7 | 5 |
| Visual Assessment | | Yes | | | | | | Semi-Annual | |
| Exotic and Nuisance Vegetation | | | | | | | | Semi-Annual | 6 |
| Project Boundary | | | | | | | | Semi-Annual | 7 |
| Reference Photos | Photographs | 22 | | | | | | Annual | |

Notes:

1. Cross-sections were permanently marked with rebar to establish location. Surveys include points measured at all breaks in slope, including top of bank, bankfull, edge of water, and thalweg.
2. Pattern and profile will be assessed visually during semi-annual site visits. Longitudinal profile was collected during as-built baseline monitoring survey only, unless observations indicate widespread lack of vertical stability (greater than 10% of reach is affected) and profile survey is warranted in additional years to monitor adjustments or survey repair work.
3. Riffle 100-count substrate sampling were collected during the baseline monitoring only.
4. Crest gages and/or transducers will be inspected quarterly or semi-annually, evidence of bankfull events will be documented with a photo when possible. Transducers, if used, will be set to record stage once every 2 hours. The transducer will be inspected and downloaded semi-annually. A transducer was installed on the intermittent portion of UT1 Reach 1 to document 30 days of continuous flow.
5. Permanent vegetation monitoring plot assessments will follow CVS Level 2 protocols. Mobile vegetation monitoring plot assessments will document number of planted stems, height, and species using a circular or 100 m2 square/rectangular plot. 2% of the non-shaded planted acreage will be monitored with permanent plots within the 50' stream buffer, and 1% of the non-shaded planted acreage will be monitored with mobile plots beyond the 50' stream buffer. Planted shaded areas will be visually assessed.
6. Locations of exotic and nuisance vegetation will be mapped.
7. Locations of vegetation damage, boundary encroachments, etc. will be mapped.

Table 5b. Monitoring Component Summary

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

West Side

| Parameter | Monitoring Feature | Quantity / Length by Reach | | | | | | | | Frequency | Notes | |
|--------------------------------|--|------------------------------|-------------|------|------|-------------|-------------|-------------|--------------------------|------------------------|------------------------|---|
| | | UT2 Reach 1 | UT2 Reach 2 | UT2A | UT2B | UT3 Reach 1 | UT3 Reach 2 | UT3 Reach 3 | Wetland Re-establishment | | | |
| Dimension | Riffle Cross-Section | 1 | 2 | 2 | 2 | 1 | 1 | 1 | N/A | Year 1, 2, 3, 5, and 7 | 1 | |
| | Pool Cross-Section | 1 | 1 | 2 | 2 | 1 | 1 | 1 | N/A | | | |
| Pattern | Pattern | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2 | |
| Profile | Longitudinal Profile | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | |
| Substrate | Reach Wide (RW) Pebble Count | 1 RW | 1 RW | 1 RW | 1 RW | 1 RW | 1 RW | 1 RW | N/A | Year 1, 2, 3, 5, and 7 | 3 | |
| Stream Hydrology | Crest Gage (CG) and/or Transducer (SG) | 1 SG | | 1 SG | 1 SG | 1 SG | | | N/A | Semi-Annual | 4 | |
| Wetland Hydrology | Groundwater Gages | | | | | | | | | 9 | Quarterly | |
| Vegetation | CVS Level 2/Mobile Plots | 25 (15 permanent, 10 mobile) | | | | | | | | | Year 1, 2, 3, 5, and 7 | 5 |
| Visual Assessment | | Yes | | | | | | | | | Semi-Annual | |
| Exotic and Nuisance Vegetation | | | | | | | | | | | Semi-Annual | 6 |
| Project Boundary | | | | | | | | | | | Semi-Annual | 7 |
| Reference Photos | Photographs | 22 | | | | | | | | | Annual | |

Notes:

1. Cross-sections were permanently marked with rebar to establish location. Surveys include points measured at all breaks in slope, including top of bank, bankfull, edge of water, and thalweg.
2. Pattern and profile will be assessed visually during semi-annual site visits. Longitudinal profile was collected during as-built baseline monitoring survey only, unless observations indicate widespread lack of vertical stability (greater than 10% of reach is affected) and profile survey is warranted in additional years to monitor adjustments or survey repair work.
3. Riffle 100-count substrate sampling was collected during the baseline monitoring only.
4. Crest gages and/or transducers will be inspected quarterly or semi-annually, evidence of bankfull events will be documented with a photo when possible. Transducers, if used, will be set to record stage once every 2 hours. The transducer will be inspected and downloaded semi-annually. A transducer was installed on the intermittent portion of UT2A and UT2B to document 30 days of continuous flow.
5. Permanent vegetation monitoring plot assessments will follow CVS Level 2 protocols. Mobile vegetation monitoring plot assessments will document number of planted stems, height, and species using a circular or 100 m2 square/rectangular plot. 2% of the non-shaded planted acreage will be monitored with permanent plots within the 50' stream buffer, and 1% of the non-shaded planted acreage will be monitored with mobile plots beyond the 50' stream buffer. Planted shaded areas will be visually assessed.
6. Locations of exotic and nuisance vegetation will be mapped.
7. Locations of vegetation damage, boundary encroachments, etc. will be mapped.

APPENDIX 2. Visual Assessment Data

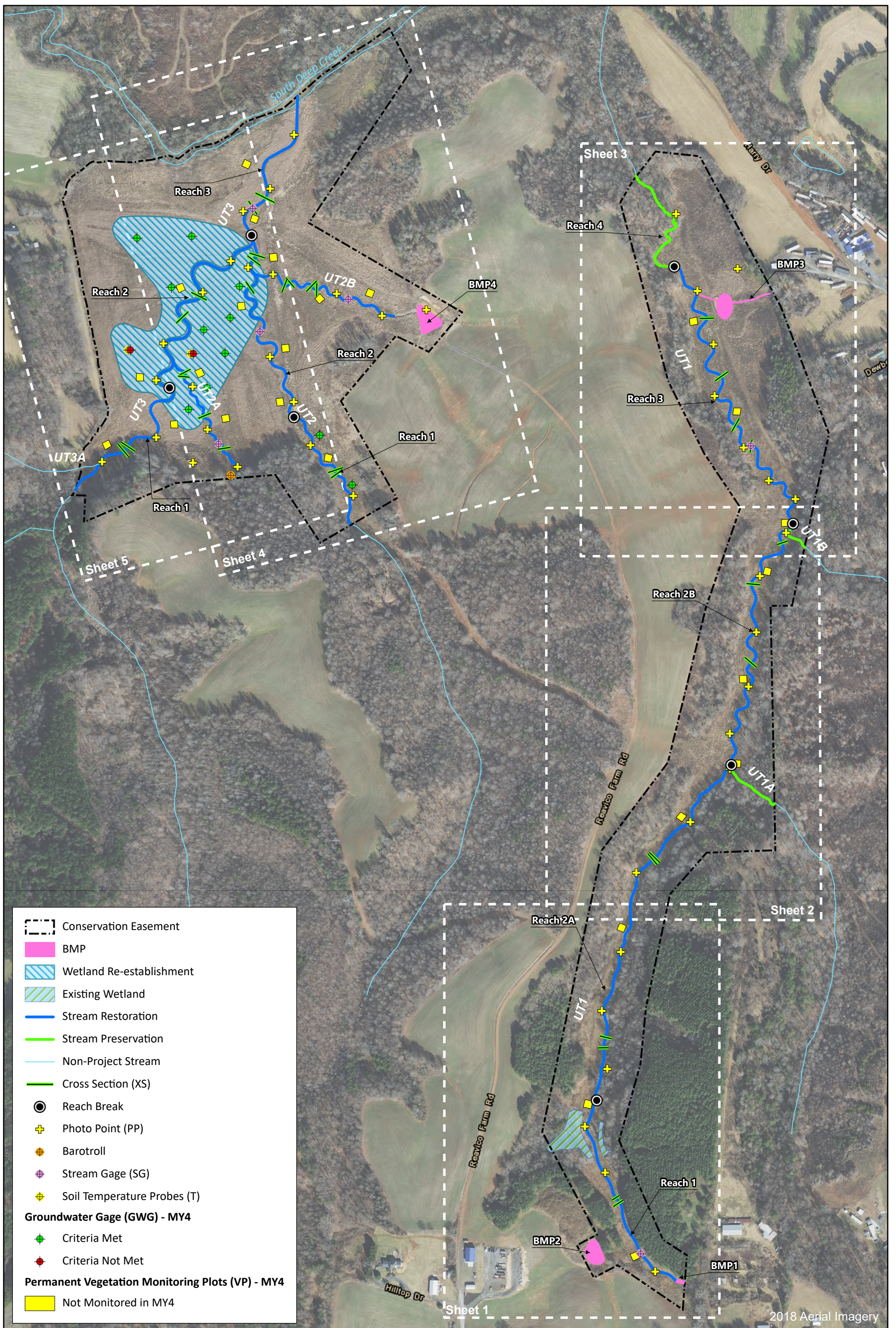


Figure 3.0 Current Condition Plan View Map (Key)
 Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

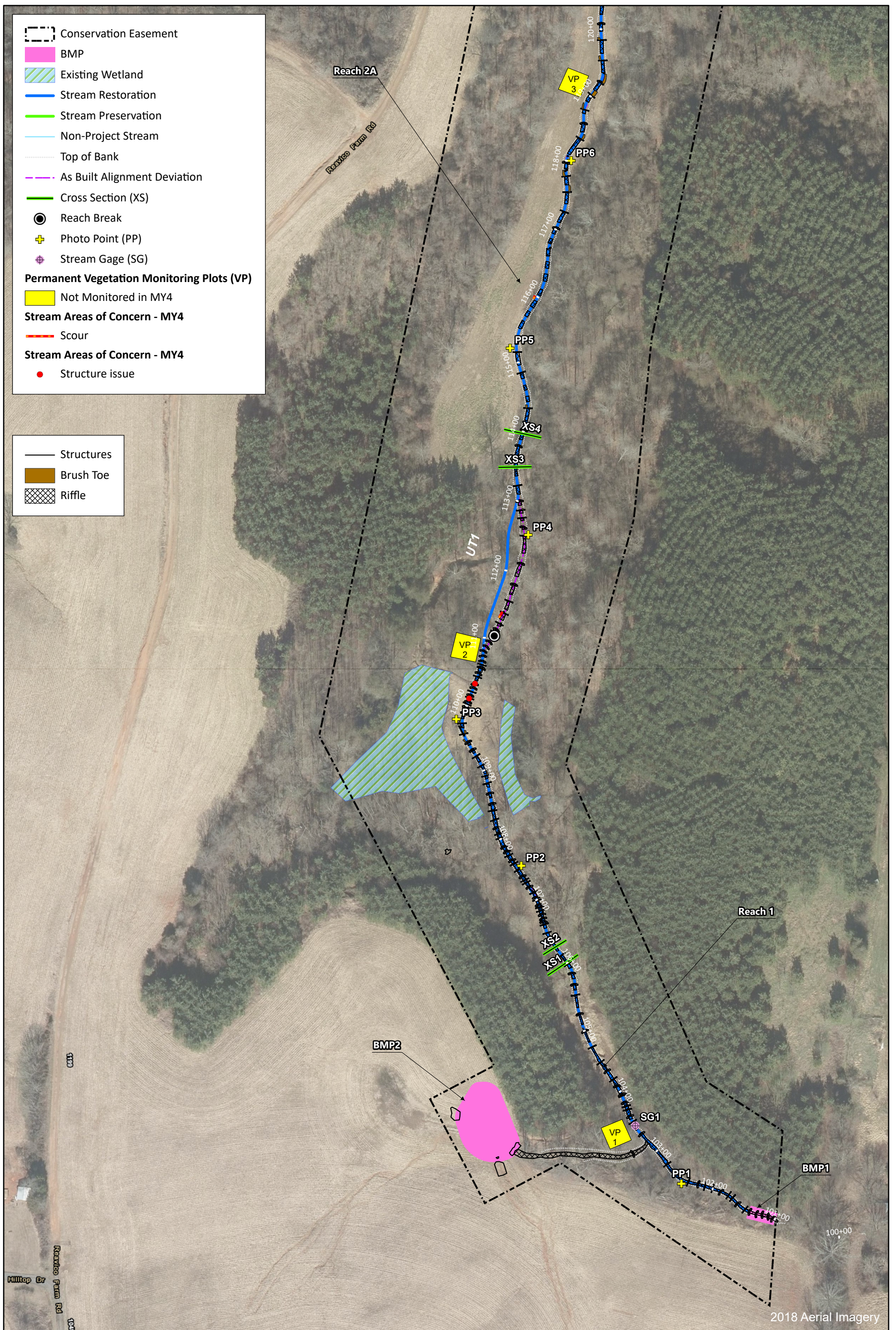
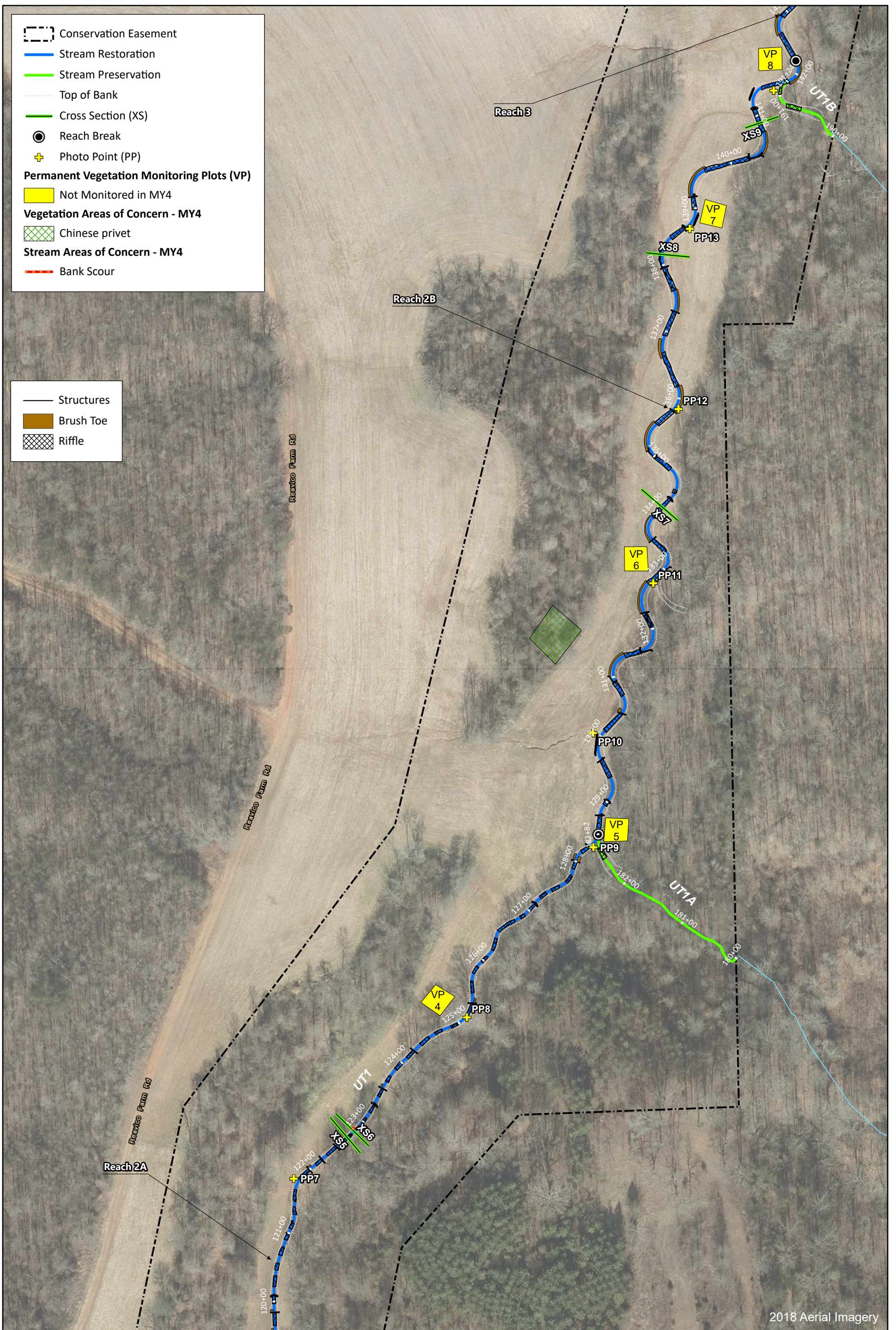


Figure 3.1 Current Condition Plan View Map (Sheet 1)
 Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022



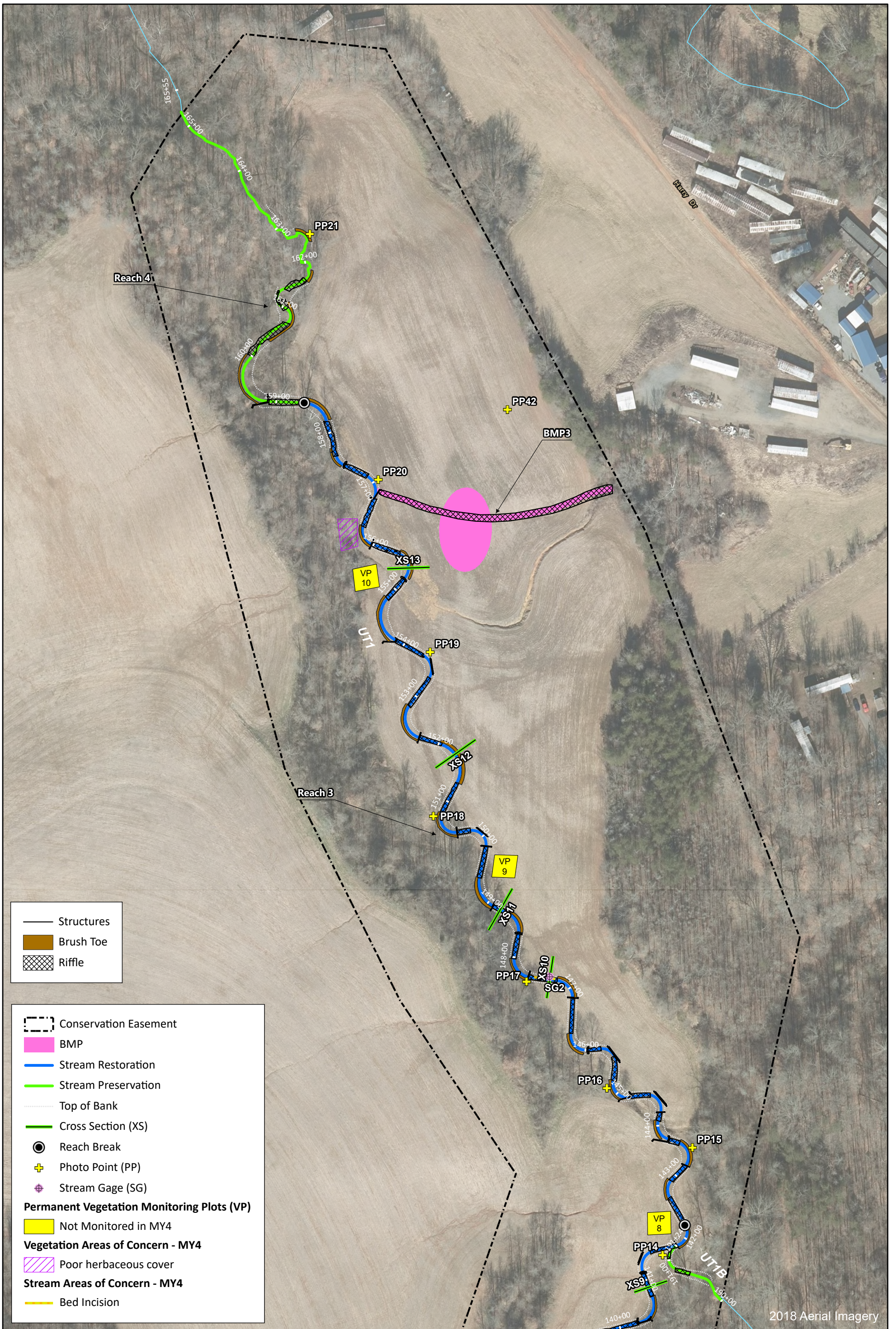


Figure 3.3 Current Condition Plan View Map (Sheet 3)
 Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

