

## Baseline Assessment – Stream Attributes

### REVISIT

\*ADDITIONAL FIELD VISITS WERE COMPLETED ON 3-24-2022 TO EVALUATE REACH S-A69(2) (PROXY) LOCATED UPSTREAM OF S-A69(1). STREAM FLOW WAS PRESENT, THEREFORE REVISED RBP FORMS WERE COMPLETED AND WATER QUALITY DATA WAS COLLECTED.

### Reach S-A69(1) (Pipeline ROW) Intermittent Spread D Nicholas County, West Virginia

Data	Included
Photos	✓*
SWVM Form	✓*
FCI Calculator and HGM Form	N/A – PERENNIAL (NOT SHADEABLE)
RBP Physical Characteristics Form	✓*
Water Quality Data	✓*
RBP Habitat Form	✓*
RBP Benthic Form	✓*
Benthic Identification Sheet	N/A – NO HABITAT/OUTSIDE WV COLLECTION SEASON*
Wolman Pebble Count	✓
Reference Reach Software Pebble Count Data	✓
Longitudinal Profile and Cross Sections	✓

## Spread D Stream S-A69 (1) (Pipeline ROW) Nicholas County



Photo Type: DS, US View  
Location, Orientation, Photographer Initials: Downstream Edge of ROW, Upstream View, JM  
Lat: 38.317217 Long: -80.671495 (9/7/2021)



Photo Type: DS, DS View  
Location, Orientation, Photographer Initials: Downstream Edge of ROW, Downstream View, JM  
Lat: 38.317217 Long: -80.671495 (9/7/2021)



## Spread D Stream S-A69 (1) (Pipeline ROW) Nicholas County



Photo Type: US View at Center  
Location, Orientation, Photographer Initials: Center ROW, Upstream View, JM  
Lat: 38.317217 Long: -80.671495 (9/7/2021)



Photo Type: DS View at Center  
Location, Orientation, Photographer Initials: ROW Center, Downstream View, JM  
Lat: 38.317217 Long: -80.671495 (9/7/2021)



## Spread D Stream S-A69 (1) (Pipeline ROW) Nicholas County



Photo Type: US, US View

Location, Orientation, Photographer Initials: Upstream Edge of ROW, Upstream View, JM  
Lat: 38.317217 Long: -80.671495 (9/7/2021)

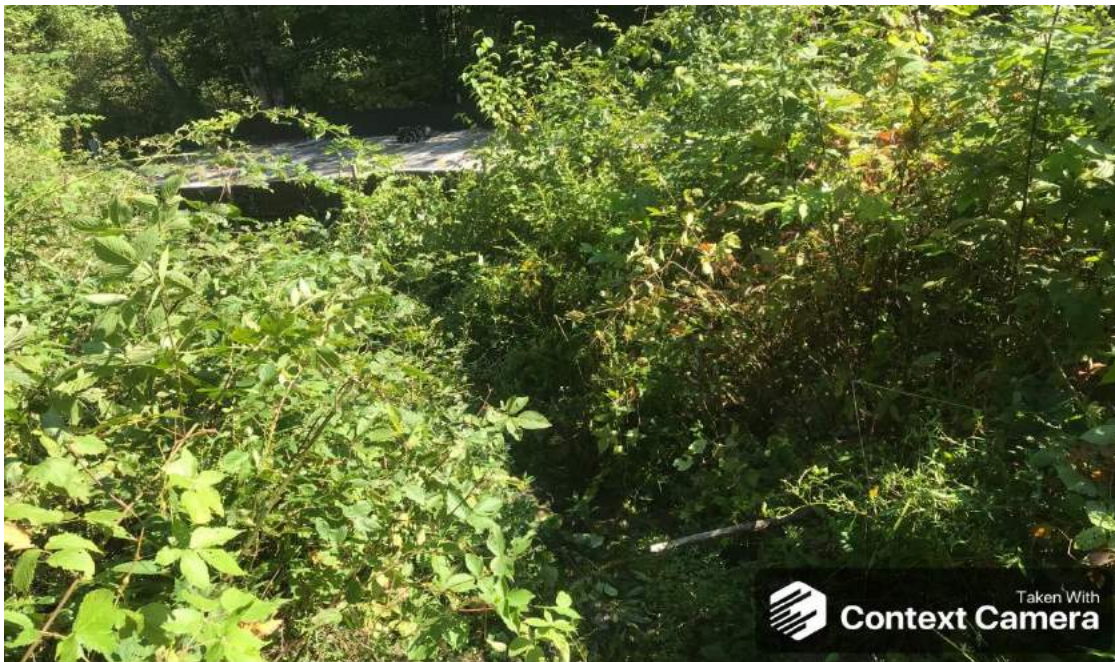


Photo Type: US, DS View

Location, Orientation, Photographer Initials: Upstream Edge of ROW, Downstream View, JM  
Lat: 38.317217 Long: -80.671495 (9/7/2021)





Photo Type: US Edge of ROW, US View  
Location, Orientation, Photographer Initials: Upstream Edge of Right of Way, Upstream View, BB/ABK  
(3/24/2022)



