



Pigg River Restoration at Power Dam

Year 3 Monitoring Report

As required by VDEQ Permit #15-1551 and USFWS Biological Opinion for the Pigg River Restoration at Power Dam Project.

Prepared for:

Friends of the Rivers of Virginia, Inc.
Attn: Mr. Bill Tanger, Chairman
P.O. Box 1750
Roanoke, Virginia 24008

Prepared By:

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DECEMBER 2019

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Introduction

Wetland Studies and Solutions, Inc. (WSSI) presents this monitoring report to the Friends of the Rivers of Virginia (FORVA), providing data related to Year 3 Monitoring efforts. The monitoring program has been designed to track changes to the river corridor and adjacent wetlands following the removal of the decommissioned Power Dam on the Pigg River in Rocky Mount, Virginia, and in accordance with the *Virginia Water Protection Permit Joint Permit Application #15-1551* (draft dated 6/30/2016). Monitoring activities were performed as outlined in the *Pigg River Restoration at Power Dam Monitoring RFP* (WSSI#1054, dated July 27, 2016, a.k.a. “RFP”). Results of annual monitoring required by the U.S. Fish and Wildlife Service in their biological opinion dated January 13, 2016 are hereby incorporated by reference.

Monitoring Year 3 field data was collected by WSSI staff Matthew Hutchins W.P.I.T.¹ and Nathan Staley P.E.² during baseflow conditions on September 30 – October 2, 2019. A total of twelve (12) cross sections were assessed. Cross-sections were established during November 2016 Post-Construction Monitoring and based on locations outlined in the RFP. Cross-sections, as located by GPS, are shown in **Exhibit 1**. Half of the cross-sections were established upstream and half below the relic dam structure. Spacing was adjusted to focus on areas around the dam where the greatest change was anticipated to occur. Cross-sections covered areas far enough upstream to be beyond backwater effects created by the dam and stretched downstream to the point where effects of the dam removal were anticipated to be largely diminished. Cross-section locations were also selected to correspond with previous monitoring efforts (Hitt et al., 2009; Bass, 2015).

Methods

The focus of Year-3 Monitoring efforts was to locate the twelve monitoring stations previously established and document current channel conditions. The results are compared with post-construction monitoring information to show channel evolution throughout the dam removal 5-year post-construction monitoring period. WSSI staff began by accessing upstream cross-sections by boat. Upstream access was gained through the Town of Rocky Mount’s sanitary sewer pumping station (entrance road located near the intersection of Power Dam Road and Scenic River Drive). Cross-sections 1-5 were accessed by boat. Cross-sections 6-12 were accessed via vehicle/foot travel through Town or private property – specifically public land or Town property for sections 6-8, via Hudson Farm Lane (private) for sections 9-11, and through private land on Chestnut Hill Road just downstream of the Pigg River bridge for section 12.

At each cross-section, WSSI staff photo-documented local conditions through upstream, downstream and channel bank photos. All photo documentation adhered to VWP guidelines, noting direction, photographer, date/time, vegetative cover (as applicable), and a brief description. Additional photos were taken to document conditions at locations where significant tributaries upstream of the dam join Pigg River. This information is included at the end of **Appendix A**.

¹ Wetland Professional In Training, Society of Wetlands Scientists Certification Program, Inc.

² Professional Engineer – License #047145

In addition to photographs, WSSI staff surveyed cross-section geometry using a laser level and survey tape to record station/elevation information. During Year 3 monitoring, points were surveyed at any break in slope, generally consistent with methodologies used in the *Sediment Capacity and Fate Modeling Report* (Bass, 2015) and Post-Construction Monitoring. Slight variations in cross section geometry are attributable to differences in individual sampling events and site-specific factors (i.e. normal survey error, vegetation, slack in the survey tape, etc.). At most of cross sections water depth measurements were taken due to vegetation obstruction (especially for generation of the thalweg profile) and the water surface depth added to the edge of water elevation recorded during cross section survey. Though less exact, this method was necessary due to field conditions and allows relative comparison of overall bed level elevation changes. Major changes seen in cross sections are due to channel evolution and erosion following dam removal. Cross-section geometry for re-surveyed sections is given in **Appendix B**, with sections showing Post-Construction, 1-year, 2-year and 3-year channel geometry overlaid.

Physical habitat parameters including particle size, embeddedness, woody debris, and thalweg depth measurements were recorded consistent with previous studies (Hitt et al., 2009). Observations regarding embeddedness are included with the section descriptions and photographs in **Appendix A**. The presence and quantification of large woody debris was documented by visual assessment for areas 150 feet upstream and downstream of the measured cross-section. Woody debris counts are also given in **Appendix A**.

Thalweg measurements were taken to document streambed elevation changes in the vicinity of the cross-section. Depth measurements were collected at 10-ft. intervals (generally) from the cross-section location in both the upstream and downstream direction for a distance of approximately 50 ft. (each direction). In all cases water depth measurement was taken due to vegetation obstruction and the depth measurement added to the elevation of the edge of water measurement taken during cross section survey. Incomplete thalweg survey information in prior year monitoring was due to similar issues with thick bank vegetation. Therefore, field procedures were modified in Year 3 to allow a more complete general picture of bed elevation changes in future monitoring events. (Note: The modified methodology assumes a negligible water surface slope.) Thalweg plots are given in **Appendix A**.

The method of data collection for bed material size varied depending on local conditions. The particle size distribution at most of the cross sections was uniformly sandy, so no pebble count surveys were warranted. Bed material at the five of the cross sections, specifically 3, 7, 8, 11 and 12, were coarser in nature and warranted formal sampling. Wolman riffle pebble counts were performed at these cross sections and particle size distribution data is presented in **Appendix B**.

Wetland data points were conducted at forested wetland sites #2, #3, and #4, as outlined in the Joint Permit Application (four locations within Site #2 and two location each within Site #3 and #4). Wetland sites are shown in **Exhibit 1**. Sampling consisted of photo documentation of site conditions and observations of vegetation, hydrology and soil characteristics necessary for completion of the “Wetland Determination Data Form – Eastern Mountains and Piedmont Region” from the U.S. Army Corps of Engineers Regional Supplement, Version 2 (2012). A 18”

deep test pit/auger hole was dug to document the presence or absence of a hydric soil, water table or saturation. Field data forms are included in **Appendix C**.

Also included within this report are the results of the Year 3 (11/5/2018 – 10/5/2019) ground and surface water monitoring at Wetland Site #2, (location shown in **Exhibit 1**). Groundwater monitoring information and results can be found in **Appendix D** with corresponding local weather station data given in **Appendix E**.

Results and Conclusions

Year 3 monitoring cross section surveys indicate continued bed incision at Cross Section 1 and 2 (approximately 1.5-ft of drop in Cross Section 1 and 2.5-ft in Cross Section 2 in bed elevations since Year 2), likely driven by the storm events experienced throughout the year. Cross Section 3 saw such a dramatic bank failure neither end pin could be found. Resurvey at Cross Section 3 was precluded by a large debris jam. Basic field measurements were taken and indicate minimal further incision (bed rock outcroppings are now exposed), but channel widening of over 30 feet. Cross Sections 4 saw little change in bed incision but continued bank failure, especially on the left bank. Changes at Sections 5 and 6 were less dramatic since significant evolution occurred immediately following construction and these sections now approach the invert elevation of the dam remains. Upstream of the removed dam, there was a significant loss of bank vegetation and signs of consistent bank failure, even though rain events were less frequent than the previous year, based off precipitation data from NOAA dating from January to September for 2018 and 2019. 2018 showed a total of 55.78 inches and 2019 showed a total of 38.13 inches. Tension cracking and mass failure is visible at cross sections where steep banks still exist. Downstream of the removed dam the banks had sediment deposits, with these deposits burying most of the end pins on both banks. End pins at various cross sections downstream of the dam saw deposition ranging from 2 inches to 10 inches, confirming sediment transport in overbank events since Year 2 monitoring.

Pebble count monitoring data shows an increase in amount of cross sections that justified performing a pebble count. Five pebble counts were taken during Year 3 monitoring 4 more than Year 2. This year there has been a transition toward seeing less sand and more gravel throughout the cross sections. Cross Sections 3 especially had bedrock present showing that the stream may have reached the lowest point.

Year 3 monitoring is the first year to require a detailed analysis of soil characteristics in wetland areas. Previous soil assessment and wetland determinations were performed by agency staff prior to dam removal and WSSI involvement. USFWS staff notes from wetland assessments performed on November 18, 2015 state that Site 4 was:

“perched over 5 feet above the water surface of the Pigg River. Site is not connected to the river and will not be impacted by the project. Boundary flagging and wetland determination data forms were not completed for this site.”

WSSI staff took two data points at Site 4 (adjacent to Cross Section 2) during Year 3 monitoring. Results showed that the site did not meet the hydrology or hydric soil requirements for a wetland. Additional assessment during future monitoring will aid in drawing conclusions regarding changing conditions. At Site 3 (adjacent to Cross Section 4), all three parameters were met but no saturation, water table or standing water was present at the time of monitoring. At Site 2 (multiple sample locations) the plants, soils, and hydrology were all present and met the requirements needed to be considered a wetland.

WETLAND STUDIES AND SOLUTIONS, INC.



Matthew Hutchins, WPIT³
Environmental Technician



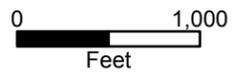
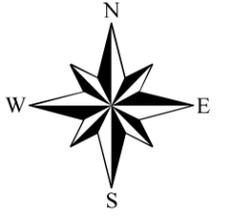
Nathan Staley, P.E.⁴
Senior Associate Engineer

³ Wetland Professional in Training, Society of Wetland Scientists Certification Program, Inc.

⁴ Professional Engineer – License #047145



Pigg River Restoration at Power Dam-Monitoring
 Permanent Monitoring Locations
 Original Scale: 1"=1000'



- Survey Locations
- Cross Sections

L:\Proposals\GIS\2016\PiggRiverRestoration_PowerDam\PiggRiverRestoration.mxd

Aerial Imagery Source: Virginia Base Mapping Program (VBMP) - 2015 Natural Color Imagery

Appendix A

Cross Section 1

<u>Location</u>	<u>Latitude</u>	<u>Longitude</u>
Left Bank	36.990985	-79.864618
Right Bank	36.990712	-79.864937

Description: Cross Section 1 is located approximately 600 feet downstream of the existing sanitary pump station, accessible via Scenic River Road. Access was by boat from the upstream pumping station. Local conditions were noted as forested on the left bank and agricultural fields on the right bank. (Note: Left and right bank references will always be made facing downstream.) The left bank slope was steep, and the right bank sloped gradually with a sharp drop at the top of the bank. In contrast to previous monitoring events, both banks have more vegetation than the previous year. In addition, 300 yards downstream of the Cross Section there were two large pile ups of large woody debris.

The instrument setup for this Cross Section was on the left bank (Height of Instrument, HI = 4.64 ft.). The Cross Section plot and thalweg profile are shown below. No pebble count was taken at this location due to the uniform fine-grained (sandy) nature of bed sediments. Isolated pockets of gravel from 12-50mm were observed across the stream adjacent to some woody debris.



Photo 1-1

Location, Orientation: XS 1, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 9:11 AM

Taken by: *See note below

Description: View looking upstream from the middle of Cross Section 1

Woody Debris: 15

*Note: All Post-construction photographs taken by M. Hutchins, unless otherwise noted.



Photo 1-2

Location, Orientation: XS 1, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 9:11 AM

Description: View looking downstream from the middle of Cross Section 1

Woody Debris: 30



Photo 1-3

Location, Orientation: XS 1, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 9:11 AM

Description: View looking left from the middle of Cross Section 1

Vegetation: 60% herbaceous cover, few trees at top of bank, large woody debris present



Photo 1-4

Location, Orientation: XS 1, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 9:13 AM

Description: View looking right from the middle of Cross Section 1

Vegetation: 40% herbaceous cover, no trees



Photo 1-5

Location, Orientation: XS 1, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 9:12 AM

Description: View looking downstream at Cross Section 1 from an upstream position



Photo 1-6

Location, Orientation: XS 1, Downstream looking up

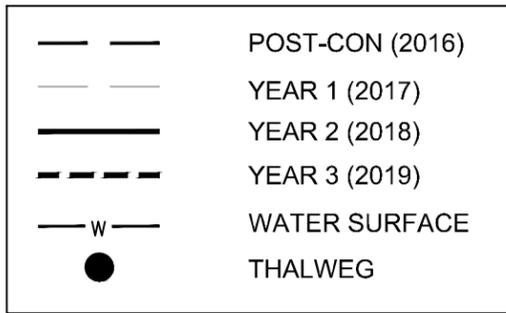
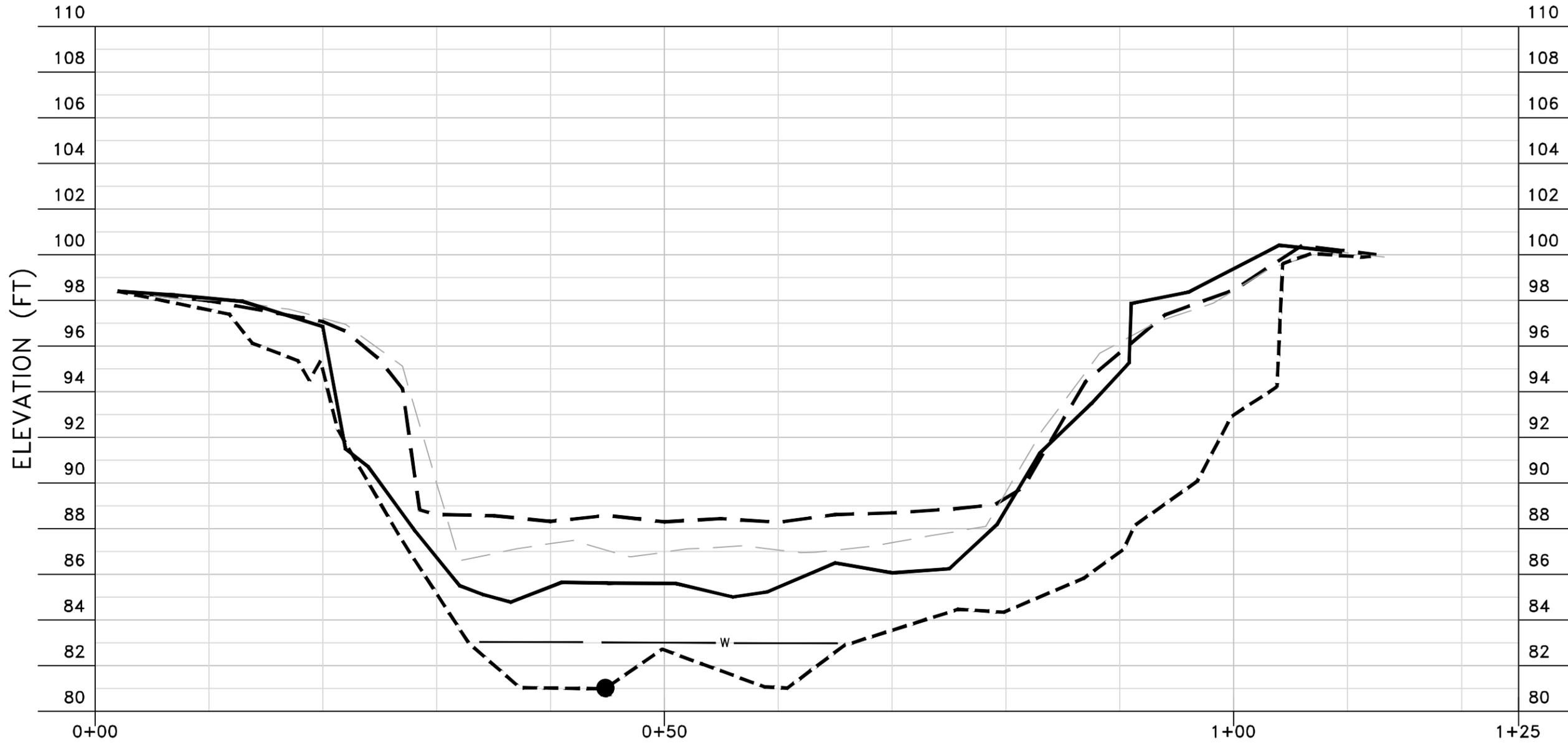
Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 9:13 AM

Description: View looking upstream at Cross Section 1 from a downstream position

XS 1



DISTANCE ALONG BASELINE (FT)

PROFILE SCALE:

HORIZ: 1"=10'

VERT: 1"=5'

(ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)

ELEVATION (FT)

Pigg River Dam Removal Restoration - Monitoring
Rocky Mount, Virginia

REVISIONS		Rev. By	App. By
No.	Date	Description	

Boundary and Topo Source:
WSSI and Orange Digital Data

Design	Draft	Approved
MEH	MEH	NAS

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Year 3 - XS 1
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SCALE: AS NOTED

Cross Section 2

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.984705	-79.864096
Right Bank	36.984655	-79.864333

Description: Cross Section 2 is located approximately 2,400 feet downstream (south) of Cross Section 1 and 1,200 feet downstream of an old power line easement. Powerlines were not seen at the time of survey this year. Access was by boat from the upstream pumping station. Local conditions were noted as forested on both banks. The right bank sloped down with a drop off near the top of bank with some herbaceous cover and woody debris. The left bank was highly eroded with little herbaceous cover and large amount of woody debris.

The instrument setup for this Cross Section was measured from left bank (HI = 4.93 ft.). The Cross Section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy) nature of bed sediments but 10% of bed contained 3-10mm gravel. The left bank end pin was not found and was assumed to be washed away. The right bank pin was moved six feet back (the pin was moved after measurements were taken), due to it being right on the edge of the eroding bank. Year 3 showed increased bed incision and bank failure.

This Cross Section was located adjacent to the overbank wetland area (left bank) identified in permit documents and previous reports as Wetland Site #4. Wetland data forms are given in Appendix C.



Photo 2-1

Location, Orientation: XS 2, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #4, DP-1 and DP-2

9/30/19, 11:33 AM

Description: View looking upstream from the center of Cross Section 2

Woody Debris: 25



Photo 2-2

Location, Orientation: XS 2, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #4, DP-1 and DP-2

9/30/19, 11:33 AM

Description: View looking downstream from the middle of Cross Section 2

Woody Debris: 10



Photo 2-3

Location, Orientation: XS 2, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #4, DP-1 and DP-2

9/30/19, 11:33 AM

Description: View looking left from the middle of Cross Section 2

Vegetation: 40% herbaceous cover, few trees, woody debris



Photo 2-4

Location, Orientation: XS 2, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #4, DP-1 and DP-2

9/30/19, 11:33 AM

Description: View looking right from the middle of Cross Section 2

Vegetation: 70% herbaceous cover, few trees, woody debris



Photo 2-5

Location, Orientation: XS 2, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #4, DP-1 and DP-2

9/30/19, 11:34 AM

Description: View looking downstream at Cross Section 2 from an upstream position



Photo 2-6

Location, Orientation: XS 2, Downstream looking up
Permit Number: JPA #15-1551
Wetland Data Sheet Reference: Site #4, DP-1 and DP-2
9/30/19, 11:36 AM

Description: View looking upstream at Cross Section 2 from a downstream position



Photo 2-7

Location, Orientation: XS 2, Right Bank end pin before moving
Permit Number: JPA #15-1551
Wetland Data Sheet Reference: Site #4, DP-1 and DP-2
9/30/19, 10:53 AM

Description: Photo of the end pin right on the edge of bank erosion before it was moved.



Photo 2-8

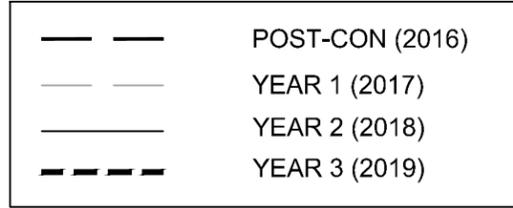
Location, Orientation: XS 2, Right Bank end pin after moving

Permit Number: JPA #15-1551

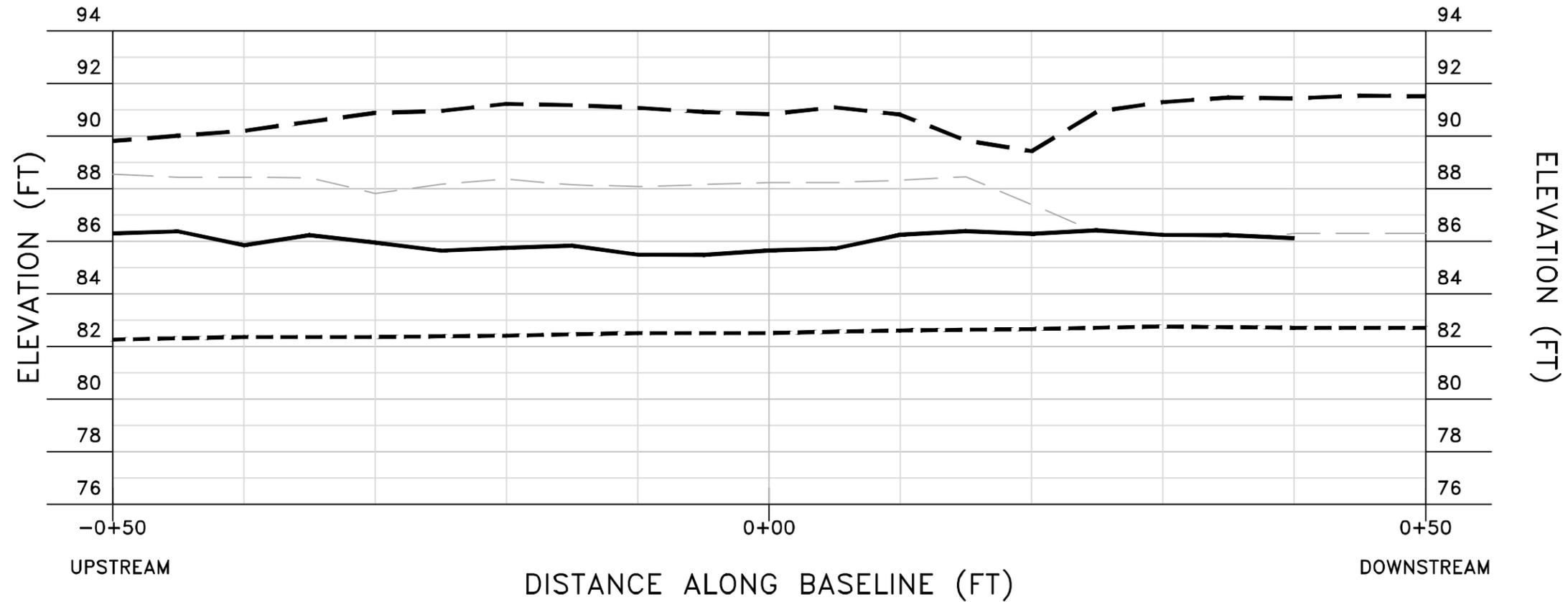
Wetland Data Sheet Reference: Site #4, DP-1 and DP-2

9/30/19, 11:17 AM

Description: View looking at Right Bank end pin after moving it six feet back after the survey was taken.



Thalweg XS 2



PROFILE SCALE:
 HORIZ: 1"=10'
 VERT: 1"=5'
 (ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



Pigg River Dam Removal Restoration - Monitoring
 Rocky Mount, Virginia
 Year 3 - Thalweg Profile XS 2
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DATE: OCT 2019 SCALE: AS NOTED

Boundary and Topo Source:
 WSSI and Orange Digital Data

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MEH	MEH	NAS

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Cross Section 3

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.980573	-79.855954
Right Bank	36.980669	-79.855792

Description: Cross Section 3 was located approximately 2,600 feet downstream of Cross Section 2, 500 feet southeast of the south end of Scenic River Road, and just downstream of a large meander bend. Access was by boat from the upstream pumping station. Significant erosion and bank failure was seen at this section. After an exhaustive search, it was assumed that both end pins were washed away and lost. Local conditions were noted as forested at the top both banks above the erosion. The left bank was composed of 20% vegetative cover and exposed root structures creating a steep vertical upper bank with the lower left bank primarily composed of sediment deposits and large chunks of the eroded bank. The right bank was also steeply sloped and composed of exposed bedrock and woody debris. A large pile of woody debris extended 300+ feet upstream from the Cross Section location and blocked crews from resurveying at Cross Section 3. Rough field measurements indicated 30-40 feet of channel widening since Year 2 monitoring. Bedrock outcroppings seen in the channel bottom indicate the section has reached maximum incision.

No survey was taken. A pebble count was taken due to the variety of bed material and presence of bedrock and can be found in Appendix B.



Photo 3-1

Location, Orientation: XS 3, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 1:49 PM

Description: View looking upstream at Cross Section 3 from a downstream position

Woody Debris: >100



Photo 3-2

Location, Orientation: XS 3, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 1:49 PM

Description: View looking downstream at Cross Section 3 from a downstream position

Woody Debris: 10



Photo 3-3

Location, Orientation: XS 3, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 1:49 PM

Description: View looking left at Cross Section 3 from a downstream position

Vegetation: 10% herbaceous plants, few trees on top of bank



Photo 3-4

Location, Orientation: XS 3, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 1:49 PM

Description: View looking right at Cross Section 3 from a downstream position

Vegetation: 10% herbaceous cover, a few trees at top of bank, exposed bedrock and woody debris



Photo 3-5

Location, Orientation: XS 3, Large Debris Pile

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 1:51 PM

Description: View looking from left bank at the large debris pile at Cross Section #3



Photo 3-6

Location, Orientation: XS 3, Downstream looking up

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 1:49 PM

Description: View looking upstream at Cross Section 3 from a downstream position

Cross Section 4

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.985663	-79.856937
Right Bank	36.985403	-79.856873
Thalweg	36.985530	-79.856930

Description: Cross Section 4 is located approximately 1,600 feet downstream of Cross Section 3, east of Scenic River Road and west of Power Dam Road in a short, straight, run between two sharp meander pools. Access was by boat from the upstream pumping station. The right upper bank face was vertical, approximately 10-ft high. The lower right bank was a steady slope composed of herbaceous cover. The left upper bank had shrubs; the lower left bank was a steep drop to the water showing signs of bank failure. Both pins were moved back six feet due to continued bank failure (the pins were moved after measurements were taken).

The instrument setup for this Cross Section was at the left bank (HI = 4.47 ft.). The Cross Section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy/silty) nature of bed sediments.

This Cross Section was located adjacent to the overbank wetland area (right bank) identified in permit documents and previous reports as Wetland Site #3. Wetland data forms are given in Appendix C.