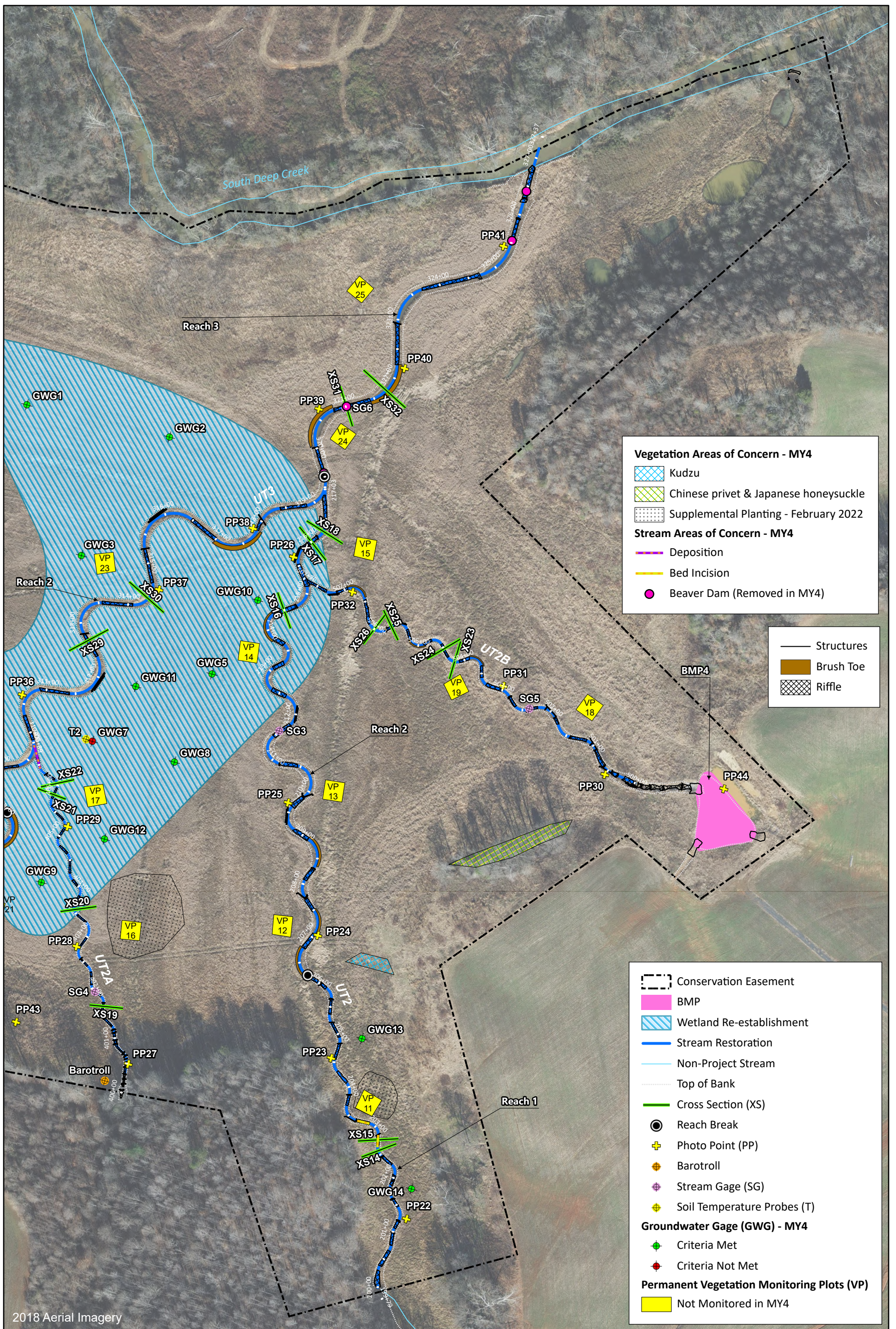


Figure 3.4 Current Condition Plan View Map (Sheet 4)
 Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

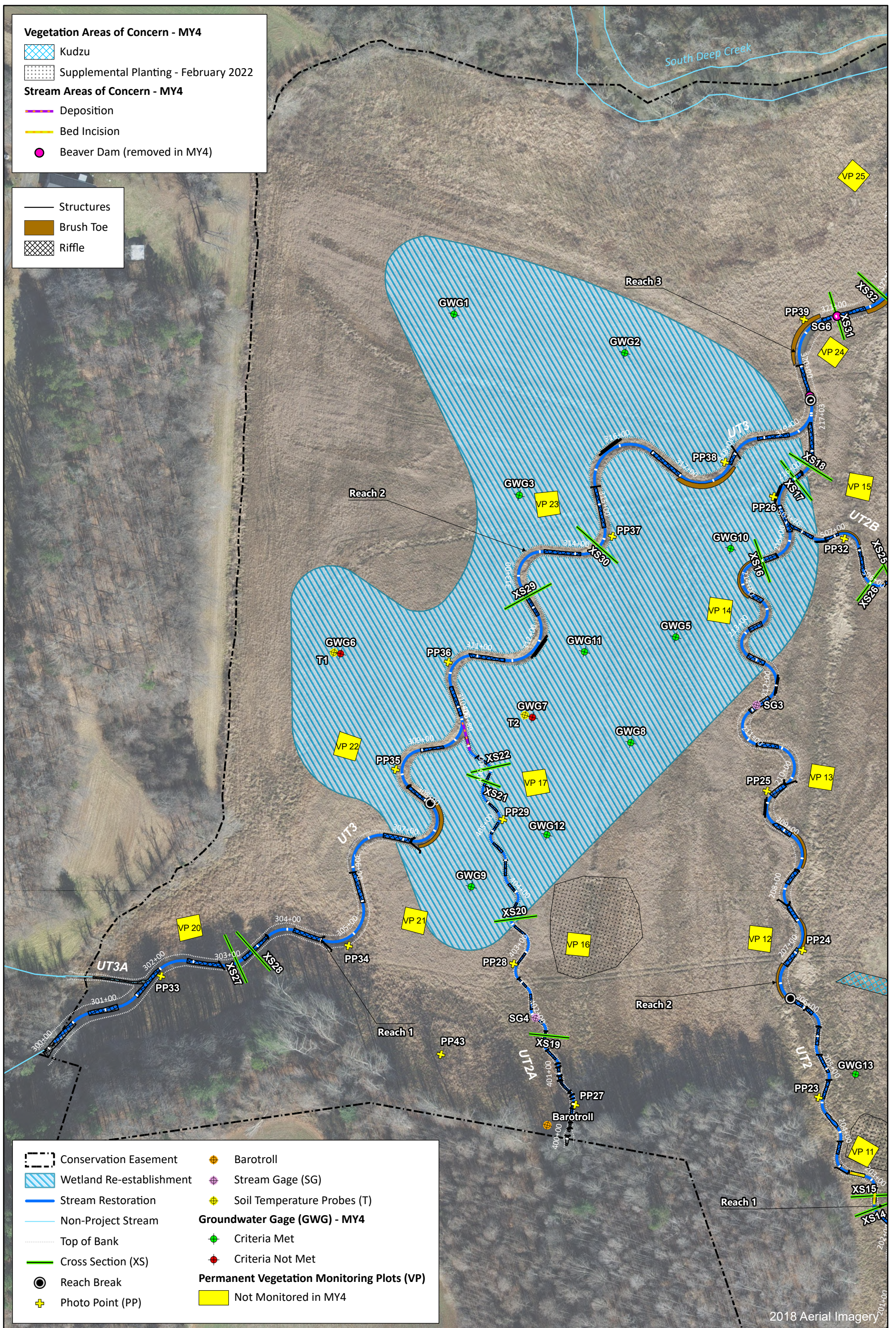


Table 6a. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022
 Reach: UT1 Reach 1 (STA 101+39 to 111+05)
 Assessed Length: 966

| 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 | 25 | 25 | | | | | | | 100% |
| | | Depth Sufficient | 25 | 25 | | | | | | | 100% |
| | 3. Step Pool Condition | Length Appropriate | N/A | N/A | | | | | | | N/A |
| | | Thalweg centering at upstream of meander bend (Run) | N/A | N/A | | | | | | | N/A |
| 4. Thalweg Position | Thalweg centering at downstream of meander bend (Glide) | N/A | N/A | N/A | | | | | | | |
| | | | | | | | | | | | |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 0 | 0 | 100% | 0 | 0 | 100% | |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | 0 | 0 | 100% | |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% | |
| Totals | | | | | 0 | 0 | 100% | 0 | 0 | 100% | |
| 3. Engineered Structures ¹ | 1. Overall Integrity | Structures physically intact with no dislodged boulders or logs. | 84 | 86 | | | | 98% | | | |
| | 2. Grade Control | Grade control structures exhibiting maintenance of grade across the sill | 84 | 86 | | | | 98% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 84 | 86 | | | | 98% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 84 | 86 | | | | 98% | | | |
| | 4. Habitat | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 84 | 86 | | | | 98% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6b. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022
 Reach: UT1 Reach 2A (STA 111+05 to 128+51)
 Assessed Length: 1,746

| 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 | 35 | 35 | | | 100% | | | |
| | 3. Step Pool Condition | Depth Sufficient | 35 | 35 | | | 100% | | | |
| | | Length Appropriate | N/A | N/A | | | N/A | | | |
| | 4. Thalweg Position | Thalweg centering at upstream of meander bend (Run) | N/A | N/A | | | N/A | | | |
| Thalweg centering at downstream of meander bend (Glide) | | N/A | N/A | N/A | | | | | | |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 3 | 20 | 99% | 0 | 0 | 99% |
| | 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% | 0 | 0 | 100% |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% |
| Totals | | | | | 3 | 20 | 99% | 0 | 0 | 99% |
| 3. Engineered Structures ¹ | 1. Overall Integrity | Structures physically intact with no dislodged boulders or logs. | 42 | 42 | | | 100% | | | |
| | 2. Grade Control | Grade control structures exhibiting maintenance of grade across the sill | 41 | 41 | | | 100% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 41 | 41 | | | 100% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 41 | 41 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 41 | 41 | | | 100% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6c. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022
 Reach: UT1 Reach 2B (STA 128+51 to 142+19)
 Assessed Length: 1,368

| 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 | 20 | 20 | | | 100% | | | |
| | | Length Appropriate | 20 | 20 | | | 100% | | | |
| | 4. Thalweg Position | Thalweg centering at upstream of meander bend (Run) | 20 | 20 | | | 100% | | | |
| Thalweg centering at downstream of meander bend (Glide) | | 20 | 20 | 100% | | | | | | |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 1 | 10 | 99.6% | 0 | 0 | 99.6% |
| | 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% | 0 | 0 | 100% |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% |
| Totals | | | | | 1 | 10 | 99.6% | 0 | 0 | 99.6% |
| 3. Engineered Structures ¹ | 1. Overall Integrity | Structures physically intact with no dislodged boulders or logs. | 33 | 33 | | | 100% | | | |
| | 2. Grade Control | Grade control structures exhibiting maintenance of grade across the sill | 19 | 19 | | | 100% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 19 | 19 | | | 100% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 33 | 33 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 33 | 33 | | | 100% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6d. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022
 Reach: UT1 Reach 3 (STA 142+19 to 158+60)
 Assessed Length: 1,641

| 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 | | | 1 | 30 | 98% | | | |
| | 2. Riffle Condition | Texture/Substrate | 22 | 22 | | | 100% | | | |
| | 3. Meander Pool Condition | Depth Sufficient | 22 | 22 | | | 100% | | | |
| | | Length Appropriate | 22 | 22 | | | 100% | | | |
| | 4. Thalweg Position | Thalweg centering at upstream of meander bend (Run) | 22 | 22 | | | 100% | | | |
| Thalweg centering at downstream of meander bend (Glide) | | 22 | 22 | 100% | | | | | | |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% |
| Totals | | | | | 0 | 0 | 100% | 0 | 0 | 100% |
| 3. Engineered Structures ¹ | 1. Overall Integrity | Structures physically intact with no dislodged boulders or logs. | 38 | 38 | | | 100% | | | |
| | 2. Grade Control | Grade control structures exhibiting maintenance of grade across the sill | 17 | 17 | | | 100% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 17 | 17 | | | 100% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 38 | 38 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 38 | 38 | | | 100% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6e. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022
 Reach: UT2 Reach 1 (STA 200+00 to 206+23)
 Assessed Length: 623

| 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 | | | 2 | 42 | 93% | | | |
| | 2. Riffle Condition | Texture/Substrate | 15 | 15 | | | 100% | | | |
| | 3. Meander Pool Condition | Depth Sufficient | 14 | 14 | | | 100% | | | |
| | | Length Appropriate | 14 | 14 | | | 100% | | | |
| | 4. Thalweg Position | Thalweg centering at upstream of meander bend (Run) | 15 | 15 | | | 100% | | | |
| Thalweg centering at downstream of meander bend (Glide) | | 15 | 15 | 100% | | | | | | |
| | | | | | | | | | | |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% |
| Totals | | | | | 0 | 0 | 100% | 0 | 0 | 100% |
| 3. Engineered Structures ¹ | 1. Overall Integrity | Structures physically intact with no dislodged boulders or logs. | 12 | 12 | | | 100% | | | |
| | 2. Grade Control | Grade control structures exhibiting maintenance of grade across the sill | 11 | 11 | | | 100% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 11 | 11 | | | 100% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 12 | 12 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 12 | 12 | | | 100% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6f. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022
 Reach: UT2 Reach 2 (STA 206+23 to 217+03)
 Assessed Length: 1,080

| 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 | 14 | 14 | | | 100% | | | |
| | 3. Meander Pool Condition | Depth Sufficient | 14 | 14 | | | 100% | | | |
| | | Length Appropriate | 14 | 14 | | | 100% | | | |
| | 4. Thalweg Position | Thalweg centering at upstream of meander bend (Run) | 14 | 14 | | | 100% | | | |
| Thalweg centering at downstream of meander bend (Glide) | | 14 | 14 | 100% | | | | | | |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% |
| Totals | | | | | 0 | 0 | 100% | 0 | 0 | 100% |
| 3. Engineered Structures ¹ | 1. Overall Integrity | Structures physically intact with no dislodged boulders or logs. | 12 | 12 | | | 100% | | | |
| | 2. Grade Control | Grade control structures exhibiting maintenance of grade across the sill | 6 | 6 | | | 100% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 6 | 6 | | | 100% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 12 | 12 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 12 | 12 | | | 100% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6g. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022

Reach: UT2A (STA 400+34 to 406+89)

Assessed Length: 655

| 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 | | | 1 | 41 | 94% | | | |
| | | Degradation | | | 0 | 0 | 100% | | | |
| | 2. Riffle Condition | Texture/Substrate | 18 | 19 | | | 95% | | | |
| | 3. Meander Pool Condition | Depth Sufficient | 17 | 17 | | | 100% | | | |
| | | Length Appropriate | 17 | 17 | | | 100% | | | |
| | 4. Thalweg Position | Thalweg centering at upstream of meander bend (Run) | 17 | 17 | | | 100% | | | |
| Thalweg centering at downstream of meander bend (Glide) | | 17 | 17 | 100% | | | | | | |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% |
| Totals | | | | | 0 | 0 | 100% | 0 | 0 | 100% |
| 3. Engineered Structures ¹ | 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 | 13 | 13 | | | 100% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 13 | 13 | | | 100% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 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% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6h. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022

Reach: UT2B (STA 500+00 to 507+76)

Assessed Length: 776

| 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 | 17 | 17 | | | 100% | | | |
| | 3. Meander Pool Condition | Depth Sufficient | 15 | 15 | | | 100% | | | |
| | | Length Appropriate | 15 | 15 | | | 100% | | | |
| | 4. Thalweg Position | Thalweg centering at upstream of meander bend (Run) | 15 | 15 | | | 100% | | | |
| Thalweg centering at downstream of meander bend (Glide) | | 15 | 15 | 100% | | | | | | |
| Totals | | | | | 0 | 0 | 100% | 0 | 0 | 100% |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% |
| Totals | | | | | 0 | 0 | 100% | 0 | 0 | 100% |
| 3. Engineered Structures ¹ | 1. Overall Integrity | Structures physically intact with no dislodged boulders or logs. | 12 | 12 | | | 100% | | | |
| | 2. Grade Control | Grade control structures exhibiting maintenance of grade across the sill | 7 | 7 | | | 100% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 7 | 7 | | | 100% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 12 | 12 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 12 | 12 | | | 100% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6i. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022
 Reach: UT3 Reach 1 (STA 300+13 to 307+92)
 Assessed Length: 779

| 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 | 8 | 8 | | | 100% | | | |
| | 3. Meander Pool Condition | Depth Sufficient | 8 | 8 | | | 100% | | | |
| | | Length Appropriate | 8 | 8 | | | 100% | | | |
| | 4. Thalweg Position | Thalweg centering at upstream of meander bend (Run) | 8 | 8 | | | 100% | | | |
| Thalweg centering at downstream of meander bend (Glide) | | 8 | 8 | 100% | | | | | | |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% |
| Totals | | | | | 0 | 0 | 100% | 0 | 0 | 100% |
| 3. Engineered Structures ¹ | 1. Overall Integrity | Structures physically intact with no dislodged boulders or logs. | 6 | 6 | | | 100% | | | |
| | 2. Grade Control | Grade control structures exhibiting maintenance of grade across the sill | 5 | 5 | | | 100% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 5 | 5 | | | 100% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 6 | 6 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 6 | 6 | | | 100% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6j. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022
 Reach: UT3 Reach 2 (STA 307+92 to 319+51)
 Assessed Length: 1,159

| Major Channel Category | Channel Sub-Category | Metric | Number Stable, Performing as Intended | Total Number in As-Built | Number of Unstable Segments | Amount of Unstable Footage | % Stable, Performing as Intended | Number with Stabilizing Woody Vegetation | Footage with Stabilizing Woody Vegetation | Adjust % for Stabilizing Woody Vegetation |
|---|--|--|---------------------------------------|--------------------------|-----------------------------|----------------------------|----------------------------------|--|---|---|
| 1. Bed | 1. Vertical Stability (Riffle and Run units) | Aggradation | | | 0 | 0 | 100% | | | |
| | | Degradation | | | 0 | 0 | 100% | | | |
| | 2. Riffle Condition | Texture/Substrate | 10 | 10 | | | 100% | | | |
| | 3. Meander Pool Condition | Depth Sufficient | 10 | 10 | | | 100% | | | |
| | | Length Appropriate | 10 | 10 | | | 100% | | | |
| | 4. Thalweg Position | Thalweg centering at upstream of meander bend (Run) | 10 | 10 | | | 100% | | | |
| Thalweg centering at downstream of meander bend (Glide) | | 10 | 10 | 100% | | | | | | |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% |
| Totals | | | | | 0 | 0 | 100% | 0 | 0 | 100% |
| 3. Engineered Structures ¹ | 1. Overall Integrity | Structures physically intact with no dislodged boulders or logs. | 7 | 7 | | | 100% | | | |
| | 2. Grade Control | Grade control structures exhibiting maintenance of grade across the sill | 4 | 4 | | | 100% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 4 | 4 | | | 100% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 7 | 7 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 7 | 7 | | | 100% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6k. Visual Stream Morphology Stability Assessment Table

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022

Reach: UT3 Reach 3 (STA 319+51 to STA 327+15)

Assessed Length: 764

| 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 | 4 | 4 | | | 100% | | | |
| | | Length Appropriate | 4 | 4 | | | 100% | | | |
| | 4. Thalweg Position | Thalweg centering at upstream of meander bend (Run) | 4 | 4 | | | 100% | | | |
| Thalweg centering at downstream of meander bend (Glide) | | 4 | 4 | 100% | | | | | | |
| 2. Bank | 1. Scoured/Eroded | Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | 0 | 0 | 100% |
| | 3. Mass Wasting | Bank slumping, calving, or collapse | | | 0 | 0 | 100% | 0 | 0 | 100% |
| Totals | | | | | 0 | 0 | 100% | 0 | 0 | 100% |
| 3. Engineered Structures ¹ | 1. Overall Integrity | Structures physically intact with no dislodged boulders or logs. | 6 | 6 | | | 100% | | | |
| | 2. Grade Control | Grade control structures exhibiting maintenance of grade across the sill | 4 | 4 | | | 100% | | | |
| | 2a. Piping | Structures lacking any substantial flow underneath sills or arms. | 4 | 4 | | | 100% | | | |
| | 3. Bank Protection | Bank erosion within the structures extent of influence does not exceed 15%. | 6 | 6 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow. | 6 | 6 | | | 100% | | | |

¹Excludes constructed riffles since they are evaluated in section 1.

Table 7. Vegetation Condition Assessment Table

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Last Date of Visual Assessment: 11/1/2022

Planted Acreage **68.3**

| Vegetation Category | Definitions | Mapping Threshold (acres) | Number of Polygons | Combined Acreage | % of Planted Acreage |
|-------------------------------------|--|---------------------------|--------------------|------------------|----------------------|
| Bare Areas ¹ | Very limited cover of both woody and herbaceous material | 0.1 | 1 | 0.03 | 0.04% |
| Low Stem Density Areas | Woody stem densities clearly below target levels based on MY3, 4, 5, or 7 stem count criteria. | 0.1 | 0 | 0.00 | 0.0% |
| Total | | | 1 | 0.03 | 0.04% |
| Areas of Poor Growth Rates or Vigor | Areas with woody stems of a size class that are obviously small given the monitoring year. | 0.1 | 0 | 0.00 | 0.0% |
| Cumulative Total | | | 1 | 0.03 | 0.04% |

Easement Acreage **103.2**

| Vegetation Category | Definitions | Mapping Threshold (SF) | Number of Polygons | Combined Acreage | % of Easement Acreage |
|-----------------------------|--|------------------------|--------------------|------------------|-----------------------|
| Invasive Areas of Concern | Areas or points (if too small to render as polygons at map scale). | 1000 | 3 | 0.22 | 0.2% |
| Easement Encroachment Areas | Areas or points (if too small to render as polygons at map scale). | none | 0 | 0.0 | 0.0% |

¹ Area included is less than 0.1 acres.