Photo Type: US Edge, DS View  
Location, Orientation, Photographer Initials: Upstream Edge of Right of Way, Downstream View, BB/ABK  
(3/24/2022)





Photo Type: C ROW, US View

Location, Orientation, Photographer Initials: Center of Right of Way, Upstream View, BB/ABK (3/24/2022)



Photo Type: C ROW, DS View

Location, Orientation, Photographer Initials: Center of Right of Way, Downstream View, BB/ABK (3/24/2022)





Photo Type: DS Edge, US View

Location, Orientation, Photographer Initials: Downstream Edge of Right of Way, Upstream View, BB/ABK  
(3/24/2022)



Photo Type: DS Edge, DS View

Location, Orientation, Photographer Initials: Downstream Edge of Right of Way, Downstream View, BB/ABK  
(3/24/2022)



38.317217° N, -80.671495° W



Photo Type: ROW, N

Location, Orientation, Photographer Initials: Right of Way, North View, BB/ABK (3/24/2022)

38.317217° N, -80.671495° W



Photo Type: ROW, S

Location, Orientation, Photographer Initials: Right of Way, South View, BB/ABK (3/24/2022)

"Q:\Charleston\2021 Projects\21-0244- MVP- STREAM AND WETLAND CONDITIONS ASSESSMENT AND SURVEY PLAN\002 - Pre-Crossing Monitoring\Spread D\S-A69(1)\Photos - Spread D - S-A69(1) - 3-24-2022 (21-0244-002).docx"



USCE FILE NO./ Project Name: (v2.1, Sept 2015)				MOUNTAIN VALLEY PIPELINE				IMPACT COORDINATES: (in Decimal Degrees)				Lat.	38.317217				Lon.	-80.671495				WEATHER:				10% CLOUD COVER AND SUNNY; RECENT RAIN (PREVIOUS 24 HRS)				DATE:				3/24/2022																																																	
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)												S-A69(1) (UNT TO BIG BEAVER CREEK)												MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)																								Comments:																																			
STREAM IMPACT LENGTH:				82				FORM OF MITIGATION:								RESTORATION (Levels I-III)				MIT COORDINATES: (in Decimal Degrees)				Lat.					Lon.								PRECIPITATION PAST 48 HRS:								Mitigation Length:																																						
Column No. 1- Impact Existing Condition (Debit)												Column No. 2- Mitigation Existing Condition - Baseline (Credit)												Column No. 3- Mitigation Projected at Five Years Post Completion (Credit)												Column No. 4- Mitigation Projected at Ten Years Post Completion (Credit)												Column No. 5- Mitigation Projected at Maturity (Credit)																																			
Stream Classification:				Intermittent												Stream Classification:																Stream Classification:				0								Stream Classification:				0																																			
Percent Stream Channel Slope				18												Percent Stream Channel Slope																Percent Stream Channel Slope				0								Percent Stream Channel Slope				0																																			
HGM Score (attach data forms):												HGM Score (attach data forms):												HGM Score (attach data forms):												HGM Score (attach data forms):												HGM Score (attach data forms):																																			
Average												Average												Average												Average												Average																																			
Hydrology				0.54				0.40666667								Hydrology								0								Hydrology								0								Hydrology								0																											
Biogeochemical Cycling				0.42												Biogeochemical Cycling																Biogeochemical Cycling																Biogeochemical Cycling												Biogeochemical Cycling																							
Habitat				0.26												Habitat																Habitat																Habitat												Habitat																							
PART I - Physical, Chemical and Biological Indicators												PART I - Physical, Chemical and Biological Indicators												PART I - Physical, Chemical and Biological Indicators												PART I - Physical, Chemical and Biological Indicators												PART I - Physical, Chemical and Biological Indicators																																			
				Points Scale				Range				Site Score								Points Scale				Range				Site Score								Points Scale				Range				Site Score								Points Scale				Range				Site Score								Points Scale				Range				Site Score							
PHYSICAL INDICATOR (Applies to all streams classifications)												PHYSICAL INDICATOR (Applies to all streams classifications)												PHYSICAL INDICATOR (Applies to all streams classifications)												PHYSICAL INDICATOR (Applies to all streams classifications)												PHYSICAL INDICATOR (Applies to all streams classifications)																																			
USEPA RBP (High Gradient Data Sheet)												USEPA RBP (Low Gradient Data Sheet)												USEPA RBP (High Gradient Data Sheet)												USEPA RBP (High Gradient Data Sheet)												USEPA RBP (High Gradient Data Sheet)																																			
1. Epifaunal Substrate/Available Cover				0-20				11								1. Epifaunal Substrate/Available Cover				0-20				0								1. Epifaunal Substrate/Available Cover				0-20				0								1. Epifaunal Substrate/Available Cover				0-20				0								1. Epifaunal Substrate/Available Cover				0-20				0											
2. Embeddedness				0-20				16								2. Embeddedness				0-20				0								2. Embeddedness				0-20				0								2. Embeddedness				0-20				0								2. Embeddedness				0-20				0											
3. Velocity/ Depth Regime				0-20				7								3. Velocity/ Depth Regime				0-20				0								3. Velocity/ Depth Regime				0-20				0								3. Velocity/ Depth Regime				0-20				0								3. Velocity/ Depth Regime				0-20				0											
4. Sediment Deposition				0-20				16								4. Sediment Deposition				0-20				0								4. Sediment Deposition				0-20				0								4. Sediment Deposition				0-20				0								4. Sediment Deposition				0-20				0											
5. Channel Flow Status				0-20				15								5. Channel Flow Status				0-20				0								5. Channel Flow Status				0-20				0								5. Channel Flow Status				0-20				0								5. Channel Flow Status				0-20				0											
6. Channel Alteration				0-20				18								6. Channel Alteration				0-20				0								6. Channel Alteration				0-20				0								6. Channel Alteration				0-20				0								6. Channel Alteration				0-20				0											
7. Frequency of Riffles (or bends)				0-20				6								7. Frequency of Riffles (or bends)				0-20				0								7. Frequency of Riffles (or bends)				0-20				0								7. Frequency of Riffles (or bends)				0-20				0								7. Frequency of Riffles (or bends)				0-20				0											
8. Bank Stability (LB & RB)				0-20				16								8. Bank Stability (LB & RB)				0-20				0								8. Bank Stability (LB & RB)				0-20				0								8. Bank Stability (LB & RB)				0-20				0				</																							



## FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for  $V_{CCANOPY}$  ( $\geq 20\%$  cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

**Project Name:** MVP Stream Assessment

**Location:** Nicholas County, Spread D

**Sampling Date:** 9/7/21

Project Site      Before Project

**Subclass for this SAR:**

Intermittent Stream

**Uppermost stratum present at this SAR:**

Shrub/Herb Strata

**SAR number:** S-A69 (1)

**Functional Results Summary:**

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.54
Biogeochemical Cycling	0.42
Habitat	0.26

**Variable Measure and Subindex Summary:**

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canopy over channel.	Not Used, <20%	Not Used
$V_{EMBED}$	Average embeddedness of channel.	2.20	0.53
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	0.55	0.28
$V_{BERO}$	Total percent of eroded stream channel bank.	19.40	0.97
$V_{LWD}$	Number of down woody stems per 100 feet of stream.	1.49	0.19
$V_{TDBH}$	Average dbh of trees.	Not Used	Not Used
$V_{SNAG}$	Number of snags per 100 feet of stream.	0.00	0.10
$V_{SSD}$	Number of saplings and shrubs per 100 feet of stream.	29.85	0.46
$V_{SRICH}$	Riparian vegetation species richness.	0.00	0.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	18.00	0.22
$V_{HERB}$	Average percent cover of herbaceous vegetation.	76.88	1.00
$V_{WLUSE}$	Weighted Average of Runoff Score for Catchment.	0.81	0.85



## High-Gradient Headwater Streams in Appalachia Field Data Sheet and Calculator

Team: <b>SM, JH</b>	Latitude/UTM Northing: <b>38.317217</b>
Project Name: <b>MVP Stream Assessment</b>	Longitude/UTM Easting: <b>-80.671496</b>
Location: <b>Nicholas County, Spread D</b>	Sampling Date: <b>9/7/21</b>
SAR Number: <b>S-A69 (1)</b>	Reach Length (ft): <b>67</b>
Stream Type: <b>Intermittent Stream</b>	
Top Strata: <b>Shrub/Herb Strata</b> (determined from percent calculated in $V_{CCANOPY}$ )	
Site and Timing: <b>Project Site</b>	<b>Before Project</b>

### Sample Variables 1-4 in stream channel

- 1  $V_{CCANOPY}$  Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

Not Used,  
<20%

List the percent cover measurements at each point below:

0									

- 2  $V_{EMBED}$  Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.2

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983 )

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

4	1	1	3	3	4	1	1	1	1
1	4	1	4	3	3	3	5	3	4
1	1	4	3	1	1	1	1	1	1

- 3  $V_{SUBSTRATE}$  Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in  $V_{EMBED}$ .

0.55 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

62.30	0.08	0.08	3.90	2.60	54.30	0.08	0.08	0.30	1.90
8.70	3.30	0.40	2.50	1.30	2.90	0.60	0.30	30.30	0.90
0.08	0.08	1.90	0.60	0.50	0.30	0.20	0.08	0.08	0.30

- 4  $V_{BERO}$  Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated. If both banks are eroded, total erosion for the stream may be up to 200%.

19 %

Left Bank: **5 ft**

Right Bank: **8 ft**

### Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

- 5  $V_{LWD}$  Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated.

1.5

Number of downed woody stems: **1**

- 6  $V_{TDBH}$  Average dbh of trees (measure only if  $V_{CCANOPY}$  tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.

Not Used

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				

- 7  $V_{SNAG}$  Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated.

0.0

Left Side: **0**

Right Side: **0**

- 8  $V_{SSD}$  Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated.