Photo 4-1

Location, Orientation: XS 4, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #3, DP-1 and DP-2

9/30/19, 3:26 PM

Description: View looking upstream from the center of Cross Section 4

Woody Debris: 5



Photo 4-2

Location, Orientation: XS 4, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #3, DP-1 and DP-2

9/30/19, 3:26 PM

Description: View looking downstream from the middle of Cross Section 4

Woody Debris: 30



Photo 4-3

Location, Orientation: XS 4, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #3, DP-1 and DP-2

9/30/19, 3:26 PM

Description: View looking left from the middle of Cross Section 4

Vegetation: 40% herbaceous cover with some shrubs on the top of the bank



Photo 4-4

Location, Orientation: XS 4, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #3, DP-1 and DP-2

9/30/19, 3:26 PM

Description: View looking right from the middle of Cross Section 4

Vegetation: 40% herbaceous cover, small shrubs and a few trees at top of bank



Photo 4-5

Location, Orientation: XS 4, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #3, DP-1 and DP-2

10/01/18, 3:33 PM

Description: View looking downstream at Cross Section 4 from an upstream position



Photo 4-6

Location, Orientation: XS 4, Downstream looking up

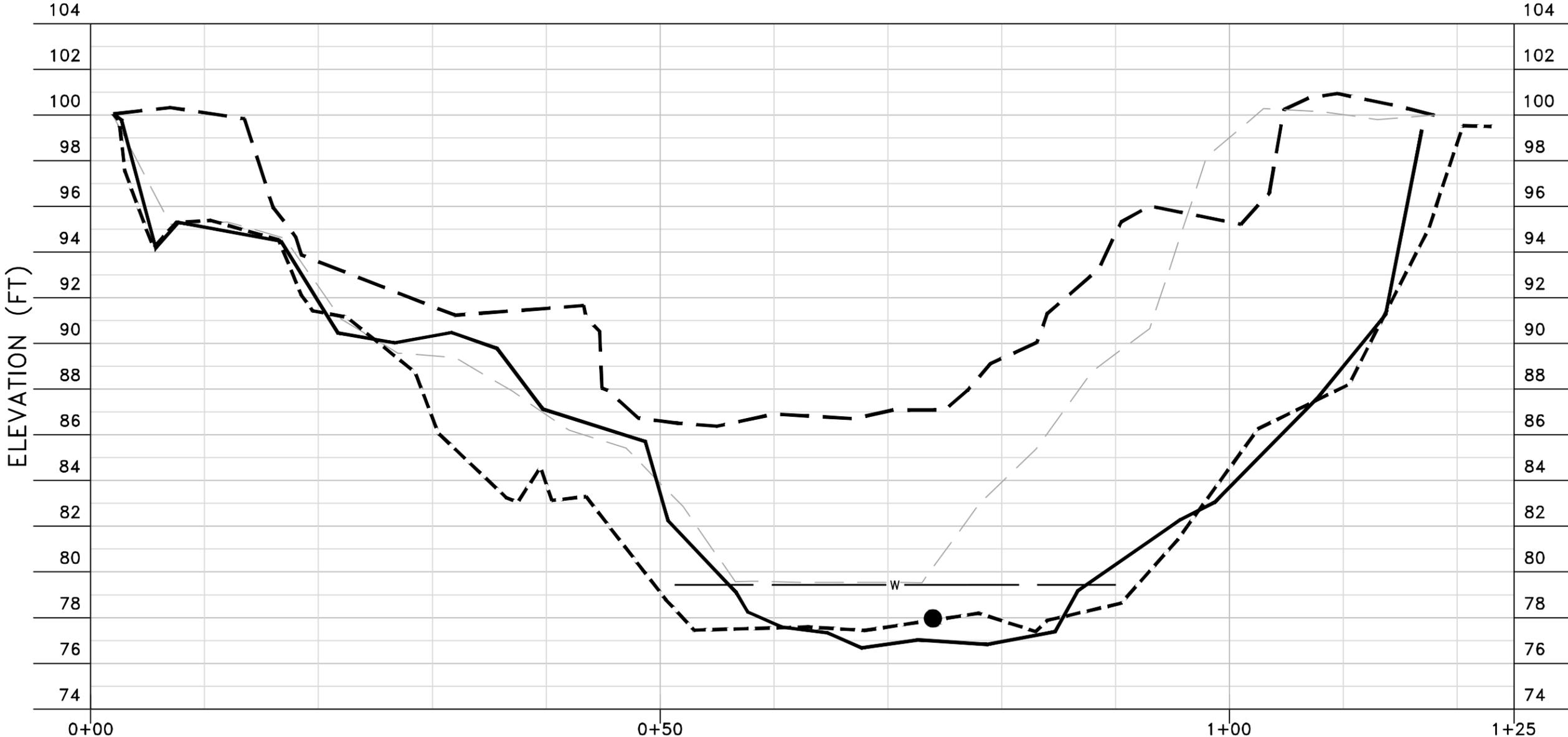
Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #3, DP-1 and DP-2

10/01/18, 3:33 PM

Description: View looking upstream at Cross Section 4 from a downstream position

XS 4



- — POST-CON (2016)
- — YEAR 1 (2017)
- — YEAR 2 (2018)
- - - YEAR 3 (2019)
- w — WATER SURFACE
- THALWEG

DISTANCE ALONG BASELINE (FT)

PROFILE SCALE:
 HORIZ: 1"=10'
 VERT: 1"=5'

(ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



Pigg River Dam Removal Restoration - Monitoring
 Rocky Mount, Virginia

Year 3 - XS 4
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		No.	Date

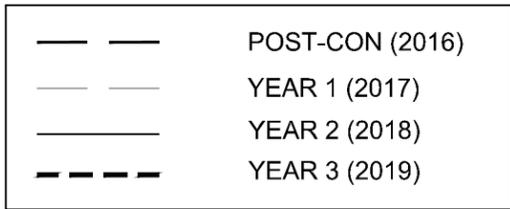
SCALE: AS NOTED
DATE: OCT 2019

Boundary and Topo Source:
WSSI and Orange Digital Data

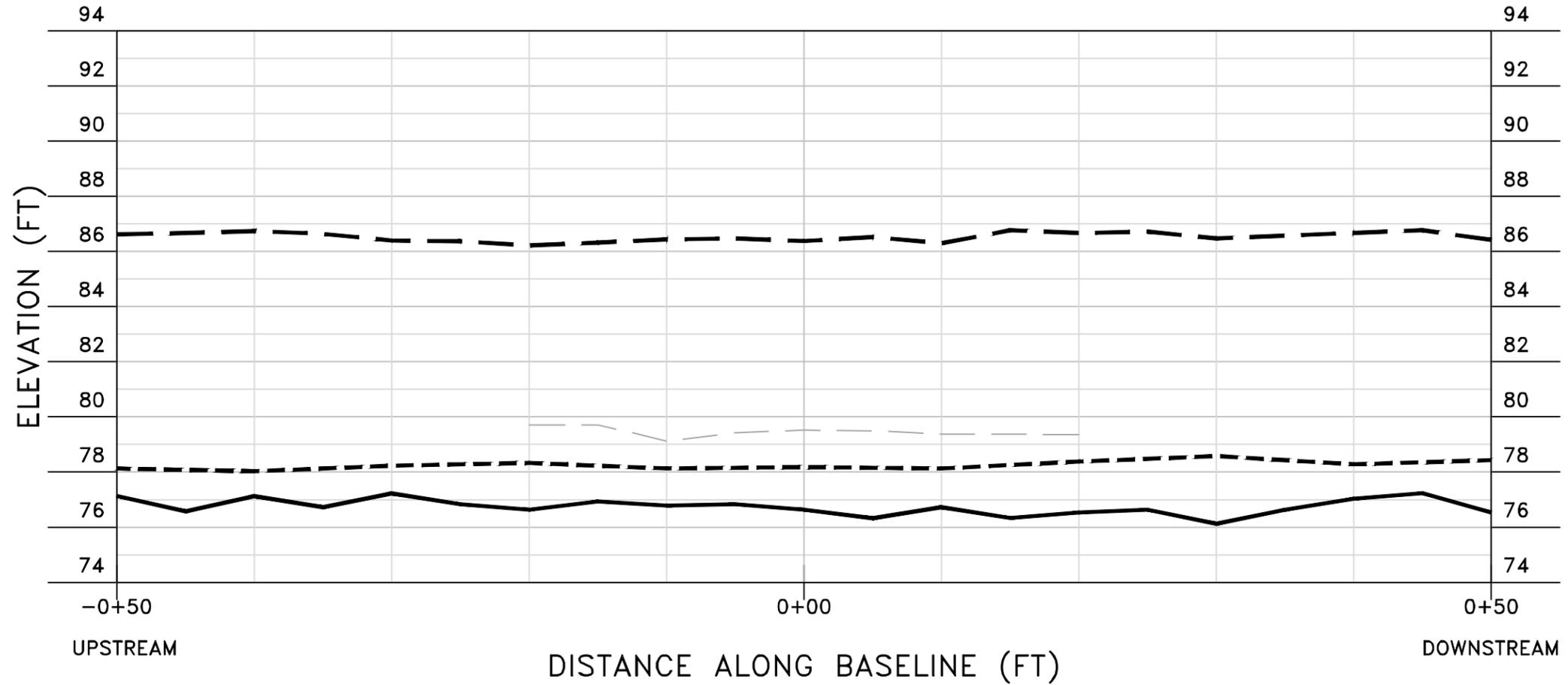
Design	Draft	Approved
MEH	MEH	NAS

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Computer File Name:
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Thalweg XS 4



PROFILE SCALE:
 HORIZ: 1"=10'
 VERT: 1"=5'
 (ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



Pigg River Dam Removal Restoration - Monitoring
 Rocky Mount, Virginia
 Year 3 - Thalweg Profile XS 4
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DATE: OCT 2019 SCALE: AS NOTED

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 WSSI and Orange Digital Data

Design	Draft	Approved
MEH	MEH	NAS

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Computer File Name:
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Cross Section 5

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.991448	-79.857178
Right Bank		

Description: Cross Section 5 is located approximately 2,000 feet downstream of Cross Section 4; approximately 800 feet downstream (north) of the power line easement (power lines were not present this year). Access was by boat from the upstream pumping station. The Cross Section has not experienced much change since the previous year. Banks are starting to grow vegetation with bank failure only seen at the top of the banks. The right bank is flanked by a wide steep mudflat about 5 ft. tall. The upper right bank has herbaceous vegetation with a few trees at the top of the bank. The upper left bank drops off and then slowly slopes towards the water with herbaceous vegetation starting to grow. Both pins were moved back due to continued bank failure, right bank pin was moved back 8 ft and the left bank pin was moved back 5 feet (pins were moved after measurements were taken).

The measurements started at left bank with the instrument setup for this cross section on the right bank (HI 1= 4.09 ft. HI 2= 3.10 ft). The Cross Section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy) nature of bed sediments.



Photo 5-1

Location, Orientation: XS 5, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 5:28 PM

Description: View looking upstream from the center of Cross Section 5

Woody Debris: 10



Photo 5-2

Location, Orientation: XS 5, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 5:28 PM

Description: View looking downstream from the middle of Cross Section 5

Woody Debris: 5



Photo 5-3

Location, Orientation: XS 5, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site #2, DP-1 and DP-2

9/30/19, 5:28 PM

Description: View looking left from the middle of Cross Section 5

Vegetation: 20% herbaceous cover



Photo 5-4

Location, Orientation: XS 5, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

9/30/19, 5:26 PM

Description: View looking right from the middle of Cross Section 5

Vegetation: 50% herbaceous cover (mainly upper bank)

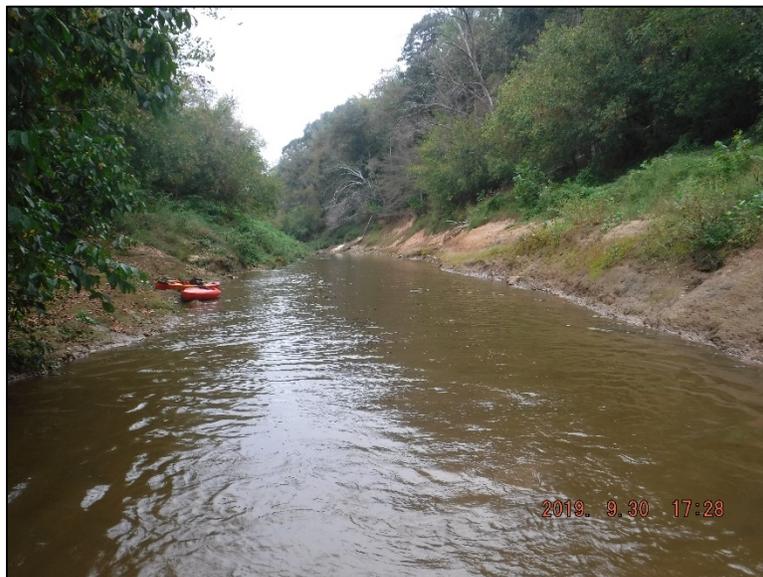


Photo 5-5

Location, Orientation: XS 5, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 6:01 PM

Description: View looking downstream at Cross Section 5 from an upstream position



Photo 5-6

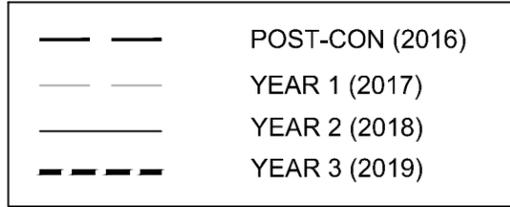
Location, Orientation: XS 5, Downstream looking up

Permit Number: JPA #15-1551

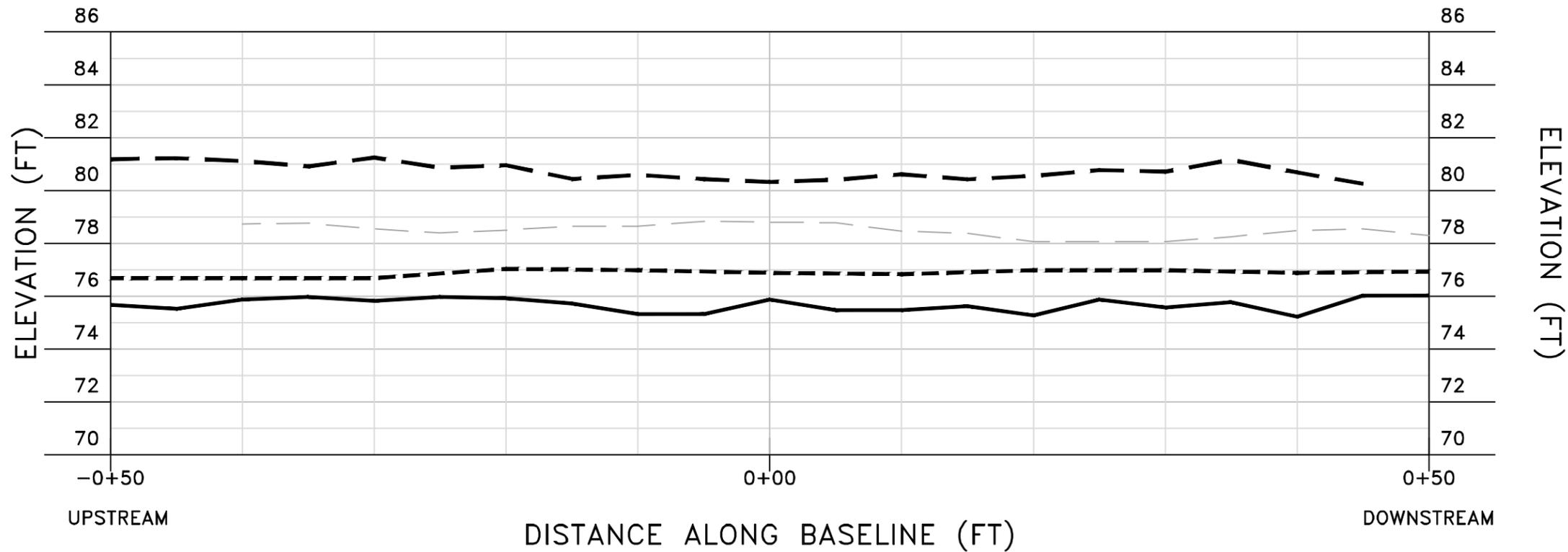
Wetland Data Sheet Reference: n/a

9/30/19, 5:27 PM

Description: View looking upstream at Cross Section 5 from a downstream position



Thalweg XS 5



PROFILE SCALE:
 HORIZ: 1"=10'
 VERT: 1"=5'
 (ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



Pigg River Dam Removal Restoration - Monitoring
 Rocky Mount, Virginia
 Year 3 - Thalweg Profile XS 5
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REVISIONS		Rev. No.	App. By	Date
No.	Description			

DATE: OCT 2019 SCALE: AS NOTED

Boundary and Topo Source:
 WSSI and Orange Digital Data

Design	Draft	Approved
MEH	MEH	NAS

Sheet #
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Cross Section 6

<u>Location</u>	<u>Latitude</u>	<u>Longitude</u>
Left Bank		
Right Bank	36.995027	-79.859314

Description: Cross Section 6 is located approximately 300 feet upstream of the Power Dam structure. Access was by foot via the trail paralleling Power Dam Road. The Cross Section is bounded on both banks by forested conditions. Year 2 survey work found the thalweg to be roughly at the elevation of the dam breach. Thus, further downcutting was not expected. Year 3 survey showed some sediment deposition between Year 2 and Year 3. This section was approximately 30-ft deep from top of bank to the bottom of the bank. It is characterized by a wide channel Cross Section with widening of the channel apparent from previously confined cross sections (XS 4, 5, 6). The right bank had a vertical upper bank with evidence of continued bank failures. Tension cracks were evident. Midway down the right bank a large shelf was established with herbaceous vegetation and major scouring occurring at the lower right bank. The upper left bank showed evidence of mass failure with steep vertical faces covered with herbaceous vegetation. The mid- to lower-left bank sloped down and was covered with herbaceous vegetation.

The instrument setup for this Cross Section was at the right bank (HI 1 = 3.72 ft.; HI 2= 3.59 ft.). The Cross Section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy) nature of bed sediments.

This Cross Section was located adjacent to a wider area of wetlands (as previously delineated), located on the left bank – the lower end of the area identified in permit documents and previous reports as Wetland Site #2. The Wetland data forms are given in Appendix C.



Photo 6-1

Location, Orientation: XS 6, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/1/19, 9:27 AM

Description: View looking upstream from the center of Cross Section 6

Woody Debris: 10



Photo 6-2

Location, Orientation: XS 6, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/1/19, 9:27 AM

Description: View looking downstream from the middle of Cross Section 6

Woody Debris: 5



Photo 6-3

Location, Orientation: XS 6, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/1/19, 9:27 AM

Description: View looking left from the middle of Cross Section 6
Vegetation: 85% herbaceous cover, large trees and shrubs at top of bank



Photo 6-4

Location, Orientation: XS 6, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/1/19, 9:27 AM

Description: View looking right from the middle of Cross Section 6
Vegetation: 30% herbaceous cover, large trees and shrubs at top of bank



Photo 6-5

Location, Orientation: XS 6, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/1/19, 9:31 AM

Description: View looking downstream at Cross Section 6 from an upstream position



Photo 6-6

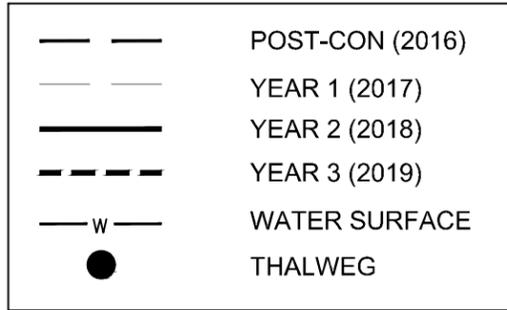
Location, Orientation: XS 6, Downstream looking up

Permit Number: JPA #15-1551

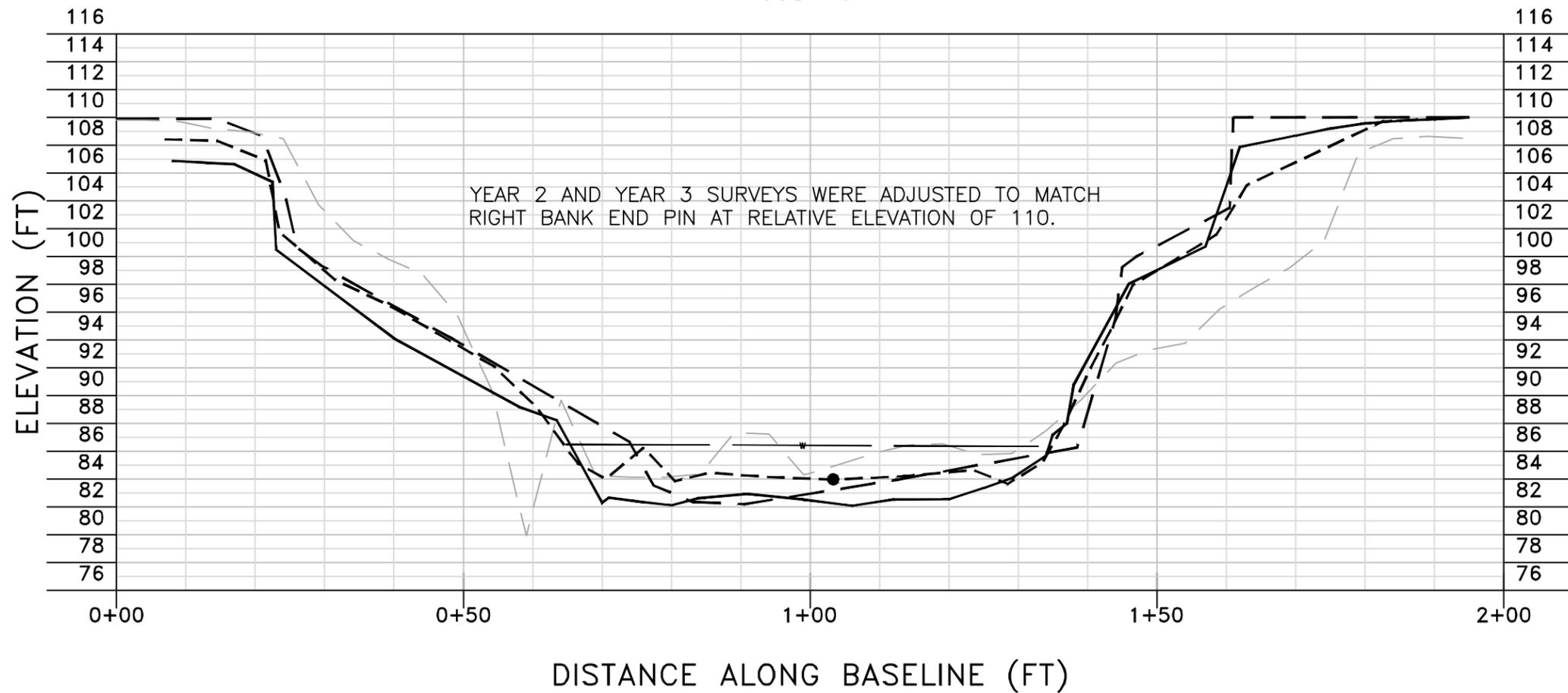
Wetland Data Sheet Reference: n/a

10/1/19, 9:24 AM

Description: View looking upstream at Cross Section 6 from a downstream position



XS 6



PROFILE SCALE:
 HORIZ: 1"=20'
 VERT: 1"=10'

PROFILE SCALE:
 HORIZ: 1"=10'
 VERT: 1"=5'

(ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



Pigg River Dam Removal Restoration - Monitoring
 Rocky Mount, Virginia

Year 3 - XS 5 & 6

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No.	Description			

DATE: OCT 2019 SCALE: AS NOTED

Boundary and Topo Source: WSSI and Orange Digital Data

Design	Draft	Approved
MEH	MEH	NAS

Sheet # 11 of 24

Computer File Name: C:\2019\2019-08-14\2019-08-14.dwg

Cross Section 7

<i><u>Location</u></i>	<i><u>Latitude</u></i>	<i><u>Longitude</u></i>
Left Bank	36.997204	-79.860491
Right Bank	36.997218	-79.859878

Description: Cross Section 7 is located approximately 450 feet downstream of the Power Dam Road bridge. Vehicular access was gained via farm field roads on Rocky Mount treatment plant property. The Cross Section was bounded on the left bank by forest and on the right bank by a narrow band of trees along the top of bank with agricultural fields just beyond.

Sediment has continued to deposit on the left bank, the left bank pin was buried under 6 inches of sediment. Little vegetation has established on both right and left banks. The right bank contained large woody debris. The left bank pin was moved up to the new existing grade elevation in order to make it easier to find in the following years (pin was moved after measurements were taken).

The instrument setup for this Cross Section was at the right bank (HI = 3.69 ft.). The Cross Section plot and thalweg profile are shown below. A pebble count was taken at this location due to the variation in bed material and data shown in Appendix B.



Photo 7-1

Location, Orientation: XS 7, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 8:44 AM

Description: View looking upstream from the middle of Cross Section 7

Woody Debris: 30



Photo 7-2

Location, Orientation: XS 7, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 8:44 AM

Description: View looking downstream from the middle of Cross Section 7

Woody Debris: 60



Photo 7-3

Location, Orientation: XS 7, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 8:44 AM

Description: View looking left from the middle of Cross Section 7

Vegetation: 5% herbaceous cover, few trees



Photo 7-4

Location, Orientation: XS 7, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 8:44 AM

Description: View looking right from the middle of Cross Section 7

Vegetation: 5% herbaceous plants, trees at bankfull



Photo 7-5

Location, Orientation: XS 7, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 8:46 AM

Description: View looking downstream at Cross Section 7 from an upstream position



Photo 7-6

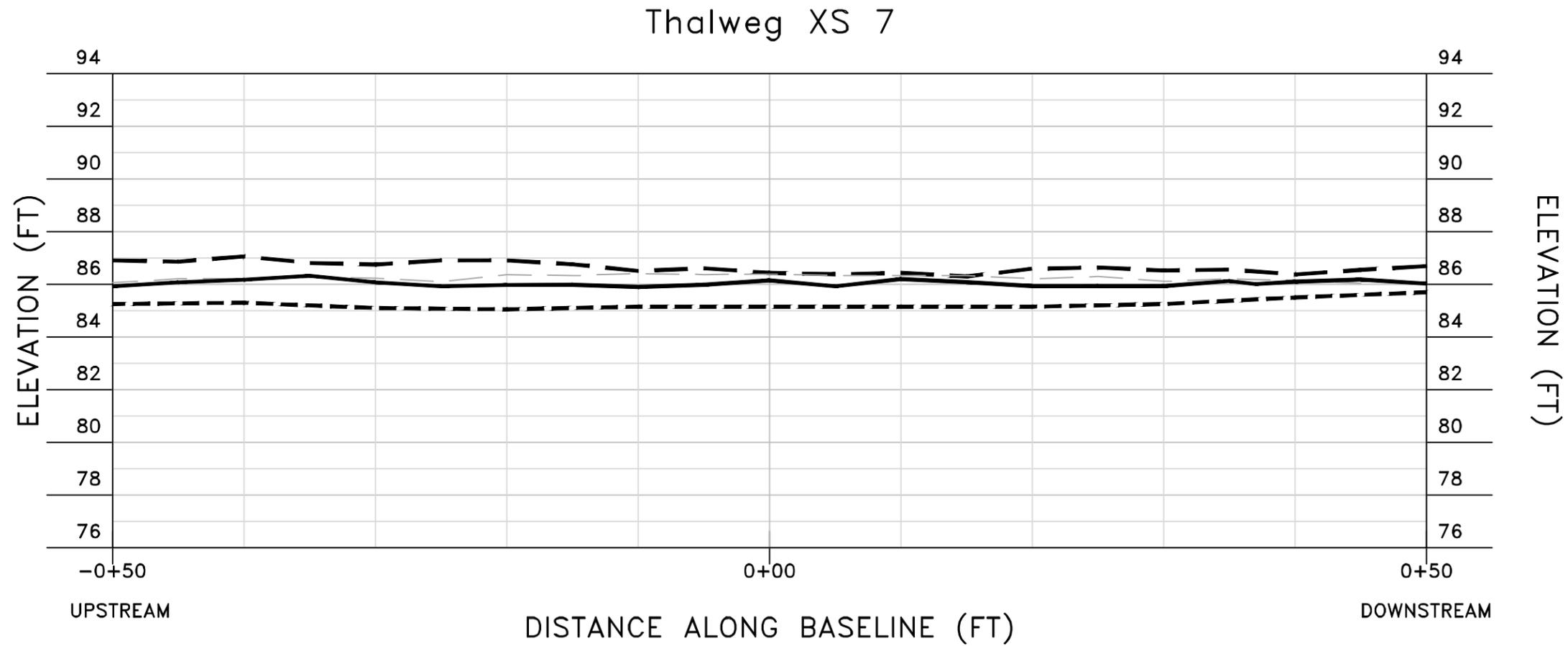
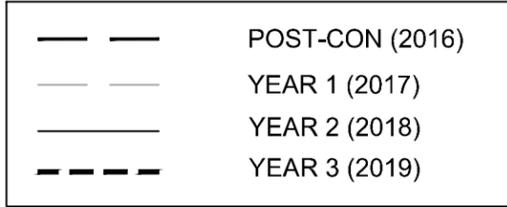
Location, Orientation: XS 7, Downstream looking up

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 8:47 AM

Description: View looking upstream at Cross Section 7 from a downstream position



PROFILE SCALE:
 HORIZ: 1"=10'
 VERT: 1"=5'
 (ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



Pigg River Dam Removal Restoration - Monitoring
 Rocky Mount, Virginia
 Year 3 - Thalweg Profile XS 7
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No.	Date	Description	Rev. By	App. By

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DATE: OCT 2019

SCALE: AS NOTED

Boundary and Topo Source:
 WSSI and Orange Digital Data

Design	Draft	Approved
NAS	NAS	NAS

Sheet #
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Computer File Name:
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Cross Section 8

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.998831	-79.856019
Right Bank	36.998555	-79.856062

Description: Cross Section 8 is located approximately 2,000 feet downstream of the dam, or 1,400 feet downstream of Cross Section 7, due north of the existing Town of Rocky Mount Sewage Treatment Plant. Vehicular access was gained via farm field roads on treatment plant property. The Cross Section is bounded on the left bank by forest and on the right bank by a narrow band of trees along the top of bank with agricultural fields just beyond.