Stream Photographs
MY4



Photo Point 1 – UT1 Reach 1, view upstream (03/14/2022)



Photo Point 1 – UT1 Reach 1, view downstream (03/14/2022)



Photo Point 2 – UT1 Reach 1, view upstream (03/14/2022)



Photo Point 2 – UT1 Reach 1, view downstream (03/14/2022)



Photo Point 3 – UT1 Reach 1, view upstream (03/14/2022)



Photo Point 3 – UT1 Reach 1, view downstream (03/14/2022)



Photo Point 4 – UT1 Reach 2A, view upstream (03/14/2022)



Photo Point 4 – UT1 Reach 2A, view downstream (03/14/2022)



Photo Point 5 – UT1 Reach 2A, view upstream (03/14/2022)



Photo Point 5 – UT1 Reach 2A, view downstream (03/14/2022)



Photo Point 6 – UT1 Reach 2A, view upstream (03/14/2022)



Photo Point 6 – UT1 Reach 2A, view downstream (03/14/2022)



Photo Point 7 – UT1 Reach 2A, view upstream (03/14/2022)



Photo Point 7 – UT1 Reach 2A, view downstream (03/14/2022)



Photo Point 8 – UT1 Reach 2A, view upstream (03/14/2022)



Photo Point 8 – UT1 Reach 2A, view downstream (03/14/2022)



Photo Point 9 – UT1 Reach 2A, view upstream (03/14/2022)



Photo Point 9 – UT1 Reach 2A, view downstream (03/14/2022)



Photo Point 9 – UT1A, view upstream (03/14/2022)



Photo Point 10 – UT1 Reach 2B, view upstream (03/14/2022)



Photo Point 10 – UT1 Reach 2B, view downstream (03/14/2022)



Photo Point 11 – UT1 Reach 2B, view upstream (03/14/2022)



Photo Point 11 – UT1 Reach 2B, view downstream (03/14/2022)



Photo Point 12 – UT1 Reach 2B, view upstream (03/14/2022)



Photo Point 12 – UT1 Reach 2B, view downstream (03/14/2022)



Photo Point 13 – UT1 Reach 2B, view upstream (03/14/2022)



Photo Point 13 – UT1 Reach 2B, view downstream (03/14/2022)



Photo Point 14 – UT1 Reach 2B, view upstream (03/14/2022)



Photo Point 14 – UT1 Reach 2B, view downstream (03/14/2022)



Photo Point 14 – UT1B, view upstream (03/14/2022)



Photo Point 15 – UT1 Reach 3, view upstream (03/14/2022)



Photo Point 15 – UT1 Reach 3, view downstream (03/14/2022)



Photo Point 16 – UT1 Reach 3, view upstream (03/14/2022)



Photo Point 16 – UT1 Reach 3, view downstream (03/14/2022)



Photo Point 17 – UT1 Reach 3, view upstream (03/14/2022)



Photo Point 17 – UT1 Reach 3, view downstream (03/14/2022)



Photo Point 18 – UT1 Reach 3, view upstream (03/14/2022)



Photo Point 18 – UT1 Reach 3, view downstream (03/14/2022)



Photo Point 19 – UT1 Reach 3, view upstream (03/14/2022)



Photo Point 19 – UT1 Reach 3, view downstream (03/14/2022)



Photo Point 20 – UT1 Reach 3, view upstream (03/14/2022)



Photo Point 20 – UT1 Reach 3, view downstream (03/14/2022)



Photo Point 20 – UT1 Reach 3 BMP 3, view upstream (03/14/2022)



Photo Point 21 – UT1 Reach 4, view upstream (03/14/2022)



Photo Point 21 – UT1 Reach 4, view downstream (03/14/2022)



Photo Point 22 – UT2 Reach 1, view upstream (03/14/2022)



Photo Point 22 – UT2 Reach 1, view downstream (03/14/2022)



Photo Point 23 – UT2 Reach 1, view upstream (03/14/2022)



Photo Point 23 – UT2 Reach 1, view downstream (03/14/2022)



Photo Point 24 – UT2 Reach 2, view upstream (03/14/2022)



Photo Point 24 – UT2 Reach 2, view downstream (03/14/2022)



Photo Point 25 – UT2 Reach 2, view upstream (03/14/2022)



Photo Point 25 – UT2 Reach 2, view downstream (03/14/2022)



Photo Point 26 – UT2 Reach 2, view upstream (03/14/2022)



Photo Point 26 – UT2 Reach 2, view downstream (03/14/2022)



Photo Point 27 – UT2A, view upstream (03/14/2022)



Photo Point 27 – UT2A, view downstream (03/14/2022)



Photo Point 28 – UT2A, view upstream (03/14/2022)



Photo Point 28 – UT2A, view downstream (03/14/2022)



Photo Point 29 – UT2A, view upstream (03/14/2022)



Photo Point 29 – UT2A, view downstream (03/14/2022)



Photo Point 30 – UT2B, view upstream (03/14/2022)



Photo Point 30 – UT2B, view downstream (03/14/2022)



Photo Point 31 – UT2B, view upstream (03/14/2022)



Photo Point 31 – UT2B, view downstream (03/14/2022)



Photo Point 32 – UT2B, view upstream (03/14/2022)



Photo Point 32 – UT2B, view downstream (03/14/2022)



Photo Point 33 – UT3 Reach 1, view upstream (03/14/2022)



Photo Point 33 – UT3 Reach 1, view downstream (03/14/2022)



Photo Point 34 – UT3 Reach 1, view upstream (03/14/2022)



Photo Point 34 – UT3 Reach 1, view downstream (03/14/2022)



Photo Point 35 – UT3 Reach 1, view upstream (03/14/2022)



Photo Point 35 – UT3 Reach 1, view downstream (03/14/2022)



Photo Point 36 – UT3 Reach 2, view upstream (03/14/2022)



Photo Point 36 – UT3 Reach 2, view downstream (03/14/2022)



Photo Point 37 – UT3 Reach 2, view upstream (03/14/2022)



Photo Point 37 – UT3 Reach 2, view downstream (03/14/2022)



Photo Point 38 – UT3 Reach 2, view upstream (03/14/2022)



Photo Point 38 – UT3 Reach 2, view downstream (03/14/2022)



Photo Point 39 – UT3 Reach 3, view upstream (03/14/2022)



Photo Point 39 – UT3 Reach 3, view downstream (03/14/2022)



Photo Point 40 – UT3 Reach 3, view upstream (03/14/2022)



Photo Point 40 – UT3 Reach 3, view downstream (03/14/2022)



Photo Point 41 – UT3 Reach 3, view upstream (03/14/2022)



Photo Point 41 – UT3 Reach 3, view downstream (03/14/2022)



Photo Point 42 – UT1 Reach 3, up valley (03/14/2022)



Photo Point 42 – UT1 Reach 4, down valley (03/14/2022)



Photo Point 43 – UT2A, northeast view (03/14/2022)



Photo Point 43 – UT2A, north view (03/14/2022)



Photo Point 43 – UT3 Reach 3, northwest view (03/14/2022)



Photo Point 44 – BMP 4 above UT2B, inlet view (03/14/2022)



Photo Point 44 – BMP 4 above UT2B, outlet view (03/14/2022)

Groundwater Gage Photographs
MY4



Groundwater Gage 1 – (2/15/2022)



Groundwater Gage 2 – (2/15/2022)



Groundwater Gage 3 – (2/15/2022)



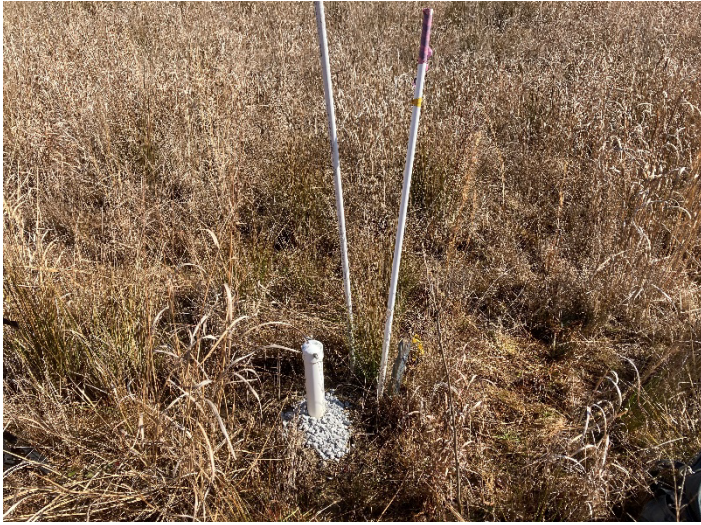
Groundwater Gage 5 – (2/15/2022)



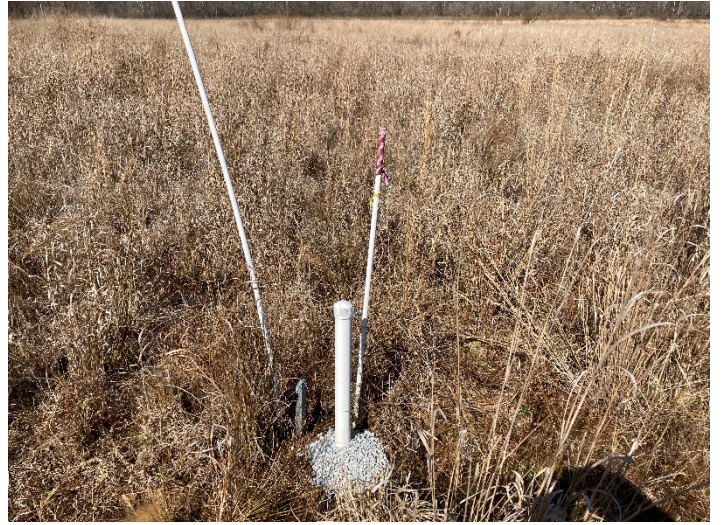
Groundwater Gage 6 – (2/15/2022)



Groundwater Gage 7 – (2/15/2022)



Groundwater Gage 8 – (2/15/2022)



Groundwater Gage 9 – (2/15/2022)



Groundwater Gage 10 – (2/15/2022)



Groundwater Gage 11 – (11/1/2022)



Groundwater Gage 12 – (11/1/2022)



Groundwater Gage 13 – (4/28/2022)



Groundwater Gage 14 – (4/28/2022)

**Leaf Out and Leaf Senescence Photographs
MY4**



Red Bud Blooming Photo Documentation – (3/30/2022)



River Birch Leaf Out Photo Documentation – (3/30/2022)



Leaf Senescence Photo Documentation – (11/01/2022)



Leaf Senescence Photo Documentation – (11/01/2022)

APPENDIX 3. Vegetation Plot Data

Vegetation assessment and analysis not required in Monitoring Year 4

APPENDIX 4. Morphological Summary Data and Plots

Morphological surveys and analysis not required in Monitoring Year 4

APPENDIX 5. Hydrology Summary Data and Plots

Table 14a. Verification of Bankfull Events

Lone Hickory Mitigation Site
 DMS Project No. 97135
 Monitoring Year 4 - 2022

| Reach | MY | Date of Occurrence | Date of Data Collection | Method | |
|-------------|------------|------------------------------------|-------------------------|-------------|------------|
| UT1 Reach 3 | MY2 | 2/6/2020 | 2/6/2020 | Stream Gage | |
| | | 5/27/2020 | 5/27/2020 | | |
| | | 8/6/2020 | 8/6/2020 | | |
| | MY3 | 1/9/2021 | 1/9/2021 | | |
| | | 2/20/2021 | 2/20/2021 | | |
| | MY4 | 1/27/2022 | 1/27/2022 | | |
| | | 1/30/2022 | 1/30/2022 | | |
| | | 5/22/2022 | 5/22/2022 | | |
| UT2 Reach 2 | MY2 | 2/6/2020 | 2/6/2020 | | |
| | | 5/21/2020 | 5/21/2020 | | |
| | | 5/27/2020 | 5/27/2020 | | |
| | | 7/24/2020 | 7/24/2020 | | |
| | | 8/6/2020 | 8/6/2020 | | |
| | | | 10/11/2020 | | 10/11/2020 |
| | MY3 | 2/16/2021 | 2/16/2021 | | |
| | | 6/12/2021 | 6/12/2021 | | |
| | MY4 | 1/3/2022 | 1/3/2022 | | |
| | | 2/23/2022 | 2/23/2022 | | |
| | | 3/25/2022 | 3/25/2022 | | |
| | | 5/21/2022 | 5/21/2022 | | |
| | | 5/27/2022 | 5/27/2022 | | |
| | | | 7/7/2022 | 7/7/2022 | |
| | | 8/15/2022 | 8/15/2022 | | |
| UT2A | MY2 | 2/6/2020 | 2/6/2020 | | |
| | | 5/27/2020 | 5/27/2020 | | |
| | | 8/6/2020 | 8/6/2020 | | |
| | | 10/11/2020 | 10/11/2020 | | |
| | MY3 | 3/18/2021 | 3/18/2021 | | |
| | | 6/12/2021 | 6/12/2021 | | |
| | MY4 | 5/21/2022 | 5/21/2022 | | |
| 5/27/2022 | | 5/27/2022 | | | |
| UT2B | MY1 | 6/8/2019 | 6/8/2019 | | |
| | MY2 | 2/6/2020 | 2/6/2020 | | |
| | | 5/27/2020 | 5/27/2020 | | |
| | MY3 | 1/24/2021 | 1/24/2021 | | |
| UT3 Reach 3 | MY1 | 6/8/2019 - 6/9/2019 | 6/8/2019 - 6/9/2019 | | |
| | | 6/23/2019 | 6/23/2019 | | |
| | MY2 | 1/11/2020 | 1/11/2020 | | |
| | | 1/24/2020 | 1/24/2020 | | |
| | | 2/6/2020 - 2/13/2020 ¹ | 2/6/2020 - 2/13/2020 | | |
| | | 4/13/2020 | 4/13/2020 | | |
| | | 4/30/2020 | 4/30/2020 | | |
| | | 5/22/2020 | 5/22/2020 | | |
| | | 5/27/2020 | 5/27/2020 | | |
| | | 7/24/2020 | 7/24/2020 | | |
| | | 8/6/2020 | 8/6/2020 | | |
| | | 8/13/2020 - 8/15/2020 ¹ | 8/13/2020 - 8/15/2020 | | |
| | | 8/21/2020 | 8/21/2020 | | |
| | | 9/17/2020 | 9/17/2020 | | |
| | | 9/25/2020 | 9/25/2020 | | |
| | 10/11/2020 | 10/11/2020 | | | |
| | 10/29/2020 | 10/29/2020 | | | |
| | MY3 | 1/28/2021 | 1/28/2021 | | |
| | | 2/13/2021 | 2/13/2021 | | |
| | | 2/16/2021 | 2/16/2021 | | |
| 2/18/2021 | | 2/18/2021 | | | |
| 3/18/2021 | | 3/18/2021 | | | |
| 3/26/2021 | | 3/26/2021 | | | |
| | | 6/12/2021 | 6/12/2021 | | |
| MY4 | 1/3/2022 | 1/3/2022 | | | |
| | 2/23/2022 | 2/23/2022 | | | |
| | 3/23/2022 | 3/23/2022 | | | |

¹ Multiple bankfull events occurred within these date ranges.

Table 14b. Verification of Consecutive Flow Days

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

| Reach | MY | Dates of Occurrence | Maximum Consecutive Days of Stream Flow | Method |
|-------------|-----|------------------------|---|-------------|
| UT1 Reach 1 | MY1 | 3/27/2019 - 10/22/2019 | 209 days | Stream Gage |
| | MY2 | 3/8/2020 - 11/3/2020 | 241 days | |
| | MY3 | 5/18/2021 - 9/9/2021 | 114 days | |
| | MY4 | 1/1/2022 - 11/1/2022 | 304 days | |
| UT2A | MY1 | 3/25/2019 - 5/28/2019 | 64 days | |
| | MY2 | 2/22/2020 - 7/14/2020 | 143 days | |
| | MY3 | 1/1/2021 - 7/29/2021 | 210 days | |
| | MY4 | 1/1/2022 - 5/4/2022 | 123 days | |
| UT2B | MY1 | 4/5/2019 - 4/28/2019 | 23 days | |
| | MY2 | 2/5/2020 - 3/5/2020 | 29 days | |
| | MY3 | 1/24/2021 - 3/6/2021 | 42 days | |
| | MY4 | 2/3/2022 - 2/13/2022 | 11 days | |

Table 15. Wetland Gage Attainment Summary

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

| Summary of Groundwater Gage Results for Monitoring Years 1 through 7 | | | | | | | |
|--|--|------------------------|------------------------|-------------------------|-----|-----|-----|
| Gage | Success Criteria ² Achieved/Max Consecutive Days During Growing Season (Percentage) | | | | | | |
| | MY1 | MY2 | MY3 | MY4 | MY5 | MY6 | MY7 |
| Reference | Yes/25 days (12.1%) | Yes/97 days (46.9%) | N/A | N/A | | | |
| 1 | Yes/25 days (12.1%) | Yes/46 days (22.2%) | No/16 days (7.7%) | Yes/27 days (13.0%) | | | |
| 2 | Yes/23 days (11.1%) | Yes/46 days (22.2%) | No/14 days (6.8%) | Yes/27 days (13.0%) | | | |
| 3 | Yes/24 days (11.6%) | Yes/46 days (22.2%) | Yes/22 days (10.6%) | Yes/39 days (18.8%) | | | |
| 4 ¹ | Yes/109 days (52.7%) | N/A | N/A | N/A | | | |
| 5 | Yes/48 days (23.2%) | Yes/86 days (41.5%) | Yes/22 days (10.6%) | Yes/56 days (27.1%) | | | |
| 6 | Yes/23 days (11.1%) | Yes/26 days (12.6%) | No/10 days (4.8%) | No/15 days (7.3%) | | | |
| 7 | Yes/24 days (11.6%) | No/16 days (7.7%) | No/4 days (1.9%) | No/15 days (7.3%) | | | |
| 8 | Yes/48 days (23.2%) | Yes/46 days (22.2%) | No/11 days (5.3%) | Yes/20 days (9.7%) | | | |
| 9 | Yes/26 days (12.6%) | Yes/46 days (22.2%) | No/14 days (6.8%) | Yes/19 days (9.2%) | | | |
| 10 ¹ | N/A | Yes/46 days (22.2%) | No/11 days (5.3%) | Yes/38 days (18.4%) | | | |
| 11 ³ | N/A | N/A | N/A | Yes/27 days (13.0%) | | | |
| 12 ³ | N/A | N/A | N/A | Yes/19 days (9.2%) | | | |
| 13 ³ | N/A | N/A | N/A | Yes/116 days (56.3%) | | | |
| 14 ³ | N/A | N/A | N/A | Yes/20 days (9.7%) | | | |

¹ GWG 10 was installed adjacent to GWG 4 but outside of the former ditch location at the end of October 2019. Reporting for GWG 10 begins in MY2 and GWG 4 will be omitted from future monitoring reports.

² The success criteria is 19 consecutive days, (9.2%) of the growing season (April 4 to October 27).

³ GWG 11 - GWG 14 were installed on April 22, 2022.