29.9

Left Side: **7**

Right Side: **13**



9	V <sub>SRICH</sub>	Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data.	0.00
Group 1 = 1.0		Group 2 (-1.0)	
<input type="checkbox"/> <i>Acer rubrum</i>	<input type="checkbox"/> <i>Magnolia tripetala</i>	<input type="checkbox"/> <i>Ailanthus altissima</i>	<input type="checkbox"/> <i>Lonicera japonica</i>
<input type="checkbox"/> <i>Acer saccharum</i>	<input type="checkbox"/> <i>Nyssa sylvatica</i>	<input type="checkbox"/> <i>Albizia julibrissin</i>	<input type="checkbox"/> <i>Lonicera tatarica</i>
<input type="checkbox"/> <i>Aesculus flava</i>	<input type="checkbox"/> <i>Oxydendrum arboreum</i>	<input type="checkbox"/> <i>Alliaria petiolata</i>	<input type="checkbox"/> <i>Lotus corniculatus</i>
<input type="checkbox"/> <i>Asimina triloba</i>	<input type="checkbox"/> <i>Prunus serotina</i>	<input type="checkbox"/> <i>Alternanthera philoxeroides</i>	<input type="checkbox"/> <i>Lythrum salicaria</i>
<input type="checkbox"/> <i>Betula alleghaniensis</i>	<input type="checkbox"/> <i>Quercus alba</i>	<input type="checkbox"/> <i>Aster tataricus</i>	<input type="checkbox"/> <i>Microstegium vimineum</i>
<input type="checkbox"/> <i>Betula lenta</i>	<input type="checkbox"/> <i>Quercus coccinea</i>	<input type="checkbox"/> <i>Cerastium fontanum</i>	<input type="checkbox"/> <i>Paulownia tomentosa</i>
<input type="checkbox"/> <i>Carya alba</i>	<input type="checkbox"/> <i>Quercus imbricaria</i>	<input type="checkbox"/> <i>Coronilla varia</i>	<input type="checkbox"/> <i>Polygonum cuspidatum</i>
<input type="checkbox"/> <i>Carya glabra</i>	<input type="checkbox"/> <i>Quercus prinus</i>	<input type="checkbox"/> <i>Elaeagnus umbellata</i>	<input type="checkbox"/> <i>Pueraria montana</i>
<input type="checkbox"/> <i>Carya ovalis</i>	<input type="checkbox"/> <i>Quercus rubra</i>	<input type="checkbox"/> <i>Lespedeza bicolor</i>	<input type="checkbox"/> <i>Rosa multiflora</i>
<input type="checkbox"/> <i>Carya ovata</i>	<input type="checkbox"/> <i>Quercus velutina</i>	<input type="checkbox"/> <i>Lespedeza cuneata</i>	<input type="checkbox"/> <i>Sorghum halepense</i>
<input type="checkbox"/> <i>Cornus florida</i>	<input type="checkbox"/> <i>Sassafras albidum</i>	<input type="checkbox"/> <i>Ligustrum obtusifolium</i>	<input type="checkbox"/> <i>Verbena brasiliensis</i>
<input type="checkbox"/> <i>Fagus grandifolia</i>	<input type="checkbox"/> <i>Tilia americana</i>	<input type="checkbox"/> <i>Ligustrum sinense</i>	
<input type="checkbox"/> <i>Fraxinus americana</i>	<input type="checkbox"/> <i>Tsuga canadensis</i>		
<input type="checkbox"/> <i>Liriodendron tulipifera</i>	<input type="checkbox"/> <i>Ulmus americana</i>		
<input type="checkbox"/> <i>Magnolia acuminata</i>			
0 Species in Group 1		0 Species in Group 2	

**Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.**

10	V <sub>DETRITUS</sub>	Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.	18.00 %																								
<table border="1"> <tr> <th colspan="4">Left Side</th> <th colspan="4">Right Side</th> </tr> <tr> <td>5</td> <td>3</td> <td>50</td> <td>55</td> <td>1</td> <td>5</td> <td>20</td> <td>5</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>				Left Side				Right Side				5	3	50	55	1	5	20	5								
Left Side				Right Side																							
5	3	50	55	1	5	20	5																				
11	V <sub>HERB</sub>	Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do not include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.	77 %																								
<table border="1"> <tr> <th colspan="4">Left Side</th> <th colspan="4">Right Side</th> </tr> <tr> <td>80</td> <td>95</td> <td>40</td> <td>40</td> <td>90</td> <td>95</td> <td>80</td> <td>95</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>				Left Side				Right Side				80	95	40	40	90	95	80	95								
Left Side				Right Side																							
80	95	40	40	90	95	80	95																				