This section had mature woody vegetation to within five feet of the baseflow water surface elevation on the right bank. The water surface width at this section was consistent with that seen at Cross Section 7. The banks contain fine sediment released then deposited from behind the dam. The right bank was mostly sediment and some herbaceous vegetation. The left bank had some herbaceous vegetation and woody debris.

The instrument setup for this Cross Section was at the right bank (HI = 3.77 ft.). The Cross Section plot and thalweg profile are shown below. A pebble count was taken at this location due to the variation in bed material and data shown in Appendix B.



Photo 8-1

Location, Orientation: XS 8, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 10:04 AM

Description: View looking upstream from the middle of Cross Section 8

Woody Debris: 5



Photo 8-2

Location, Orientation: XS 8, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 10:04 AM

Description: View looking downstream from the middle of Cross Section 8

Woody Debris: 20



Photo 8-3

Location, Orientation: XS 8, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 10:04 AM

Description: View looking left from the middle of Cross Section 8

Vegetation: 20% herbaceous cover, saplings, small trees



Photo 8-4

Location, Orientation: XS 8, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 10:05 AM

Description: View looking right from the middle of Cross Section 8

Vegetation: 15% herbaceous plants, trees



Photo 8-5

Location, Orientation: XS 8, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 10:05 AM

Description: View looking downstream at Cross Section 8 from an upstream position



Photo 8-6

Location, Orientation: XS 8, Downstream looking up

Permit Number: JPA #15-1551

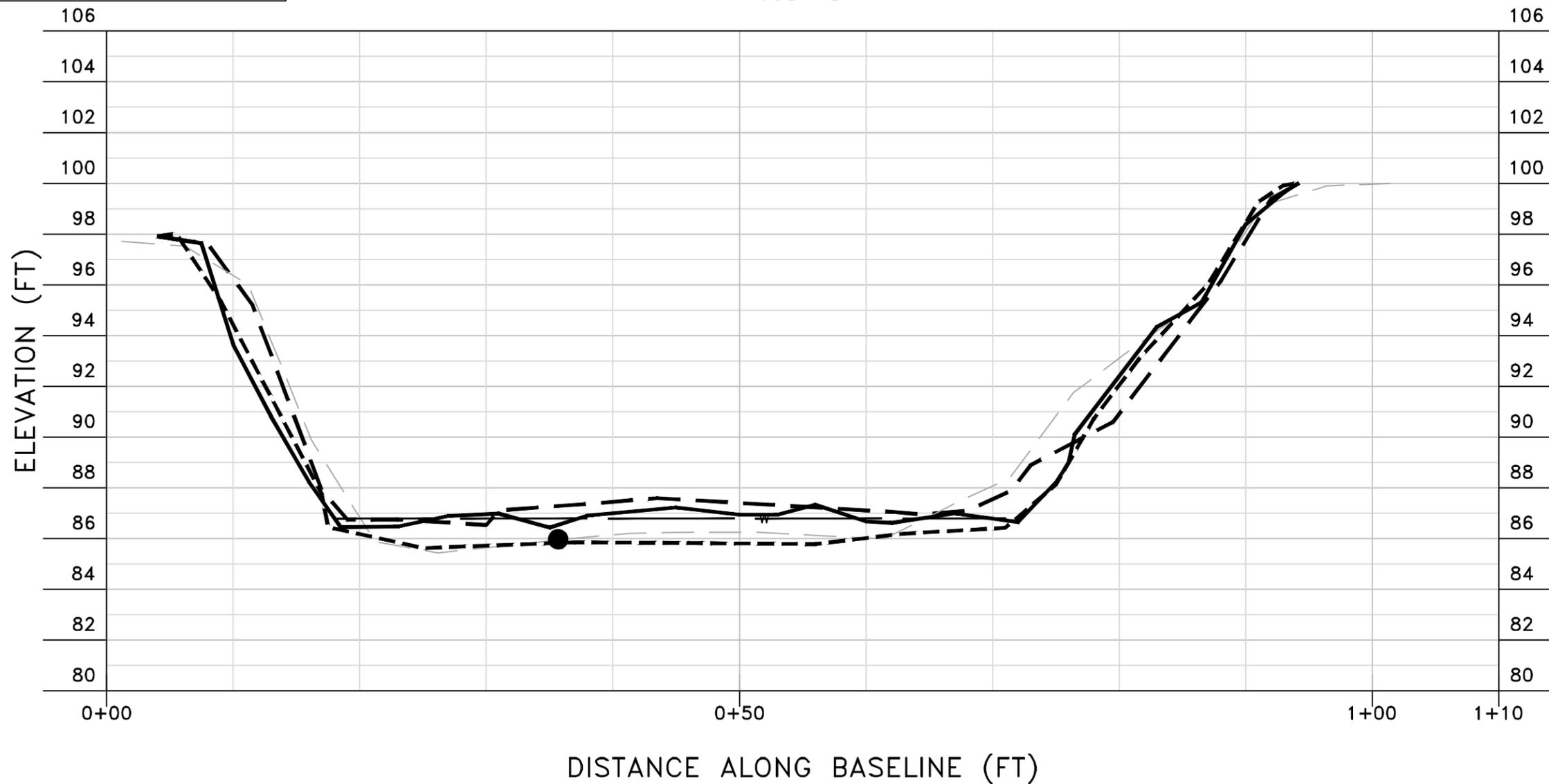
Wetland Data Sheet Reference: n/a

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Description: View looking upstream at Cross Section 8 from a downstream position



XS 8

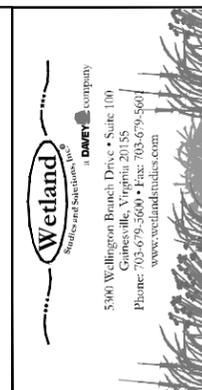


PROFILE SCALE:

HORIZ: 1"=10'

VERT: 1"=5'

(ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



Pigg River Dam Removal Restoration - Monitoring
 Rocky Mount, Virginia
 Year 3 - XS 8
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REVISIONS		Rev. By	App. By
No.	Date	Description	

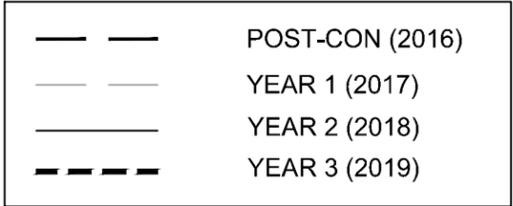
DATE: OCT 2019 SCALE: AS NOTED

Boundary and Topo Source:
WSSI and Orange Digital Data

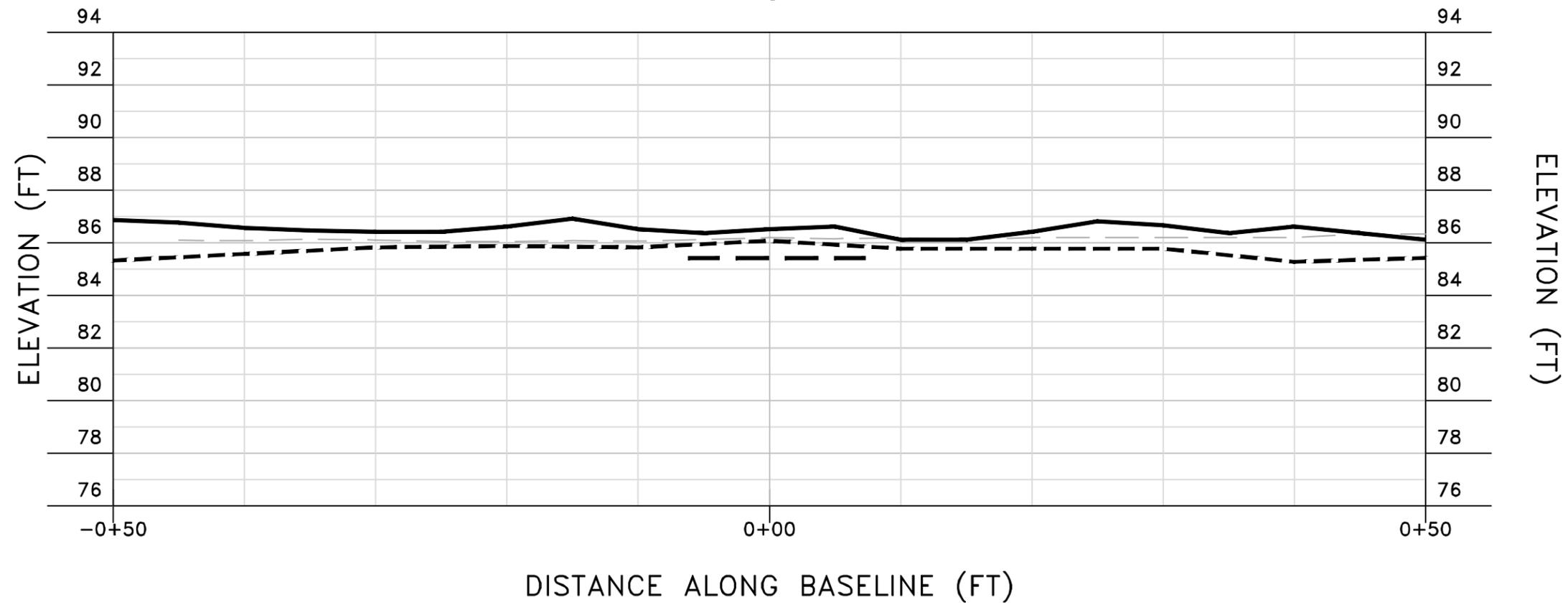
Design	Draft	Approved
MEH	MEH	NAS

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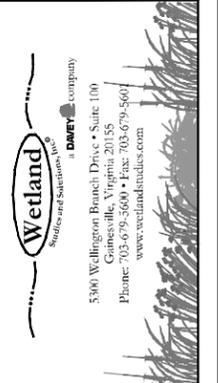
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Thalweg XS 8



PROFILE SCALE:
 HORIZ: 1"=10'
 VERT: 1"=5'
 (ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



Pigg River Dam Removal Restoration - Monitoring
 Rocky Mount, Virginia
 Year 3 - Thalweg Profile XS 8
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REVISIONS		Rev. No.	App. By	Date
No.	Description			

DATE: OCT 2019
 SCALE: AS NOTED

Boundary and Topo Source:
 WSSI and Orange Digital Data

Design	Draft	Approved
NAS	NAS	NAS

Sheet #
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Computer File Name:
 C:\2019\2019-08-14\2019-08-14.dwg

Cross Section 9

<i><u>Location</u></i>	<i><u>Latitude</u></i>	<i><u>Longitude</u></i>
Left Bank	36.995239	-79.856860
Right Bank	36.995536	-79.856751

Description: Cross Section 9 is located approximately 1.0 mi downstream of the dam, or 3,300 feet downstream of Cross Section 8. The section was located at the southwest corner of the field at the downstream boundary of sewage treatment plant property, just before a sharp left meander. Vehicular access was gained from the rear of the treatment plant parking lot.

The Cross Section was bounded on both banks by a narrow band of trees along the top of bank with agricultural fields just beyond. Banks showed signs of erosion with some herbaceous cover on the left bank but mainly covered in woody debris. The right bank had large amount of herbaceous cover. The water surface width at this section was consistent with that seen at Cross Section 8. Sediment had buried bed features and filled the original thalweg location. Sediment deposition has filled the right side of the bed between year 3 and year 2.

The instrument setup for this Cross Section was at the right bank (HI = 4.71 ft.). The Cross Section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy) nature of bed sediments with pockets of fine gravel (2-10mm).



Photo 9-1

Location, Orientation: XS 9, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 10:20 AM

Description: View looking upstream from the middle of Cross Section 9

Woody Debris: 11



Photo 9-2

Location, Orientation: XS 9, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 11:20 AM

Description: View looking downstream from the middle of Cross Section 9

Woody Debris: 13



Photo 9-3

Location, Orientation: XS 9, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 11:20 AM

Description: View looking left from the middle of Cross Section 9

Vegetation: 20% herbaceous cover with few trees on top of bank



Photo 9-4

Location, Orientation: XS 9, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 11:20 AM

Description: View looking right from the middle of Cross Section 9

Vegetation: 70% herbaceous cover on bank



Photo 9-5

Location, Orientation: XS 9, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 11:21 AM

Description: View looking downstream at Cross Section 9 from an upstream position



Photo 9-6

Location, Orientation: XS 9, Downstream looking up

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/19, 11:23 AM

Description: View looking upstream at Cross Section 9 from a downstream position

Cross Section 10

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.990961	-79.850516
Right Bank	36.990694	-79.850709

Description: Cross Section 10 is located approximately 1.5 mi. downstream of the dam, or 2,700 feet downstream of Cross Section 9, east of Power Dam Road and north of the power line easement. Accessed via vehicle from Hudson Farm Lane. The section is flanked by fields on both sides, with a narrow band of trees along the tops of bank. Mature trees dotted the banks down to the edge of the observed water surface and root structure afforded good bank stability despite steep slopes and an incised section (~12-ft bank height). The water surface width at this section was consistent with that seen at Cross Section 9. Sediment deposition (sand) was noted on the left side of the bed. Banks were relatively stable due to some coverage by woody root structure. The left bank showed more sediment deposits and some scour marks near toe of slope. Fine sediment had continued to move downstream, with this year's Cross Section lower than previous years. Both end pins were buried under 5-8 inches of sediment showing that significant sediment deposit is occurring in overbank flow events.

The instrument setup for this Cross Section was at the left bank (HI = 5.08 ft.). The Cross Section plot and thalweg profile are shown below. No pebble count was taken at this location due to the uniform fine-grained (sandy) nature of bed sediments.



Photo 10-1

Location, Orientation: XS 10, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 10:42 AM

Description: View looking upstream from the middle of Cross Section 10

Woody Debris: 10



Photo 10-2

Location, Orientation: XS 10, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 10:42 AM

Description: View looking downstream from the middle of Cross Section 10

Woody Debris: 10



Photo 10-3

Location, Orientation: XS 10, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 10:42 AM

Description: View looking left from the middle of Cross Section 10

Vegetation: 20% herbaceous cover, trees



Photo 10-4

Location, Orientation: XS 10, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 10:42 AM

Description: View looking right from the middle of Cross Section 10

Vegetation: 40% herbaceous cover, some trees higher on bank



Photo 10-5

Location, Orientation: XS 10, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 10:43 AM

Description: View looking downstream at Cross Section 10 from an upstream position



Photo 10-6

Location, Orientation: XS 10, Downstream looking up

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 10:44 AM

Description: View looking upstream at Cross Section 10 from a downstream position

Cross Section 11

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.991708	-79.845110
Right Bank	36.991595	-79.845424

Description: Cross Section 11 is located approximately 2.6 miles downstream of the dam, or 1.1 miles downstream of Cross Section 10, north of the power line easement and approximately 1/3rd mile east of Cross Section 10 (as the crow flies). Accessed via vehicle from Hudson Farm Lane. The section was flanked by fields on the left bank and dense forest on the right bank, with a narrow band of trees along the left top of bank. Mature trees grew along the banks to within a few feet of the observed water surface elevation. Banks were stable and slopes much more gradual than other Cross Sections (generally 2:1 or less). The water surface width at this section was consistent with that seen at Cross Section 10. Bank erosion and sand deposits were observed on both banks, with more sand deposits on the right bank. Both end pins were buried under sediment - the left bank under 2 inches and the right bank under 5 inches, both pins were then moved up to the new existing grade after measurements were taken in order to facilitate future monitoring. Larger sized pebbles and sand are starting to fill the bed, indicating the fine sand moving through the system.

The instrument setup for this Cross Section was at the left bank (HI = 3.66 ft.). The Cross Section plot and thalweg profile are shown below. A pebble count was taken at this location due to the variation in bed material and data shown in Appendix B.



Photo 11-1

Location, Orientation: XS 11, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 11:50 AM

Description: View looking upstream from the middle of Cross Section 11

Woody Debris: 6



Photo 11-2

Location, Orientation: XS 11, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 11:50 AM

Description: View looking downstream from the middle of Cross Section 11

Woody Debris: 10



Photo 11-3

Location, Orientation: XS 11, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 11:51 AM

Description: View looking left from the middle of Cross Section 11

Vegetation: 5% herbaceous cover, trees



Photo 11-4

Location, Orientation: XS 11, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 11:51 AM

Description: View looking right from the middle of Cross Section 11

Vegetation: 5% herbaceous cover and bamboo/forest at bankfull



Photo 11-5

Location, Orientation: XS 11, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 11:51 AM

Description: View looking downstream at Cross Section 11 from an upstream position



Photo 11-6

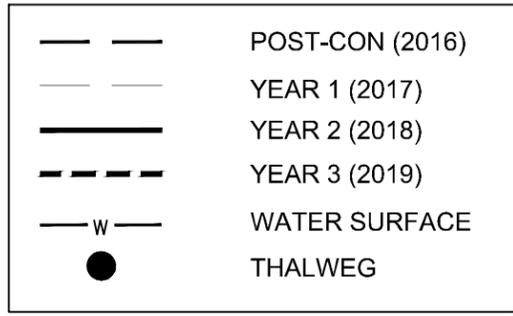
Location, Orientation: XS 11, Downstream looking up

Permit Number: JPA #15-1551

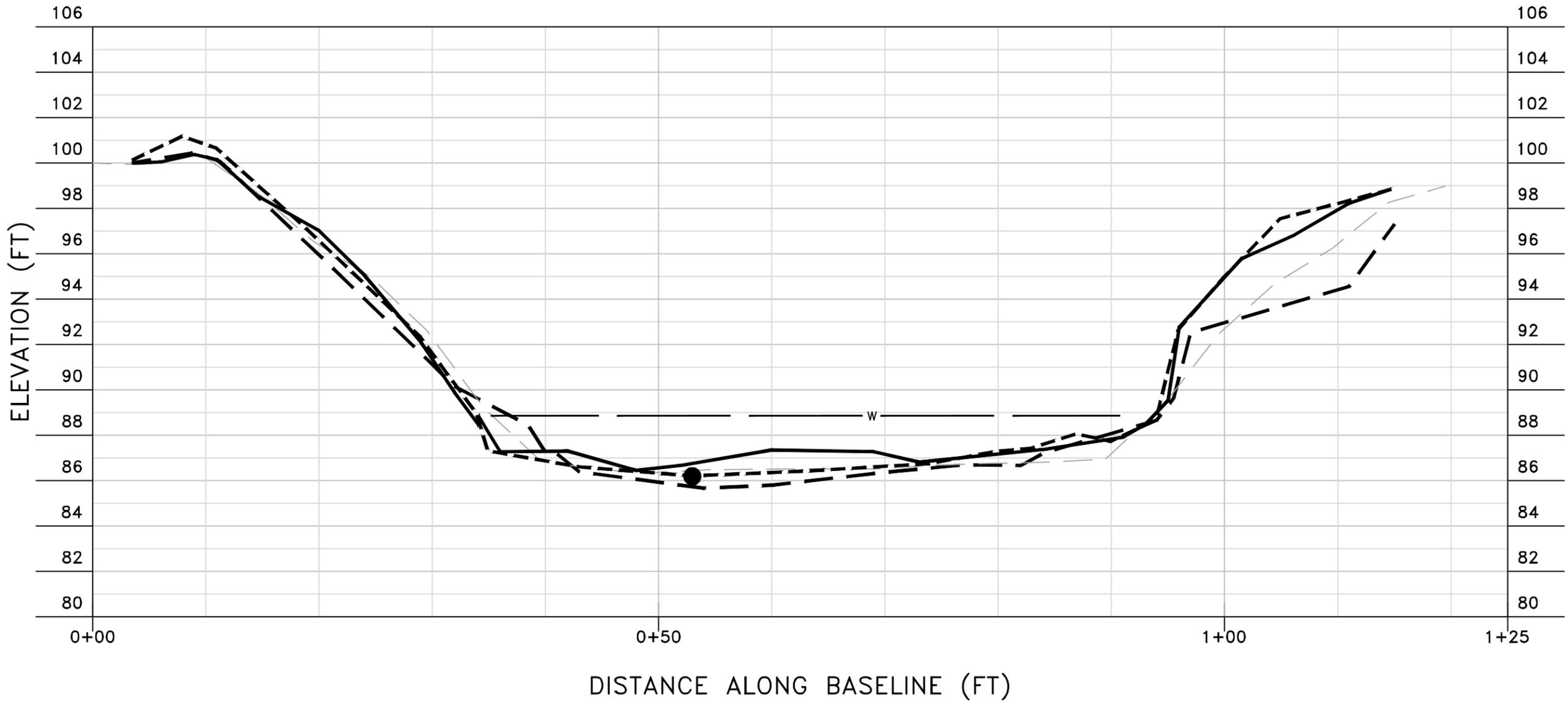
Wetland Data Sheet Reference: n/a

10/01/19, 11:52 AM

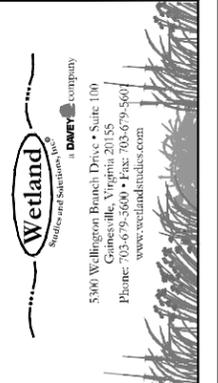
Description: View looking upstream at Cross Section 11 from a downstream position



XS 11



PROFILE SCALE:
 HORIZ: 1"=10'
 VERT: 1"=5'
 (ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



Pigg River Dam Removal Restoration - Monitoring
 Rocky Mount, Virginia
 Year 3 - XS 11
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REVISIONS		Rev. No.	App. By	Date

DATE: OCT 2019 SCALE: AS NOTED

Boundary and Topo Source:
 WSSI and Orange Digital Data

Design	Draft	Approved
MEH	MEH	NAS

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 Computer File Name:

Cross Section 12

<i><u>Location</u></i>	<i><u>Latitude</u></i>	<i><u>Longitude</u></i>
Left Bank	37.002258	-79.825398
Right Bank	37.002247	-79.825677

Description: Cross Section 12 is located approximately 5.2 mi downstream of the dam, or 2.6 mi downstream of Cross Section 11, approximately 300 feet downstream of the Chestnut Hill Road bridge. The section was accessed by parking along the Chestnut Hill Road and walking through the private property on the right bank (with permission). The section is flanked by lawn/fields on the right bank (with a narrow band of trees at the top of bank) and forest on the left bank. The right bank was steep (~1:1) and was stable due to mature woody vegetation and root mass. The right bank also saw large amounts of sediment deposition the pin being under 10 inches of sediment as well as woody debris. The left bank shows signs of sediment deposition and scour marks almost to bankfull. The end pin was buried under 4 inches of sediment. The section is located at the head of a riffle feature. There was little change from the previous year, only a larger amount of sediment deposition noticed. Both pins were moved up to surrounding grade after measurements were taken.

The instrument setup for this Cross Section was at the right bank (HI = 5.27 ft.). The Cross Section plot and thalweg profile are shown below. A pebble count was taken at this location due to the variation in bed material and data shown in Appendix B.