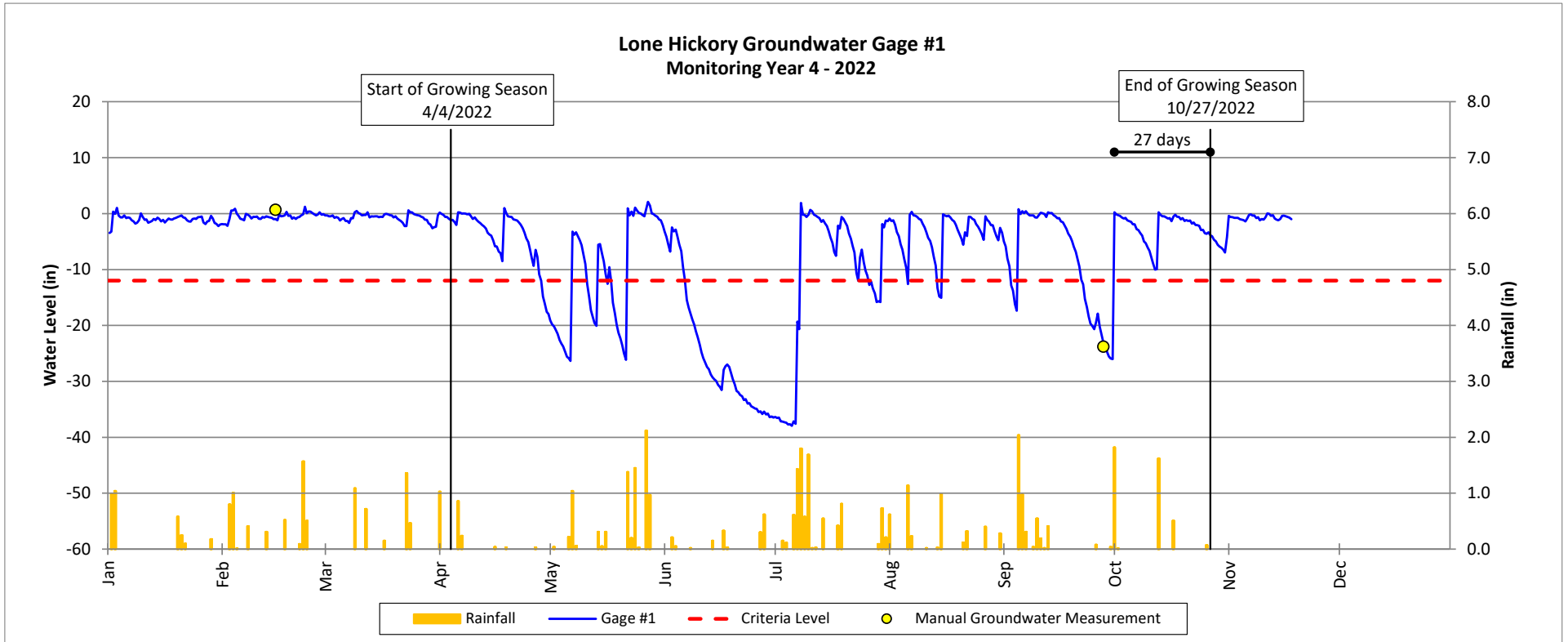
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



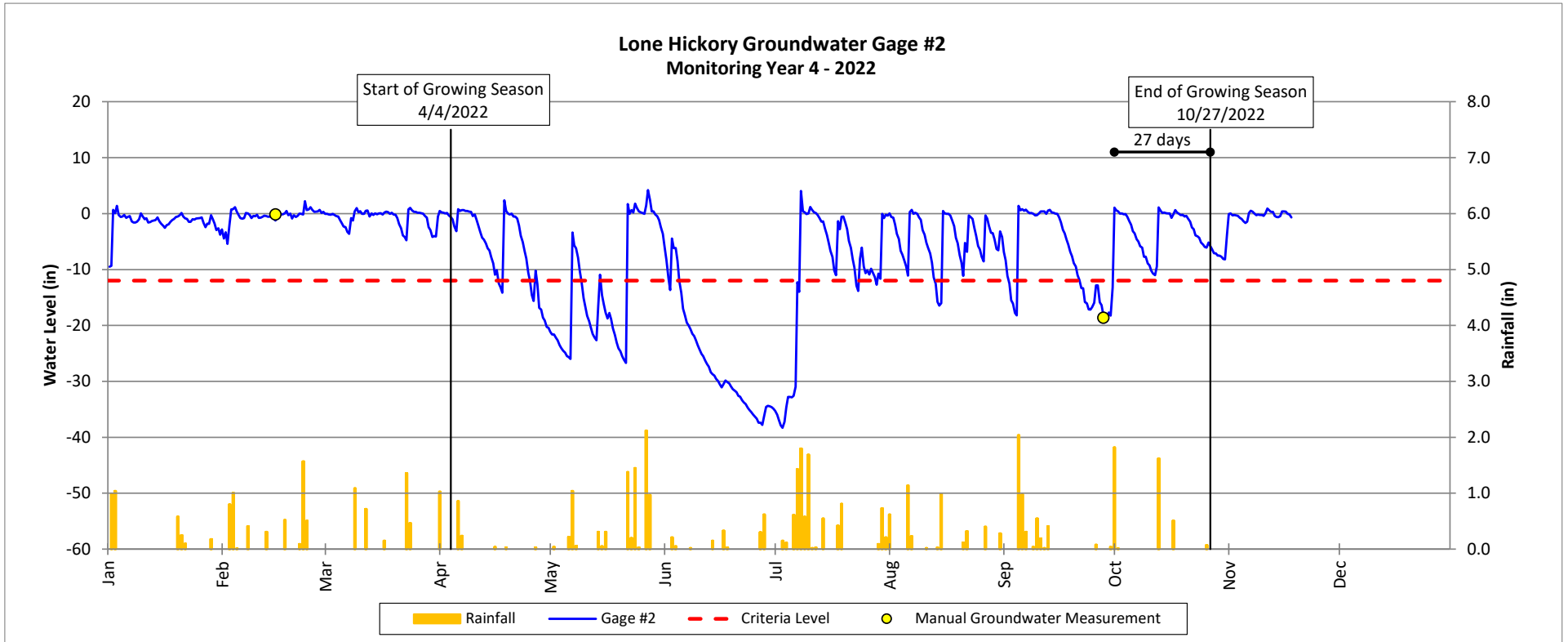
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



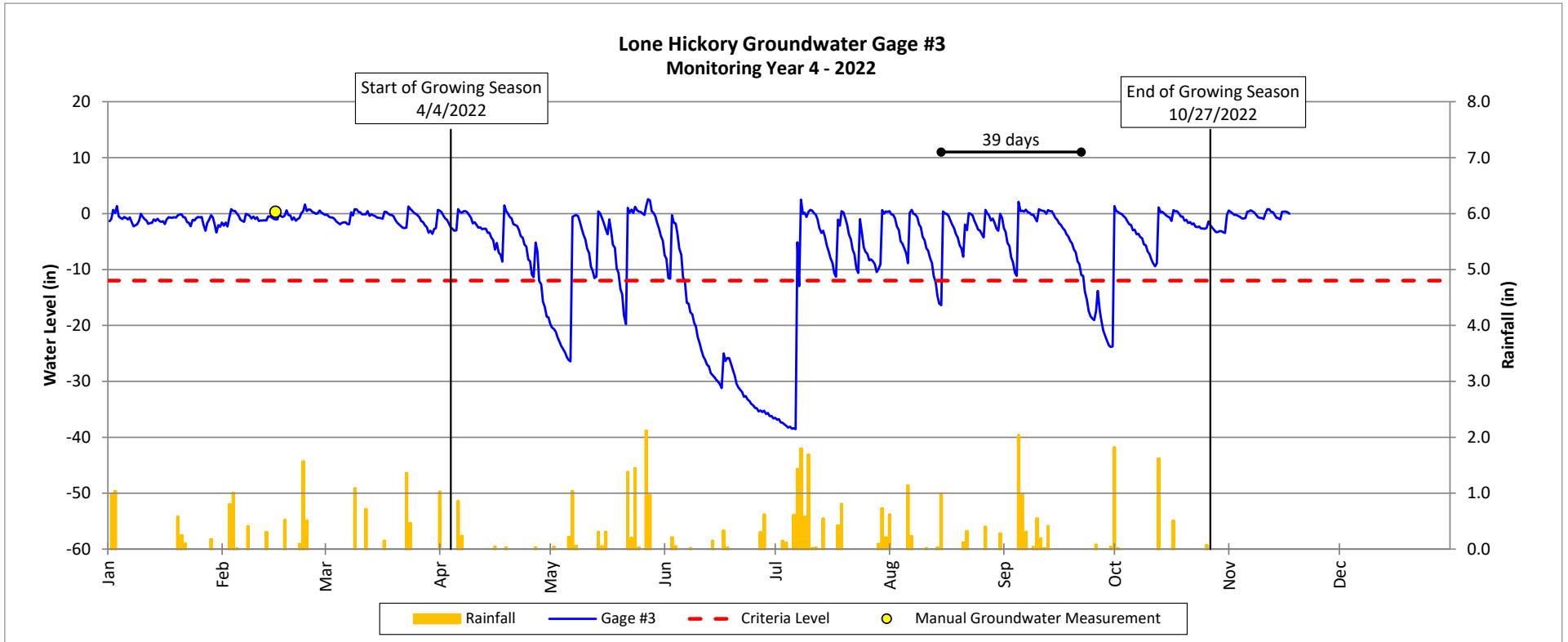
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



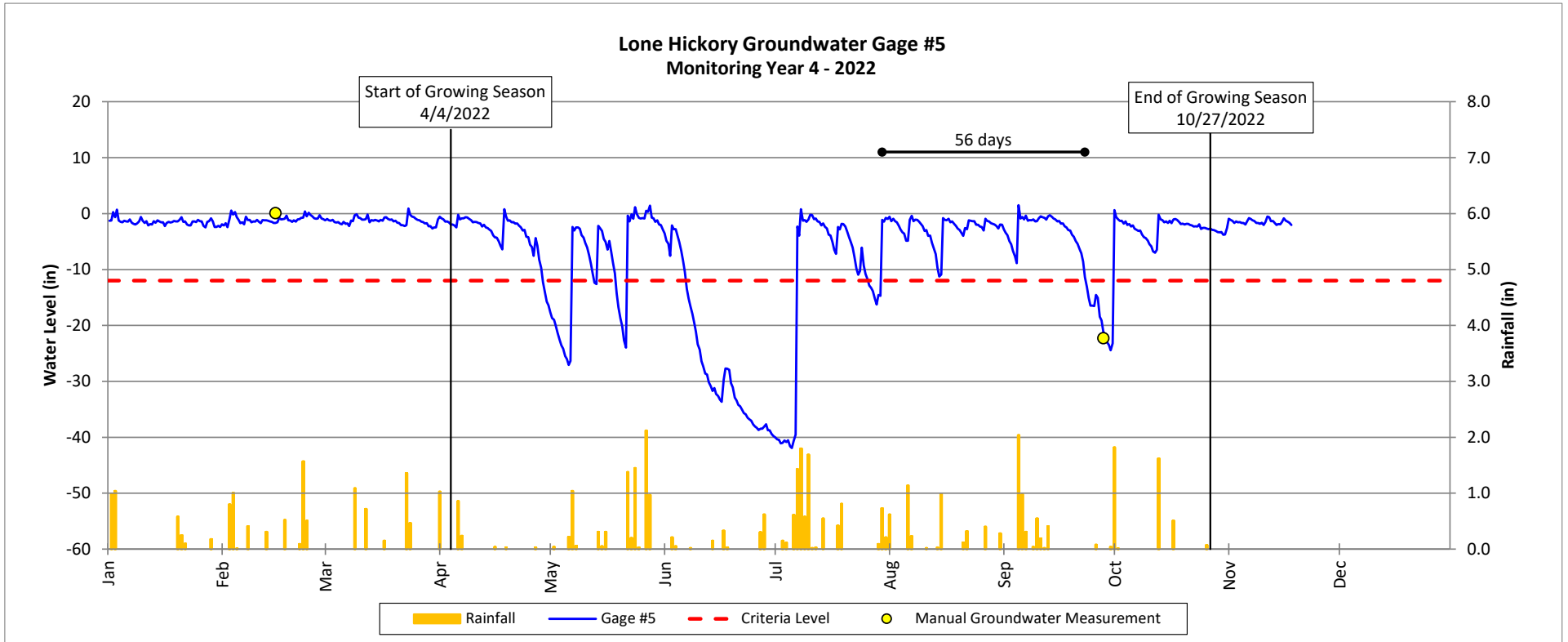
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



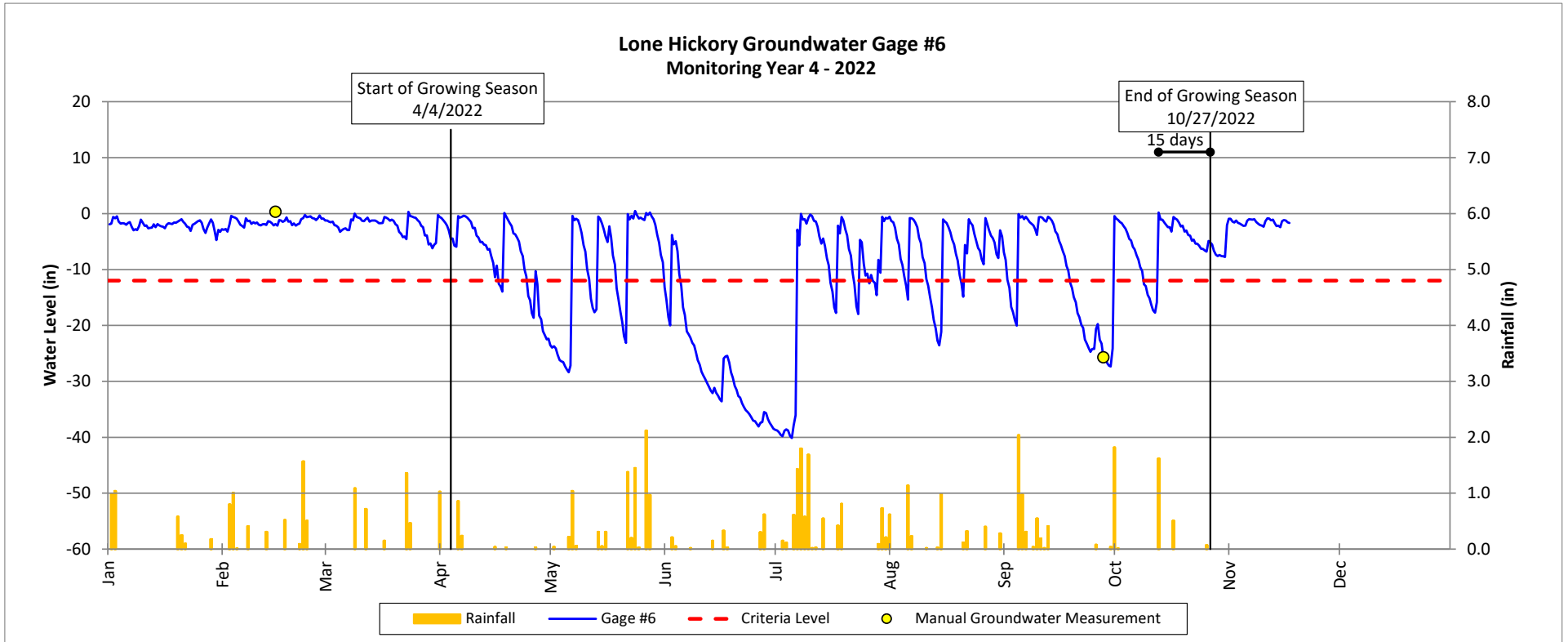
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



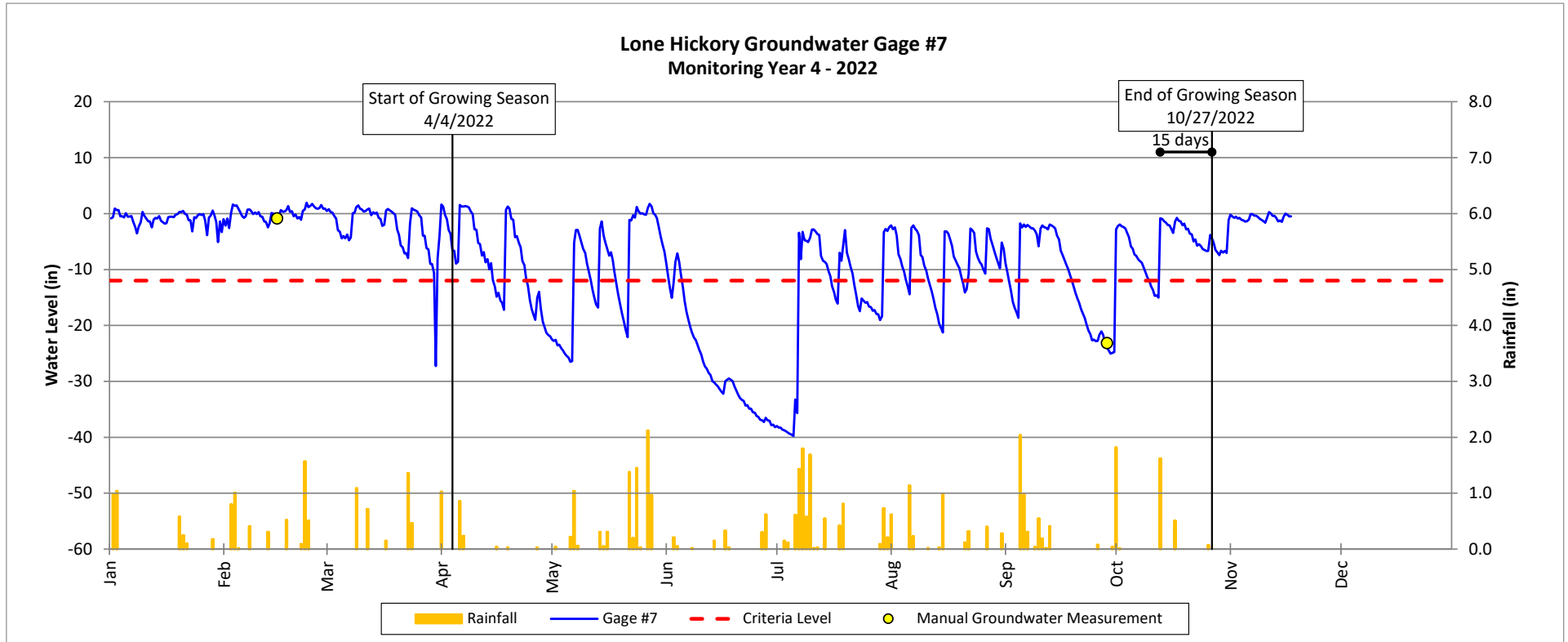
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



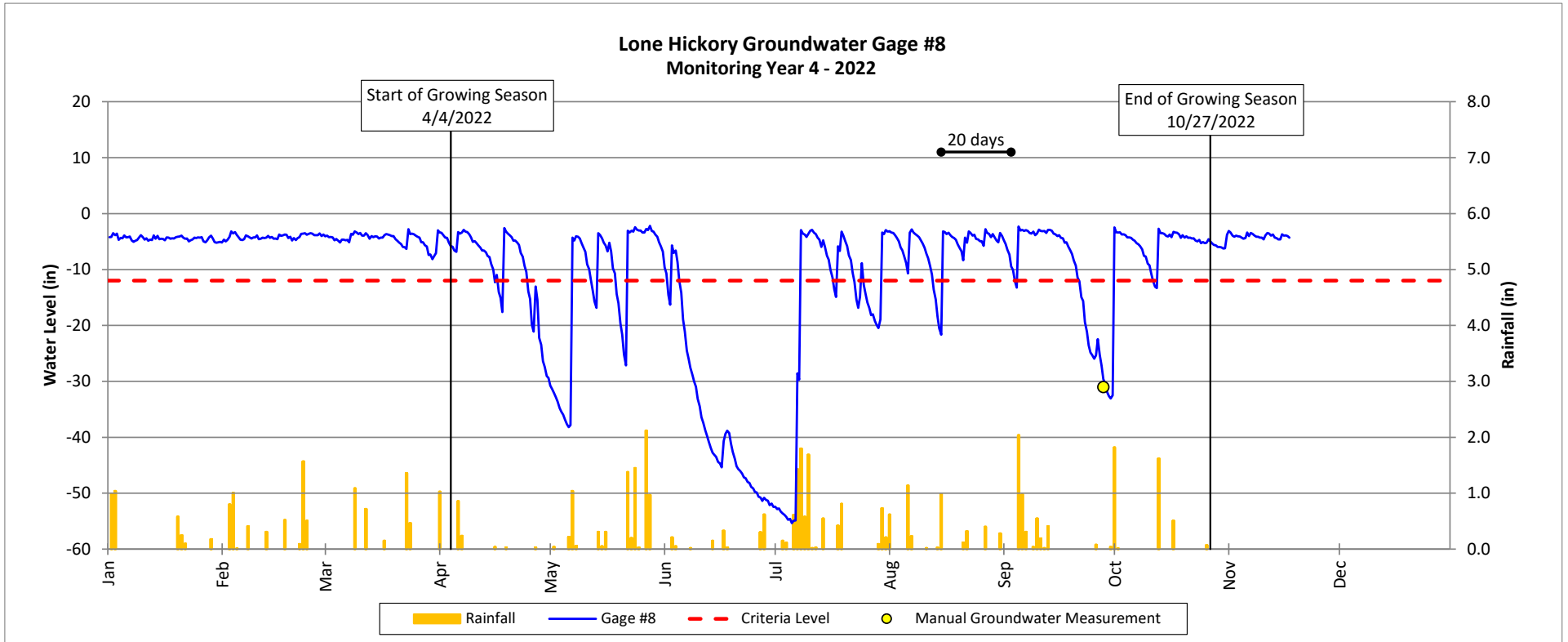
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



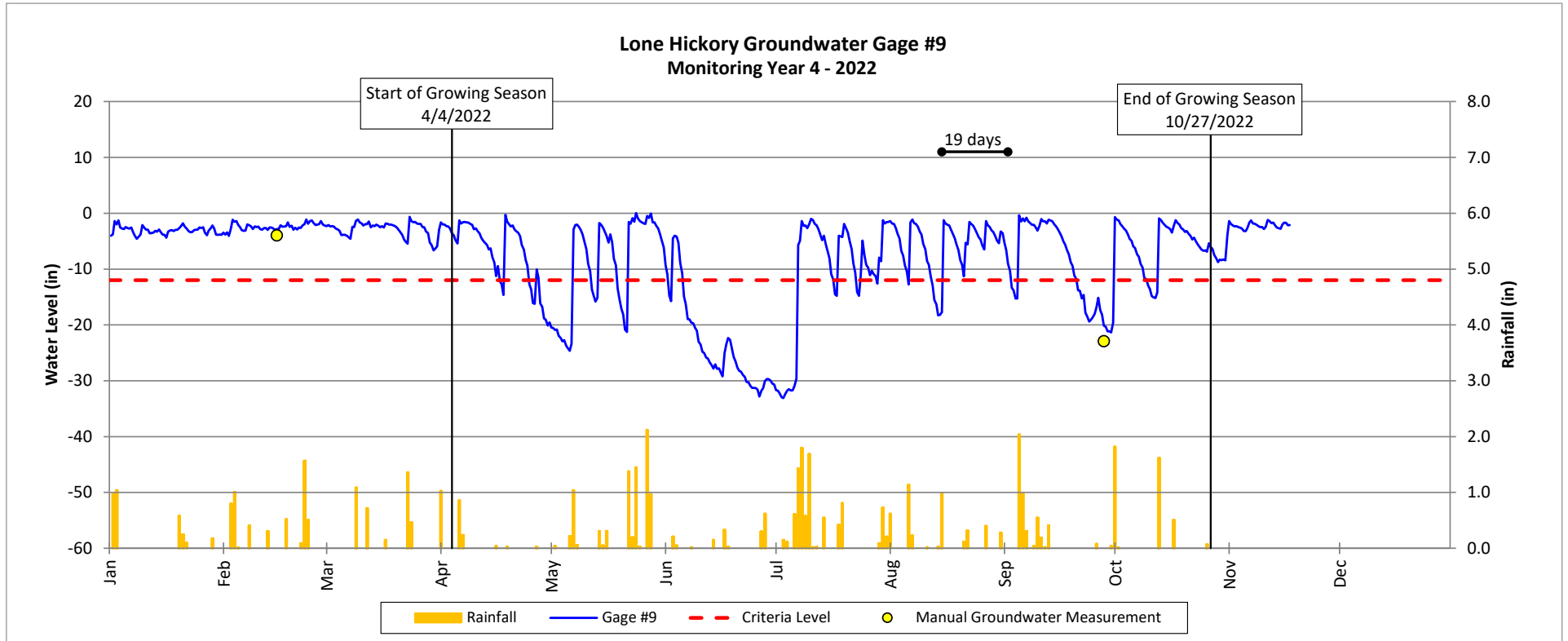
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