**Sample Variable 12 within the entire catchment of the stream.**

12	V <sub>WLUSE</sub>	Weighted Average of Runoff Score for watershed:	0.81																																				
<table border="1"> <tr> <th>Land Use (Choose From Drop List)</th> <th>Runoff Score</th> <th>% in Catchment</th> <th>Running Percent (not &gt;100)</th> </tr> <tr> <td>Open space (pasture, lawns, parks, etc.), grass cover &lt;50%</td> <td>0.1</td> <td>2.47</td> <td>2.47</td> </tr> <tr> <td>Forest and native range (&gt;75% ground cover)</td> <td>1</td> <td>76.35</td> <td>78.82</td> </tr> <tr> <td>Forest and native range (&lt;50% ground cover)</td> <td>0.5</td> <td>6.2</td> <td>85.02</td> </tr> <tr> <td>Open space (pasture, lawns, parks, etc.), grass cover &lt;50%</td> <td>0.1</td> <td>14.98</td> <td>100</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>				Land Use (Choose From Drop List)	Runoff Score	% in Catchment	Running Percent (not >100)	Open space (pasture, lawns, parks, etc.), grass cover <50%	0.1	2.47	2.47	Forest and native range (>75% ground cover)	1	76.35	78.82	Forest and native range (<50% ground cover)	0.5	6.2	85.02	Open space (pasture, lawns, parks, etc.), grass cover <50%	0.1	14.98	100																
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S-A69 (1)			Notes:
Variable	Value	VSI	
V <sub>CCANOPY</sub>	Not Used, <20%	Not Used	
V <sub>EMBED</sub>	2.2	0.53	
V <sub>SUBSTRATE</sub>	0.55 in	0.28	
V <sub>BERO</sub>	19 %	0.97	
V <sub>LWD</sub>	1.5	0.19	
V <sub>TDBH</sub>	Not Used	Not Used	
V <sub>SNAG</sub>	0.0	0.10	
V <sub>SSD</sub>	29.9	0.46	
V <sub>SRICH</sub>	0.00	0.00	
V <sub>DETRITUS</sub>	18.0 %	0.22	
V <sub>HERB</sub>	77 %	1.00	
V <sub>WLUSE</sub>	0.81	0.85	



STREAM NAME	UNT to Big Beaver Creek	LOCATION
STATION #	S-A69(1) RIVERMILE	STREAM CLASS Intermittent
LAT	38.317217 LONG -80.671495	COUNTY Nicholas
STORET #	AGENCY POTESTA	
INVESTIGATORS A. Kincaid/ B/ Burdette		
FORM COMPLETED BY	DATE	REASON FOR SURVEY
B. Burdette	3-24-2022 TIME 1445	Baseline Assessment Revision

*Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1*



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input type="checkbox"/> Residential	<b>Local Watershed NPS Pollution</b> <input checked="" type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources <b>Local Watershed Erosion</b> <input checked="" type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	<b>Indicate the dominant type and record the dominant species present</b> <input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous Dominant species present <u>Rosa multiflora</u>	
<b>INSTREAM FEATURES</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">           Estimated Reach Length <u>40</u> ft_m            Estimated Stream Width <u>1.2</u> ft_m            Sampling Reach Area <u>48</u> ft<sup>2</sup>_m<sup>2</sup>            Area in km<sup>2</sup> (m<sup>2</sup>x1000) _____ km<sup>2</sup>            Estimated Stream Depth <u>0.1</u> ft_m            Surface Velocity <u>0.2</u> ft/sec_m/sec            Stream Dry <input type="checkbox"/> </div> <div style="width: 45%;"> <b>Canopy Cover</b>  <input checked="" type="checkbox"/> Partly open    <input type="checkbox"/> Partly shaded    <input type="checkbox"/> Shaded            High Water Mark <u>0.75</u> ft_m  <b>Proportion of Reach Represented by Stream Morphology Types</b>            Riffle<sup>10</sup> _____ %    Run<sup>80</sup> _____ %            Pool<sup>10</sup> _____ %  <b>Channelized</b>    <input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No  <b>Dam Present</b>    <input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No         </div> </div>	
<b>LARGE WOODY DEBRIS</b>	LWD <u>0</u> m <sup>2</sup> Density of LWD <u>0</u> m <sup>2</sup> /km <sup>2</sup> (LWD/ reach area)	
<b>AQUATIC VEGETATION</b>	<b>Indicate the dominant type and record the dominant species present</b> <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae Dominant species present <u>none</u> Portion of the reach with aquatic vegetation <u>0</u> %	
<b>WATER QUALITY</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">           Temperature <u>8.4</u> °C            Specific Conductance <u>38.9</u> us/cm            Dissolved Oxygen <u>11.32</u> mg/L            pH <u>6.57</u> su            Turbidity <u>28</u> NTU            WQ Instrument Used <u>ysi quattro</u> </div> <div style="width: 45%;"> <b>Water Odors</b>  <input checked="" type="checkbox"/> Normal/None    <input type="checkbox"/> Sewage  <input type="checkbox"/> Petroleum    <input type="checkbox"/> Chemical  <input type="checkbox"/> Fishy    <input type="checkbox"/> Other _____  <b>Water Surface Oils</b>  <input type="checkbox"/> Slick    <input type="checkbox"/> Sheen    <input type="checkbox"/> Globs    <input type="checkbox"/> Flecks  <input checked="" type="checkbox"/> None    <input type="checkbox"/> Other _____  <b>Turbidity (if not measured)</b>  <input checked="" type="checkbox"/> Clear    <input type="checkbox"/> Slightly turbid    <input type="checkbox"/> Turbid  <input type="checkbox"/> Opaque    <input type="checkbox"/> Stained    <input type="checkbox"/> Other _____         </div> </div>	
<b>SEDIMENT/ SUBSTRATE</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Odors</b>  <input checked="" type="checkbox"/> Normal    <input type="checkbox"/> Sewage    <input type="checkbox"/> Petroleum  <input type="checkbox"/> Chemical    <input type="checkbox"/> Anaerobic    <input type="checkbox"/> None  <input type="checkbox"/> Other _____  <b>Oils</b>  <input checked="" type="checkbox"/> Absent    <input type="checkbox"/> Slight    <input type="checkbox"/> Moderate    <input type="checkbox"/> Profuse         </div> <div style="width: 45%;"> <b>Deposits</b>  <input type="checkbox"/> Sludge    <input type="checkbox"/> Sawdust    <input type="checkbox"/> Paper fiber    <input checked="" type="checkbox"/> Sand  <input type="checkbox"/> Relict shells    <input type="checkbox"/> Other _____  <b>Looking at stones which are not deeply embedded, are the undersides black in color?</b>  <input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No         </div> </div>	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")	50			
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	20	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	0			
Clay	< 0.004 mm (slick)	0			