Photo 12-1

Location, Orientation: XS 12, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 1:45 PM

Description: View looking upstream from the middle of Cross Section 12

Woody Debris: 3



Photo 12-2

Location, Orientation: XS 12, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 1:46 PM

Description: View looking downstream from the middle of Cross Section 12

Woody Debris: 11



Photo 12-3

Location, Orientation: XS 12, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 1:40 PM

Description: View looking left from the middle of Cross Section 12

Vegetation: 40% herbaceous cover, trees



Photo 12-4

Location, Orientation: XS 12, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 1:40 PM

Description: View looking right from the middle of Cross Section 12

Vegetation: 70% herbaceous cover, trees at top of bank



Photo 12-5

Location, Orientation: XS 12, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/19, 1:43 PM

Description: View looking downstream at Cross Section 12 from an upstream position



Photo 12-6

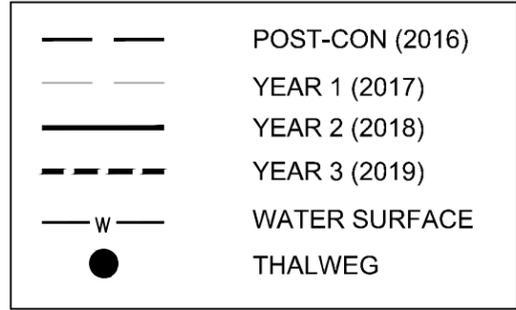
Location, Orientation: XS 12, Downstream looking up

Permit Number: JPA #15-1551

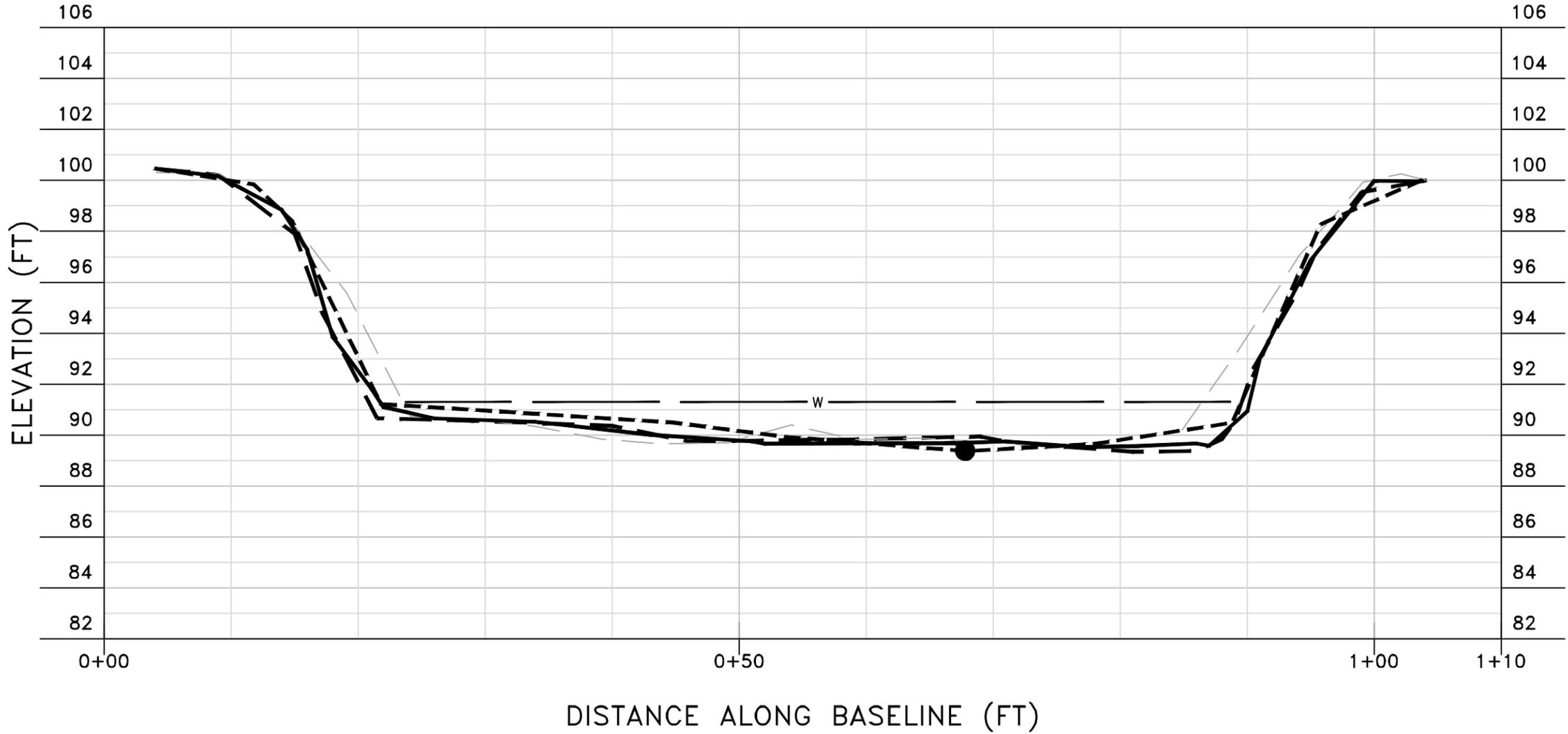
Wetland Data Sheet Reference: n/a

10/01/19, 1:41 PM

Description: View looking upstream at Cross Section 12 from a downstream position



XS 12



ELEVATION (FT)

DISTANCE ALONG BASELINE (FT)

PROFILE SCALE:
 HORIZ: 1"=10'
 VERT: 1"=5'

(ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



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 Rocky Mount, Virginia
 Year 3 - XS 12
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No.	Date	Description	

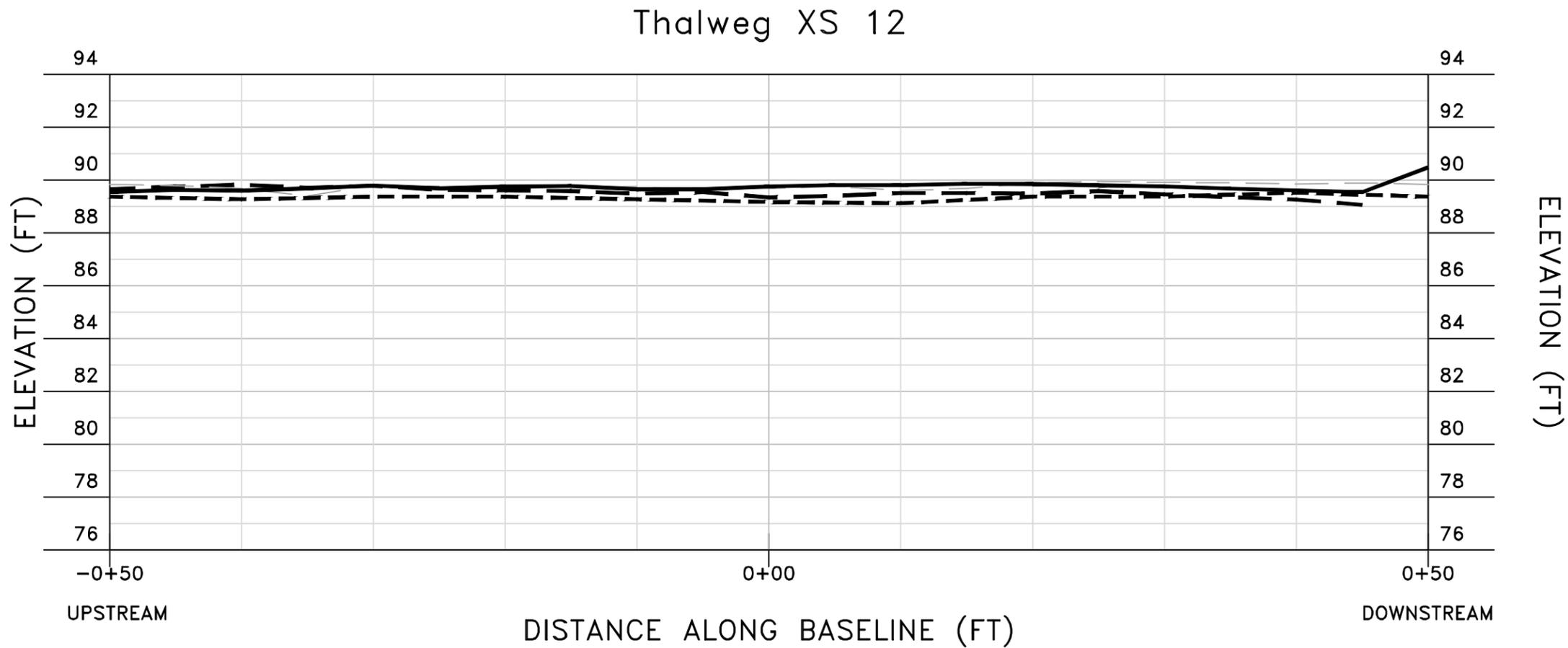
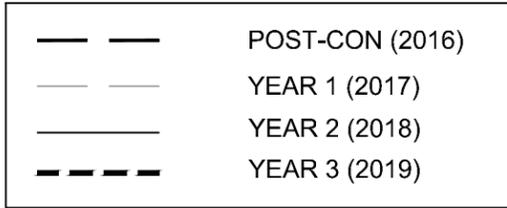
DATE: OCT 2019 SCALE: AS NOTED

Boundary and Topo Source:
WSSI and Orange Digital Data

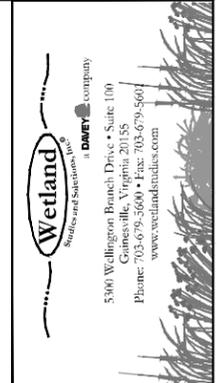
Design	Draft	Approved
MEH	MEH	NAS

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23 of 24

Computer File Name:
20191020_0844_01.XS12.PDF



PROFILE SCALE:
 HORIZ: 1"=10'
 VERT: 1"=5'
 (ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



Pigg River Dam Removal Restoration - Monitoring
 Rocky Mount, Virginia

Year 3 - Thalweg Profile XS 12

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No.	Date	Description		

DATE: OCT 2019 SCALE: AS NOTED

Boundary and Topo Source:
 WSSI and Orange Digital Data

Design	Draft	Approved
MEH	MEH	NAS

Sheet #
 24 of 24

Computer File Name:
 C:\2019\2019-08-01\2019-08-01.dwg

Photographic Documentation of Tributary Channels

The following photos are provided as documentation of conditions seen at the mouth of tributaries located along Pigg River for areas upstream of the dam remains. Conditions at these confluence points can be generally characterized as having a deeply incised tributary channel which has downcut through deposits created during the past 100 years of backwater created by the dam. A steep drop (typically 2-4 feet) in invert elevation is typical as tributaries enter the main channel.



Photo T1

Location, Orientation: Tributary 1*, Looking Upstream from Pigg River

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

09/30/19, 10:15 AM

Description: Approximately 500 feet upstream of XS2

*Tributaries number sequentially, as encountered during annual monitoring (upstream to downstream)



Photo T2

Location, Orientation: Tributary 2, Looking Upstream from Pigg River
Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

09/30/19, 10:23 AM

Description: Approximately 100 feet downstream of XS2



Photo T3

Location, Orientation: Tributary 3, Looking Upstream from Pigg River
Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

09/30/19, 10:25 AM

Description: Approximately 500 feet downstream of XS2



Photo T4

Location, Orientation: Tributary 4, Looking Upstream from Pigg River

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

09/30/19, 12:52 PM

Description: Approximately 500 feet upstream of XS3



Photo T5

Location, Orientation: Tributary 5, Looking Upstream from Pigg River

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

09/30/19, 1:24 PM

Description: Approximately 100 feet upstream of XS3



Photo T6

Location, Orientation: Tributary 8, Looking Upstream from Pigg River

Permit Number: JPA #15-1551

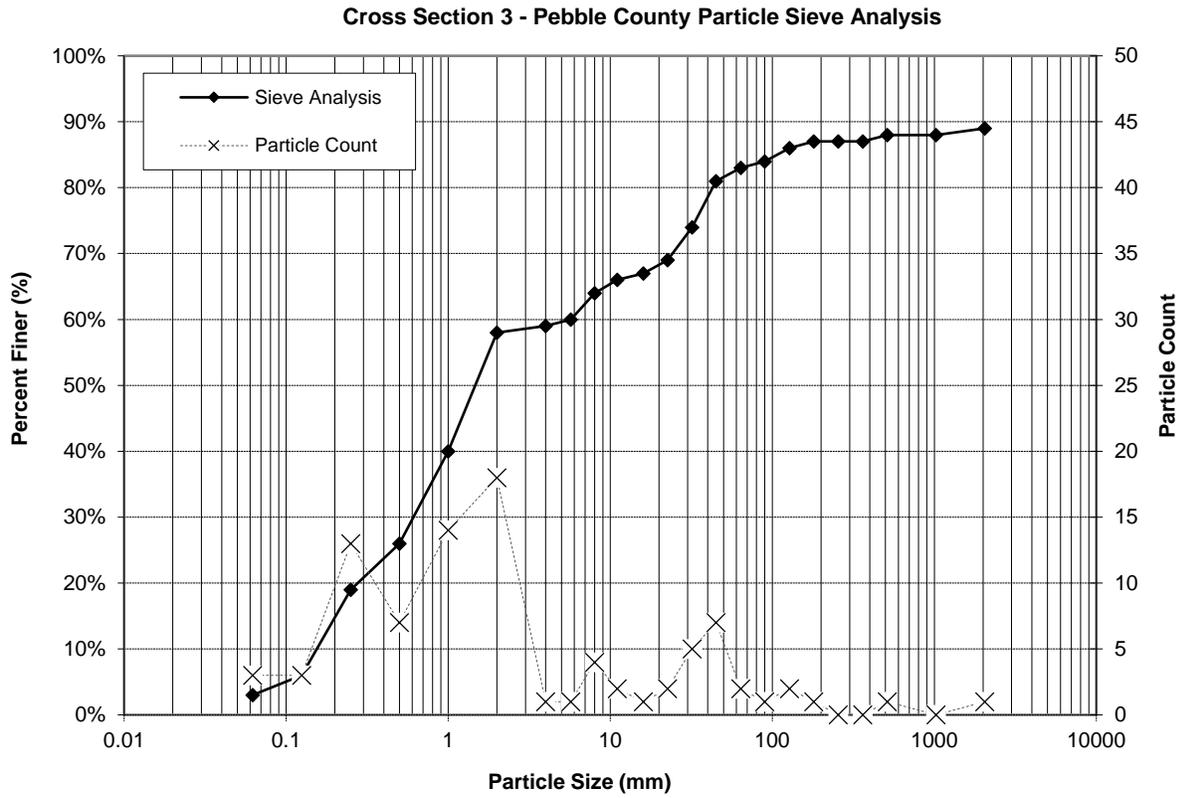
Wetland Data Sheet Reference: n/a

09/30/19, 4:41 PM

Description: Approximately 500 feet downstream of XS4

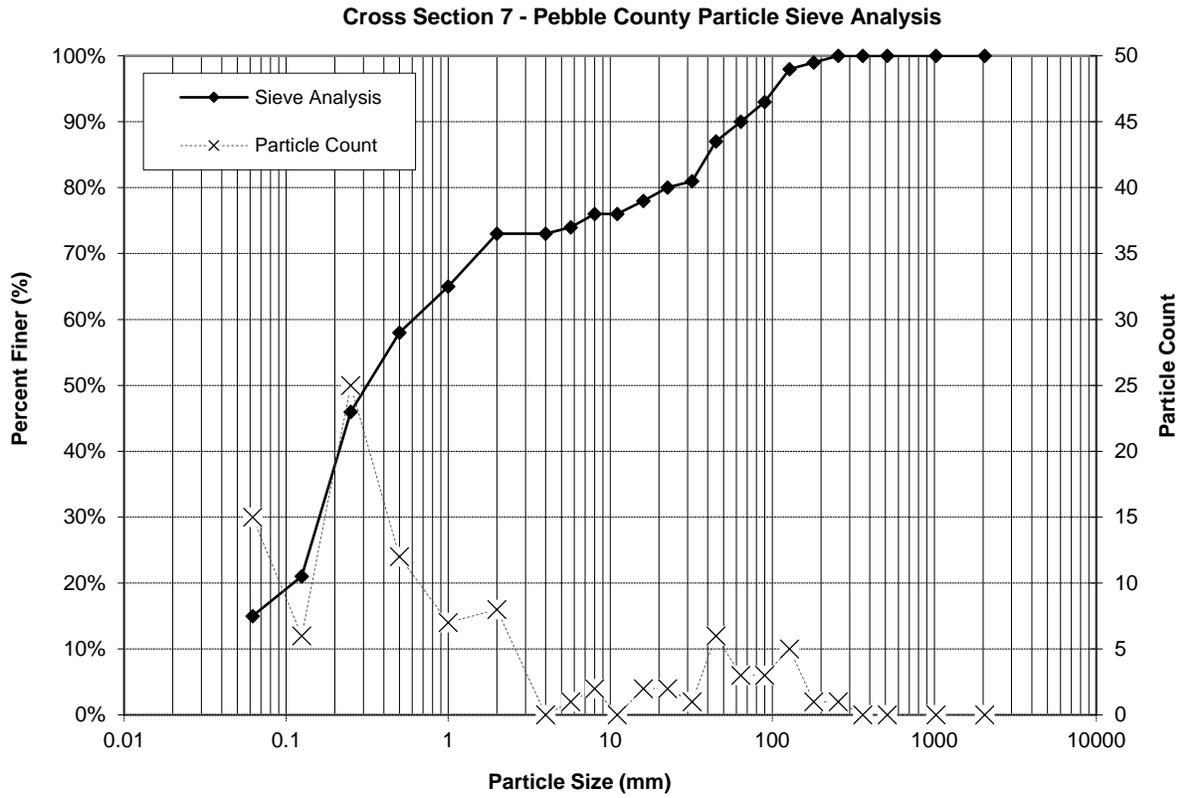
Appendix B Pebble Count Data

RIFFLE CROSS SECTION PEBBLE COUNT DATA WITH PARTICLE SIZE ANALYSIS								
Project Name: Pigg River Monitoring (WSSI# 22906.01)								
Stream ID & XS Station: XS3 (Located 250 ft. upstream in nearest riffle)					Date: Oct. 2019			
Evaluators: MEH, NAS					FORVA			
Pebble Count Data								
Particle				Particle Count	ITEM %	CUM %	Particle Size Analysis	
Description	Size (mm)		Total					
	Silt/Clay	0	0.062	3	3%	3%		
SAND	Very Fine	0.062	0.125	3	3%	6%		Silt/Clay (%) 3%
	Fine	0.125	0.25	13	13%	19%		Sand (%) 55%
	Medium	0.25	0.5	7	7%	26%		Gravel (%) 25%
	Coarse	0.5	1.0	14	14%	40%		Cobble (%) 4%
	Very Coarse	1.0	2.0	18	18%	58%		Boulder (%) 2%
GRAVEL	Very Fine	2.0	4.0	1	1%	59%		Bedrock (%) 11%
	Fine	4.0	5.7	1	1%	60%		
	Fine	5.7	8.0	4	4%	64%	D16 (mm) 0.22	
	Medium	8.0	11.03	2	2%	66%	D35 (mm) 0.82	
	Medium	11.3	16.0	1	1%	67%	D50 (mm) 1.56	
	Coarse	16.0	22.6	2	2%	69%	D84 (mm) 90.00	
	Coarse	22.6	32.0	5	5%	74%	D95 (mm) BR	
	Very Coarse	32	45	7	7%	81%	D100 (mm) BR	
	Very Coarse	45	64	2	2%	83%		
COBBLE	Small	64	90	1	1%	84%		
	Small	90	128	2	2%	86%		
	Large	128	180	1	1%	87%		
	Large	180	256	0	0%	87%		
BOULDER	Small	256	362	0	0%	87%		
	Small	362	512	1	1%	88%		
	Medium	512	1024	0	0%	88%		
	Large - Vry Large	1024	2048	1	1%	89%		
	Bedrock	2048		11	11%	100%		
Total Particles				100				



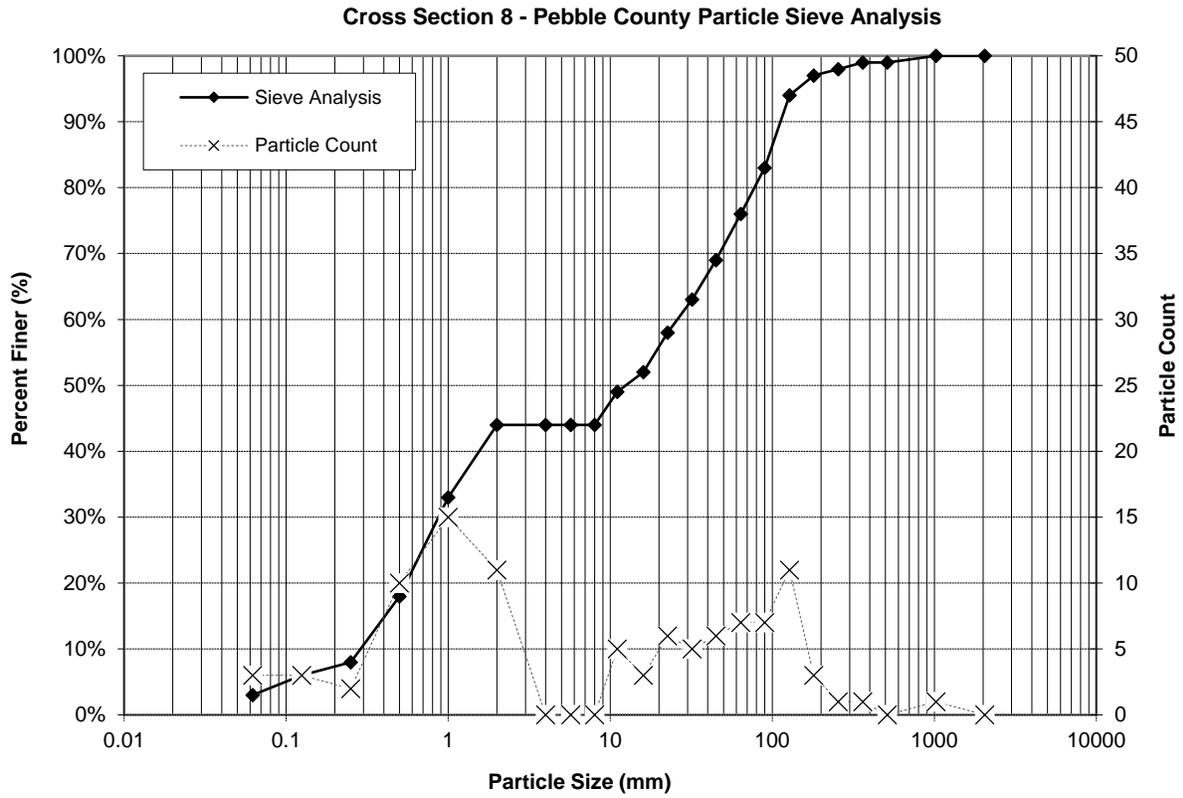
RIFFLE CROSS SECTION PEBBLE COUNT DATA WITH PARTICLE SIZE ANALYSIS							
Project Name: Pigg River Monitoring (WSSI# 22906.01)							
Stream ID & XS Station: XS7 (Located 250 ft. upstream in nearest riffle)					Date: Oct. 2019		
Evaluators: MEH, NAS					FORVA		
Pebble Count Data							
	Particle		Particle Count	ITEM %	CUM %	Particle Size Analysis	
	Description	Size (mm)					Total
	Silt/Clay	0	0.062	15	15%		15%
SAND	Very Fine	0.062	0.125	6	6%		21%
	Fine	0.125	0.25	25	25%		46%
	Medium	0.25	0.5	12	12%		58%
	Coarse	0.5	1.0	7	7%		65%
	Very Coarse	1.0	2.0	8	8%		73%
GRAVEL	Very Fine	2.0	4.0	0	0%		73%
	Fine	4.0	5.7	1	1%		74%
	Fine	5.7	8.0	2	2%	76%	
	Medium	8.0	11.03	0	0%	76%	
	Medium	11.3	16.0	2	2%	78%	
	Coarse	16.0	22.6	2	2%	80%	
	Coarse	22.6	32.0	1	1%	81%	
	Very Coarse	32	45	6	6%	87%	
	Very Coarse	45	64	3	3%	90%	
COBBLE	Small	64	90	3	3%	93%	
	Small	90	128	5	5%	98%	
	Large	128	180	1	1%	99%	
	Large	180	256	1	1%	100%	
BOULDER	Small	256	362	0	0%	100%	
	Small	362	512	0	0%	100%	
	Medium	512	1024	0	0%	100%	
	Large - Vry Large	1024	2048	0	0%	100%	
	Bedrock	2048		0	0%	100%	
			Total Particles	100			

Silt/Clay (%)	15%
Sand (%)	58%
Gravel (%)	17%
Cobble (%)	10%
Boulder (%)	0%
Bedrock (%)	0%
D16 (mm)	0.07
D35 (mm)	0.20
D50 (mm)	0.33
D84 (mm)	38.50
D95 (mm)	105.20
D100 (mm)	185.00

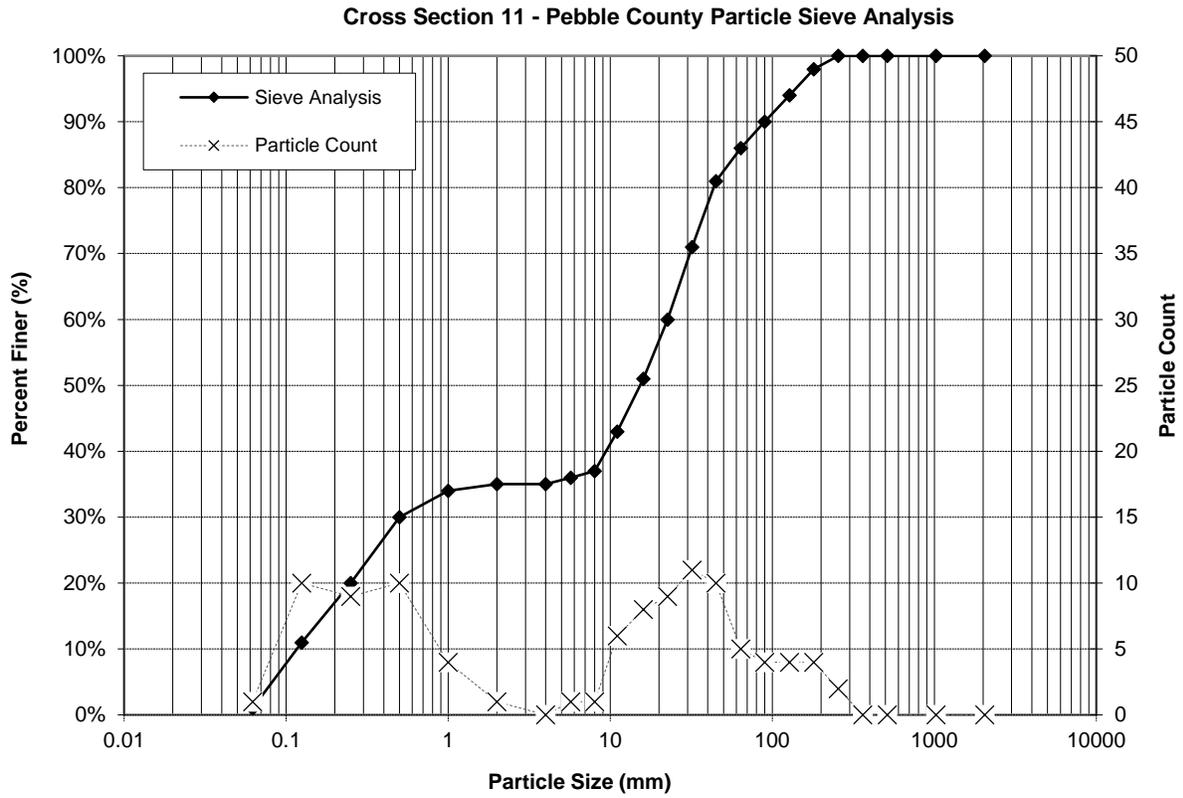


RIFFLE CROSS SECTION PEBBLE COUNT DATA WITH PARTICLE SIZE ANALYSIS						
Project Name: Pigg River Monitoring (WSSI# 22906.01)						
Stream ID & XS Station: XS8 (Located 250 ft. upstream in nearest riffle)					Date: Oct. 2019	
Evaluators: MEH, NAS					FORVA	
Pebble Count Data						
Particle				Particle Count	ITEM %	CUM %
Description		Size (mm)		Total		
	Silt/Clay	0	0.062	3	3%	3%
SAND	Very Fine	0.062	0.125	3	3%	6%
	Fine	0.125	0.25	2	2%	8%
	Medium	0.25	0.5	10	10%	18%
	Coarse	0.5	1.0	15	15%	33%
	Very Coarse	1.0	2.0	11	11%	44%
GRAVEL	Very Fine	2.0	4.0	0	0%	44%
	Fine	4.0	5.7	0	0%	44%
	Fine	5.7	8.0	0	0%	44%
	Medium	8.0	11.03	5	5%	49%
	Medium	11.3	16.0	3	3%	52%
	Coarse	16.0	22.6	6	6%	58%
	Coarse	22.6	32.0	5	5%	63%
	Very Coarse	32	45	6	6%	69%
	Very Coarse	45	64	7	7%	76%
COBBLE	Small	64	90	7	7%	83%
	Small	90	128	11	11%	94%
	Large	128	180	3	3%	97%
	Large	180	256	1	1%	98%
BOULDER	Small	256	362	1	1%	99%
	Small	362	512	0	0%	99%
	Medium	512	1024	1	1%	100%
	Large - Vry Large	1024	2048	0	0%	100%
	Bedrock	2048		0	0%	100%
Total Particles				100		