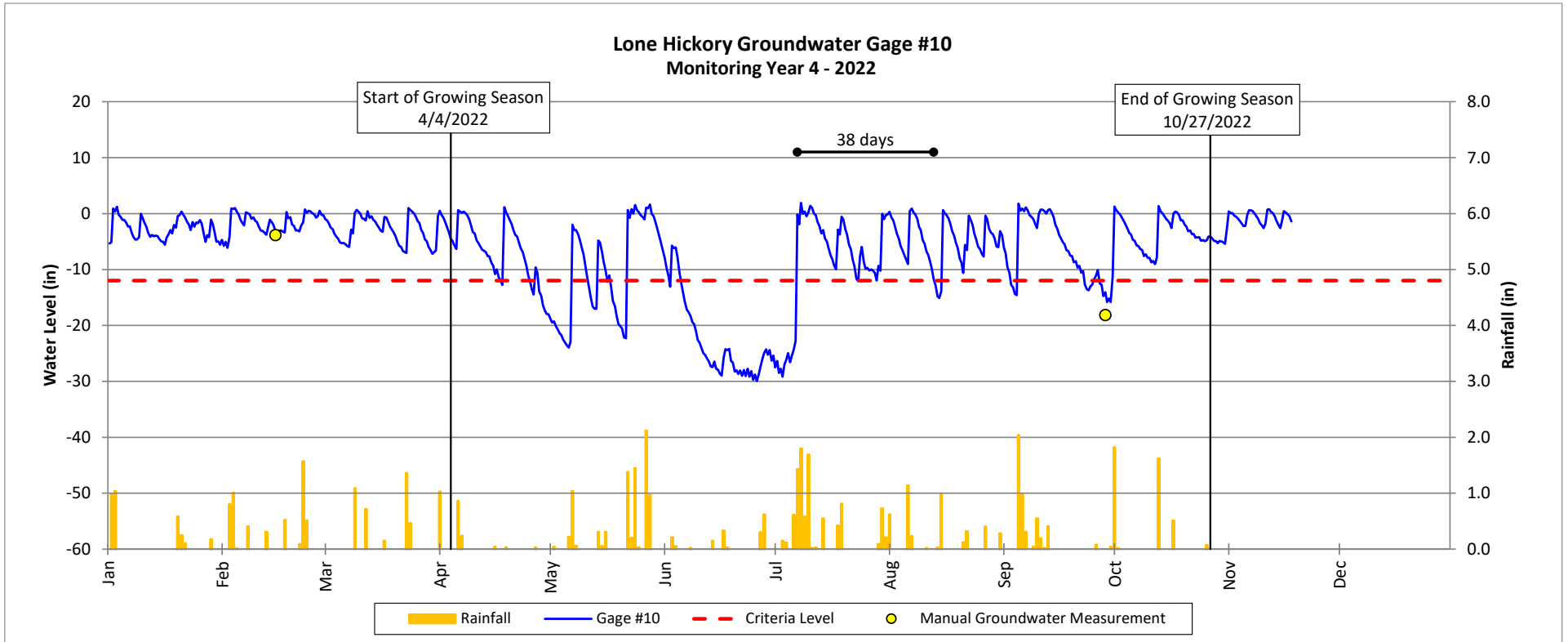
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



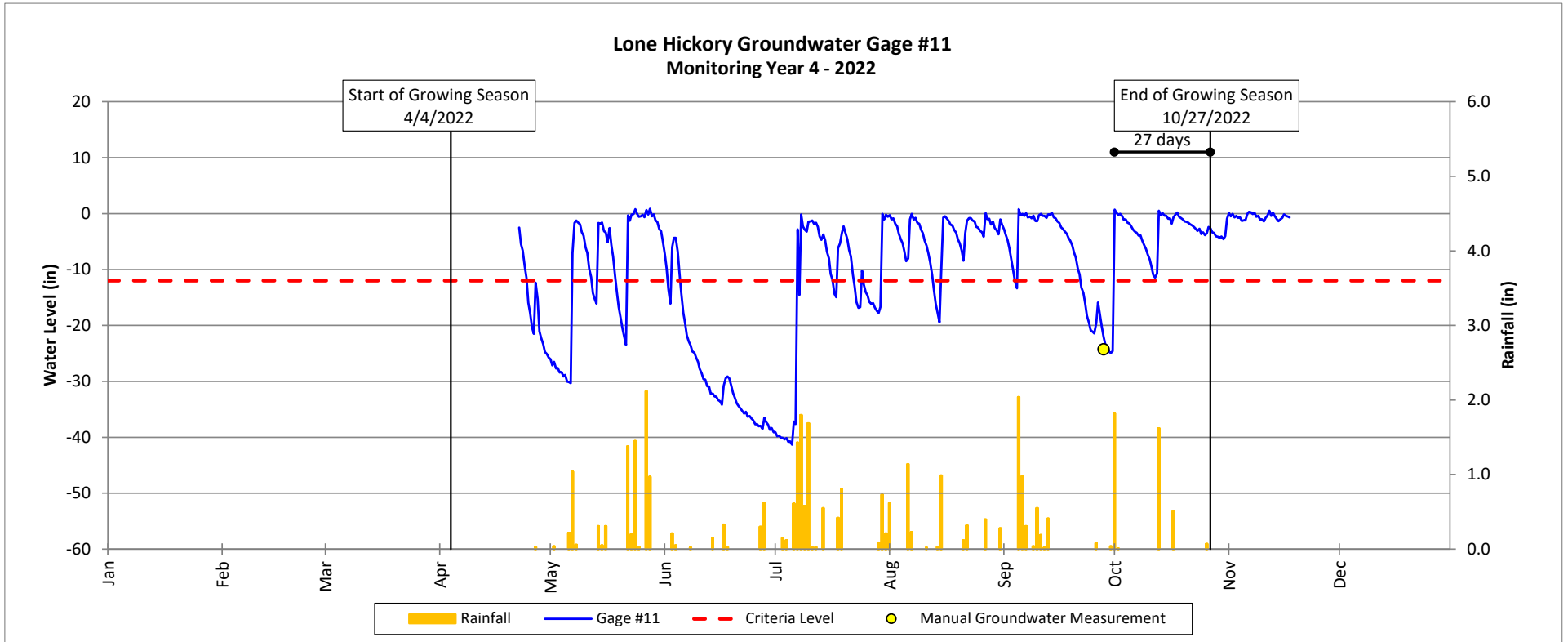
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



- New GWG installed on 4/22/2022

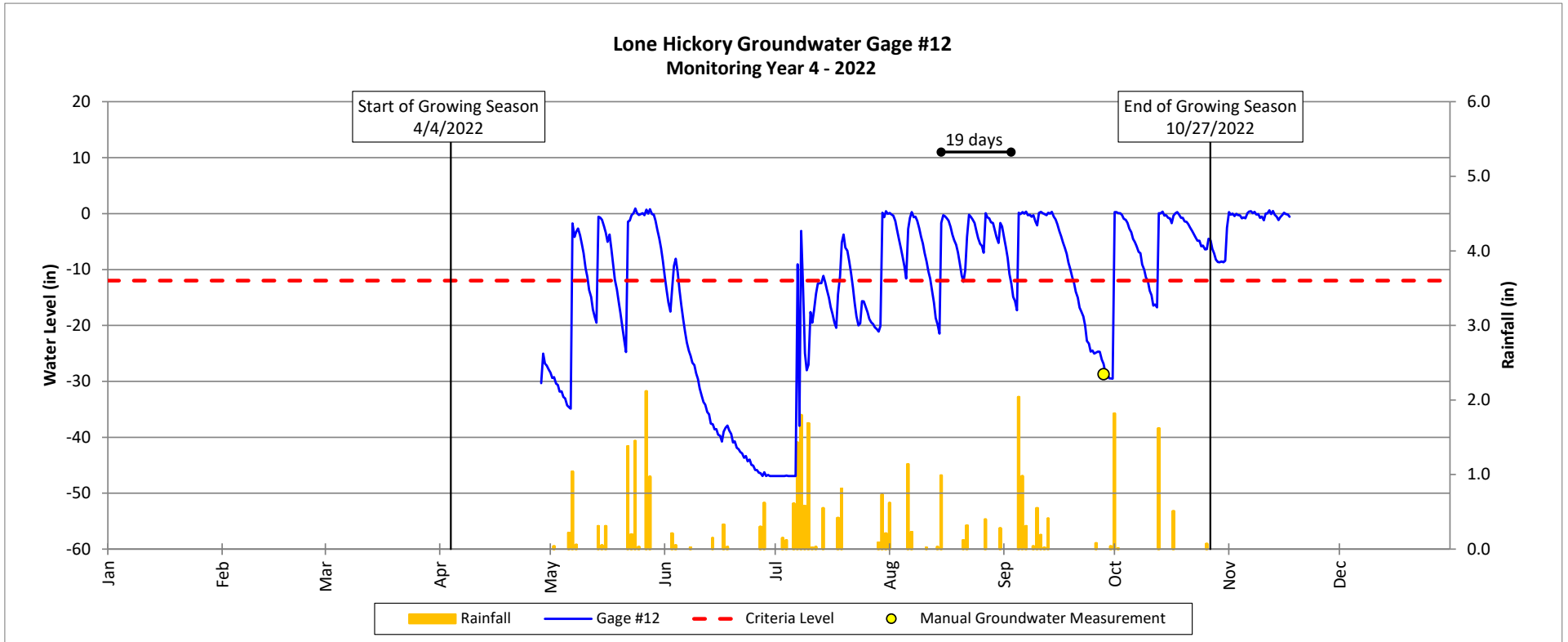
Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