WQ = Downstream Readings



# HABITAT ASSESSMENT FIELD DATA SHEET - HG - USE ON ALL STREAMS (FRONT)

STREAM NAME UNT to Big Beaver Creek		LOCATION	
STATION # S-A69(1) RIVERMILE		STREAM CLASS Intermittent	
LAT 38.317217 LONG -80.671495		COUNTY Nicholas	
STORET #		AGENCY POTESTA	
INVESTIGATORS A. Kincaid/ B. Burdette			
FORM COMPLETED BY B. Burdette		DATE 3-24-2022 TIME 1445 AM PM	REASON FOR SURVEY Baseline Assessment Revisit

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	<b>1. Epifaunal Substrate/ Available Cover</b>  <input type="checkbox"/> N/A  <b>SCORE 11</b>	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	<b>2. Embeddedness</b>  <b>SCORE 16</b>	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	<b>3. Velocity/Depth Regime</b>  <input type="checkbox"/> N/A  <b>SCORE 7</b>	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime (usually slow-deep).
		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	<b>4. Sediment Deposition</b>  <b>SCORE 16</b>	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	<b>5. Channel Flow Status</b> <input type="checkbox"/> N/A  <b>SCORE 15</b>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

# HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<b>6. Channel Alteration</b>  Channelization or dredging absent or minimal; stream with normal pattern.  <b>SCORE 18</b>	Channelization or dredging absent or minimal; stream with normal pattern.  20 19 18 17 16	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.  15 14 13 12 11	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  10 9 8 7 6	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.  5 4 3 2 1 0
<b>7. Frequency of Riffles (or bends)</b>  <input type="checkbox"/> N/A  <b>SCORE 6</b>	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.  20 19 18 17 16	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.  15 14 13 12 11	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.  10 9 8 7 6	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.  5 4 3 2 1 0
<b>8. Bank Stability (score each bank)</b>  Note: determine left or right side by facing downstream. <b>SCORE 8</b> <b>SCORE 8</b>	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  Left Bank 10 9 Right Bank 10 9	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.  8 7 6 8 7 6	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.  5 4 3 5 4 3	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.  2 1 0 2 1 0
<b>9. Vegetative Protection (score each bank)</b>  <b>SCORE 6</b> <b>SCORE 6</b>	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.  Left Bank 10 9 Right Bank 10 9	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.  8 7 6 8 7 6	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.  5 4 3 5 4 3	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.  2 1 0 2 1 0
<b>10. Riparian Vegetative Zone Width (score each bank riparian zone)</b>  <b>SCORE 2</b> <b>SCORE 2</b>	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.  Left Bank 10 9 Right Bank 10 9	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.  8 7 6 8 7 6	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  5 4 3 5 4 3	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.  2 1 0 2 1 0

Total Score **121** Habitat Parameter 9. Vegetative Protection: Boulders along banks, limiting vegetation.



## BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME <u>UNT to Big Beaver Creek</u>		LOCATION
STATION # <u>S-A69(1)</u> <u>RIVERMILE</u>		STREAM CLASS <u>Intermittent</u>
LAT <u>38.317217</u> LONG <u>-80.671495</u>		COUNTY <u>Nicholas</u>
STORET #		AGENCY <u>POTESTA</u>
INVESTIGATORS <u>A. Kincaid/ B. Burdette</u>		LOT NUMBER
FORM COMPLETED BY <b>B. Burdette</b>		DATE <u>3-24-2022</u> TIME <u>1445</u>
REASON FOR SURVEY <u>Baseline Assessment Revisit</u>		

<b>HABITAT TYPES</b>	<b>Indicate the percentage of each habitat type present</b> <input type="checkbox"/> Cobble _____% <input type="checkbox"/> Snags _____% <input type="checkbox"/> Vegetated Banks _____% <input type="checkbox"/> Sand _____% <input type="checkbox"/> Submerged Macrophytes _____% <input type="checkbox"/> Other ( _____ ) _____%
<b>SAMPLE COLLECTION</b>	<b>Gear used</b> <input type="checkbox"/> D-frame <input type="checkbox"/> kick-net <input type="checkbox"/> Other _____  <b>How were the samples collected?</b> <input type="checkbox"/> wading <input type="checkbox"/> from bank <input type="checkbox"/> from boat  <b>Indicate the number of jabs/kicks taken in each habitat type.</b> <input type="checkbox"/> Cobble _____ <input type="checkbox"/> Snags _____ <input type="checkbox"/> Vegetated Banks _____ <input type="checkbox"/> Sand _____ <input type="checkbox"/> Submerged Macrophytes _____ <input type="checkbox"/> Other ( _____ ) _____
<b>GENERAL COMMENTS</b>	no suitable habitat for benthic collection, out of season.

### QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

### FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	1	2	3	4	Sialidae	0	1	2	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	1	2	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	3	4						
Decapoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						

# WOLMAN PEBBLE COUNT FORM

County: Nicholas

Stream ID: S-A69 (1)

Stream Name: UNT to Big Beaver Creek (1)

HUC Code:

Basin:

Survey Date: 9/7/2021

Impact: 20.42m

Surveyors: RH, SM

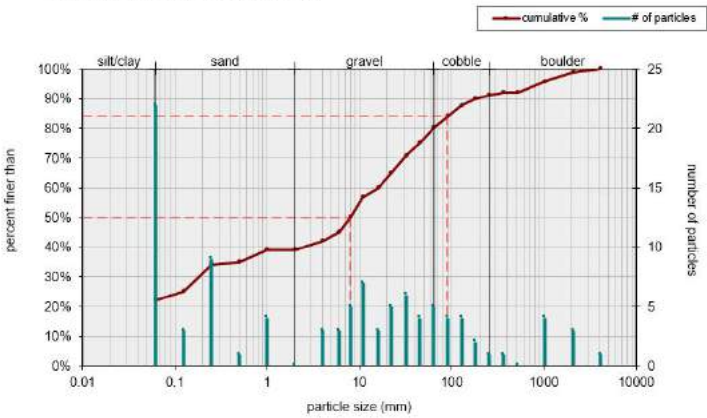
Impact: 20.42m

Type: Bankfull Channel

PEBBLE COUNT								
Inches	PARTICLE	Millimeters		Particle Count	Total #	Item %	% Cum	
	Silt/Clay	< .062	S/C	▲▼	22	22.00	22.00	
	Very Fine	.062-.125	S A N D	▲▼	3	3.00	25.00	
	Fine	.125-.25		▲▼	9	9.00	34.00	
	Medium	.25-.5		▲▼	1	1.00	35.00	
	Coarse	.50-1.0		▲▼	4	4.00	39.00	
.04-.08	Very Coarse	1.0-2		▲▼	0	0.00	39.00	
.08 -.16	Very Fine	2 -4		G R A V E L	▲▼	3	3.00	42.00
.16 - .22	Fine	4 -5.7	▲▼		3	3.00	45.00	
.22 - .31	Fine	5.7 - 8	▲▼		5	5.00	50.00	
.31 - .44	Medium	8 -11.3	▲▼		7	7.00	57.00	
.44 - .63	Medium	11.3 - 16	▲▼		3	3.00	60.00	
.63 - .89	Coarse	16 -22.6	▲▼		5	5.00	65.00	
.89 - 1.26	Coarse	22.6 - 32	▲▼		6	6.00	71.00	
1.26 - 1.77	Vry Coarse	32 - 45	▲▼		4	4.00	75.00	
1.77 -2.5	Vry Coarse	45 - 64	▲▼		5	5.00	80.00	
2.5 - 3.5	Small	64 - 90	C O B B L E		▲▼	4	4.00	84.00
3.5 - 5.0	Small	90 - 128			▲▼	4	4.00	88.00
5.0 - 7.1	Large	128 - 180		▲▼	2	2.00	90.00	
7.1 - 10.1	Large	180 - 256		▲▼	1	1.00	91.00	
10.1 - 14.3	Small	256 - 362	B O U L D E R	▲▼	1	1.00	92.00	
14.3 - 20	Small	362 - 512		▲▼	0	0.00	92.00	
20 - 40	Medium	512 - 1024		▲▼	4	4.00	96.00	
40 - 80	Large	1024 -2048		▲▼	3	3.00	99.00	
80 - 160	Vry Large	2048 -4096		▲▼	1	1.00	100.00	
	Bedrock		BDRK	▲▼	0	0.00	100.00	
				Totals:	100			
	Total Tally:							



Bankfull Channel Pebble Count, S-A69 (1)



Size (mm)		Size Distribution		Type	
D16	0.062	mean	2.4	silt/clay	22%
D35	0.5	dispersion	70.1	sand	17%
D50	8	skewness	-0.30	gravel	41%
D65	22			cobble	11%
D84	90			boulder	9%
D95	860				



— — — — —	STUDY AREA (EASEMENT)
— . — . —	EXISTING SURVEY-LOCATED THALWEG
<b>1176.87 +</b>	EXISTING SURVEYED GROUND SHOT ELEVATION