Particle Size Analysis	
Silt/Clay (%)	3%
Sand (%)	41%
Gravel (%)	32%
Cobble (%)	22%
Boulder (%)	2%
Bedrock (%)	0%
D16 (mm)	0.45
D35 (mm)	1.18
D50 (mm)	12.69
D84 (mm)	93.45
D95 (mm)	145.33
D100 (mm)	610.00



RIFFLE CROSS SECTION PEBBLE COUNT DATA WITH PARTICLE SIZE ANALYSIS								
Project Name: Pigg River Monitoring (WSSI# 22906.01)								
Stream ID & XS Station: XS11 (Located 50 ft. downstream in nearest riffle)					Date: Oct. 2019			
Evaluators: MEH, NAS					FORVA			
Pebble Count Data								
	Particle			Particle Count	ITEM %	CUM %	Particle Size Analysis	
	Description	Size (mm)		Total				
	Silt/Clay	0	0.062	1	1%	1%		
SAND	Very Fine	0.062	0.125	10	10%	11%		Silt/Clay (%) 1%
	Fine	0.125	0.25	9	9%	20%		Sand (%) 34%
	Medium	0.25	0.5	10	10%	30%		Gravel (%) 51%
	Coarse	0.5	1.0	4	4%	34%		Cobble (%) 14%
	Very Coarse	1.0	2.0	1	1%	35%		Boulder (%) 0%
GRAVEL	Very Fine	2.0	4.0	0	0%	35%		Bedrock (%) 0%
	Fine	4.0	5.7	1	1%	36%		D16 (mm) 0.19
	Fine	5.7	8.0	1	1%	37%	D35 (mm) 4.00	
	Medium	8.0	11.03	6	6%	43%	D50 (mm) 15.38	
	Medium	11.3	16.0	8	8%	51%	D84 (mm) 56.40	
	Coarse	16.0	22.6	9	9%	60%	D95 (mm) 141.00	
	Coarse	22.6	32.0	11	11%	71%	D100 (mm) 256.00	
	Very Coarse	32	45	10	10%	81%		
	Very Coarse	45	64	5	5%	86%		
COBBLE	Small	64	90	4	4%	90%		
	Small	90	128	4	4%	94%		
	Large	128	180	4	4%	98%		
	Large	180	256	2	2%	100%		
BOULDER	Small	256	362	0	0%	100%		
	Small	362	512	0	0%	100%		
	Medium	512	1024	0	0%	100%		
	Large - Vry Large	1024	2048	0	0%	100%		
	Bedrock	2048		0	0%	100%		
Total Particles				100				



RIFFLE CROSS SECTION PEBBLE COUNT DATA WITH PARTICLE SIZE ANALYSIS						
Project Name: Pigg River Monitoring (WSSI# 22906.01)						
Stream ID & XS Station: XS12 (Located 50 ft. downstream in nearest riffle)					Date: Oct. 2019	
Evaluators: MEH, NAS					FORVA	
Pebble Count Data						
Particle				Particle Count	ITEM %	CUM %
Description		Size (mm)		Total		
	Silt/Clay	0	0.062	4	4%	4%
SAND	Very Fine	0.062	0.125	3	3%	7%
	Fine	0.125	0.25	3	3%	10%
	Medium	0.25	0.5	11	11%	21%
	Coarse	0.5	1.0	18	18%	39%
	Very Coarse	1.0	2.0	6	6%	45%
GRAVEL	Very Fine	2.0	4.0	1	1%	46%
	Fine	4.0	5.7	1	1%	47%
	Fine	5.7	8.0	1	1%	48%
	Medium	8.0	11.03	4	4%	52%
	Medium	11.3	16.0	8	8%	60%
	Coarse	16.0	22.6	6	6%	66%
	Coarse	22.6	32.0	4	4%	70%
	Very Coarse	32	45	6	6%	76%
	Very Coarse	45	64	11	11%	87%
COBBLE	Small	64	90	3	3%	90%
	Small	90	128	5	5%	95%
	Large	128	180	2	2%	97%
	Large	180	256	1	1%	98%
BOULDER	Small	256	362	1	1%	99%
	Small	362	512	0	0%	99%
	Medium	512	1024	0	0%	99%
	Large - Vry Large	1024	2048	0	0%	99%
	Bedrock	2048		1	1%	100%
		Total Particles		100		

Particle Size Analysis	
Silt/Clay (%)	4%
Sand (%)	41%
Gravel (%)	42%
Cobble (%)	11%
Boulder (%)	1%
Bedrock (%)	1%
D16 (mm)	0.39
D35 (mm)	0.89
D50 (mm)	9.52
D84 (mm)	58.82
D95 (mm)	128.00
D100 (mm)	BR

Appendix C

DEQ Wetland Data Sheets and Photos

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Photo 4-1
Location, Orientation: Wetland Site 4, DP#1 Looking at the soil
Permit Number: JPA #15-1551
Wetland Data Sheet Reference: Site 4, DP#1
9/30/19, 12:19 PM
Taken by:¹
Description: Test pit soils

¹ All DEQ hydrology monitoring photos taken by M. Hutchins



Photo 4-2

Location, Orientation: Wetland Site 4, DP#1 Looking south

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 4, DP#1

09/30/19, 12:19 PM

Description: Taken from wetland site looking downstream at XS#2



Photo 4-3

Location, Orientation: Wetland Site 4, DP#2 Looking at the soils

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 4, DP#2

09/30/19, 12:44 PM

Description: Test pit soils



Photo 4-4

Location, Orientation: Wetland Site 4, DP#2 looking south

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 4, DP#2

09/30/19, 12:44 PM

Description: Taken from wetland site looking downstream at XS#2



Photo 3-1
Location, Orientation: Wetland Site 3, DP#1 Looking at the soils
Permit Number: JPA #15-1551
Wetland Data Sheet Reference: Site 3, DP#1
09/30/19, 3:07 PM
Description: Taken from wetland looking upstream at XS4



Photo 3-2
Location, Orientation: Wetland Site 4, DP#1 Looking at the soils
Permit Number: JPA #15-1551
Wetland Data Sheet Reference: Site 3, DP#1
10/2/18, 4:04 PM
Description: Test pit soil.



Photo 3-3

Location, Orientation: Wetland Site 3, DP#2 Looking west

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 3, DP#2

09/30/19, 3:08 PM

Description: From the wetland looking downstream at XS#4



Photo 3-4
Location, Orientation: Wetland Site 3, DP#2 Looking at the soils
Permit Number: JPA #15-1551
Wetland Data Sheet Reference: Site 3, DP#2
09/30/19, 3:08 PM
Description: Test pit soils.



Photo 2-1

Location, Orientation: Wetland Site 2, DP#1 Looking at the soils

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 2, DP#1

10/01/19, 3:04 PM

Description: Test pit soils



Photo 2-2
Location, Orientation: Wetland Site 2, DP#1 Looking east
Permit Number: JPA #15-1551
Wetland Data Sheet Reference: Site 2, DP#1
10/1/19, 3:05 PM
Description: Looking east at the wetland site



Photo 2-3

Location, Orientation: Wetland Site 2, DP#2 Looking at the soils

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 2, DP#2

10/01/19, 3:23 PM

Description: Test pit soils



Photo 2-4

Location, Orientation: Wetland Site 2, DP#2 Looking west

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 2, DP#2

10/01/19, 3:23 PM

Description: Taken from wetland looking west



Photo 2-5

Location, Orientation: Wetland Site 2, DP#3 Looking at the soils

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 2, DP#3

10/01/19, 3:51 PM

Description: Test pit soils. This location is closest to "Point 2" in Exhibit #1



Photo 2-6

Location, Orientation: Wetland Site 2, DP#3 Looking northwest

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 2, DP#3

10/01/19, 3:51 PM

Description: Taken from the wetland site looking northwest. This location is closest to “Point 2” in Exhibit #1



Photo 2-7

Location, Orientation: Wetland Site 2, DP#4 Looking at the soils

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 2, DP#4

10/01/19, 4:06 PM

Description: Test pit soils. This location is closest to "Point 1" in Exhibit #1



Photo 2-8

Location, Orientation: Wetland Site 2, DP#4 Looking north

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: Site 2, DP#4

10/01/19, 4:06 PM

Description: At the convergence of the two depressions in Wetland Site #2, near the most southern end of the system looking north. This location is closest to "Point 1" in Exhibit #1

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Pigg River Year 3 City/County: Franklin Sampling Date: 10/1 /2019
 Applicant/Owner: FORVA State: VA Sampling Point: Site#2,DP-1
 Investigator(s): MH Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): LRR P Lat: 36°59'40" Long: 79°51'39" Datum: NAD 83
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: All three wetland parameters (i.e., wetland hydrology, hydrophytic vegetation, and hydric soils) were satisfied at this data point, which characterizes a palustrine forested wetland at Site #2.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> True Aquatic Plants (B14)</td> </tr> <tr> <td><input checked="" type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)	<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Soil Cracks (B6)</td> </tr> <tr> <td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Drainage Patterns (B10)</td> </tr> <tr> <td><input type="checkbox"/> Moss Trim Lines (B16)</td> </tr> <tr> <td><input type="checkbox"/> Dry-Season Water Table (C2)</td> </tr> <tr> <td><input type="checkbox"/> Crayfish Burrows (C8)</td> </tr> <tr> <td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td> </tr> <tr> <td><input type="checkbox"/> Stunted or Stressed Plants (D1)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Geomorphic Position (D2)</td> </tr> <tr> <td><input type="checkbox"/> Shallow Aquitard (D3)</td> </tr> <tr> <td><input type="checkbox"/> Microtopographic Relief (D4)</td> </tr> <tr> <td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td> </tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> Microtopographic Relief (D4)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)																																		
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)																																		
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<input type="checkbox"/> Microtopographic Relief (D4)																																			
<input checked="" type="checkbox"/> FAC-Neutral Test (D5)																																			

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>5</u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: Site#2,DP-1

Tree Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____

50% of total cover: _____ 20% of total cover: _____ = Total Cover

Sapling/Shrub Stratum (Plot size: _____)

1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____

50% of total cover: _____ 20% of total cover: _____ = Total Cover

Herb Stratum (Plot size: 5' Radius)

1. <u>Ludwigia alternifolia</u>	60	<input checked="" type="checkbox"/>	FACW
2. <u>Iris pseudacorus</u>	10	<input type="checkbox"/>	OBL
3. <u>Boehmeria cylindrica</u>	5	<input type="checkbox"/>	FACW
4. <u>Persicaria maculosa</u>	1	<input type="checkbox"/>	FACW
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

50% of total cover: 38 20% of total cover: 15.2 = Total Cover 76

Woody Vine Stratum (Plot size: 30' Radius)

1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____

50% of total cover: _____ 20% of total cover: _____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u> </u>	x 1 = <u> </u>
FACW species <u> </u>	x 2 = <u> </u>
FAC species <u> </u>	x 3 = <u> </u>
FACU species <u> </u>	x 4 = <u> </u>
UPL species <u> </u>	x 5 = <u> </u>
Column Totals: <u> </u> (A)	<u> </u> (B)
Prevalence Index = B/A = <u> </u>	

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through July 2019; NI species are not used in the Dominance Test Calculation. No woody vine, sapling/shrub, or tree stratum present at this data point. There was a Fagus grandifolia that was rooted outside the wetland.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Pigg River Year 3 City/County: Franklin Sampling Date: 10/1 /2019
 Applicant/Owner: FORVA State: VA Sampling Point: Site#2,DP-2
 Investigator(s): MH Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): LRR P Lat: 36°59'38" Long: 79°51'38" Datum: NAD 83
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: All three wetland parameters (i.e., wetland hydrology, hydrophytic vegetation, and hydric soils) were satisfied at this data point, which characterizes a palustrine forested wetland at Site #2.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: Site#2,DP-2

Tree Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____

50% of total cover: _____ 20% of total cover: _____ = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Salix nigra</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>OBL</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____

50% of total cover: 5 20% of total cover: 2 10 = Total Cover

Herb Stratum (Plot size: <u>5' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Ludwigia alternifolia</u>	<u>100</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u>Persicaria hydropiper</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>
3. <u>Carex sp.</u>	<u>5</u>	<input type="checkbox"/>	<u>NI</u>
4. <u>Polygonum ramosissimum</u>	<u>2</u>	<input type="checkbox"/>	<u>FAC</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

50% of total cover: 68.5 20% of total cover: 27.4 137 = Total Cover

Woody Vine Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____

50% of total cover: _____ 20% of total cover: _____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u> </u>	x 1 = <u> </u>
FACW species <u> </u>	x 2 = <u> </u>
FAC species <u> </u>	x 3 = <u> </u>
FACU species <u> </u>	x 4 = <u> </u>
UPL species <u> </u>	x 5 = <u> </u>
Column Totals: <u> </u> (A)	<u> </u> (B)

Prevalence Index = B/A =

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through July 2019; NI species are not used in the Dominance Test Calculation. No woody vine or tree stratum present at this data point.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Pigg River Year 3 City/County: Franklin Sampling Date: 10/1 /2019
 Applicant/Owner: FORVA State: VA Sampling Point: Site#2,DP-3
 Investigator(s): MH Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): LRR P Lat: 36°59'41" Long: 79°51'38" Datum: NAD 83
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: All three wetland parameters (i.e., wetland hydrology, hydrophytic vegetation, and hydric soils) were satisfied at this data point, which characterizes a palustrine forested wetland at Site #2.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> True Aquatic Plants (B14)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Soil Cracks (B6)</td> </tr> <tr> <td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Drainage Patterns (B10)</td> </tr> <tr> <td><input type="checkbox"/> Moss Trim Lines (B16)</td> </tr> <tr> <td><input type="checkbox"/> Dry-Season Water Table (C2)</td> </tr> <tr> <td><input type="checkbox"/> Crayfish Burrows (C8)</td> </tr> <tr> <td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td> </tr> <tr> <td><input type="checkbox"/> Stunted or Stressed Plants (D1)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Geomorphic Position (D2)</td> </tr> <tr> <td><input type="checkbox"/> Shallow Aquitard (D3)</td> </tr> <tr> <td><input type="checkbox"/> Microtopographic Relief (D4)</td> </tr> <tr> <td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td> </tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> Microtopographic Relief (D4)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>16</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: Site#2,DP-3

Tree Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____

50% of total cover: _____ 20% of total cover: _____ = Total Cover

Sapling/Shrub Stratum (Plot size: 15' Radius)

1. <u>Salix nigra</u>	15	<input checked="" type="checkbox"/>	OBL
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____

50% of total cover: 7.5 20% of total cover: 3 15 = Total Cover

Herb Stratum (Plot size: 5' Radius)

1. <u>Ludwigia alternifolia</u>	80	<input checked="" type="checkbox"/>	FACW
2. <u>Scirpus cyperinus</u>	15	<input type="checkbox"/>	FACW
3. <u>Juncus effusus</u>	15	<input type="checkbox"/>	FACW
4. <u>Carex sp.</u>	10	<input type="checkbox"/>	NI
5. <u>Juncus canadensis</u>	10	<input type="checkbox"/>	OBL
6. <u>Poa sp.</u>	5	<input type="checkbox"/>	NI
7. <u>Persicaria sp.</u>	2	<input type="checkbox"/>	NI
8. <u>Polygonum argyrocoleon</u>	2	<input type="checkbox"/>	OBL
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

50% of total cover: 69.5 20% of total cover: 27.8 139 = Total Cover

Woody Vine Stratum (Plot size: 30' Radius)

1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____

50% of total cover: _____ 20% of total cover: _____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <input type="text"/>	x 1 = <input type="text"/>
FACW species <input type="text"/>	x 2 = <input type="text"/>
FAC species <input type="text"/>	x 3 = <input type="text"/>
FACU species <input type="text"/>	x 4 = <input type="text"/>
UPL species <input type="text"/>	x 5 = <input type="text"/>
Column Totals: <input type="text"/> (A)	<input type="text"/> (B)
Prevalence Index = B/A = <input type="text"/>	

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through July 2019; NI species are not used in the Dominance Test Calculation. No woody vine or tree stratum present at this data point.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Pigg River Year 3 City/County: Franklin Sampling Date: 10/1 /2019
 Applicant/Owner: FORVA State: VA Sampling Point: Site#2,DP-4
 Investigator(s): MH Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): LRR P Lat: 36°59'36" Long: 79°51'36" Datum: NAD 83
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: All three wetland parameters (i.e., wetland hydrology, hydrophytic vegetation, and hydric soils) were satisfied at this data point, which characterizes a palustrine forested wetland at Site #2.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: Site#2,DP-4

Tree Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____

50% of total cover: _____ 20% of total cover: _____ = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____

50% of total cover: _____ 20% of total cover: _____ = Total Cover

Herb Stratum (Plot size: <u>5' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Ludwigia alternifolia</u>	<u>90</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u>Persicaria hydropiper</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>OBL</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

50% of total cover: 80 20% of total cover: 32 = Total Cover 160

Woody Vine Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____

50% of total cover: _____ 20% of total cover: _____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u> </u>	x 1 = <u> </u>
FACW species <u> </u>	x 2 = <u> </u>
FAC species <u> </u>	x 3 = <u> </u>
FACU species <u> </u>	x 4 = <u> </u>
UPL species <u> </u>	x 5 = <u> </u>
Column Totals: <u> </u> (A)	<u> </u> (B)
Prevalence Index = B/A = <u> </u>	

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

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Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through July 2019; NI species are not used in the Dominance Test Calculation. No woody vine, sapling/shrub or tree stratum present at this data point.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Pigg River Year 3 City/County: Franklin Sampling Date: 9/30/2019
 Applicant/Owner: FORVA State: VA Sampling Point: Site#3,DP-1
 Investigator(s): MH Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): LRR P Lat: 36°59'07" Long: 79°51'86" Datum: NAD 83
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: All three wetland parameters (i.e., wetland hydrology, hydrophytic vegetation, and hydric soils) were satisfied at this data point, which characterizes a palustrine forested wetland at Site #4.	

HYDROLOGY

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Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: Site#3,DP-1

Tree Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer negundo</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
50% of total cover: <u>30</u> 20% of total cover: <u>12</u>	<u>60</u> = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. <u>Acer negundo</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Lindera benzoin</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
50% of total cover: <u>12.5</u> 20% of total cover: <u>5</u>	<u>25</u> = Total Cover		
Herb Stratum (Plot size: <u>5' Radius</u>)			
1. <u>Glechoma hederacea</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Carex sp.</u>	<u>30</u>	<input type="checkbox"/>	<u>NI</u>
3. <u>Boehmeria cylindrica</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
4. <u>Persicaria maculosa</u>	<u>10</u>	<input type="checkbox"/>	<u>FACW</u>
5. <u>Unknown</u>	<u>2</u>	<input type="checkbox"/>	<u>NI</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
50% of total cover: <u>53.5</u> 20% of total cover: <u>21.4</u>	<u>107</u> = Total Cover		
Woody Vine Stratum (Plot size: <u>30' Radius</u>)			
1. <u>Humulus japonicus</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Unknown</u>	<u>1</u>	<input type="checkbox"/>	<u>NI</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
50% of total cover: <u>10.5</u> 20% of total cover: <u>4.2</u>	<u>21</u> = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <input type="text"/>	x 1 = <input type="text"/>
FACW species <input type="text"/>	x 2 = <input type="text"/>
FAC species <input type="text"/>	x 3 = <input type="text"/>
FACU species <input type="text"/>	x 4 = <input type="text"/>
UPL species <input type="text"/>	x 5 = <input type="text"/>
Column Totals: <input type="text"/> (A)	<input type="text"/> (B)
Prevalence Index = B/A = <input type="text"/>	

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through July 2019; NI species are not used in the Dominance Test Calculation.

SOIL

Sampling Point: Site#3,DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR4/3	100					Silty Clay Loam	
3-18	10YR4/2	60	5YR3/3	40	C	M	Silty Clay Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- Thin Dark Surface (S9) **(MLRA 147, 148)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron Manganese Masses (F12) **(LRR N, MLRA 136)**
- Umbric Surface (F13)
- Piedmont Floodplain Soils (F19)**(MLRA 148)**
- Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10)
- Coast Prairie Redox (A16) **(MLRA 147, 148)**
- Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (Inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Pigg River Year 3 City/County: Franklin Sampling Date: 9/30/2019
 Applicant/Owner: FORVA State: VA Sampling Point: Site#3,DP-2
 Investigator(s): MH Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR or MLRA): LRR P Lat: 36°59'07" Long: 79°51'86" Datum: NAD 83
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: All three wetland parameters (i.e., wetland hydrology, hydrophytic vegetation, and hydric soils) were satisfied at this data point, which characterizes a palustrine forested wetland at Site #4.	

HYDROLOGY

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Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: Site#3,DP-2

Tree Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Acer negundo</i></u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
50% of total cover: <u>25</u> 20% of total cover: <u>10</u>	<u>50</u> = Total Cover		

Sapling/Shrub Stratum (Plot size: <u>15' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Boehmeria cylindrica</i></u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u><i>Rhus copallinum</i></u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
50% of total cover: <u>7.5</u> 20% of total cover: <u>3</u>	<u>15</u> = Total Cover		

Herb Stratum (Plot size: <u>5' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Microstegium vimineum</i></u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u><i>Boehmeria cylindrica</i></u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
3. <u><i>Persicaria maculosa</i></u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
50% of total cover: <u>50</u> 20% of total cover: <u>20</u>	<u>100</u> = Total Cover		

Woody Vine Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
50% of total cover: _____ 20% of total cover: _____	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u> </u>	x 1 = <u> </u>
FACW species <u> </u>	x 2 = <u> </u>
FAC species <u> </u>	x 3 = <u> </u>
FACU species <u> </u>	x 4 = <u> </u>
UPL species <u> </u>	x 5 = <u> </u>
Column Totals: <u> </u> (A)	<u> </u> (B)
Prevalence Index = B/A = <u> </u>	

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through July 2019; NI species are not used in the Dominance Test Calculation. No woody vine stratum present at this data point.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Pigg River Year 3 City/County: Franklin Sampling Date: 9/30/2019
 Applicant/Owner: FORVA State: VA Sampling Point: Site#4, DP-1
 Investigator(s): MH Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 4
 Subregion (LRR or MLRA): LRR P Lat: 36°59'59" Long: 79°51'53" Datum: NAD 83
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Only one (i.e., hydrophytic vegetation) of the three wetland parameters was satisfied at this data point, which characterizes a forested upland at Site #4.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: Site#4,DP-1

Tree Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer negundo</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Carpinus caroliniana</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. <u>Alnus serrulata</u>	<u>5</u>	<input type="checkbox"/>	<u>OBL</u>
4. <u>Platanus occidentalis</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>
5. _____	_____	<input type="checkbox"/>	_____
6. _____	_____	<input type="checkbox"/>	_____
7. _____	_____	<input type="checkbox"/>	_____
8. _____	_____	<input type="checkbox"/>	_____
50% of total cover: <u>32.5</u> 20% of total cover: <u>13</u>	<u>65</u> = Total Cover		

Sapling/Shrub Stratum (Plot size: <u>15' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lindera benzoin</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Rhus copallinum</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. _____	_____	<input type="checkbox"/>	_____
4. _____	_____	<input type="checkbox"/>	_____
5. _____	_____	<input type="checkbox"/>	_____
6. _____	_____	<input type="checkbox"/>	_____
7. _____	_____	<input type="checkbox"/>	_____
8. _____	_____	<input type="checkbox"/>	_____
9. _____	_____	<input type="checkbox"/>	_____
10. _____	_____	<input type="checkbox"/>	_____
50% of total cover: <u>17.5</u> 20% of total cover: <u>7</u>	<u>35</u> = Total Cover		

Herb Stratum (Plot size: <u>5' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Microstegium vimineum</u>	<u>95</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Boehmeria cylindrica</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>
3. <u>Desmodium paniculatum</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU</u>
4. <u>Glechoma hederacea</u>	<u>1</u>	<input type="checkbox"/>	<u>FACU</u>
5. _____	_____	<input type="checkbox"/>	_____
6. _____	_____	<input type="checkbox"/>	_____
7. _____	_____	<input type="checkbox"/>	_____
8. _____	_____	<input type="checkbox"/>	_____
9. _____	_____	<input type="checkbox"/>	_____
10. _____	_____	<input type="checkbox"/>	_____
11. _____	_____	<input type="checkbox"/>	_____
12. _____	_____	<input type="checkbox"/>	_____
50% of total cover: <u>53</u> 20% of total cover: <u>21.2</u>	<u>106</u> = Total Cover		

Woody Vine Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	<input type="checkbox"/>	_____
2. _____	_____	<input type="checkbox"/>	_____
3. _____	_____	<input type="checkbox"/>	_____
4. _____	_____	<input type="checkbox"/>	_____
5. _____	_____	<input type="checkbox"/>	_____
6. _____	_____	<input type="checkbox"/>	_____
50% of total cover: _____ 20% of total cover: _____	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u> </u>	x 1 = <u> </u>
FACW species <u> </u>	x 2 = <u> </u>
FAC species <u> </u>	x 3 = <u> </u>
FACU species <u> </u>	x 4 = <u> </u>
UPL species <u> </u>	x 5 = <u> </u>
Column Totals: <u> </u> (A)	<u> </u> (B)
Prevalence Index = B/A = <u> </u>	

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through July 2019; NI species are not used in the Dominance Test Calculation. No woody vine stratum present at this data point.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Pigg River Year 3 City/County: Franklin Sampling Date: 9/30/2019
 Applicant/Owner: FORVA State: VA Sampling Point: Site#4, DP-2
 Investigator(s): MH Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): LRR P Lat: 36°59'59" Long: 79°51'53" Datum: NAD 83
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Only two (i.e., hydrophytic vegetation and wetland hydrology) of the three wetland parameters were satisfied at this data point, which characterizes a forested upland at Site #4.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> True Aquatic Plants (B14)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Soil Cracks (B6)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td> </tr> <tr> <td><input type="checkbox"/> Drainage Patterns (B10)</td> </tr> <tr> <td><input type="checkbox"/> Moss Trim Lines (B16)</td> </tr> <tr> <td><input type="checkbox"/> Dry-Season Water Table (C2)</td> </tr> <tr> <td><input type="checkbox"/> Crayfish Burrows (C8)</td> </tr> <tr> <td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td> </tr> <tr> <td><input type="checkbox"/> Stunted or Stressed Plants (D1)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Geomorphic Position (D2)</td> </tr> <tr> <td><input type="checkbox"/> Shallow Aquitard (D3)</td> </tr> <tr> <td><input type="checkbox"/> Microtopographic Relief (D4)</td> </tr> <tr> <td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td> </tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> Microtopographic Relief (D4)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)																																		
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<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)																																		
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)																																		
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)																																		
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)																																		
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<input type="checkbox"/> Microtopographic Relief (D4)																																			
<input checked="" type="checkbox"/> FAC-Neutral Test (D5)																																			

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: Site#4,DP-2

Tree Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Acer negundo</i></u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u><i>Carpinus caroliniana</i></u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. <u><i>Fraxinus pennsylvanica</i></u>	<u>10</u>	<input type="checkbox"/>	<u>FACW</u>
4. _____	_____	<input type="checkbox"/>	_____
5. _____	_____	<input type="checkbox"/>	_____
6. _____	_____	<input type="checkbox"/>	_____
7. _____	_____	<input type="checkbox"/>	_____
8. _____	_____	<input type="checkbox"/>	_____
50% of total cover: <u>50</u> 20% of total cover: <u>20</u>	<u>100</u> = Total Cover		

Sapling/Shrub Stratum (Plot size: <u>15' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Lindera benzoin</i></u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u><i>Rhus copallinum</i></u>	<u>2</u>	<input type="checkbox"/>	<u>FACU</u>
3. <u><i>Fraxinus pennsylvanica</i></u>	<u>2</u>	<input type="checkbox"/>	<u>FACW</u>
4. _____	_____	<input type="checkbox"/>	_____
5. _____	_____	<input type="checkbox"/>	_____
6. _____	_____	<input type="checkbox"/>	_____
7. _____	_____	<input type="checkbox"/>	_____
8. _____	_____	<input type="checkbox"/>	_____
9. _____	_____	<input type="checkbox"/>	_____
10. _____	_____	<input type="checkbox"/>	_____
50% of total cover: <u>7</u> 20% of total cover: <u>2.8</u>	<u>14</u> = Total Cover		

Herb Stratum (Plot size: <u>5' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Persicaria maculosa</i></u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u><i>Glechoma hederacea</i></u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u><i>Microstegium vimineum</i></u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
4. _____	_____	<input type="checkbox"/>	_____
5. _____	_____	<input type="checkbox"/>	_____
6. _____	_____	<input type="checkbox"/>	_____
7. _____	_____	<input type="checkbox"/>	_____
8. _____	_____	<input type="checkbox"/>	_____
9. _____	_____	<input type="checkbox"/>	_____
10. _____	_____	<input type="checkbox"/>	_____
11. _____	_____	<input type="checkbox"/>	_____
12. _____	_____	<input type="checkbox"/>	_____
50% of total cover: <u>40</u> 20% of total cover: <u>16</u>	<u>80</u> = Total Cover		

Woody Vine Stratum (Plot size: <u>30' Radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	<input type="checkbox"/>	_____
2. _____	_____	<input type="checkbox"/>	_____
3. _____	_____	<input type="checkbox"/>	_____
4. _____	_____	<input type="checkbox"/>	_____
5. _____	_____	<input type="checkbox"/>	_____
6. _____	_____	<input type="checkbox"/>	_____
50% of total cover: _____ 20% of total cover: _____	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u> </u>	x 1 = <u> </u>
FACW species <u> </u>	x 2 = <u> </u>
FAC species <u> </u>	x 3 = <u> </u>
FACU species <u> </u>	x 4 = <u> </u>
UPL species <u> </u>	x 5 = <u> </u>
Column Totals: <u> </u> (A)	<u> </u> (B)
Prevalence Index = B/A = <u> </u>	

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through July 2019; NI species are not used in the Dominance Test Calculation. No woody vine stratum present at this data point.