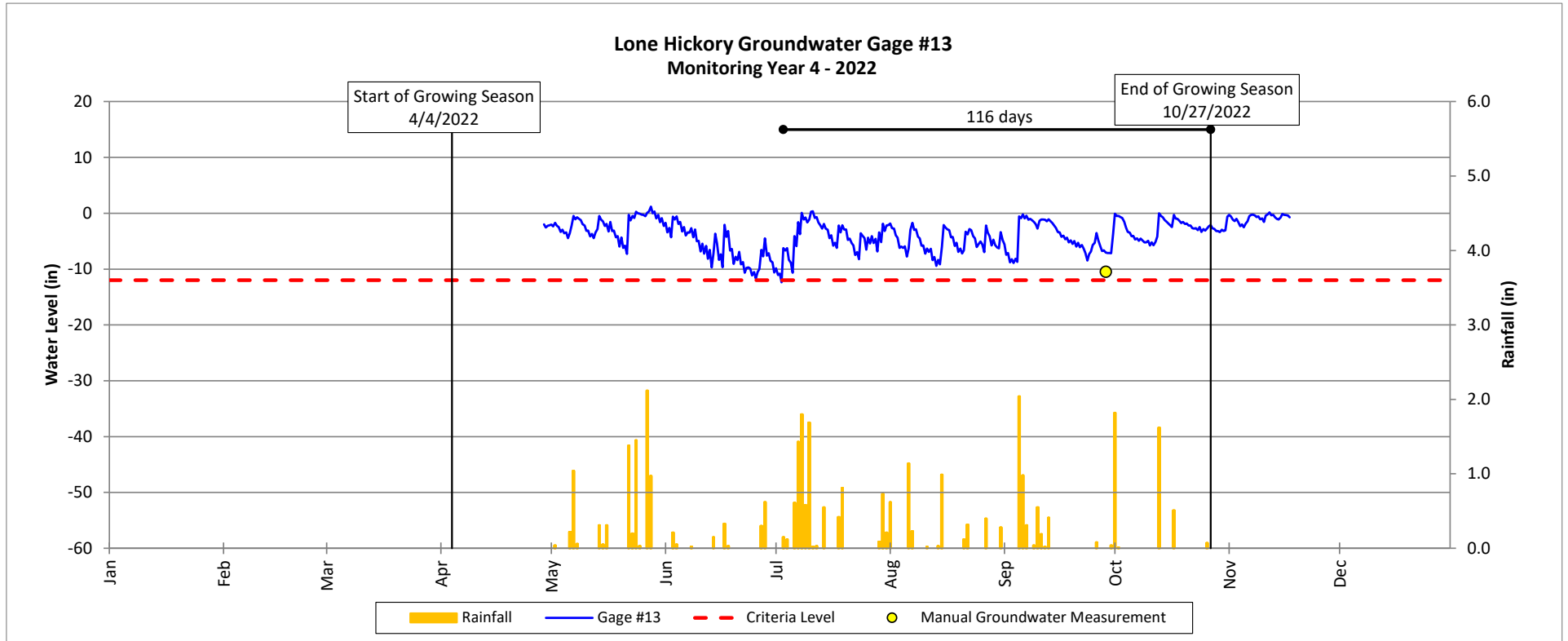
- New GWG installed on 4/22/2022

Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022



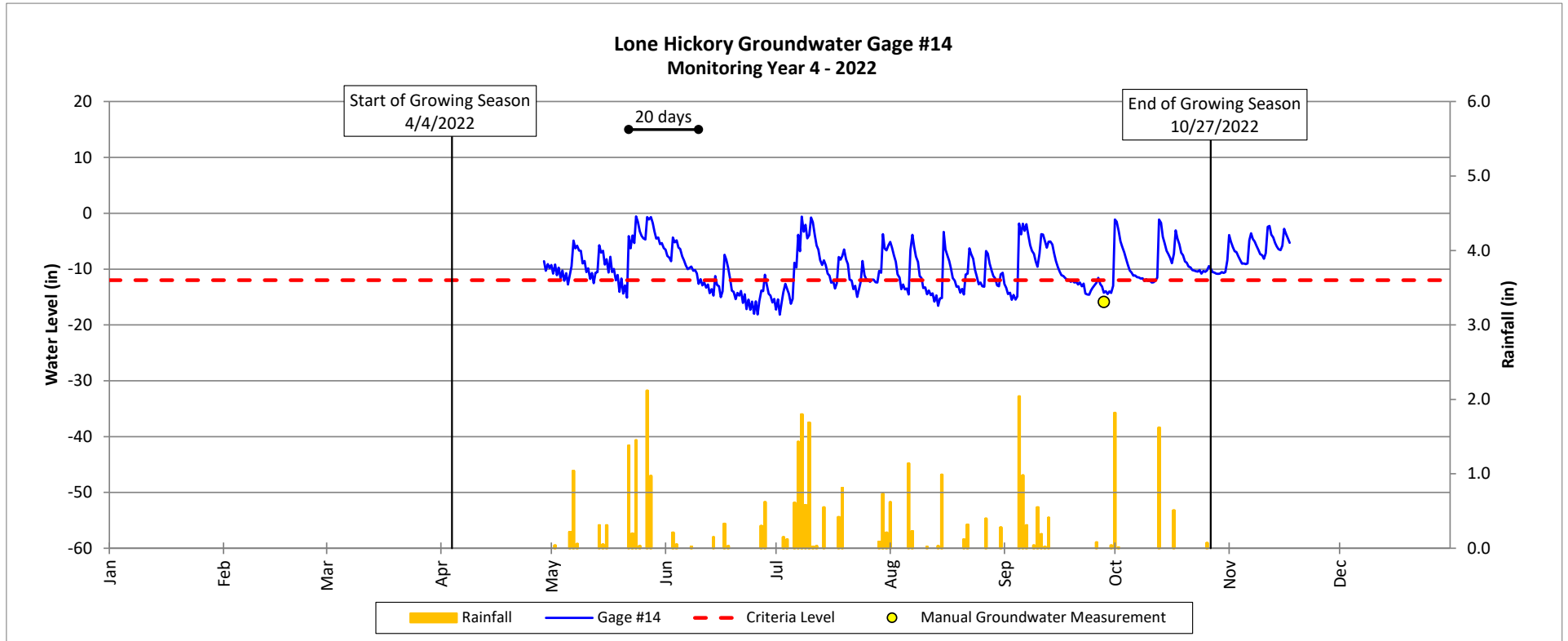
- New GWG installed on 4/22/2022

Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022



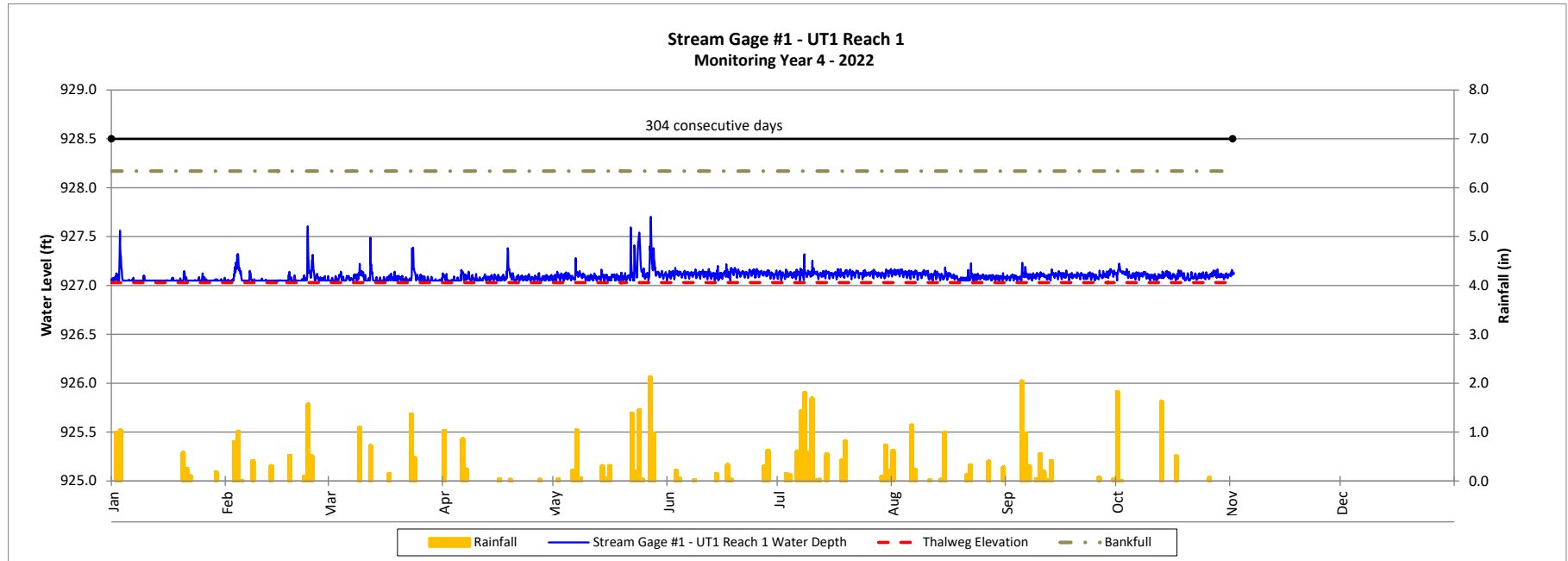
- New GWG installed on 4/22/2022

Stream Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

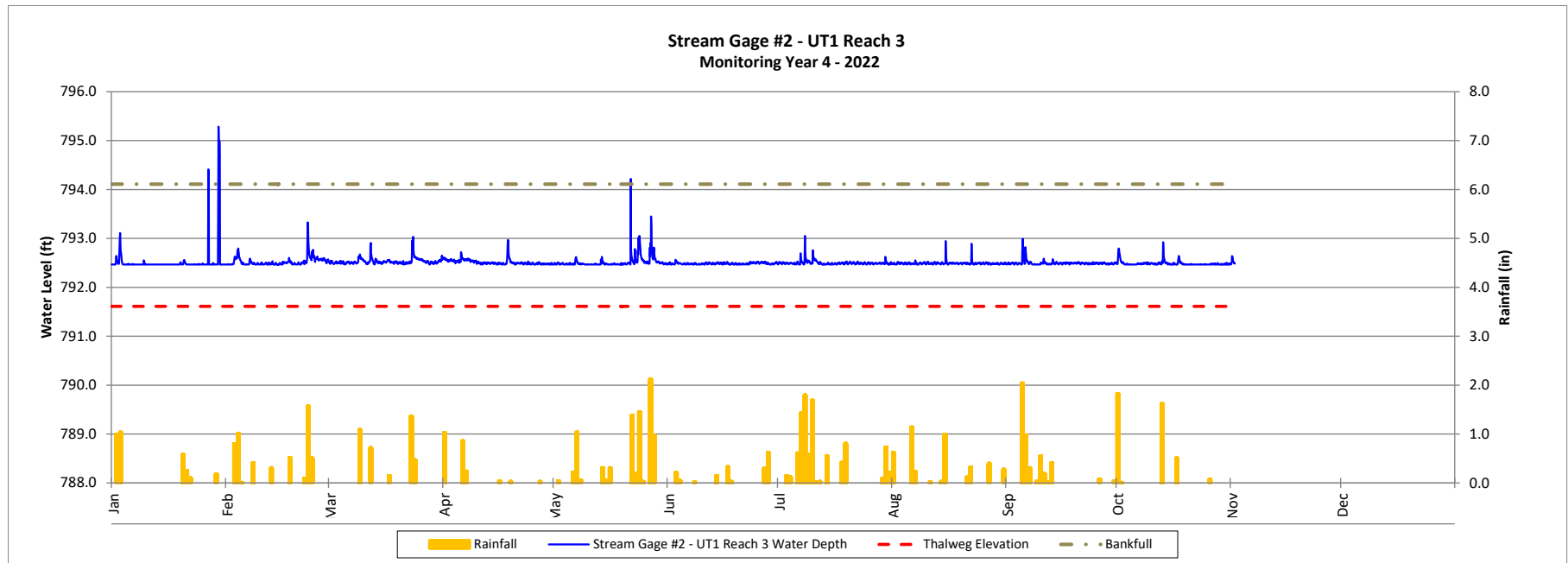


Stream Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

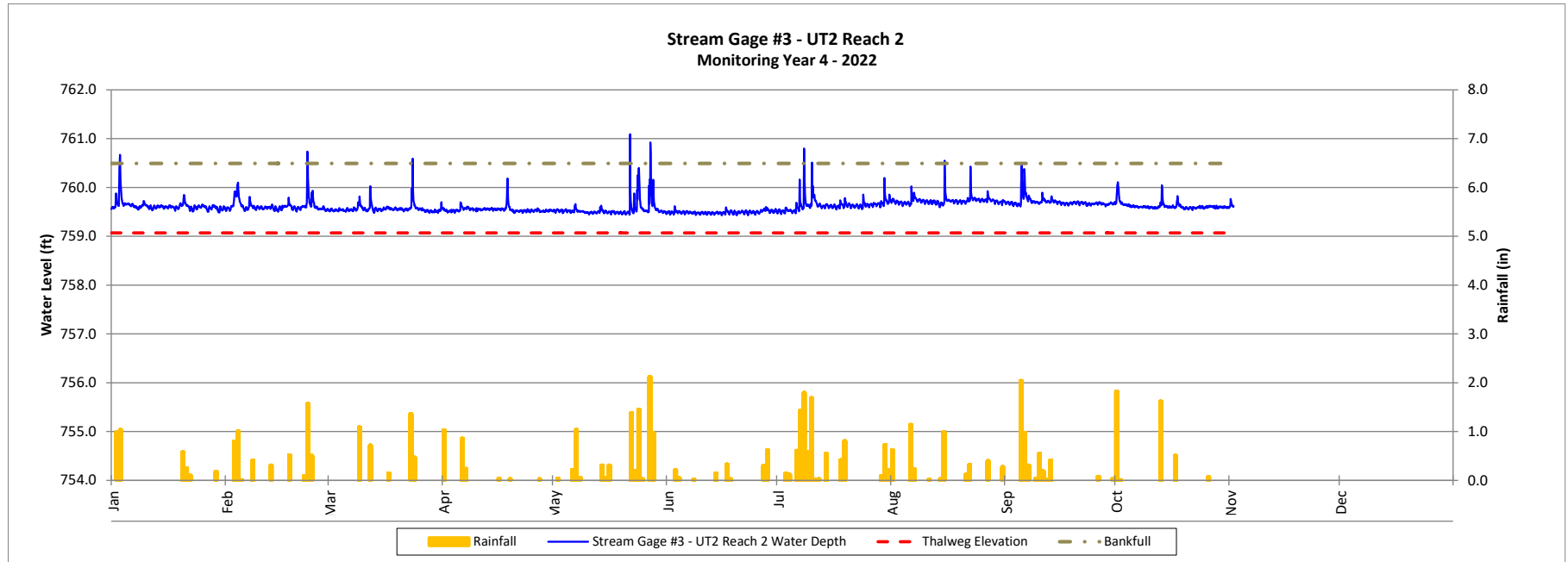


Stream Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

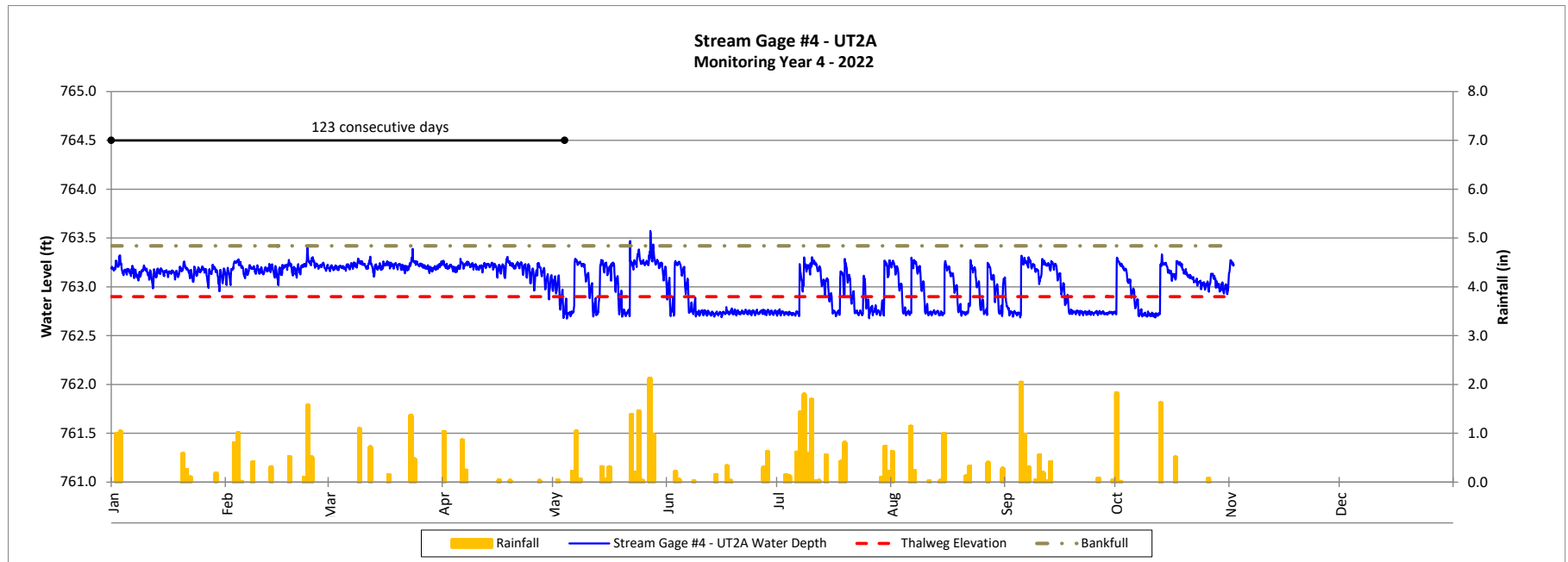


Stream Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

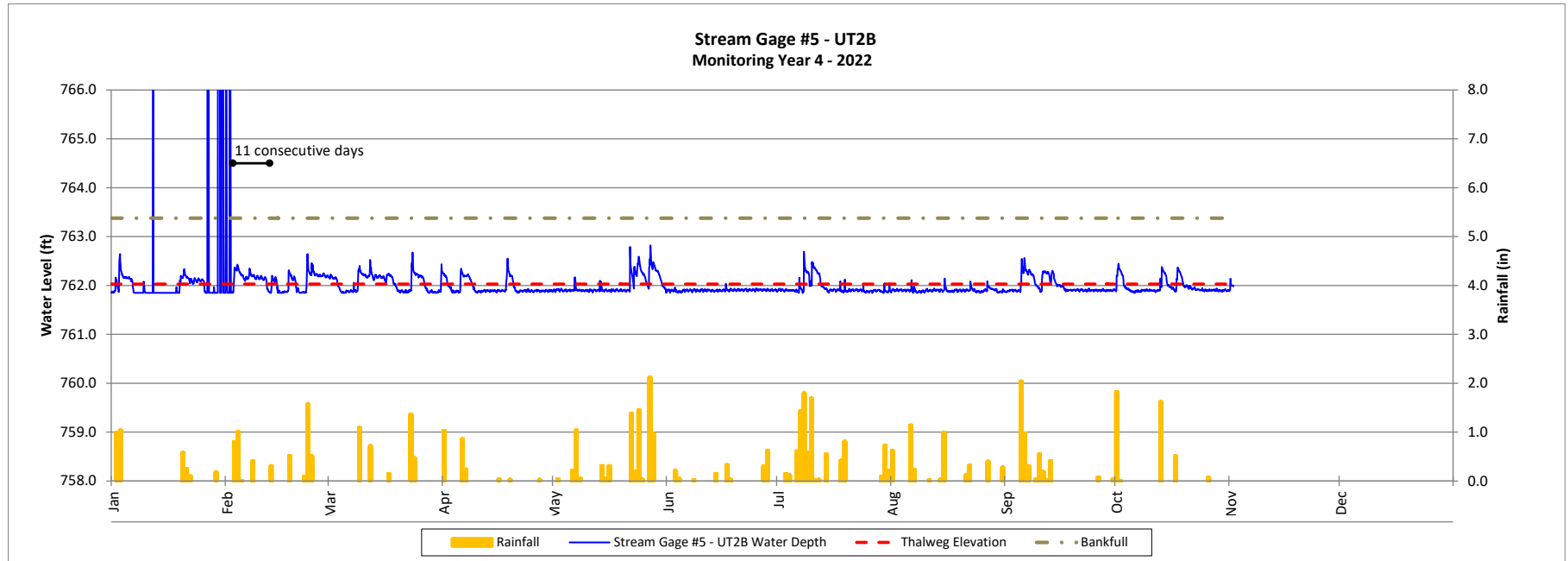


Stream Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022



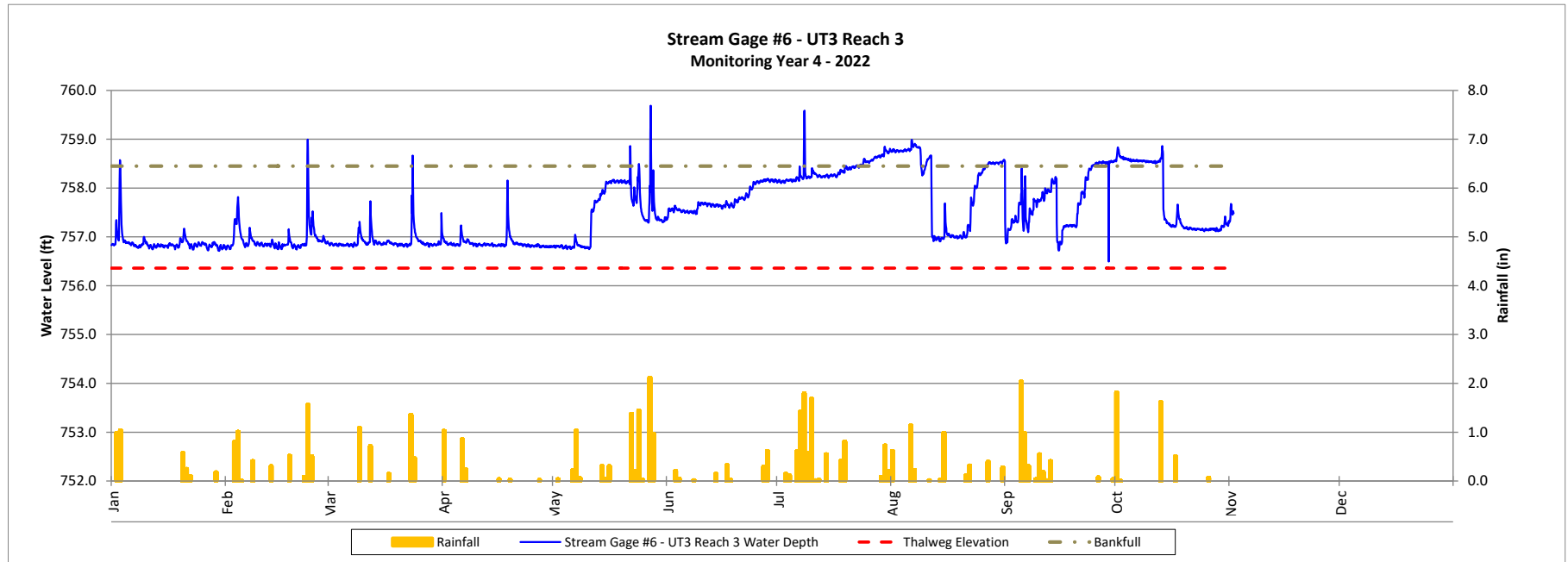
- Spike in pressure due to freezing events on 1/12/2022, 1/27/2022, and 1/29/2022 through 2/2/2022.

Stream Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022



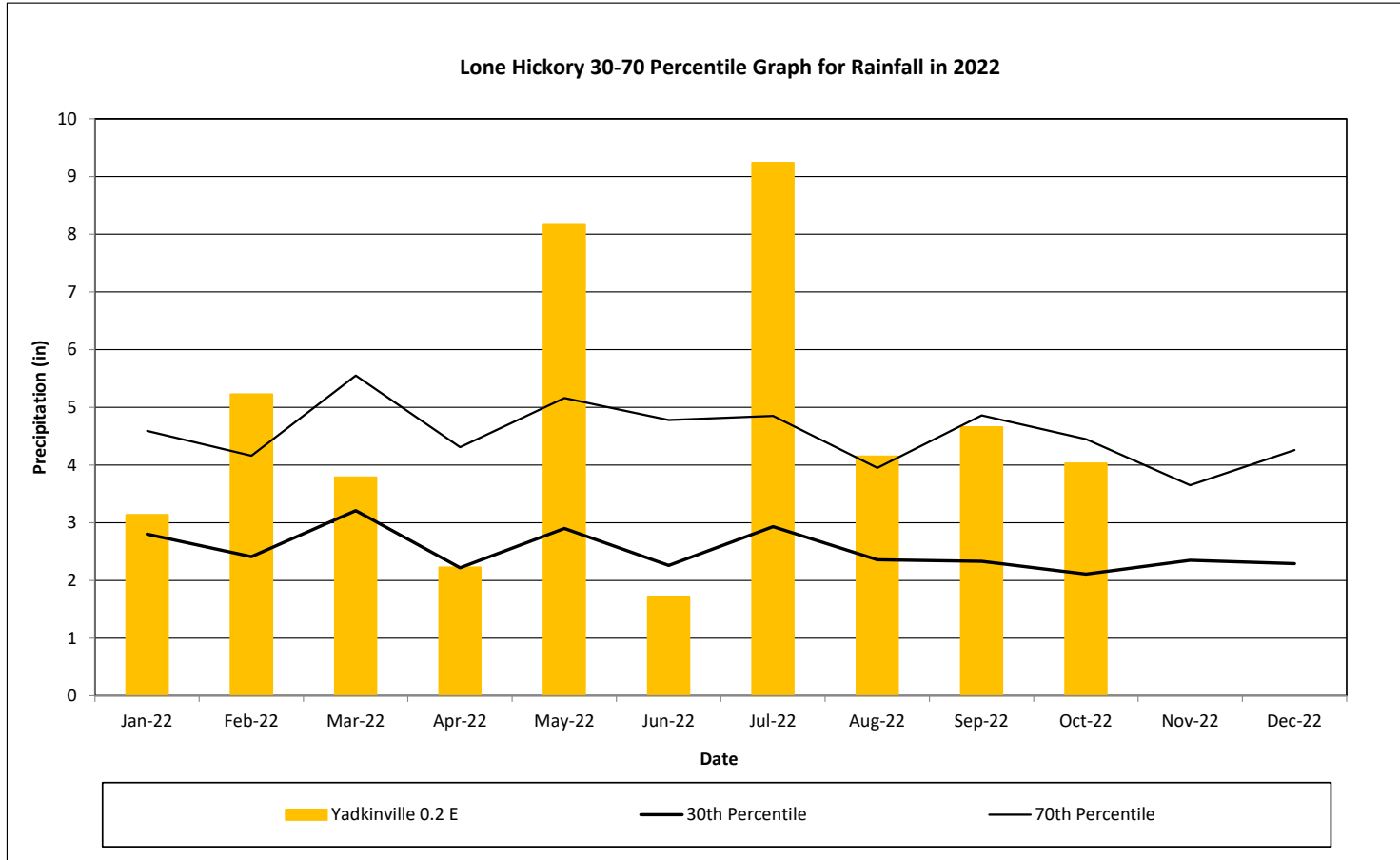
- Periods of inundation after 5/11/2022 caused by beaver activity.

Monthly Rainfall Data

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022



2022 rainfall collected by NC CRONOS Station, Yadkinville 0.2 E, NC

30th and 70th percentile rainfall data collected from WETS station Yadkinville 6E

APPENDIX 6. Supplemental Hydrology Summary Data and Plots

Table 16. Comparison Wetland Gage Attainment Summary

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

| Summary of Groundwater Gage Results for Monitoring Years 1 through 7 ⁴ | | | | | | | |
|---|--|------------------------|------------------------|-------------------------|-----|-----|-----|
| Gage | Success Criteria ² Achieved/Max Consecutive Days During Growing Season (Percentage) | | | | | | |
| | MY1 | MY2 | MY3 ³ | MY4 ³ | MY5 | MY6 | MY7 |
| Reference | Yes/25 days (12.1%) | Yes/97 days (46.9%) | N/A | N/A | | | |
| 1 | Yes/25 days (12.1%) | Yes/46 days (22.2%) | Yes/23 days (10.7%) | Yes/32 days (15.0%) | | | |
| 2 | Yes/23 days (11.1%) | Yes/46 days (22.2%) | Yes/21 days (9.8%) | Yes/27 days (12.6%) | | | |
| 3 | Yes/24 days (11.6%) | Yes/46 days (22.2%) | Yes/23 days (10.7%) | Yes/39 days (10.7%) | | | |
| 4 ¹ | Yes/109 days (52.7%) | N/A | N/A | N/A | | | |
| 5 | Yes/48 days (23.2%) | Yes/86 days (41.5%) | Yes/24 days (11.2%) | Yes/56 days (26.2%) | | | |
| 6 | Yes/23 days (11.1%) | Yes/26 days (12.6%) | No/11 days (5.1%) | Yes/20 days (9.3%) | | | |
| 7 | Yes/24 days (11.6%) | No/16 days (7.7%) | No/8 days (3.7%) | No/19 days (8.9%) | | | |
| 8 | Yes/48 days (23.2%) | Yes/46 days (22.2%) | No/12 days (5.6%) | Yes/20 days (9.3%) | | | |
| 9 | Yes/26 days (12.6%) | Yes/46 days (22.2%) | Yes/21 days (9.8%) | Yes/20 days (9.3%) | | | |
| 10 ¹ | N/A | Yes/46 days (22.2%) | No/13 days (6.1%) | Yes/38 days (17.8%) | | | |
| 11 ⁵ | N/A | N/A | N/A | Yes/27 days (12.6%) | | | |
| 12 ⁵ | N/A | N/A | N/A | No/19 days (8.9%) | | | |
| 13 ⁵ | N/A | N/A | N/A | Yes/182 days (85.0%) | | | |
| 14 ⁵ | N/A | N/A | N/A | Yes/20 days (9.3%) | | | |

¹ GWG 10 was installed adjacent to GWG 4 but outside of the former ditch location at the end of October 2019. Reporting for GWG 10 begins in MY2 and GWG 4 will be omitted from future monitoring reports.

² The established success criteria is 19 consecutive days, (9.2%) of the growing season (April 4 to October 27).

³ For comparison purposes in MY3 and MY4, the success criteria of 20 consecutive days, or (9.2%) of the extended growing season (March 28 to October 27) was evaluated.

⁴ This table summarizes the groundwater gage results for MY3 and MY4 with the growing season extended by 1 week for comparison purposes.

⁵ GWG 11 - GWG 14 were installed on April 22, 2022.