Appendix D

Groundwater Monitoring Data

Per the signed additional services proposal with the permittee (FORVA) dated December 28, 2016, on February 02, 2017, WSSI installed three (3) ground/surface water monitoring wells in and adjacent to Wetland Site #2. For the Year-1 Monitoring Period, two (2) of the monitoring wells, Wells #1 and #2, were installed within the wetland area to monitor the area's hydroperiod following dam removal. One additional well, Well #3, was installed upslope of the wetland area in order to better understand the source and magnitude of groundwater contribution to the existing wetland area.

On November 17, 2017, WSSI staff removed Well #1 and reinstalled an additional well as Well #4. Well #4 was located at a low point of the wetland depression to further expand monitoring on surface hydrology and provide a record of flood depth, frequency and duration for the Year 2 Monitoring Period.

Year 3 Methods

At Wells #2 and #4, Solinst pressure transducers were used in conjunction with an onsite barometer to collect water surface elevation data. These automated wells were programmed to take readings twice daily, recording both water depth and temperature. Manual well data collection occurred monthly, wherein transducer data from Wells #2 and #4 were downloaded and depth-to-water measurements were taken at Well #3.

Note that pressure transducers record absolute pressure (barometric pressure + water pressure). This information was then calibrated using an onsite barometer to give a water height above sensor in ft. Solinst pressure transducers also record groundwater temperature assuming the water level is above the sensor on the transducer. Once the water level falls below the transducer sensor, the water height reads 0 ft. and temperature readings become air temperature at sensor depth. Groundwater and surface water results for the Year 3 Monitoring Period are shown in Figures 1-6.

Daily sum accumulation information for precipitation, used in Figures 1-6, was taken from weather station USC00447338 accessible through NOAA's National Centers for Environmental Information Website. Precipitation data for the IFLOWS "Rocky Mount/Pigg" (referenced in the applicable permit) did not have sufficient data available for the monitoring period. Historical precipitation data for the NOAA and IFLOWS stations from both Year-1 and Year 2 monitoring periods can be found in **Appendix E**. Note that the IFLOWS weather station reports a "0" if the system has an outage or is non-responsive.

Year 3 Results

Automated hydrology information for Well #2 is shown in Figure 1 and Well #4 in Figure 2. Manual-read data from Well #3 is shown in Figure 3. Well #3 readings were taken using a water-level meter probe. Measurements were taken by lowering a sensor down the well and recording the depth to water level.

In Figures 4 – 6 elevations are given for ground and surface water levels. These figures also show daily precipitation data as a total accumulation sum in inches. Weather data referenced was taken from the NOAA station referenced in **Appendix E**, located 2.3 miles from the Wells. Average ground elevation adjacent to the well and sensor elevation are shown in Figures 4 and 5 to illustrate surface water ponding. Figure 6 shows each of the three (3) monitoring wells including daily rainfall accumulation data.

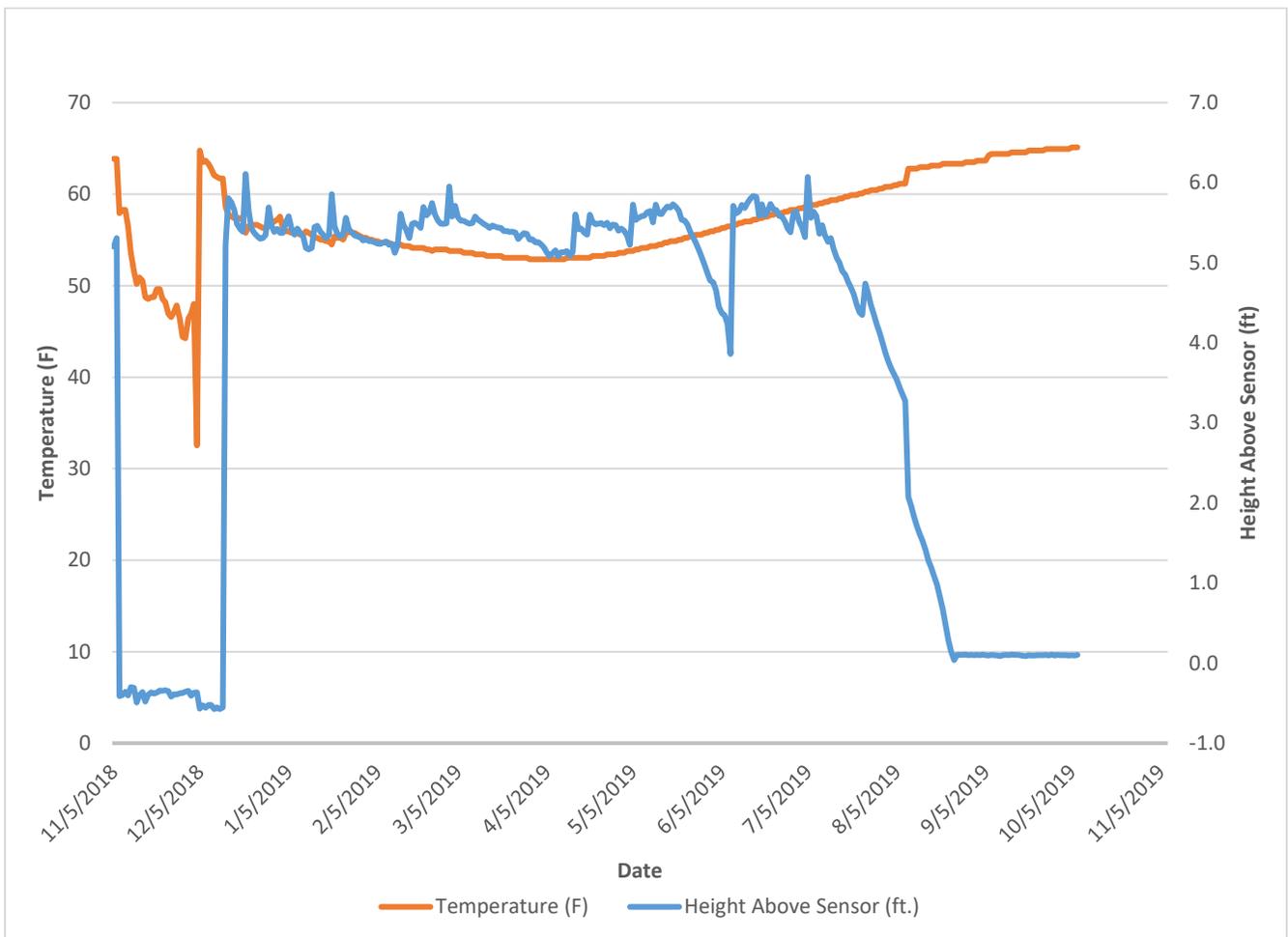


Figure 1: Well #2 – Year-3 Water Temperature and Height Above Sensor

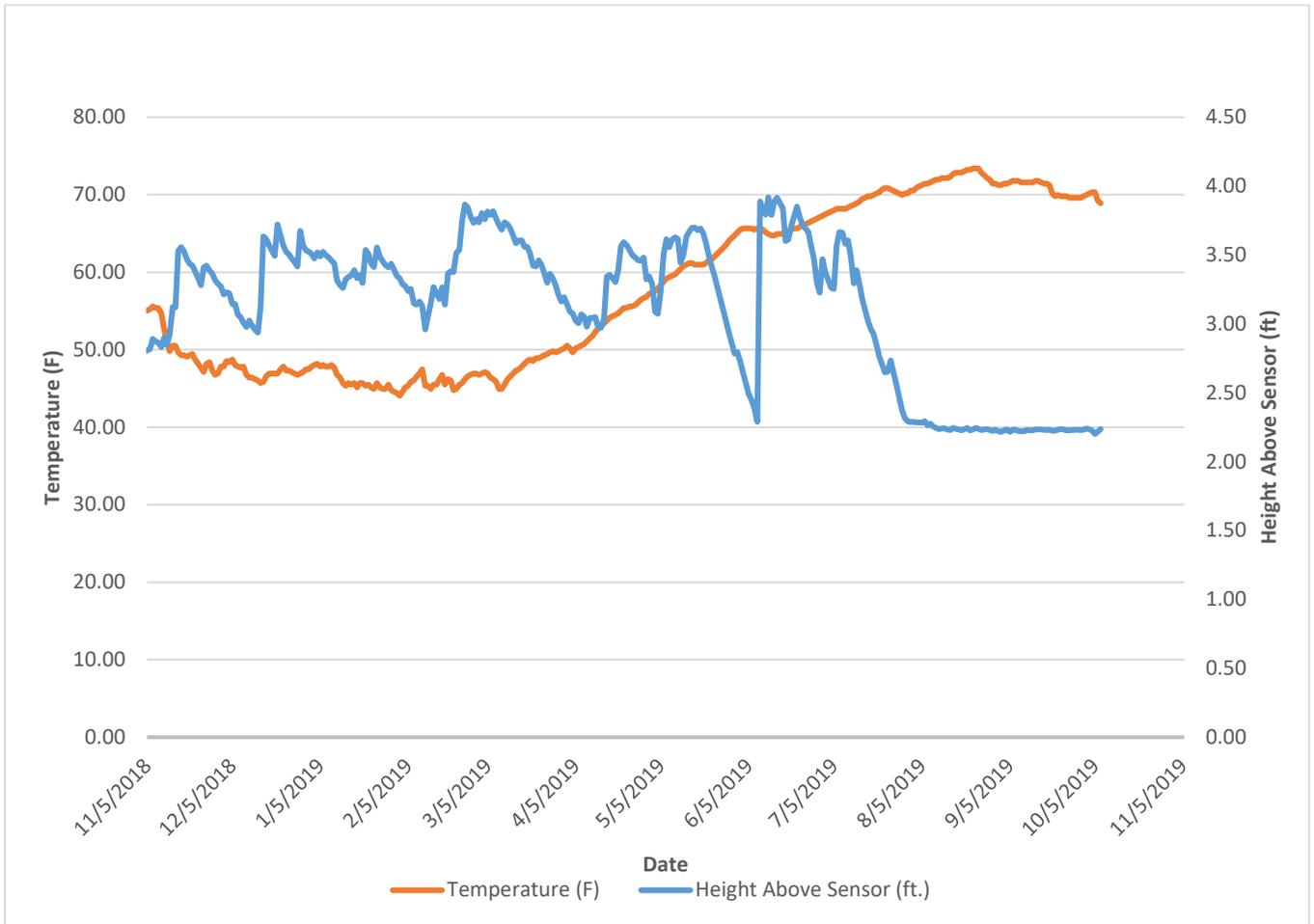


Figure 2: Well #4 – Year 3 Water Temperature and Height Above Sensor

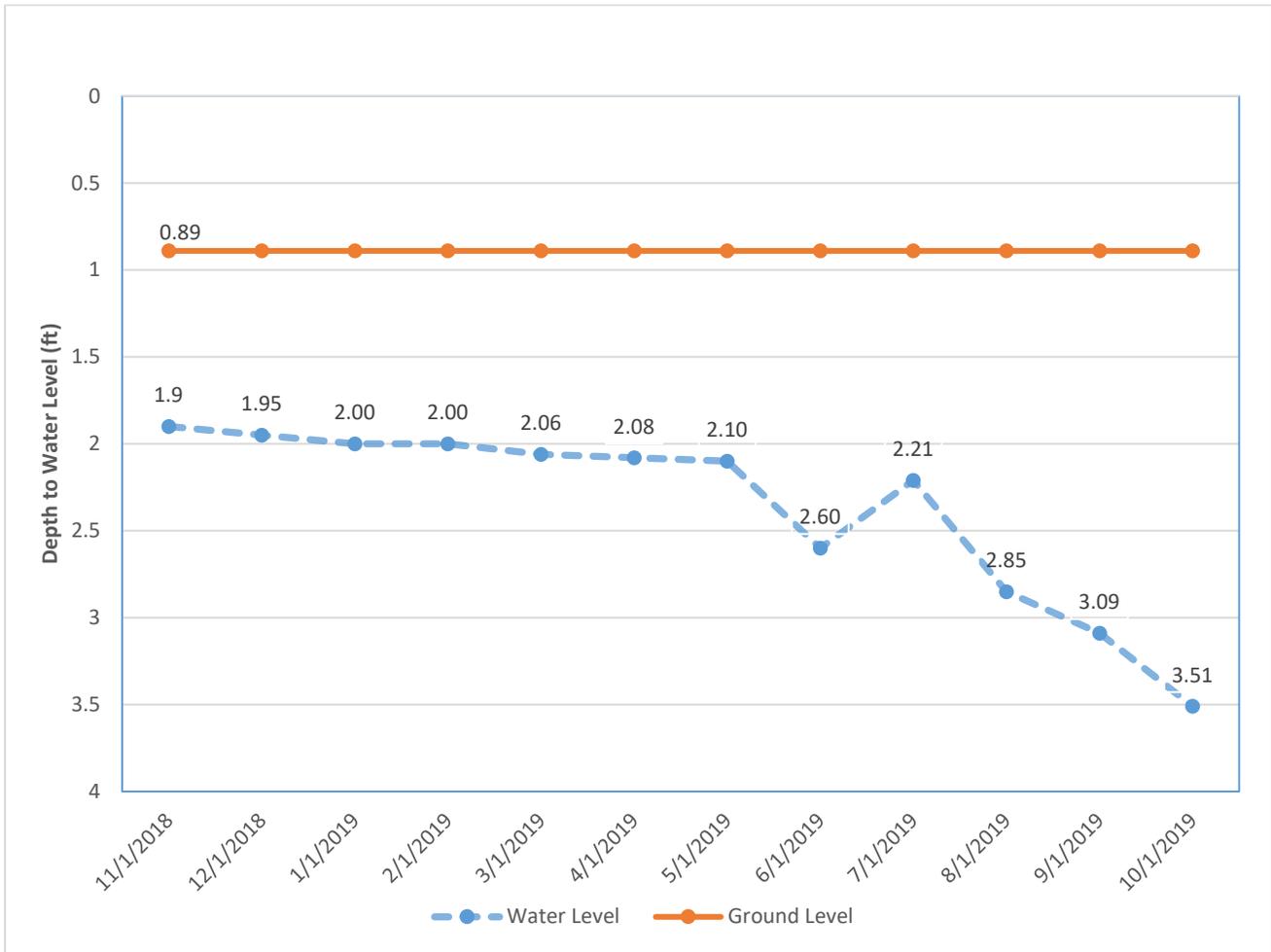


Figure 3: Well #3 – Year 3 Depth to Water Level (Manual-Read)

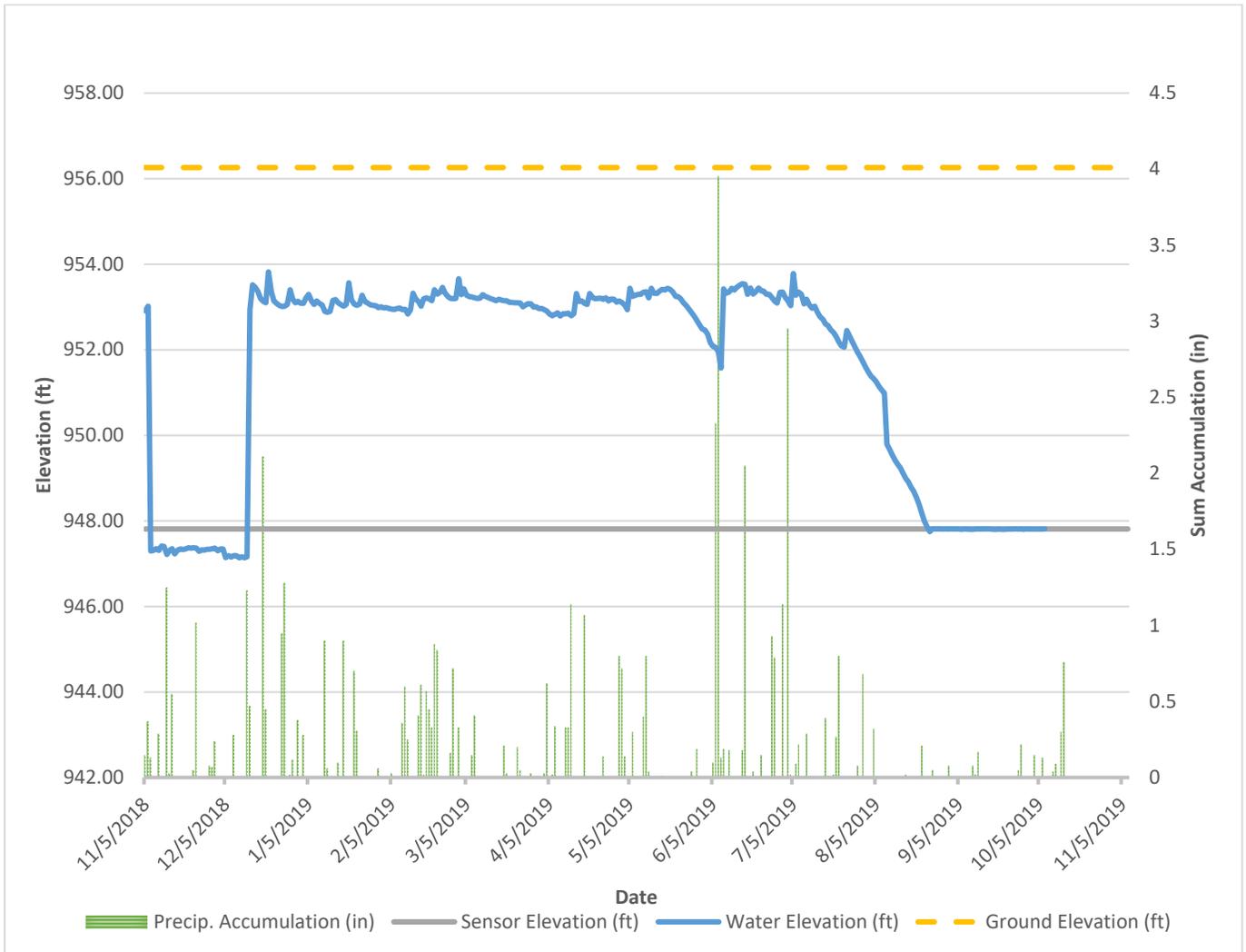


Figure 4: Well #2 – Year 3 Precipitation and Groundwater Elevation

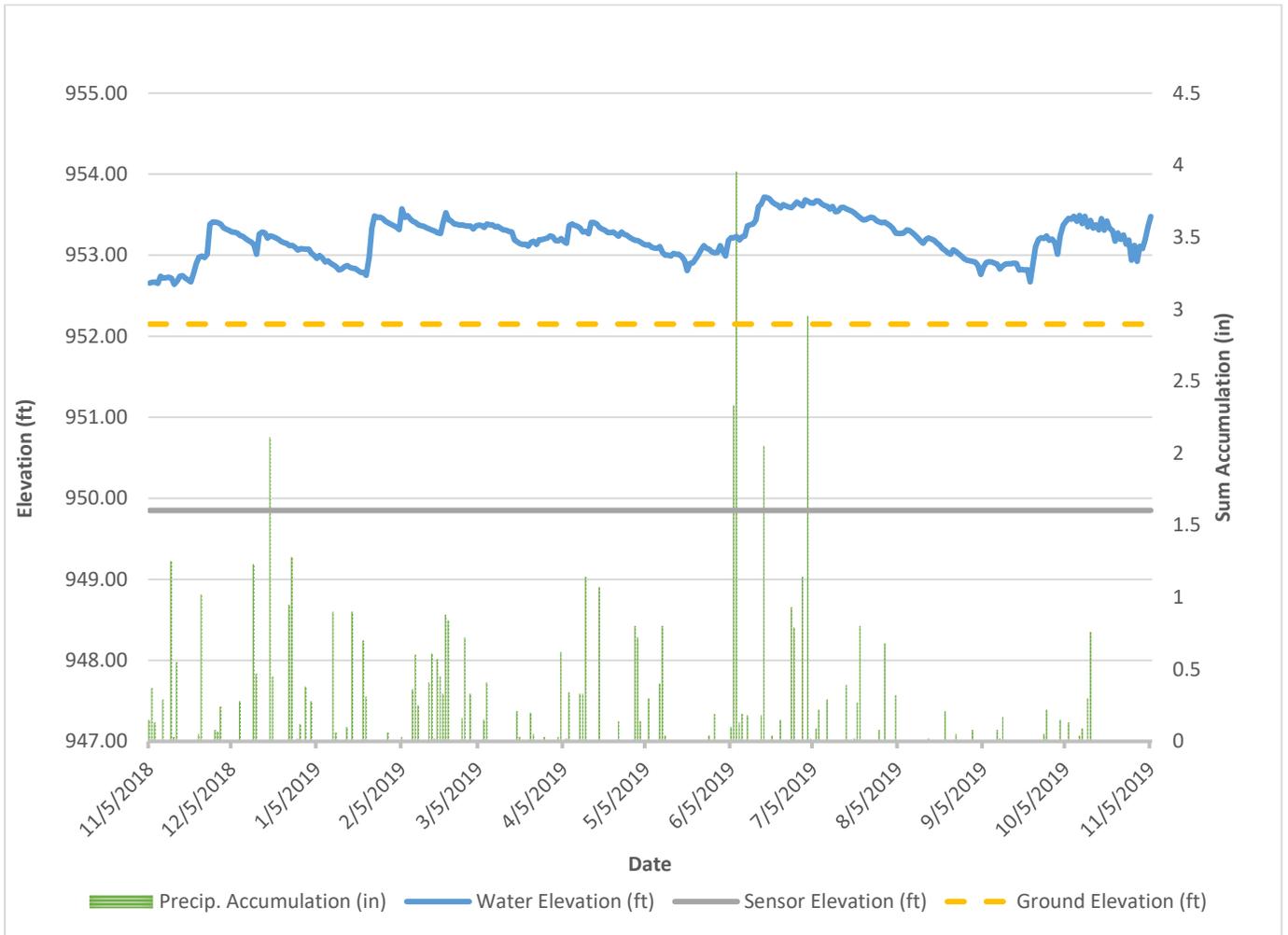


Figure 5: Well #4 – Year 3 Precipitation and Surface Water Elevation

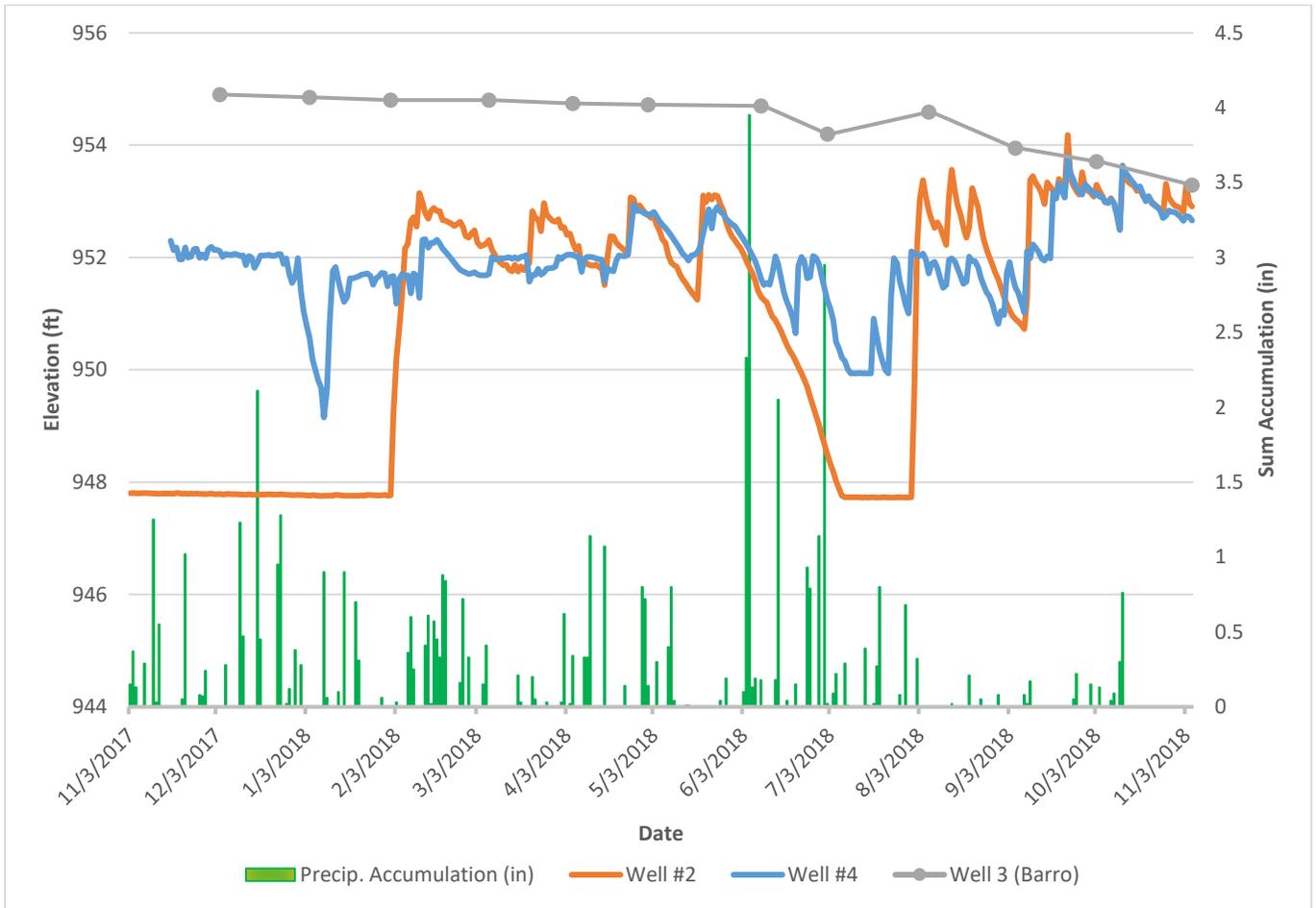


Figure 6: Year 3 Combined Precipitation and Water Elevations

Pigg River Power Dam Site Appendix D - Wetland Well Locations

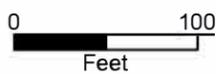
Franklin County, Virginia



L:\22000s\22900\22908_01\GIS\Wetland Well Monitoring and Parkina Lot Site Plan\WellPoint_Monitoring_2018_Rotate210degrees.mxd