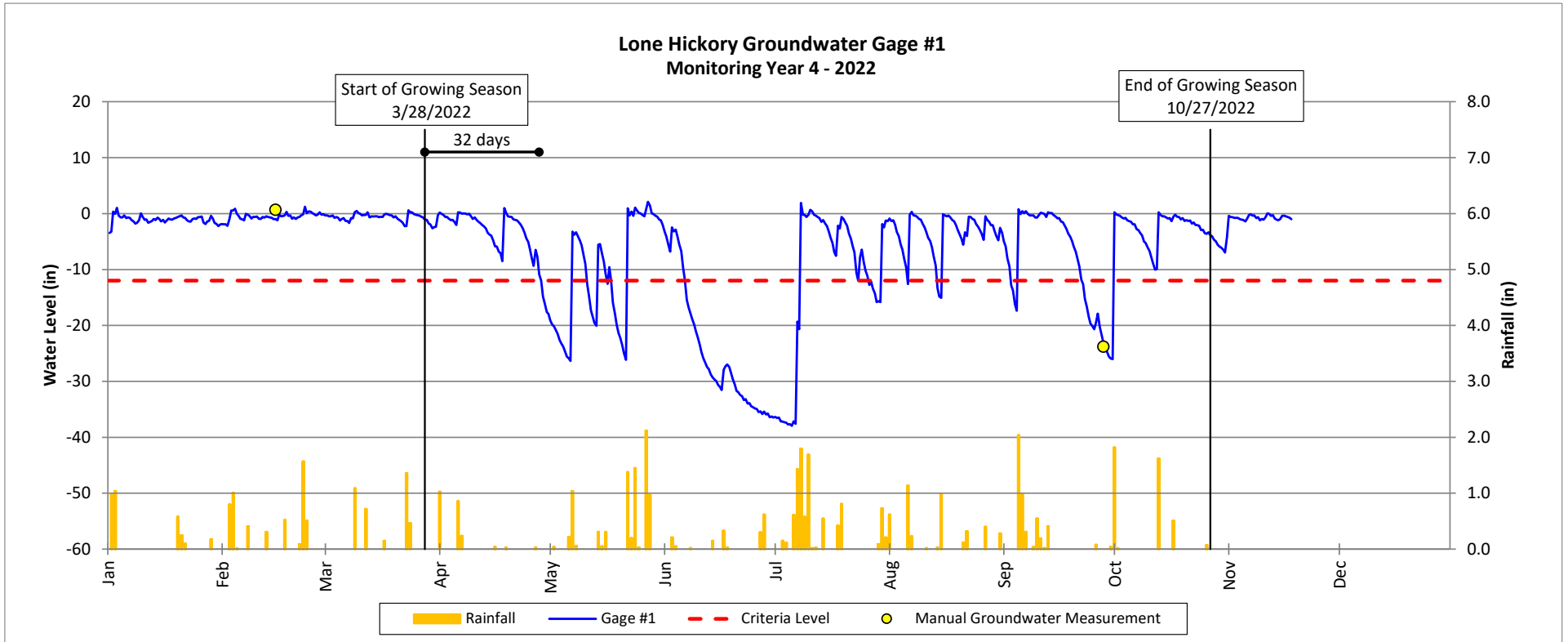
Comparison Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



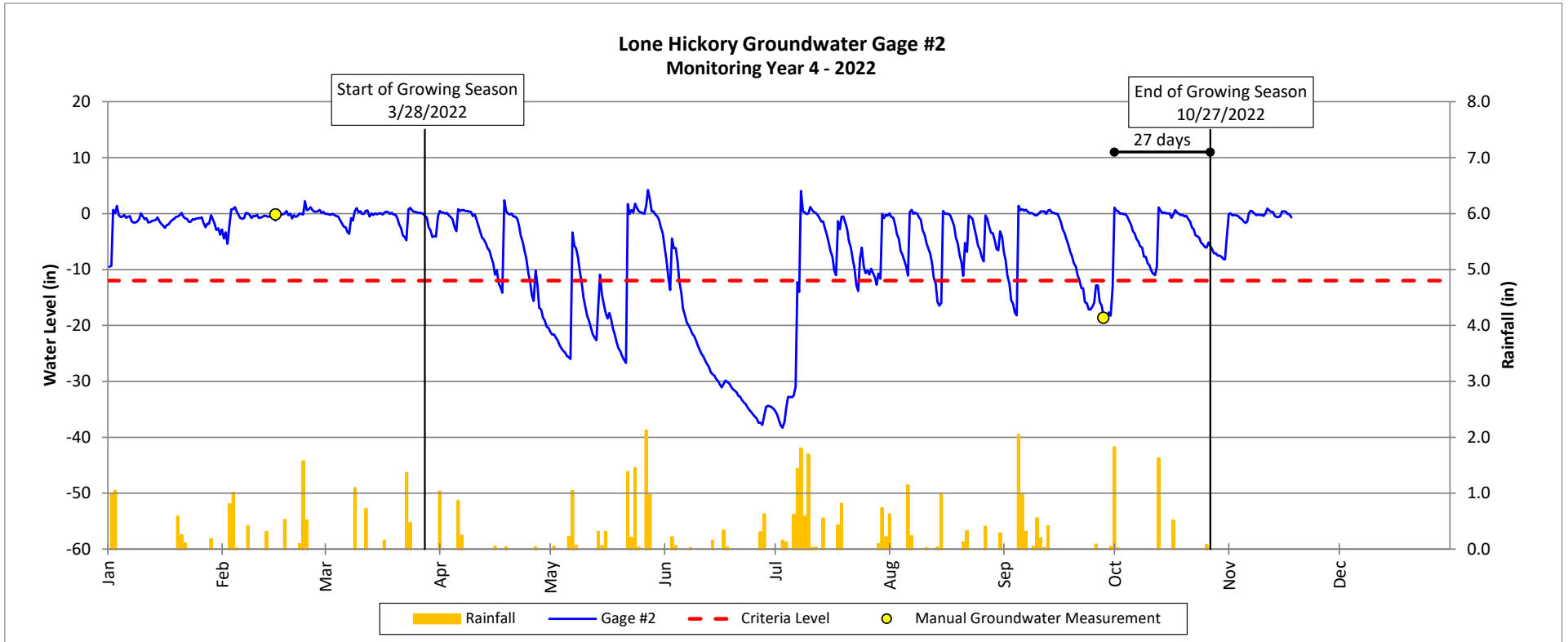
Comparison Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



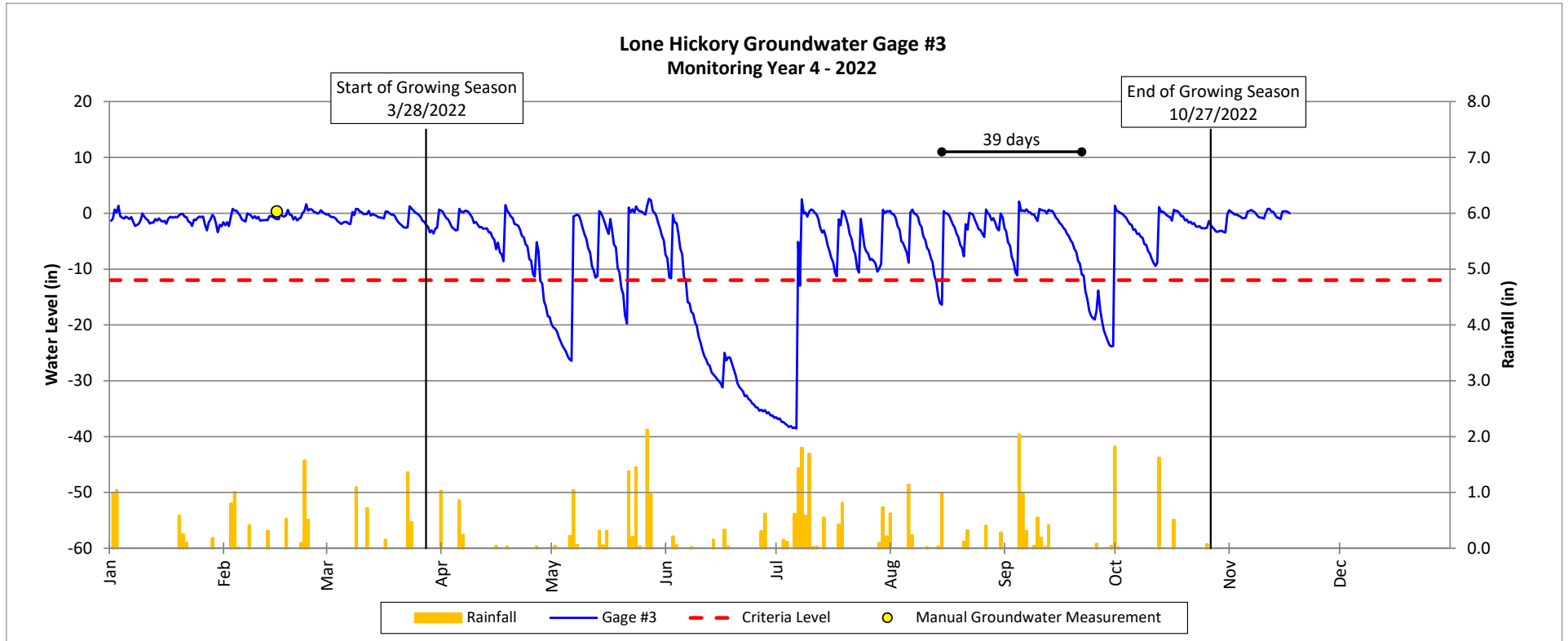
Comparison Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



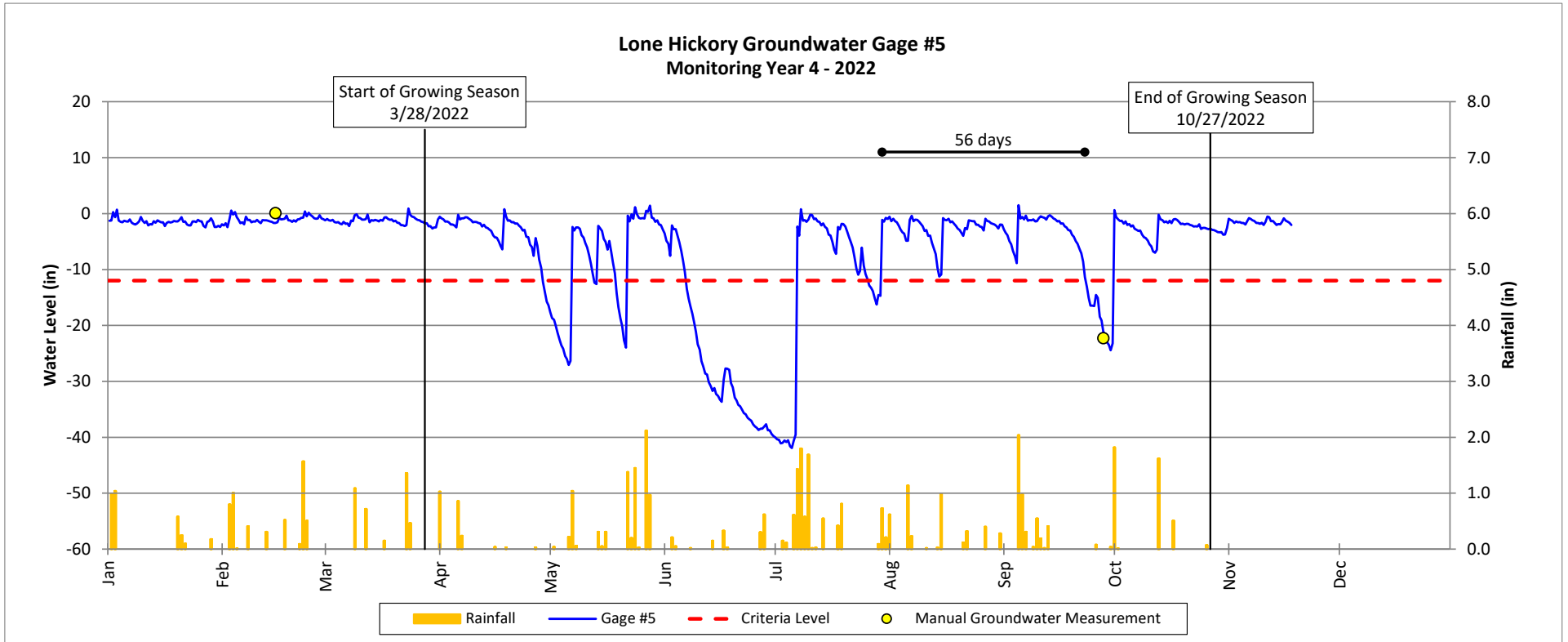
Comparison Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



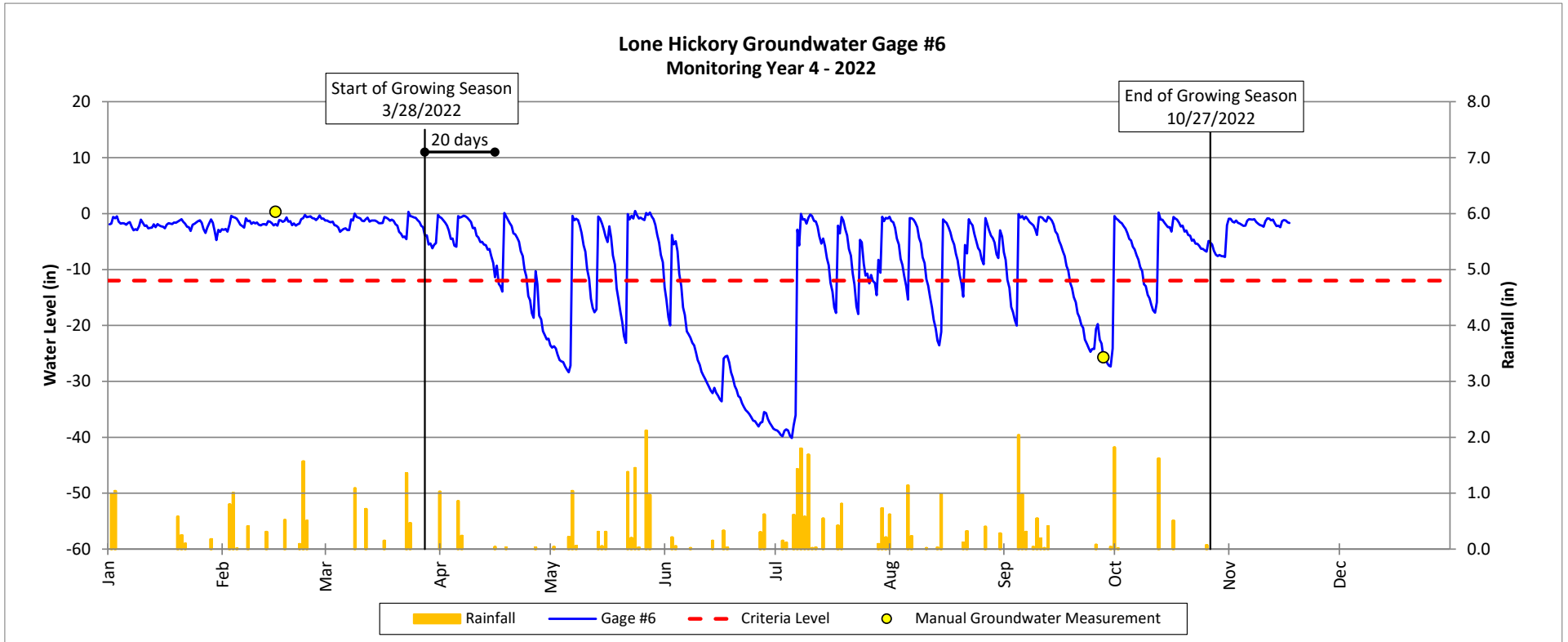
Comparison Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