Imagery Source: Pictometry®
Spring 2018 Natural Color Imagery



Wetland Studies and Solutions, Inc.
a DAVEY company

Appendix E

(Daily precipitation accumulation totals for Year-1, Year-2 and Year-3 monitoring periods, 1/30/2017-10/18/2019, are shown for the Rocky Mount/Pigg IFLOWS station as well as the Rocky Mount NOAA Station for comparison)

NOAA: Rocky Mount (USC00447338)			
(36.9769°, -79.8961°)		Elevation: 1,314.96 ft.	
Date	Temperature (F)		Precipitation (in)
	High	Low	Sum Accumulation
11/1/2017	65	36	0
11/2/2017	65	36	0
11/3/2017	74	36	0
11/4/2017	80	53	0.1
11/5/2017	63	47	0.12
11/6/2017	58	48	0
11/7/2017	76	55	0
11/8/2017	56	42	0.06
11/9/2017	45	42	0.33
11/10/2017	51	32	0.05
11/11/2017	53	22	0.01
11/12/2017	41	26	0
11/13/2017	45	28	0.22
11/14/2017	56	37	0
11/15/2017	49	33	0
11/16/2017	49	33	0.02
11/17/2017	64	28	0
11/18/2017	56	35	0
11/19/2017	62	38	0.03
11/20/2017	49	31	0
11/21/2017	54	28	0
11/22/2017	59	29	0
11/23/2017	55	24	0
11/24/2017	50	23	0
11/25/2017	58	23	0
11/26/2017	64	28	0
11/27/2017	57	27	0
11/28/2017	61	27	0
11/29/2017	63	27	0
11/30/2017	68	31	0
12/1/2017	62	31	0
12/2/2017	62	36	0
12/3/2017	53	31	0
12/4/2017	63	28	0
12/5/2017	56	28	0
12/6/2017	65	32	0
12/7/2017	44	37	0
12/8/2017	48	34	0
12/9/2017	38	29	0.3
12/10/2017	35	30	0.1
12/11/2017	40	28	0
12/12/2017	49	29	0
12/13/2017	46	22	0
12/14/2017	43	22	0
12/15/2017	46	25	0
12/16/2017	38	27	0
12/17/2017	50	27	0
12/18/2017	46	28	0
12/19/2017	60	38	0
12/20/2017	68	43	0
12/21/2017	57	33	0
12/22/2017	51	31	0
12/23/2017	59	33	0.04
12/24/2017	61	41	0.19
12/25/2017	*	*	0
12/26/2017	32	25	0
12/27/2017	38	21	0
12/28/2017	39	13	0
12/29/2017	26	13	0
12/30/2017	42	18	0
12/31/2017	41	16	0
1/1/2018	23	10	0
1/2/2018	24	3	0
1/3/2018	32	2	0

IFLOWS: Rocky Mount/Pigg (1477)			
(Unknown)		Elevation: Unknown	
Date	Temperature (F)		Precipitation (in)
	High	Low	Sum Accumulation
11/1/2017	N/A	N/A	0
11/2/2017	N/A	N/A	0
11/3/2017	N/A	N/A	0
11/4/2017	N/A	N/A	0.24
11/5/2017	N/A	N/A	0
11/6/2017	N/A	N/A	0.12
11/7/2017	N/A	N/A	0
11/8/2017	N/A	N/A	0.04
11/9/2017	N/A	N/A	0.2
11/10/2017	N/A	N/A	0
11/11/2017	N/A	N/A	0
11/12/2017	N/A	N/A	0.2
11/13/2017	N/A	N/A	0
11/14/2017	N/A	N/A	0
11/15/2017	N/A	N/A	0
11/16/2017	N/A	N/A	0.16
11/17/2017	N/A	N/A	0
11/18/2017	N/A	N/A	0
11/19/2017	N/A	N/A	0
11/20/2017	N/A	N/A	0.16
11/21/2017	N/A	N/A	0
11/22/2017	N/A	N/A	0
11/23/2017	N/A	N/A	0.16
11/24/2017	N/A	N/A	0
11/25/2017	N/A	N/A	0.2
11/26/2017	N/A	N/A	0.04
11/27/2017	N/A	N/A	0
11/28/2017	N/A	N/A	0
11/29/2017	N/A	N/A	0
11/30/2017	N/A	N/A	0
12/1/2017	N/A	N/A	0
12/2/2017	N/A	N/A	0
12/3/2017	N/A	N/A	0
12/4/2017	N/A	N/A	0
12/5/2017	N/A	N/A	0.08
12/6/2017	N/A	N/A	0
12/7/2017	N/A	N/A	0
12/8/2017	N/A	N/A	0
12/9/2017	N/A	N/A	0.08
12/10/2017	N/A	N/A	0.16
12/11/2017	N/A	N/A	0
12/12/2017	N/A	N/A	0.16
12/13/2017	N/A	N/A	0
12/14/2017	N/A	N/A	0
12/15/2017	N/A	N/A	0
12/16/2017	N/A	N/A	0
12/17/2017	N/A	N/A	0
12/18/2017	N/A	N/A	0
12/19/2017	N/A	N/A	0.47
12/20/2017	N/A	N/A	0
12/21/2017	N/A	N/A	0
12/22/2017	N/A	N/A	0
12/23/2017	N/A	N/A	0.16
12/24/2017	N/A	N/A	0
12/25/2017	N/A	N/A	0
12/26/2017	N/A	N/A	0
12/27/2017	N/A	N/A	0
12/28/2017	N/A	N/A	0
12/29/2017	N/A	N/A	0.04
12/30/2017	N/A	N/A	0
12/31/2017	N/A	N/A	0.16
1/1/2018	N/A	N/A	0.24
1/2/2018	N/A	N/A	0
1/3/2018	N/A	N/A	0

1/4/2018	32	9	0
1/5/2018	24	13	0
1/6/2018	22	6	0
1/7/2018	22	0	0
1/8/2018	15	-1	0
1/9/2018	45	14	0.08
1/10/2018	58	*	0
1/11/2018	47	39	0
1/12/2018	62	41	0.4
1/13/2018	65	30	0.59
1/14/2018	32	15	0
1/15/2018	25	8	0
1/16/2018	34	8	0
1/17/2018	44	16	0.05
1/18/2018	25	10	0.12
1/19/2018	40	13	0
1/20/2018	53	*	0
1/21/2018	62	36	0
1/22/2018	64	35	0
1/23/2018	61	37	0.58
1/24/2018	63	39	0
1/25/2018	63	31	0
1/26/2018	48	21	0
1/27/2018	55	21	0
1/28/2018	50	29	0.07
1/29/2018	54	42	0.54
1/30/2018	42	28	0
1/31/2018	32	18	0
2/1/2018	46	18	0
2/2/2018	54	29	0
2/3/2018	40	13	0
2/4/2018	38	14	0
2/5/2018	41	29	0.97
2/6/2018	42	22	0
2/7/2018	52	28	0.05
2/8/2018	52	27	0.86
2/9/2018	47	23	0
2/10/2018	56	25	0.01
2/11/2018	57	46	2.72
2/12/2018	66	57	0.3
2/13/2018	58	35	0.11
2/14/2018	42	28	0
2/15/2018	53	32	0
2/16/2018	70	50	0
2/17/2018	66	38	0.05
2/18/2018	47	35	0.13
2/19/2018	*	*	0.12
2/20/2018	56	39	0.02
2/21/2018	70	49	0
2/22/2018	75	49	0
2/23/2018	79	45	0
2/24/2018	64	44	0
2/25/2018	74	45	0.02
2/26/2018	65	52	0.09
2/27/2018	52	27	0.09
2/28/2018	60	28	0
3/1/2018	54	41	0.09
3/2/2018	58	40	0.29
3/3/2018	49	40	0.02
3/4/2018	54	34	0
3/5/2018	59	26	0
3/6/2018	53	29	0
3/7/2018	42	35	0.09
3/8/2018	45	27	0.02
3/9/2018	43	27	0
3/10/2018	47	29	0
3/11/2018	53	31	0
3/12/2018	44	32	0.22
3/13/2018	36	31	0.34

1/4/2018	N/A	N/A	0
1/5/2018	N/A	N/A	0.31
1/6/2018	N/A	N/A	0
1/7/2018	N/A	N/A	0
1/8/2018	N/A	N/A	0.04
1/9/2018	N/A	N/A	0.04
1/10/2018	N/A	N/A	0
1/11/2018	N/A	N/A	0
1/12/2018	N/A	N/A	0
1/13/2018	N/A	N/A	0.32
1/14/2018	N/A	N/A	0
1/15/2018	N/A	N/A	0
1/16/2018	N/A	N/A	0
1/17/2018	N/A	N/A	0
1/18/2018	N/A	N/A	0.08
1/19/2018	N/A	N/A	0
1/20/2018	N/A	N/A	0.31
1/21/2018	N/A	N/A	0
1/22/2018	N/A	N/A	0
1/23/2018	N/A	N/A	0.48
1/24/2018	N/A	N/A	0
1/25/2018	N/A	N/A	0
1/26/2018	N/A	N/A	0
1/27/2018	N/A	N/A	0.04
1/28/2018	N/A	N/A	0.16
1/29/2018	N/A	N/A	0
1/30/2018	N/A	N/A	0
1/31/2018	N/A	N/A	0
2/1/2018	N/A	N/A	0
2/2/2018	N/A	N/A	0
2/3/2018	N/A	N/A	0
2/4/2018	N/A	N/A	0.88
2/5/2018	N/A	N/A	0
2/6/2018	N/A	N/A	0
2/7/2018	N/A	N/A	0
2/8/2018	N/A	N/A	0
2/9/2018	N/A	N/A	0
2/10/2018	N/A	N/A	0.72
2/11/2018	N/A	N/A	0.08
2/12/2018	N/A	N/A	0
2/13/2018	N/A	N/A	0
2/14/2018	N/A	N/A	0.43
2/15/2018	N/A	N/A	0
2/16/2018	N/A	N/A	0
2/17/2018	N/A	N/A	0.08
2/18/2018	N/A	N/A	0
2/19/2018	N/A	N/A	0.08
2/20/2018	N/A	N/A	0
2/21/2018	N/A	N/A	0
2/22/2018	N/A	N/A	0
2/23/2018	N/A	N/A	0
2/24/2018	N/A	N/A	0
2/25/2018	N/A	N/A	0.04
2/26/2018	N/A	N/A	0.04
2/27/2018	N/A	N/A	0
2/28/2018	N/A	N/A	0
3/1/2018	N/A	N/A	0.24
3/2/2018	N/A	N/A	0
3/3/2018	N/A	N/A	0
3/4/2018	N/A	N/A	0
3/5/2018	N/A	N/A	0
3/6/2018	N/A	N/A	0.04
3/7/2018	N/A	N/A	0
3/8/2018	N/A	N/A	0
3/9/2018	N/A	N/A	0.16
3/10/2018	N/A	N/A	0
3/11/2018	N/A	N/A	0
3/12/2018	N/A	N/A	0.16
3/13/2018	N/A	N/A	0.4

3/14/2018	45	28	0
3/15/2018	37	28	0
3/16/2018	59	29	0
3/17/2018	60	29	0
3/18/2018	70	30	0.45
3/19/2018	62	37	0
3/20/2018	64	39	0.95
3/21/2018	41	30	0.35
3/22/2018	37	30	0.05
3/23/2018	49	33	0
3/24/2018	51	25	0
3/25/2018	41	27	0.98
3/26/2018	49	28	0
3/27/2018	52	28	0
3/28/2018	51	33	0
3/29/2018	75	38	0
3/30/2018	78	54	0.05
3/31/2018	67	30	0
4/1/2018	64	31	0
4/2/2018	68	45	0
4/3/2018	64	43	0
4/4/2018	73	43	0.22
4/5/2018	66	29	0
4/6/2018	59	31	0
4/7/2018	71	33	0.29
4/8/2018	49	29	0.13
4/9/2018	51	29	0
4/10/2018	*	*	0
4/11/2018	60	31	0
4/12/2018	64	36	0
4/13/2018	76	43	0
4/14/2018	80	53	0
4/15/2018	81	59	0
4/16/2018	81	47	1.45
4/17/2018	63	35	0
4/18/2018	64	35	0
4/19/2018	82	41	0
4/20/2018	60	32	0
4/21/2018	66	29	0
4/22/2018	69	33	0
4/23/2018	71	37	0
4/24/2018	*	*	1.53
4/25/2018	57	48	2.04
4/26/2018	70	45	0.06
4/27/2018	72	48	0.34
4/28/2018	69	41	0
4/29/2018	77	41	0
4/30/2018	64	34	0
5/1/2018	75	35	0
5/2/2018	85	47	0
5/3/2018	87	46	0
5/4/2018	88	59	0
5/5/2018	89	61	0
5/6/2018	75	58	0.01
5/7/2018	75	47	0.12
5/8/2018	76	50	0.11
5/9/2018	75	49	0
5/10/2018	79	51	0
5/11/2018	84	54	0
5/12/2018	89	60	0
5/13/2018	92	65	0
5/14/2018	92	60	0
5/15/2018	92	62	0
5/16/2018	88	64	0.34
5/17/2018	75	65	0.34
5/18/2018	81	64	0.55
5/19/2018	70	60	1.45
5/20/2018	77	63	1.92
5/21/2018	87	63	0.02

3/14/2018	N/A	N/A	0
3/15/2018	N/A	N/A	0.04
3/16/2018	N/A	N/A	0
3/17/2018	N/A	N/A	0.08
3/18/2018	N/A	N/A	0.28
3/19/2018	N/A	N/A	0.08
3/20/2018	N/A	N/A	0.92
3/21/2018	N/A	N/A	0.24
3/22/2018	N/A	N/A	0
3/23/2018	N/A	N/A	0
3/24/2018	N/A	N/A	0
3/25/2018	N/A	N/A	1.18
3/26/2018	N/A	N/A	0
3/27/2018	N/A	N/A	0.12
3/28/2018	N/A	N/A	0
3/29/2018	N/A	N/A	0
3/30/2018	N/A	N/A	0.12
3/31/2018	N/A	N/A	0
4/1/2018	N/A	N/A	0
4/2/2018	N/A	N/A	0.12
4/3/2018	N/A	N/A	0.08
4/4/2018	N/A	N/A	0.04
4/5/2018	N/A	N/A	0
4/6/2018	N/A	N/A	0.04
4/7/2018	N/A	N/A	0.2
4/8/2018	N/A	N/A	0.12
4/9/2018	N/A	N/A	0
4/10/2018	N/A	N/A	0
4/11/2018	N/A	N/A	0
4/12/2018	N/A	N/A	0
4/13/2018	N/A	N/A	0
4/14/2018	N/A	N/A	0.16
4/15/2018	N/A	N/A	0.16
4/16/2018	N/A	N/A	0
4/17/2018	N/A	N/A	0
4/18/2018	N/A	N/A	0
4/19/2018	N/A	N/A	0
4/20/2018	N/A	N/A	0
4/21/2018	N/A	N/A	0
4/22/2018	N/A	N/A	0
4/23/2018	N/A	N/A	0.28
4/24/2018	N/A	N/A	0.92
4/25/2018	N/A	N/A	0.92
4/26/2018	N/A	N/A	0.08
4/27/2018	N/A	N/A	0
4/28/2018	N/A	N/A	0
4/29/2018	N/A	N/A	0
4/30/2018	N/A	N/A	0.16
5/1/2018	N/A	N/A	0
5/2/2018	N/A	N/A	0
5/3/2018	N/A	N/A	0
5/4/2018	N/A	N/A	0
5/5/2018	N/A	N/A	0
5/6/2018	N/A	N/A	0
5/7/2018	N/A	N/A	0.04
5/8/2018	N/A	N/A	0
5/9/2018	N/A	N/A	0
5/10/2018	N/A	N/A	0
5/11/2018	N/A	N/A	0
5/12/2018	N/A	N/A	0
5/13/2018	N/A	N/A	0
5/14/2018	N/A	N/A	0
5/15/2018	N/A	N/A	0.24
5/16/2018	N/A	N/A	0.32
5/17/2018	N/A	N/A	0.32
5/18/2018	N/A	N/A	1.91
5/19/2018	N/A	N/A	1.15
5/20/2018	N/A	N/A	0
5/21/2018	N/A	N/A	0

5/22/2018	83	64	0.04
5/23/2018	83	64	0.9
5/24/2018	85	63	0
5/25/2018	81	59	0
5/26/2018	83	59	0.02
5/27/2018	77	66	0.2
5/28/2018	85	67	0
5/29/2018	77	66	0.16
5/30/2018	77	66	0.12
5/31/2018	81	66	0.2
6/1/2018	86	64	0
6/2/2018	89	66	0.01
6/3/2018	82	67	0.04
6/4/2018	87	58	0
6/5/2018	87	55	0
6/6/2018	87	53	0
6/7/2018	83	59	0
6/8/2018	82	58	0
6/9/2018	86	58	0
6/10/2018	87	64	0
6/11/2018	89	64	0.1
6/12/2018	77	59	0.1
6/13/2018	69	60	0
6/14/2018	85	64	0.48
6/15/2018	88	56	0
6/16/2018	87	56	0
6/17/2018	88	60	0
6/18/2018	92	64	0
6/19/2018	94	72	0
6/20/2018	95	69	0
6/21/2018	92	71	0
6/22/2018	87	69	0.89
6/23/2018	88	66	0.67
6/24/2018	85	68	0.05
6/25/2018	89	69	0
6/26/2018	79	68	0.36
6/27/2018	69	65	0.56
6/28/2018	83	65	0
6/29/2018	88	65	0
6/30/2018	88	63	0
7/1/2018	89	66	0
7/2/2018	92	68	0
7/3/2018	93	70	0
7/4/2018	92	71	0
7/5/2018	90	70	0
7/6/2018	92	70	0
7/7/2018	88	68	0.43
7/8/2018	80	53	0
7/9/2018	80	51	0
7/10/2018	86	56	0
7/11/2018	91	60	0
7/12/2018	92	68	0.35
7/13/2018	86	66	0
7/14/2018	86	62	0
7/15/2018	89	62	0
7/16/2018	92	63	0
7/17/2018	91	70	0
7/18/2018	89	67	0.09
7/19/2018	86	58	0
7/20/2018	87	60	0
7/21/2018	86	64	0
7/22/2018	83	64	0.07
7/23/2018	84	61	0.5
7/24/2018	83	65	0.25
7/25/2018	78	69	2.21
7/26/2018	84	63	0.55
7/27/2018	89	63	0
7/28/2018	87	67	0
7/29/2018	86	65	0

5/22/2018	N/A	N/A	0.79
5/23/2018	N/A	N/A	0
5/24/2018	N/A	N/A	0
5/25/2018	N/A	N/A	0
5/26/2018	N/A	N/A	0.16
5/27/2018	N/A	N/A	0
5/28/2018	N/A	N/A	0
5/29/2018	N/A	N/A	0.08
5/30/2018	N/A	N/A	0.28
5/31/2018	N/A	N/A	0
6/1/2018	N/A	N/A	0
6/2/2018	N/A	N/A	0
6/3/2018	N/A	N/A	0
6/4/2018	N/A	N/A	0
6/5/2018	N/A	N/A	0
6/6/2018	N/A	N/A	0
6/7/2018	N/A	N/A	0
6/8/2018	N/A	N/A	0
6/9/2018	N/A	N/A	0
6/10/2018	N/A	N/A	0.12
6/11/2018	N/A	N/A	0
6/12/2018	N/A	N/A	0.04
6/13/2018	N/A	N/A	0.43
6/14/2018	N/A	N/A	0
6/15/2018	N/A	N/A	0
6/16/2018	N/A	N/A	0
6/17/2018	N/A	N/A	0
6/18/2018	N/A	N/A	0
6/19/2018	N/A	N/A	0
6/20/2018	N/A	N/A	0
6/21/2018	N/A	N/A	0.44
6/22/2018	N/A	N/A	0.63
6/23/2018	N/A	N/A	0
6/24/2018	N/A	N/A	0
6/25/2018	N/A	N/A	0.04
6/26/2018	N/A	N/A	0.59
6/27/2018	N/A	N/A	0.04
6/28/2018	N/A	N/A	0
6/29/2018	N/A	N/A	0
6/30/2018	N/A	N/A	0
7/1/2018	N/A	N/A	0
7/2/2018	N/A	N/A	0
7/3/2018	N/A	N/A	0
7/4/2018	N/A	N/A	0.08
7/5/2018	N/A	N/A	0
7/6/2018	N/A	N/A	0.24
7/7/2018	N/A	N/A	0.04
7/8/2018	N/A	N/A	0
7/9/2018	N/A	N/A	0
7/10/2018	N/A	N/A	0
7/11/2018	N/A	N/A	0.28
7/12/2018	N/A	N/A	0
7/13/2018	N/A	N/A	0
7/14/2018	N/A	N/A	0
7/15/2018	N/A	N/A	0
7/16/2018	N/A	N/A	0
7/17/2018	N/A	N/A	0.24
7/18/2018	N/A	N/A	0
7/19/2018	N/A	N/A	0.04
7/20/2018	N/A	N/A	0
7/21/2018	N/A	N/A	0.04
7/22/2018	N/A	N/A	0.63
7/23/2018	N/A	N/A	0.08
7/24/2018	N/A	N/A	1.42
7/25/2018	N/A	N/A	0.71
7/26/2018	N/A	N/A	0
7/27/2018	N/A	N/A	0
7/28/2018	N/A	N/A	0
7/29/2018	N/A	N/A	0

7/30/2018	87	65	0
7/31/2018	84	66	2.45
8/1/2018	80	67	0.48
8/2/2018	85	69	0.58
8/3/2018	83	67	0.17
8/4/2018	79	66	0.65
8/5/2018	88	66	0
8/6/2018	91	66	0
8/7/2018	90	66	0.4
8/8/2018	91	66	0
8/9/2018	92	68	0.24
8/10/2018	89	64	0
8/11/2018	87	70	0
8/12/2018	85	64	0.35
8/13/2018	83	62	1.2
8/14/2018	82	61	0.27
8/15/2018	85	61	0
8/16/2018	85	62	0
8/17/2018	89	66	0
8/18/2018	89	69	0
8/19/2018	79	66	0.12
8/20/2018	84	67	1.48
8/21/2018	76	68	0.03
8/22/2018	85	65	0.09
8/23/2018	83	53	0.02
8/24/2018	77	51	0
8/25/2018	78	53	0
8/26/2018	82	55	0
8/27/2018	86	59	0
8/28/2018	89	59	0
8/29/2018	92	51	0
8/30/2018	92	67	0
8/31/2018	92	65	0.19
9/1/2018	86	65	0.02
9/2/2018	88	67	0.98
9/3/2018	88	66	0.05
9/4/2018	90	67	0
9/5/2018	90	67	0
9/6/2018	88	65	0
9/7/2018	90	66	0
9/8/2018	89	67	0
9/9/2018	83	62	1.64
9/10/2018	65	61	0.86
9/11/2018	69	61	0.02
9/12/2018	79	67	0.95
9/13/2018	81	69	0.04
9/14/2018	80	69	0
9/15/2018	77	71	0.35
9/16/2018	76	66	0.82
9/17/2018	73	66	2.85
9/18/2018	84	69	0.11
9/19/2018	85	60	0.03
9/20/2018	88	60	0
9/21/2018	87	64	0.22
9/22/2018	85	64	0
9/23/2018	86	61	4.56
9/24/2018	66	60	0.02
9/25/2018	65	60	0.12
9/26/2018	80	61	0
9/27/2018	83	61	0.13
9/28/2018	68	58	1.12
9/29/2018	78	61	0.03
9/30/2018	77	57	0
10/1/2018	72	59	0
10/2/2018	83	61	0
10/3/2018	82	62	0.16
10/4/2018	85	62	0
10/5/2018	87	63	0
10/6/2018	84	68	0

7/30/2018	N/A	N/A	1.55
7/31/2018	N/A	N/A	0.6
8/1/2018	N/A	N/A	0.08
8/2/2018	N/A	N/A	0.6
8/3/2018	N/A	N/A	0.36
8/4/2018	N/A	N/A	0.12
8/5/2018	N/A	N/A	0.08
8/6/2018	N/A	N/A	0.04
8/7/2018	N/A	N/A	0.04
8/8/2018	N/A	N/A	0
8/9/2018	N/A	N/A	0
8/10/2018	N/A	N/A	0
8/11/2018	N/A	N/A	0
8/12/2018	N/A	N/A	0.04
8/13/2018	N/A	N/A	0.08
8/14/2018	N/A	N/A	0.12
8/15/2018	N/A	N/A	0.64
8/16/2018	N/A	N/A	0.44
8/17/2018	N/A	N/A	0.16
8/18/2018	N/A	N/A	0
8/19/2018	N/A	N/A	0.04
8/20/2018	N/A	N/A	0.16
8/21/2018	N/A	N/A	0.08
8/22/2018	N/A	N/A	0
8/23/2018	N/A	N/A	0
8/24/2018	N/A	N/A	0
8/25/2018	N/A	N/A	0
8/26/2018	N/A	N/A	0
8/27/2018	N/A	N/A	0
8/28/2018	N/A	N/A	0
8/29/2018	N/A	N/A	0
8/30/2018	N/A	N/A	0
8/31/2018	N/A	N/A	0.04
9/1/2018	N/A	N/A	0.87
9/2/2018	N/A	N/A	0.2
9/3/2018	N/A	N/A	0
9/4/2018	N/A	N/A	0
9/5/2018	N/A	N/A	0
9/6/2018	N/A	N/A	0
9/7/2018	N/A	N/A	0
9/8/2018	N/A	N/A	0.32
9/9/2018	N/A	N/A	1.07
9/10/2018	N/A	N/A	0.48
9/11/2018	N/A	N/A	0.47
9/12/2018	N/A	N/A	0.39
9/13/2018	N/A	N/A	0.04
9/14/2018	N/A	N/A	0
9/15/2018	N/A	N/A	0.44
9/16/2018	N/A	N/A	1.04
9/17/2018	N/A	N/A	1.43
9/18/2018	N/A	N/A	0.16
9/19/2018	N/A	N/A	0
9/20/2018	N/A	N/A	0.08
9/21/2018	N/A	N/A	0
9/22/2018	N/A	N/A	1.9
9/23/2018	N/A	N/A	0.67
9/24/2018	N/A	N/A	0
9/25/2018	N/A	N/A	0.31
9/26/2018	N/A	N/A	0.04
9/27/2018	N/A	N/A	0
9/28/2018	N/A	N/A	0
9/29/2018	N/A	N/A	0
9/30/2018	N/A	N/A	0
10/1/2018	N/A	N/A	0
10/2/2018	N/A	N/A	0.04
10/3/2018	N/A	N/A	0
10/4/2018	N/A	N/A	0
10/5/2018	N/A	N/A	0
10/6/2018	N/A	N/A	0

10/7/2018	78	67	0.03
10/8/2018	85	65	0
10/9/2018	81	66	0
10/10/2018	77	66	0.05
10/11/2018	73	67	0.69
10/12/2018	72	50	3.32
10/13/2018	68	48	0
10/14/2018	62	43	0.03
10/15/2018	55	46	0.05
10/16/2018	78	53	0.02
10/17/2018	67	55	0.14
10/18/2018	69	43	0
10/19/2018	60	34	0
11/1/2018			0
11/2/2018			0.1
11/3/2018			0.98
11/4/2018			0
11/5/2018			0.15
11/6/2018			0.37
11/7/2018			0.13
11/8/2018			0
11/9/2018			0
11/10/2018			0.29
11/11/2018			0
11/12/2018			0
11/13/2018			1.25
11/14/2018			0.03
11/16/2018			0.55
11/17/2018			0
11/18/2018			0
11/19/2018			0
11/20/2018			0
11/21/2018	49	26	0
11/22/2018	55	29	0
11/23/2018	51	29	0
11/24/2018	35	29	0.05
11/25/2018	44	28	1.02
11/26/2018	56	32	0
11/27/2018	56	32	0
11/28/2018	38	23	0
11/29/2018	38	21	0
11/30/2018	51	20	0.08
12/1/2018	59	38	0.07
12/2/2018	48	38	0.24
12/3/2018	58	36	0
12/4/2018	61	36	0
12/5/2018	46	32	0
12/6/2018	42	21	0
12/7/2018	44	23	0
12/8/2018	44	26	0
12/9/2018	39	25	0.28
12/11/2018	44	13	
12/12/2018	46	13	0
12/13/2018	45	25	0
12/14/2018	50	26	0
12/15/2018	41	34	1.23
12/16/2018	47	41	0.47
12/17/2018	55	41	0
12/18/2018	57	35	0
12/19/2018	51	25	0
12/20/2018	52	25	0
12/21/2018			2.11
12/22/2018	58	38	0.45
12/23/2018	45	24	0
12/24/2018	53	24	0
12/25/2018	45	26	0
12/26/2018	48	23	0
12/27/2018	48	22	0
12/28/2018	41	26	0.95

10/7/2018	N/A	N/A	0
10/8/2018	N/A	N/A	0
10/9/2018	N/A	N/A	0
10/10/2018	N/A	N/A	0
10/11/2018	N/A	N/A	0
10/12/2018	N/A	N/A	0
10/13/2018	N/A	N/A	0
10/14/2018	N/A	N/A	0
10/15/2018	N/A	N/A	0
10/16/2018	N/A	N/A	0
10/17/2018	N/A	N/A	0
10/18/2018	N/A	N/A	0
10/19/2018	N/A	N/A	0
11/1/2018	N/A	N/A	0
11/2/2018	N/A	N/A	0
11/3/2018	N/A	N/A	0
11/4/2018	N/A	N/A	0
11/5/2018	N/A	N/A	0
11/6/2018	N/A	N/A	0
11/7/2018	N/A	N/A	0
11/8/2018	N/A	N/A	0
11/9/2018	N/A	N/A	0
11/10/2018	N/A	N/A	0
11/11/2018	N/A	N/A	0
11/12/2018	N/A	N/A	0
11/13/2018	N/A	N/A	0
11/14/2018	N/A	N/A	0
11/16/2018	N/A	N/A	0
11/17/2018	N/A	N/A	0
11/18/2018	N/A	N/A	0
11/19/2018	N/A	N/A	0
11/20/2018	N/A	N/A	0
11/21/2018	N/A	N/A	0
11/22/2018	N/A	N/A	0
11/23/2018	N/A	N/A	0
11/24/2018	N/A	N/A	0
11/25/2018	N/A	N/A	0
11/26/2018	N/A	N/A	0
11/27/2018	N/A	N/A	0
11/28/2018	N/A	N/A	0
11/29/2018	N/A	N/A	0
11/30/2018	N/A	N/A	0
12/1/2018	N/A	N/A	0
12/2/2018	N/A	N/A	0
12/3/2018	N/A	N/A	0
12/4/2018	N/A	N/A	0
12/5/2018	N/A	N/A	0
12/6/2018	N/A	N/A	0
12/7/2018	N/A	N/A	0
12/8/2018	N/A	N/A	0
12/9/2018	N/A	N/A	0
12/11/2018	N/A	N/A	0
12/12/2018	N/A	N/A	0
12/13/2018	N/A	N/A	0
12/14/2018	N/A	N/A	0
12/15/2018	N/A	N/A	0
12/16/2018	N/A	N/A	0
12/17/2018	N/A	N/A	0
12/18/2018	N/A	N/A	0
12/19/2018	N/A	N/A	0
12/20/2018	N/A	N/A	0
12/21/2018	N/A	N/A	0
12/22/2018	N/A	N/A	0
12/23/2018	N/A	N/A	0
12/24/2018	N/A	N/A	0
12/25/2018	N/A	N/A	0
12/26/2018	N/A	N/A	0
12/27/2018	N/A	N/A	0
12/28/2018	N/A	N/A	0

12/29/2018	53	39	1.28
12/30/2018	60	38	0
12/31/2018	57	40	0.02
1/1/2019	64	41	0.12
1/2/2019	61	37	0
1/3/2019	46	37	0.38
1/4/2019	52	36	0
1/5/2019	42	37	0.28
1/6/2019	55	41	0
1/7/2019	59	35	0
1/8/2019	43	37	0
1/9/2019	62	39	0
1/10/2019	45	24	0
1/11/2019	33	22	0
1/12/2019	41	22	0
1/13/2019	33	28	0.9
1/14/2019	32	28	0.06
1/15/2019	34	29	0
1/16/2019	40	24	0
1/17/2019	44	24	0
1/18/2019	35	25	0.1
1/19/2019	50	29	0
1/20/2019	49	35	0.9
1/21/2019	47	10	0
1/22/2019	29	10	0
1/23/2019	36	10	0
1/24/2019	58	32	0.7
1/25/2019	57	27	0.31
1/26/2019	42	25	0
1/27/2019	43	19	0
1/28/2019	47	20	0
1/29/2019	50	20	0
1/30/2019	50	15	0
1/31/2019	34	12	0
2/1/2019	36	12	0
2/2/2019	43	26	0.06
2/3/2019	59	26	0
2/4/2019	65	28	0
2/5/2019	67	28	0
2/6/2019	71	41	0
2/7/2019	68	41	0.03
2/8/2019	75	60	0
2/9/2019	61	30	0
2/10/2019	43	17	0
2/11/2019	39	17	0.36
2/12/2019	43	33	0.6
2/13/2019	44	33	0.25
2/14/2019	52	28	0
2/15/2019	60	25	0
2/16/2019	61	42	0
2/17/2019	45	32	0.41
2/18/2019	44	32	0.61
2/19/2019	50	27	0.02
2/20/2019	44	29	0.57
2/21/2019	32	31	0.45
2/22/2019	62	32	0.33
2/23/2019	46	36	0.88
2/24/2019	39	36	0.84
2/25/2019	66	37	0
2/26/2019	55	28	0
2/27/2019	64	29	0
2/28/2019	54	32	0
3/1/2019	60	32	0.16
3/2/2019	39	36	0.72
3/3/2019	59	36	0
3/4/2019	41	34	0.33
3/5/2019	40	24	0
3/6/2019	43	21	0
3/7/2019	37	22	0

12/29/2018	N/A	N/A	0
12/30/2018	N/A	N/A	0
12/31/2018	N/A	N/A	0
1/1/2019	N/A	N/A	0
1/2/2019	N/A	N/A	0
1/3/2019	N/A	N/A	0
1/4/2019	N/A	N/A	0
1/5/2019	N/A	N/A	0
1/6/2019	N/A	N/A	0
1/7/2019	N/A	N/A	0
1/8/2019	N/A	N/A	0
1/9/2019	N/A	N/A	0
1/10/2019	N/A	N/A	0
1/11/2019	N/A	N/A	0
1/12/2019	N/A	N/A	0
1/13/2019	N/A	N/A	0
1/14/2019	N/A	N/A	0
1/15/2019	N/A	N/A	0
1/16/2019	N/A	N/A	0
1/17/2019	N/A	N/A	0
1/18/2019	N/A	N/A	0
1/19/2019	N/A	N/A	0
1/20/2019	N/A	N/A	0
1/21/2019	N/A	N/A	0
1/22/2019	N/A	N/A	0
1/23/2019	N/A	N/A	0
1/24/2019	N/A	N/A	0
1/25/2019	N/A	N/A	0
1/26/2019	N/A	N/A	0
1/27/2019	N/A	N/A	0
1/28/2019	N/A	N/A	0
1/29/2019	N/A	N/A	0
1/30/2019	N/A	N/A	0
1/31/2019	N/A	N/A	0
2/1/2019	N/A	N/A	0
2/2/2019	N/A	N/A	0
2/3/2019	N/A	N/A	0
2/4/2019	N/A	N/A	0
2/5/2019	N/A	N/A	0
2/6/2019	N/A	N/A	0
2/7/2019	N/A	N/A	0
2/8/2019	N/A	N/A	0
2/9/2019	N/A	N/A	0
2/10/2019	N/A	N/A	0
2/11/2019	N/A	N/A	0
2/12/2019	N/A	N/A	0
2/13/2019	N/A	N/A	0
2/14/2019	N/A	N/A	0
2/15/2019	N/A	N/A	0
2/16/2019	N/A	N/A	0
2/17/2019	N/A	N/A	0
2/18/2019	N/A	N/A	0.55
2/19/2019	N/A	N/A	0
2/20/2019	N/A	N/A	0.4
2/21/2019	N/A	N/A	0.6
2/22/2019	N/A	N/A	0.52
2/23/2019	N/A	N/A	1.32
2/24/2019	N/A	N/A	0
2/25/2019	N/A	N/A	0.08
2/26/2019	N/A	N/A	0
2/27/2019	N/A	N/A	0
2/28/2019	N/A	N/A	0
3/1/2019	N/A	N/A	0.8
3/2/2019	N/A	N/A	0
3/3/2019	N/A	N/A	0.28
3/4/2019	N/A	N/A	0
3/5/2019	N/A	N/A	0
3/6/2019	N/A	N/A	0
3/7/2019	N/A	N/A	0

3/8/2019	42	30	0
3/9/2019	38	32	0.15
3/10/2019	37	34	0.41
3/11/2019	66	34	0
3/12/2019	66	27	0
3/13/2019	58	26	0
3/14/2019	62	26	0
3/15/2019	66	50	0
3/16/2019	68	39	0
3/17/2019	56	26	0
3/18/2019	57	26	0
3/19/2019	52	22	0
3/20/2019	54	22	0
3/21/2019	58	25	0.21
3/22/2019	58	40	0.03
3/23/2019	57	38	0
3/24/2019	61	26	0
3/25/2019	72	27	0
3/26/2019	65	42	0.2
3/27/2019		25	0.05
3/28/2019		24	0
3/29/2019	68	26	0
3/30/2019	76	42	0
3/31/2019	75	44	0.03
4/1/2019	57	27	0
4/2/2019	52	26	0
4/3/2019	52	28	0
4/4/2019	71	34	0
4/5/2019	74	42	0.03
4/6/2019	52	42	0.62
4/7/2019	74	50	0
4/8/2019	72	50	0.02
4/9/2019	81	58	0.34
4/10/2019	77	42	0
4/11/2019	78	44	0
4/12/2019	77	52	0
4/13/2019	68	56	0.33
4/14/2019	66	56	0.33
4/15/2019	72	50	1.14
4/16/2019	59	32	0
4/17/2019	74	34	0
4/18/2019	83	52	0
4/19/2019	83	52	0
4/20/2019	74	51	1.07
4/21/2019	58	36	0
4/22/2019	65	36	0
4/23/2019	75	40	0
4/24/2019			0
4/25/2019	82	52	0
4/26/2019	83	58	0
4/27/2019	65	63	0.14
4/28/2019	74	51	0
4/29/2019	81	48	0
4/30/2019	65	48	0
5/1/2019	86	50	0
5/2/2019	86	56	0
5/3/2019	85	57	0.8
5/4/2019	82	58	0.72
5/5/2019	81	61	0.14
5/6/2019	77	55	0
5/7/2019	78	50	0
5/8/2019	77	52	0.3
5/9/2019	82	60	0
5/10/2019	79	62	0
5/11/2019	79	64	0
5/12/2019	72	60	0.4
5/13/2019	78	53	0.8
5/14/2019	70	46	0.04
5/15/2019	64	40	0

3/8/2019	N/A	N/A	0.04
3/9/2019	N/A	N/A	0.12
3/10/2019	N/A	N/A	0
3/11/2019	N/A	N/A	0.28
3/12/2019	N/A	N/A	0
3/13/2019	N/A	N/A	0
3/14/2019	N/A	N/A	0
3/15/2019	N/A	N/A	0
3/16/2019	N/A	N/A	0
3/17/2019	N/A	N/A	0
3/18/2019	N/A	N/A	0
3/19/2019	N/A	N/A	0
3/20/2019	N/A	N/A	0
3/21/2019	N/A	N/A	0.04
3/22/2019	N/A	N/A	0.08
3/23/2019	N/A	N/A	0
3/24/2019	N/A	N/A	0
3/25/2019	N/A	N/A	0
3/26/2019	N/A	N/A	0
3/27/2019	N/A	N/A	0
3/28/2019	N/A	N/A	0
3/29/2019	N/A	N/A	0
3/30/2019	N/A	N/A	0
3/31/2019	N/A	N/A	0
4/1/2019	N/A	N/A	0
4/2/2019	N/A	N/A	0
4/3/2019	N/A	N/A	0
4/4/2019	N/A	N/A	0
4/5/2019	N/A	N/A	0.64
4/6/2019	N/A	N/A	0
4/7/2019	N/A	N/A	0
4/8/2019	N/A	N/A	0.28
4/9/2019	N/A	N/A	0
4/10/2019	N/A	N/A	0
4/11/2019	N/A	N/A	0
4/12/2019	N/A	N/A	0.16
4/13/2019	N/A	N/A	0.51
4/14/2019	N/A	N/A	0.04
4/15/2019	N/A	N/A	0
4/16/2019	N/A	N/A	0
4/17/2019	N/A	N/A	0
4/18/2019	N/A	N/A	0
4/19/2019	N/A	N/A	0.95
4/20/2019	N/A	N/A	0.04
4/21/2019	N/A	N/A	0
4/22/2019	N/A	N/A	0
4/23/2019	N/A	N/A	0
4/24/2019	N/A	N/A	0
4/25/2019	N/A	N/A	0
4/26/2019	N/A	N/A	0.12
4/27/2019	N/A	N/A	0
4/28/2019	N/A	N/A	0
4/29/2019	N/A	N/A	0
4/30/2019	N/A	N/A	0
5/1/2019	N/A	N/A	0
5/2/2019	N/A	N/A	0.99
5/3/2019	N/A	N/A	0.16
5/4/2019	N/A	N/A	0.2
5/5/2019	N/A	N/A	0.36
5/6/2019	N/A	N/A	0.04
5/7/2019	N/A	N/A	0
5/8/2019	N/A	N/A	0
5/9/2019	N/A	N/A	0.04
5/10/2019	N/A	N/A	0.04
5/11/2019	N/A	N/A	0.04
5/12/2019	N/A	N/A	0.08
5/13/2019	N/A	N/A	0.08
5/14/2019	N/A	N/A	0.04
5/15/2019	N/A	N/A	0.04

5/16/2019	73	46	0
5/17/2019	80	50	0
5/18/2019	85	55	0.01
5/19/2019	89	57	0.01
5/20/2019	88	61	0
5/21/2019	87	53	0
5/22/2019	81	52	0
5/23/2019	78	52	0
5/24/2019	86	66	0
5/25/2019	90	64	0
5/26/2019	89	64	0
5/27/2019	91	66	0
5/28/2019	87	62	0
5/29/2019	92	62	0
5/30/2019	92	61	0.04
5/31/2019	90	63	0
6/1/2019	82	54	0.19
6/2/2019	83	56	0
6/3/2019	83	59	0
6/4/2019	77	47	0
6/5/2019	81	49	0
6/6/2019	79	64	0
6/7/2019	82	66	0.1
6/8/2019	71	65	2.33
6/9/2019	68	61	3.95
6/10/2019	68	61	0.13
6/11/2019	83	62	0.19
6/12/2019	77	52	0
6/13/2019			0.18
6/14/2019	78	53	0
6/15/2019	79	49	0
6/16/2019	81	49	0
6/17/2019	87	61	0
6/18/2019	88	67	0.18
6/19/2019	83	66	2.05
6/20/2019	85	65	0
6/21/2019	84	68	0
6/22/2019	80	63	0.04
6/23/2019	79	61	0
6/24/2019	81	62	0
6/25/2019	90	62	0.15
6/26/2019	83	59	0
6/27/2019	88	60	0
6/28/2019	89	64	0
6/29/2019	88	65	0.93
6/30/2019	90	65	0.79
7/1/2019	90	66	0
7/2/2019	90	63	0
7/3/2019	90	65	1.14
7/4/2019	90	65	0
7/5/2019	86	66	2.95
7/6/2019	88	67	0.02
7/7/2019	90	70	0
7/8/2019	91	68	0.09
7/9/2019	89	68	0.22
7/10/2019	81	68	0
7/11/2019	87	68	0
7/12/2019	89	67	0.29
7/13/2019	90	67	0.01
7/14/2019	91	65	0
7/15/2019	91	65	0
7/16/2019	90	67	0
7/17/2019	91	68	0
7/18/2019	91	69	0
7/19/2019	89	70	0.39
7/20/2019	94	71	0.01
7/21/2019	94	71	0
7/22/2019	90	70	0.02
7/23/2019	88	67	0.27

5/16/2019	N/A	N/A	0.12
5/17/2019	N/A	N/A	0.04
5/18/2019	N/A	N/A	0.16
5/19/2019	N/A	N/A	0
5/20/2019	N/A	N/A	0.04
5/21/2019	N/A	N/A	0
5/22/2019	N/A	N/A	0
5/23/2019	N/A	N/A	0
5/24/2019	N/A	N/A	0
5/25/2019	N/A	N/A	0
5/26/2019	N/A	N/A	0
5/27/2019	N/A	N/A	0
5/28/2019	N/A	N/A	0
5/29/2019	N/A	N/A	0
5/30/2019	N/A	N/A	0
5/31/2019	N/A	N/A	0
6/1/2019	N/A	N/A	0
6/2/2019	N/A	N/A	0
6/3/2019	N/A	N/A	0
6/4/2019	N/A	N/A	0
6/5/2019	N/A	N/A	0
6/6/2019	N/A	N/A	0
6/7/2019	N/A	N/A	0
6/8/2019	N/A	N/A	0
6/9/2019	N/A	N/A	0
6/10/2019	N/A	N/A	0
6/11/2019	N/A	N/A	0
6/12/2019	N/A	N/A	0.04
6/13/2019	N/A	N/A	0.08
6/14/2019	N/A	N/A	0.04
6/15/2019	N/A	N/A	0
6/16/2019	N/A	N/A	0
6/17/2019	N/A	N/A	0
6/18/2019	N/A	N/A	0
6/19/2019	N/A	N/A	0.04
6/20/2019	N/A	N/A	0.04
6/21/2019	N/A	N/A	0.2
6/22/2019	N/A	N/A	0
6/23/2019	N/A	N/A	0.08
6/24/2019	N/A	N/A	0
6/25/2019	N/A	N/A	0.36
6/26/2019	N/A	N/A	0.04
6/27/2019	N/A	N/A	0.4
6/28/2019	N/A	N/A	0.28
6/29/2019	N/A	N/A	0.32
6/30/2019	N/A	N/A	0
7/1/2019	N/A	N/A	0.08
7/2/2019	N/A	N/A	0
7/3/2019	N/A	N/A	0.04
7/4/2019	N/A	N/A	0.12
7/5/2019	N/A	N/A	0.32
7/6/2019	N/A	N/A	0.36
7/7/2019	N/A	N/A	0.28
7/8/2019	N/A	N/A	0.12
7/9/2019	N/A	N/A	0
7/10/2019	N/A	N/A	0.32
7/11/2019	N/A	N/A	0.31
7/12/2019	N/A	N/A	0.88
7/13/2019	N/A	N/A	0.56
7/14/2019	N/A	N/A	0
7/15/2019	N/A	N/A	0
7/16/2019	N/A	N/A	0
7/17/2019	N/A	N/A	0.08
7/18/2019	N/A	N/A	0.04
7/19/2019	N/A	N/A	0.04
7/20/2019	N/A	N/A	0.04
7/21/2019	N/A	N/A	0
7/22/2019	N/A	N/A	0
7/23/2019	N/A	N/A	0.04

7/24/2019	70	56	0.8
7/25/2019	81	56	0
7/26/2019	83	56	0
7/27/2019	85	56	0
7/28/2019	86	59	0
7/29/2019	90	61	0
7/30/2019	89	61	0
7/31/2019	90	65	0.08
8/1/2019	88	64	0
8/2/2019	86	65	0.68
8/3/2019	82	66	0
8/4/2019	86	65	0
8/5/2019	88	65	0
8/6/2019	88	64	0.32
8/7/2019	89	65	0
8/8/2019	88	65	0
8/9/2019	89	65	0
8/10/2019	90	65	0
8/11/2019	86	59	0
8/12/2019	86	59	0
8/13/2019	90	59	0
8/14/2019	92	70	0
8/15/2019	91	66	0
8/16/2019	91	65	0
8/17/2019	88	65	0
8/18/2019	89	65	0.02
8/19/2019	92	65	0
8/20/2019	93	68	0
8/21/2019	92	67	0
8/22/2019	92	67	0
8/23/2019	89	68	0
8/24/2019	88	63	0.21
8/25/2019	71	60	0
8/26/2019	75	56	0
8/27/2019	78	61	0
8/28/2019	73	64	0.05
8/29/2019	86	53	0
8/30/2019	84	52	0
8/31/2019	87	53	0
9/1/2019	90	61	0
9/2/2019	86	59	0
9/3/2019	90	59	0.08
9/4/2019	88	62	0
9/5/2019	93	62	0
9/6/2019	93	62	0
9/7/2019	88	68	0
9/8/2019	85	56	0
9/9/2019	88	56	0
9/10/2019	88	64	0
9/11/2019	86	65	0
9/12/2019	95	65	0.08
9/13/2019	95	65	0.02
9/14/2019	76	66	0.17
9/15/2019	79	63	0
9/16/2019	86	58	0
9/17/2019	91	59	0
9/18/2019	91	59	0
9/19/2019	76	54	0
9/20/2019	73	44	0
9/21/2019	79	44	0
9/22/2019	88	55	0
9/23/2019	91	55	0
9/24/2019	90	60	0
9/25/2019	84	49	0
9/26/2019	84	50	0
9/27/2019	90	58	0
9/28/2019	85	60	0
9/29/2019	85	64	0.05
9/30/2019	91	64	0.22

7/24/2019	N/A	N/A	0.12
7/25/2019	N/A	N/A	0.2
7/26/2019	N/A	N/A	0
7/27/2019	N/A	N/A	0
7/28/2019	N/A	N/A	0
7/29/2019	N/A	N/A	0.04
7/30/2019	N/A	N/A	0.08
7/31/2019	N/A	N/A	0.16
8/1/2019	N/A	N/A	0
8/2/2019	N/A	N/A	0.2
8/3/2019	N/A	N/A	0.04
8/4/2019	N/A	N/A	0
8/5/2019	N/A	N/A	0
8/6/2019	N/A	N/A	0.04
8/7/2019	N/A	N/A	0.08
8/8/2019	N/A	N/A	0.04
8/9/2019	N/A	N/A	0
8/10/2019	N/A	N/A	0
8/11/2019	N/A	N/A	0
8/12/2019	N/A	N/A	0
8/13/2019	N/A	N/A	0
8/14/2019	N/A	N/A	0
8/15/2019	N/A	N/A	0
8/16/2019	N/A	N/A	0.08
8/17/2019	N/A	N/A	0
8/18/2019	N/A	N/A	0
8/19/2019	N/A	N/A	0
8/20/2019	N/A	N/A	0
8/21/2019	N/A	N/A	0
8/22/2019	N/A	N/A	0.36
8/23/2019	N/A	N/A	0
8/24/2019	N/A	N/A	0
8/25/2019	N/A	N/A	0
8/26/2019	N/A	N/A	0
8/27/2019	N/A	N/A	0.04
8/28/2019	N/A	N/A	0
8/29/2019	N/A	N/A	0
8/30/2019	N/A	N/A	0
8/31/2019	N/A	N/A	0
9/1/2019	N/A	N/A	0
9/2/2019	N/A	N/A	0.16
9/3/2019	N/A	N/A	0
9/4/2019	N/A	N/A	0.16
9/5/2019	N/A	N/A	0
9/6/2019	N/A	N/A	0
9/7/2019	N/A	N/A	0
9/8/2019	N/A	N/A	0
9/9/2019	N/A	N/A	0
9/10/2019	N/A	N/A	0.31
9/11/2019	N/A	N/A	0.32
9/12/2019	N/A	N/A	0
9/13/2019	N/A	N/A	0
9/14/2019	N/A	N/A	0
9/15/2019	N/A	N/A	0
9/16/2019	N/A	N/A	0
9/17/2019	N/A	N/A	0
9/18/2019	N/A	N/A	0
9/19/2019	N/A	N/A	0
9/20/2019	N/A	N/A	0
9/21/2019	N/A	N/A	0
9/22/2019	N/A	N/A	0
9/23/2019	N/A	N/A	0
9/24/2019	N/A	N/A	0.08
9/25/2019	N/A	N/A	0
9/26/2019	N/A	N/A	0
9/27/2019	N/A	N/A	0
9/28/2019	N/A	N/A	0
9/29/2019	N/A	N/A	0
9/30/2019	N/A	N/A	0

10/1/2019	83	64	0
10/2/2019	90	67	0
10/4/2019	96	63	0
10/5/2019	88	57	0
10/6/2019	68	51	0.15
10/7/2019	68	55	0
10/8/2019	80	59	0
10/9/2019	59	54	0.13
10/10/2019	72	54	0
10/11/2019	75	45	0
10/12/2019	78	45	0
10/13/2019	79	50	0.04
10/14/2019	61	45	0.09
10/15/2019	76	38	0
10/16/2019	74	38	0.3
10/17/2019	63	47	0.76
10/18/2019	61	35	0
** Incomplete or Missing Data reports as "0".			

10/1/2019	N/A	N/A	0
10/2/2019	N/A	N/A	0.32
10/4/2019	N/A	N/A	0
10/5/2019	N/A	N/A	0
10/6/2019	N/A	N/A	0
10/7/2019	N/A	N/A	0
10/8/2019	N/A	N/A	0
10/9/2019	N/A	N/A	0
10/10/2019	N/A	N/A	0.16
10/11/2019	N/A	N/A	0
10/12/2019	N/A	N/A	0
10/13/2019	N/A	N/A	0
10/14/2019	N/A	N/A	0
10/15/2019	N/A	N/A	0
10/16/2019	N/A	N/A	0
10/17/2019	N/A	N/A	0
10/18/2019	N/A	N/A	0
** Incomplete or Missing Data reports as "0".			

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