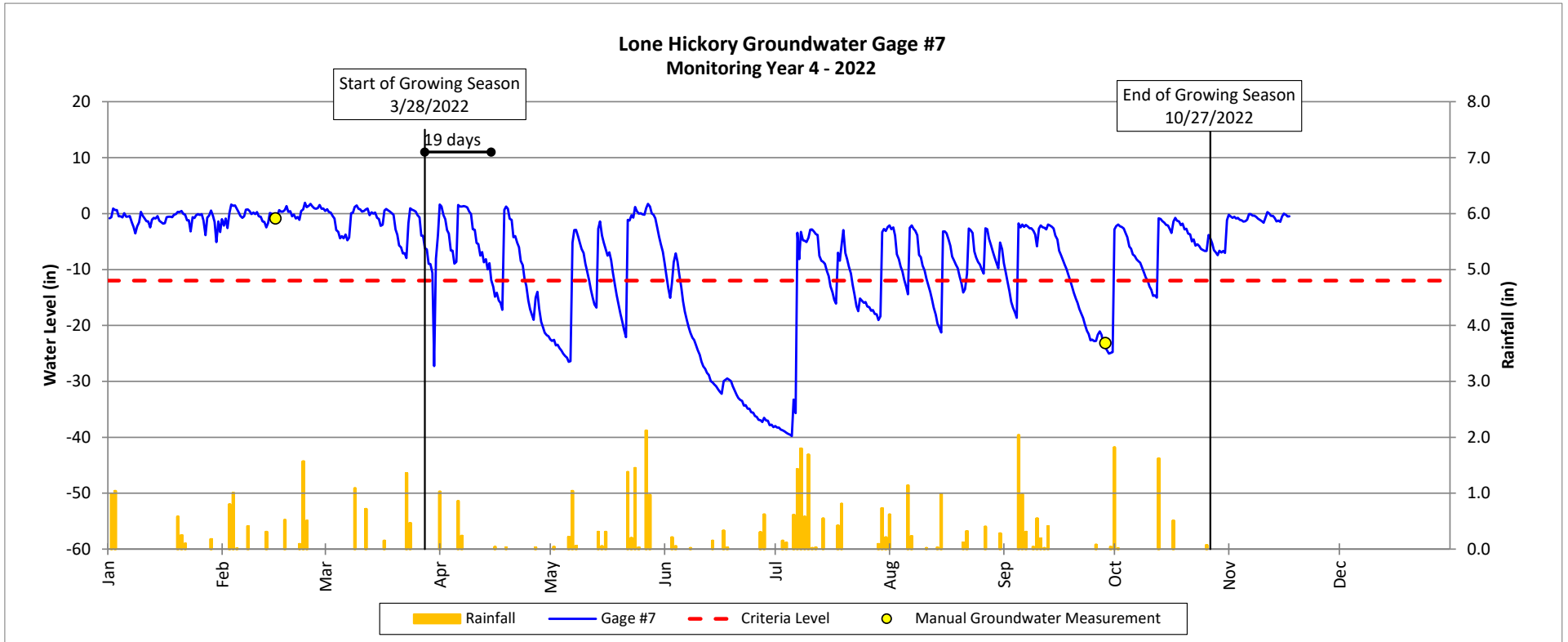
Comparison Groundwater Gage Plots

Lone Hickory Mitigation Site

DMS Project No. 97135

Monitoring Year 4 - 2022

Wetland Re-est



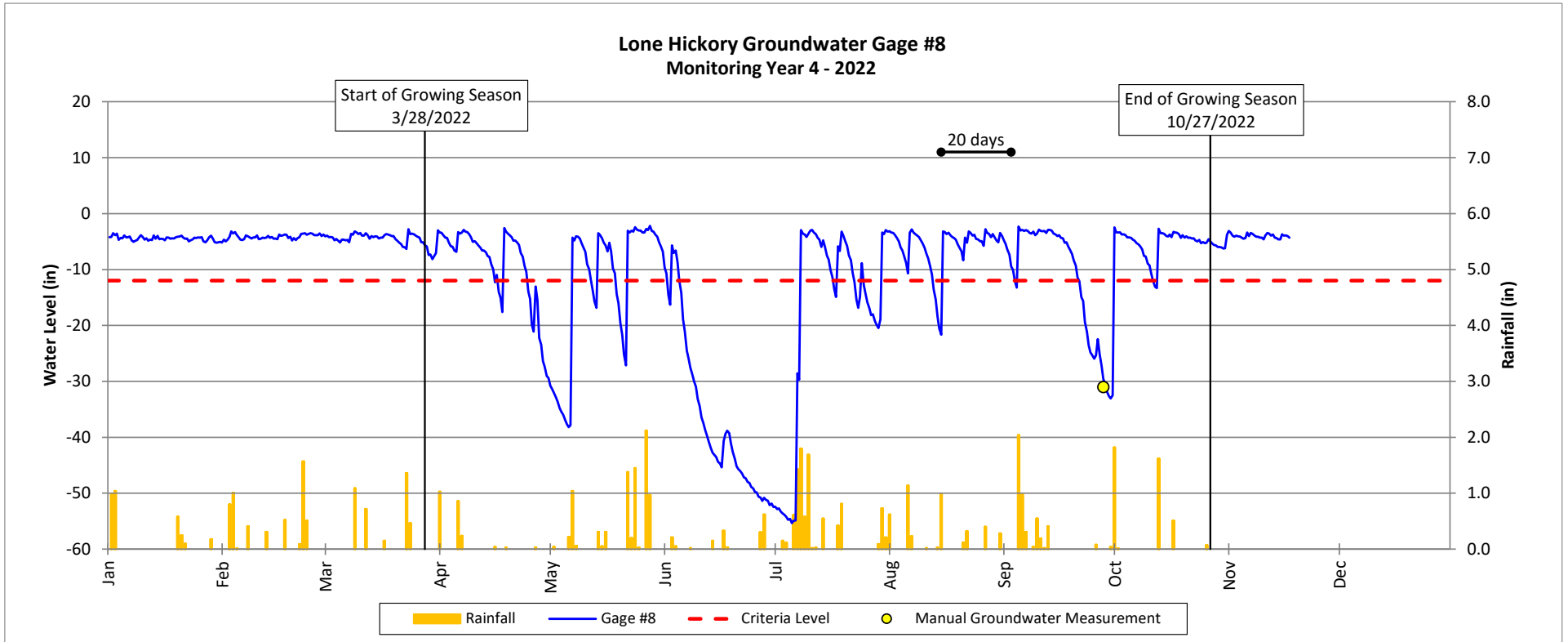
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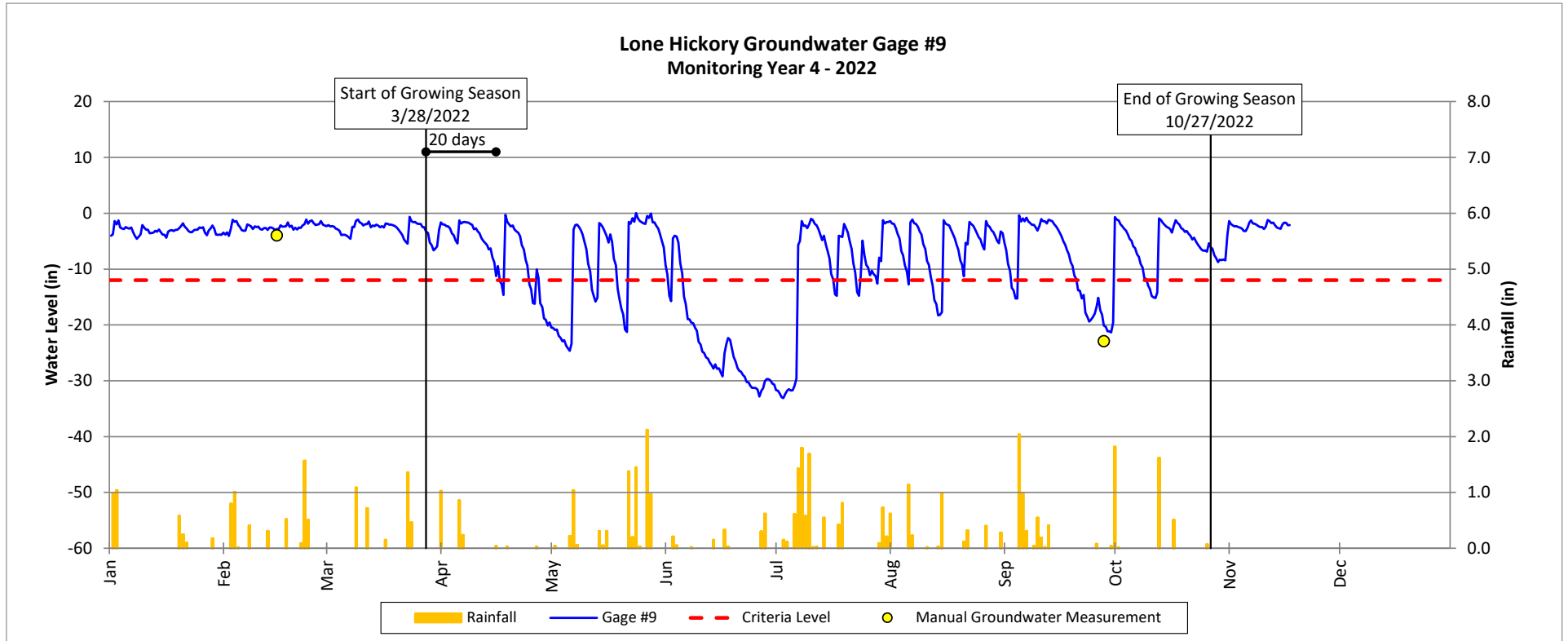
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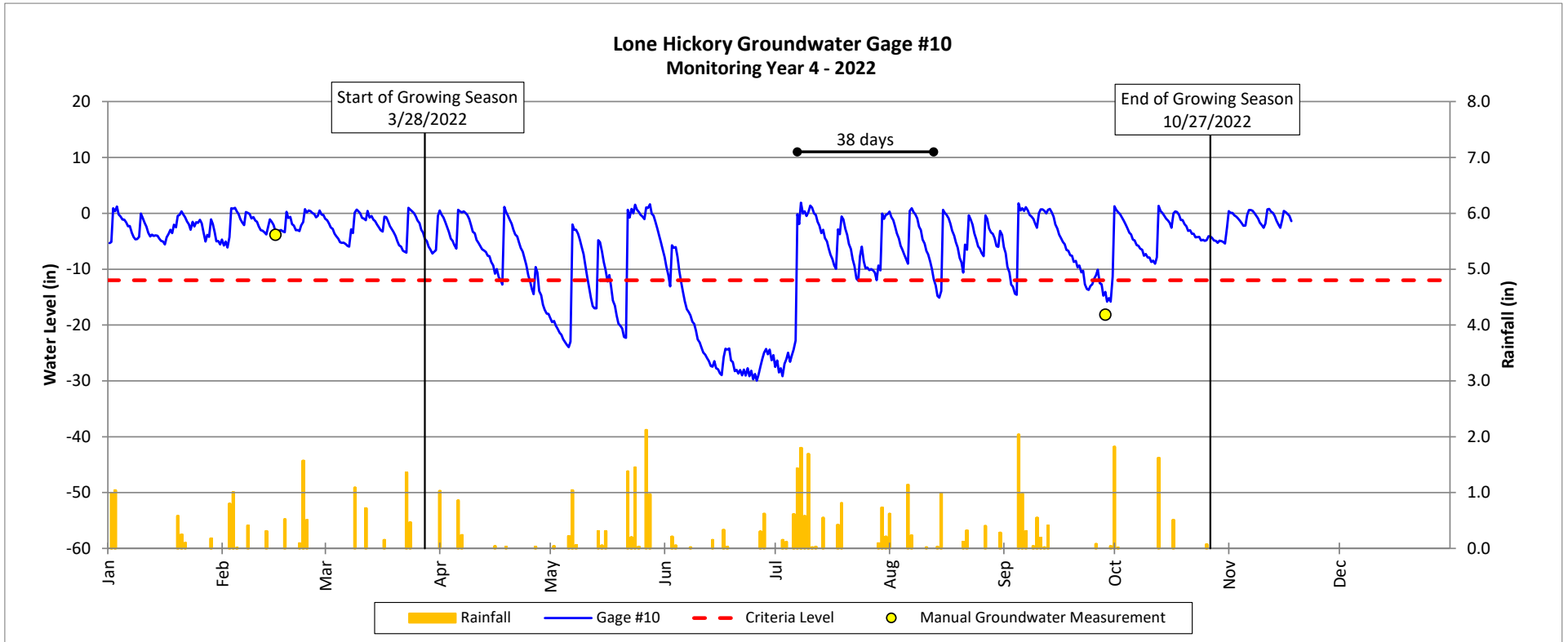
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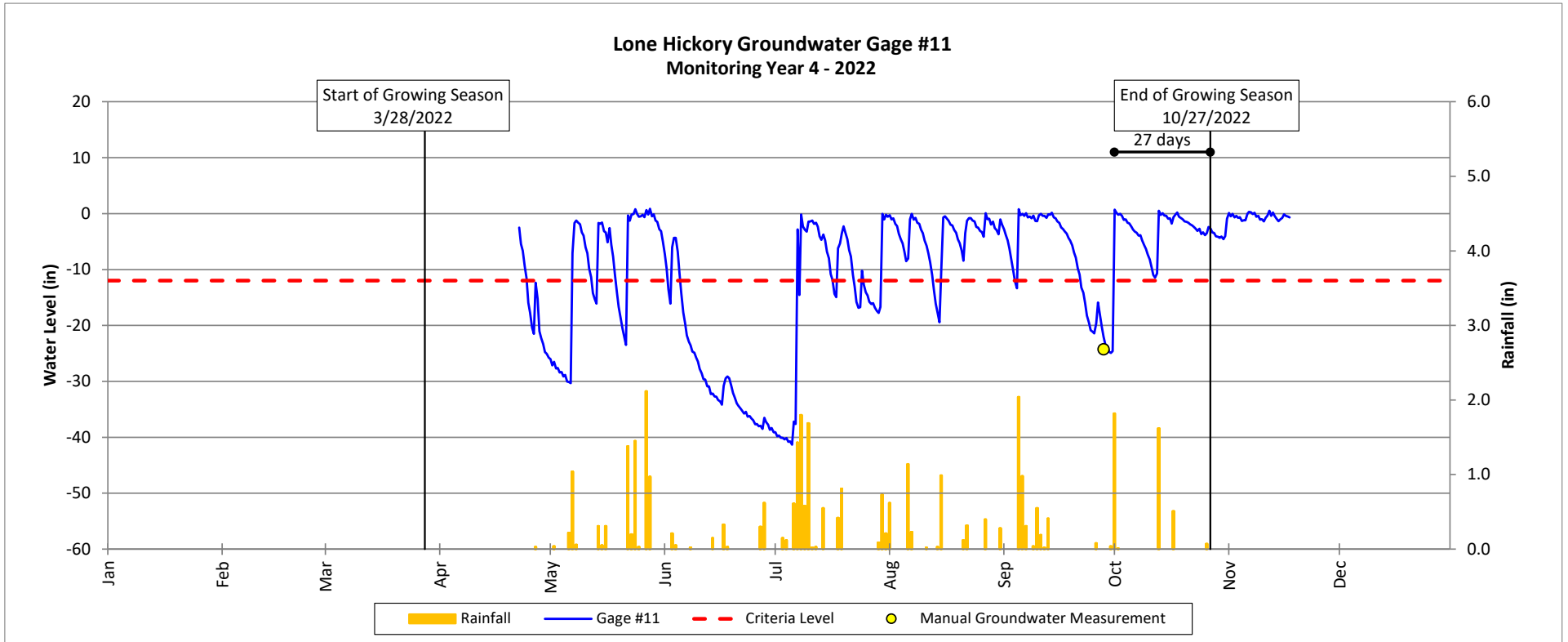
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- New GWG installed on 4/22/2022

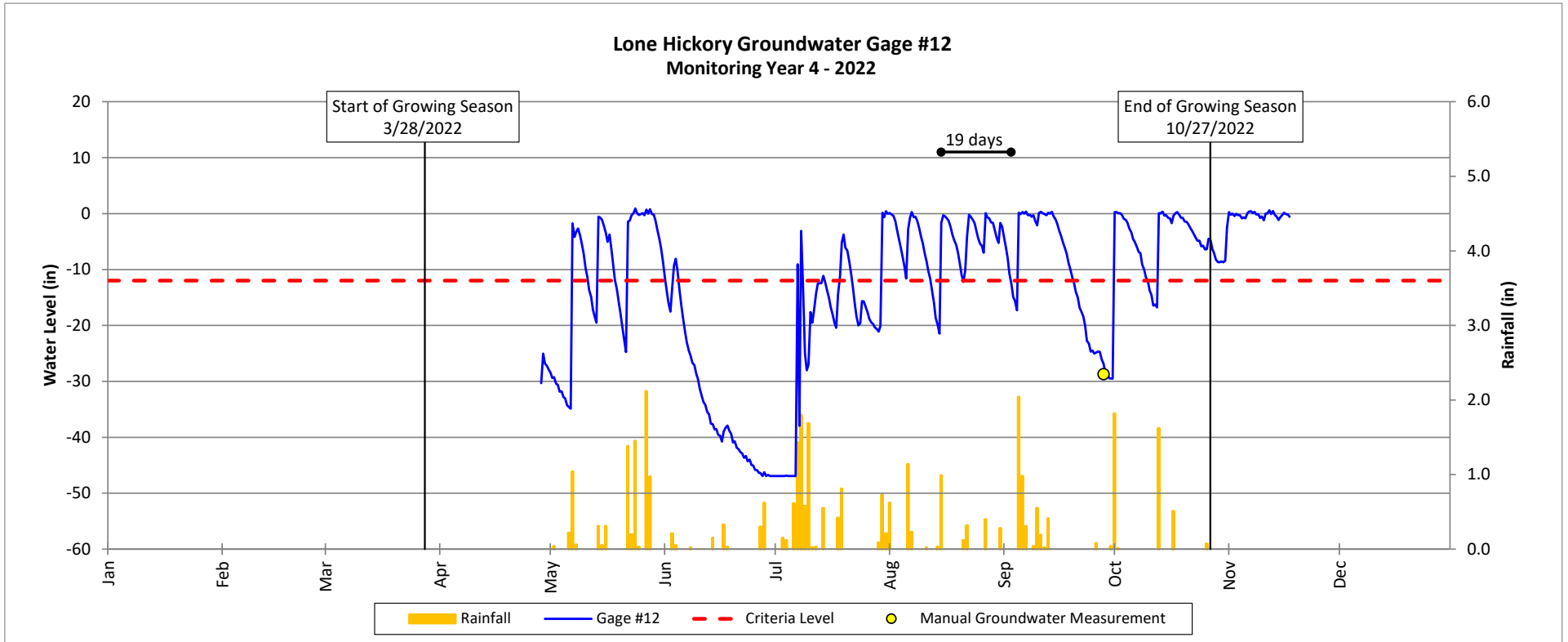
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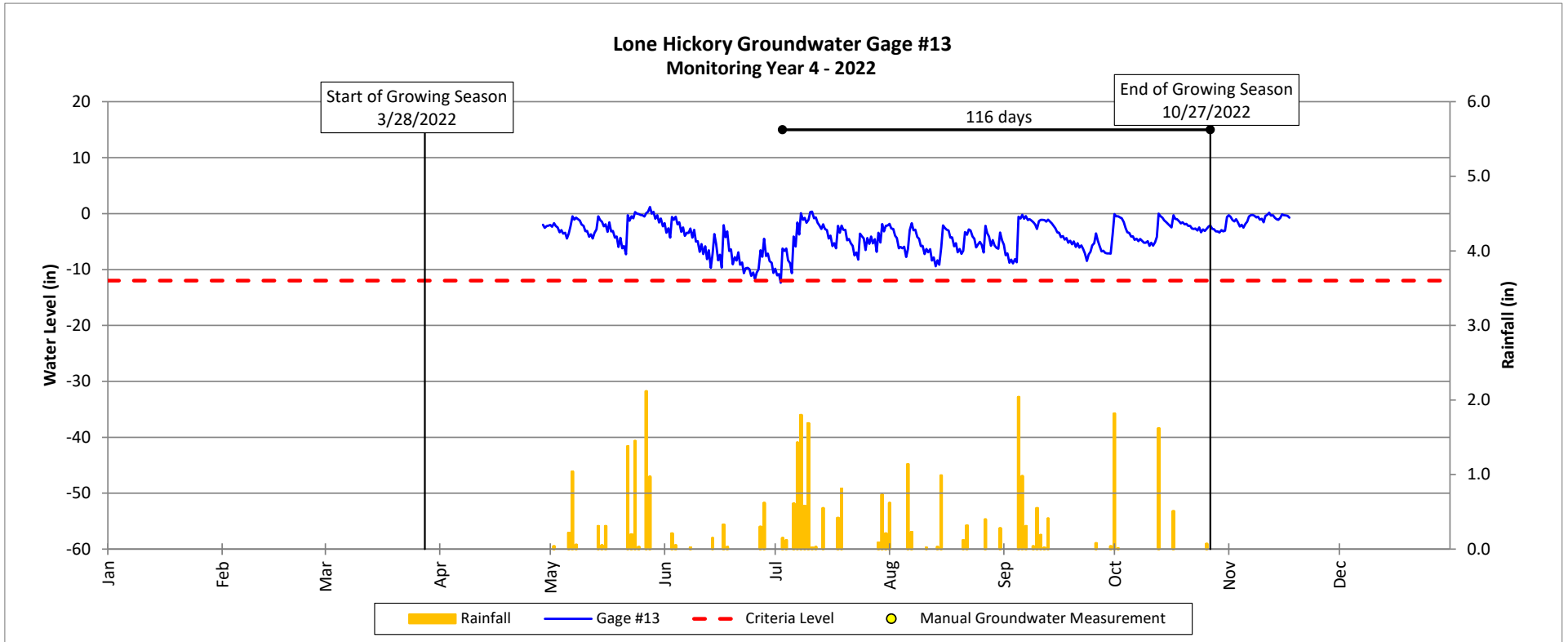
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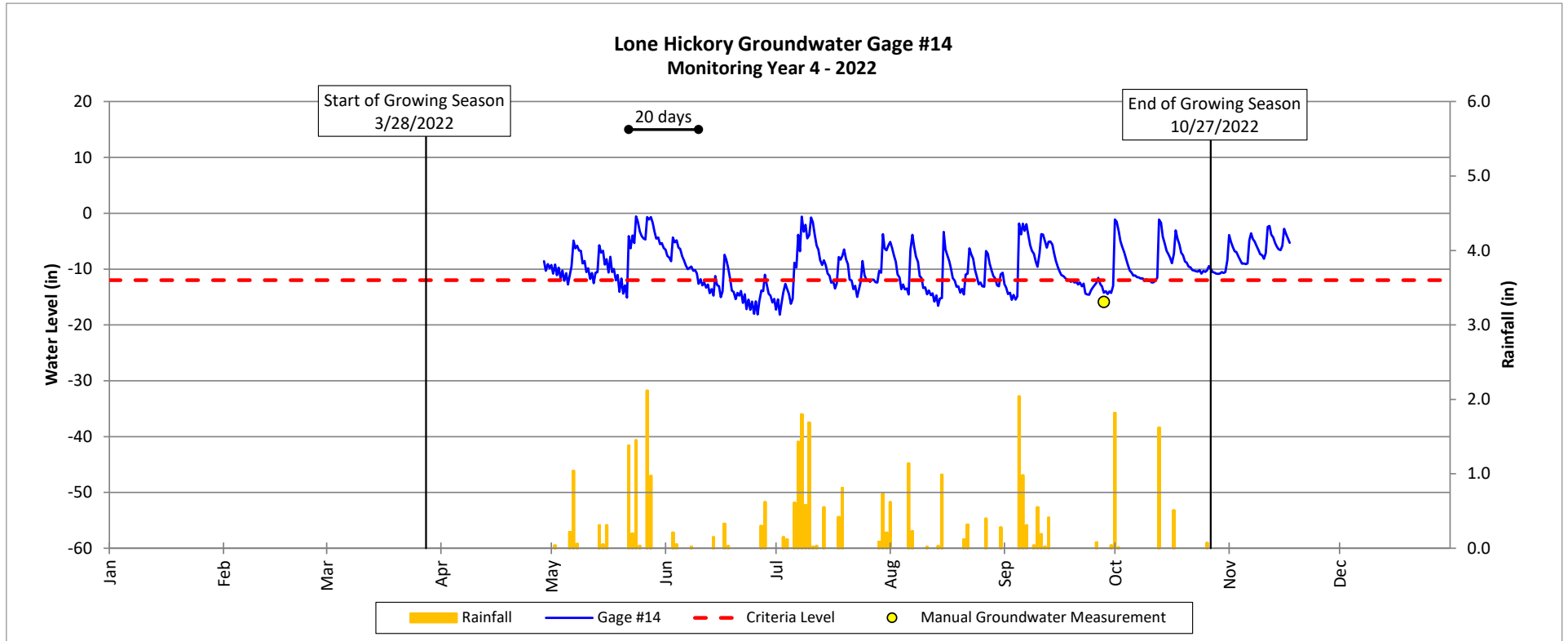
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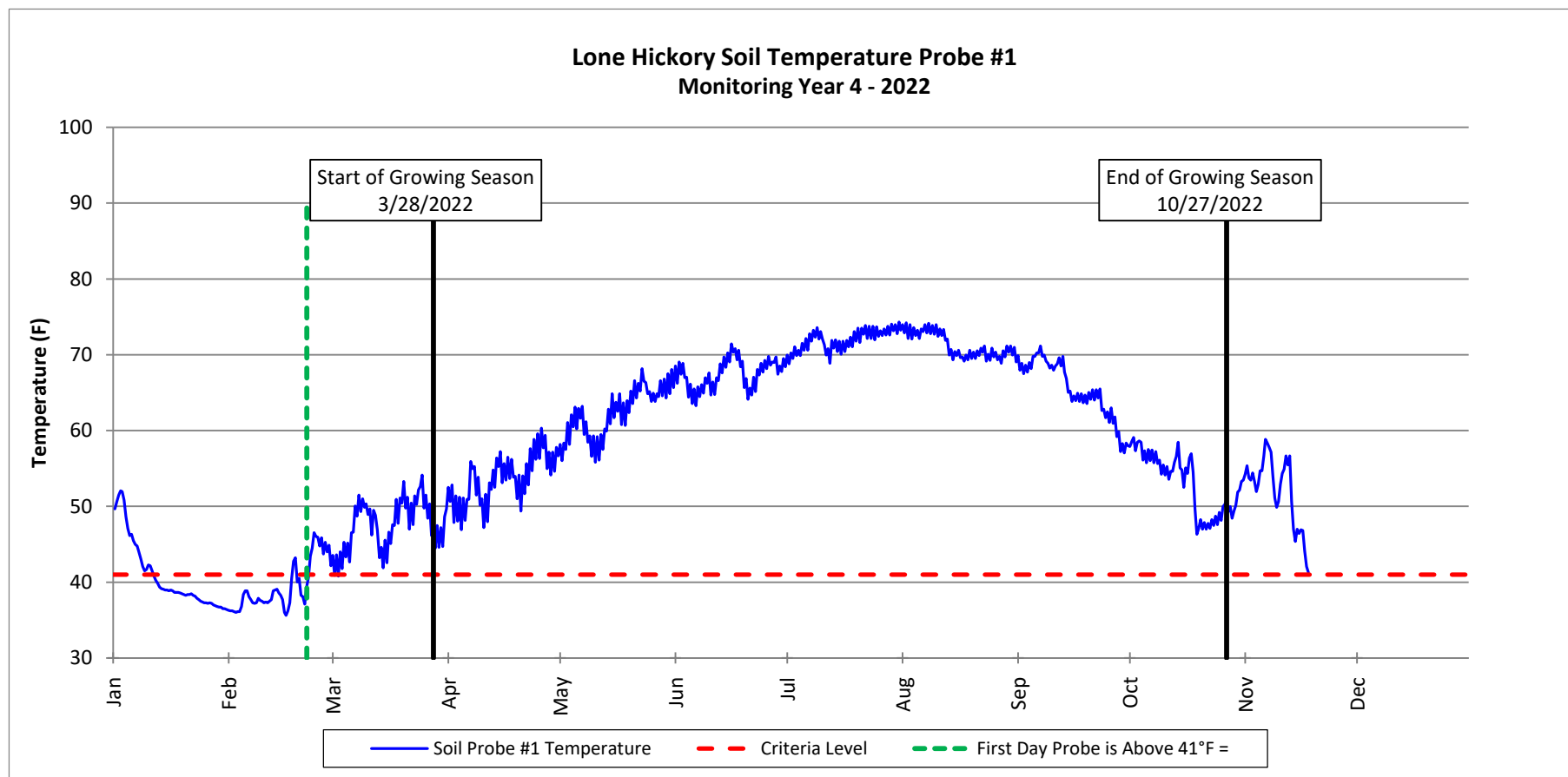
Soil Temperature Probe Plots

Lone Hickory Mitigation Site

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Monitoring Year 4 - 2022



Soil Temperature Probe Plots

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