1. THIS MAP HAS BEEN ORIENTED TO NAD 1983 UTM ZONE 17N, AND VERTICALLY TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), USING REAL TIME DGPS. FIELD LOCATIONS WERE COMPLETED ON SEPTEMBER 7, 2021.
2. EASEMENT LINES SHOWN ON PLAN VIEW WERE PROVIDED BY MOUNTAIN VALLEY PIPELINE.
3. SURVEY POINTS FOR CROSS SECTIONS AND THALWEG PROFILES COLLECTED IN 2021 HAVE BEEN USED IN COMBINATION WITH SURVEY POINTS COLLECTED PREVIOUSLY IN 2020 IN ORDER TO GENERATE THE PRE-CROSSING SURFACE SHOWN IN PLAN. DUE TO NATURAL EROSIONAL STREAM PROCESSES THAT CAN OCCUR OVER TIME, MINOR ADJUSTMENTS TO THE PROFILE ALIGNMENTS MAY HAVE BEEN REQUIRED IN ORDER TO GENERATE A CLEAN PRE-CROSSING SURFACE.
4. ALL SECTION VIEWS SHOWN LEFT TO RIGHT FACING DOWNSTREAM.
5. POST-CROSSING SURVEY INFORMATION SHOWN IN RED. DATA PENDING.
6. POST-CROSSING SURVEY POINTS FOR CROSS SECTIONS AND THALWEG ARE PROJECTED ONTO PRE-CROSSING SECTION AND PROFILE VIEWS FOR COMPARISON.



PHOTO TAKEN LOOKING DOWNSTREAM  
FROM UPSTREAM IMPACT LIMITS

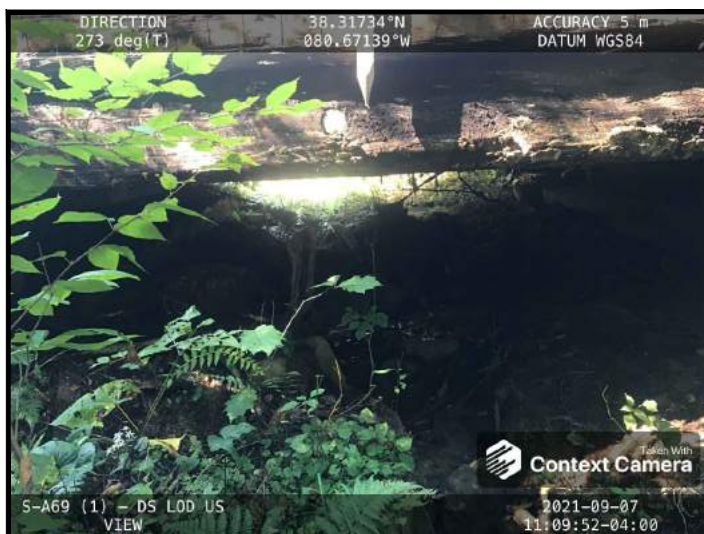


PHOTO TAKEN LOOKING UPSTREAM FROM  
DOWNSTREAM IMPACT LIMITS

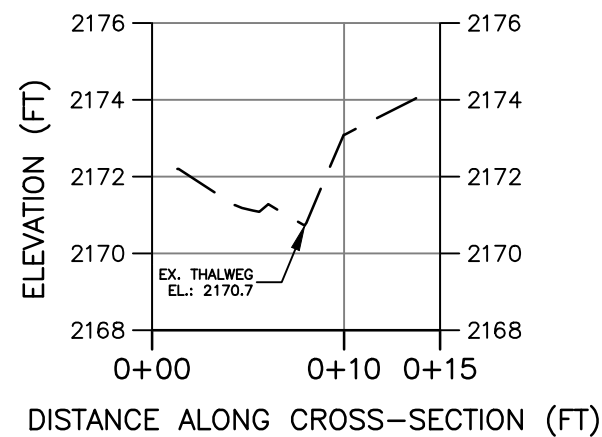
PENDING CROSSING

PHOTO TAKEN LOOKING DOWNSTREAM  
FROM UPSTREAM IMPACT LIMITS

PENDING CROSSING

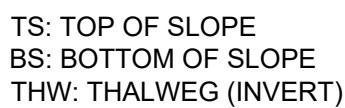
PHOTO TAKEN LOOKING UPSTREAM FROM  
DOWNSTREAM IMPACT LIMITS

## PRE-CROSSING



— — — EXISTING GRADE

**CROSS SECTION**  
SCALE: H: 1"=10'  
V: 1"=5'



AS-BUILT TABLE: S-A69 (1) CROSS SECTION A					
PRE-CROSSING				AS-BUILT	
PT. LOC.	NORTHING	EASTING	ELEV	VERT. DIFF.	HORZ. DIFF.
TS-L	13914249.47	1734655.67	2172.20		
BS-L	13914246.78	1734656.81	2171.25		
THW	13914245.18	1734657.49	2171.28		
BS-R	13914243.40	1734658.25	2170.76		
TS-R	13914241.52	1734659.59	2173.06		

Profile view graph showing ELEVATION (FT) on the Y-axis (ranging from 2170 to 2192) and CROSS-SECTION (FT) on the X-axis (ranging from 0+00 to 1+00). The profile is represented by a dashed line with vertical drop markers labeled with elevation values.

Cross-Section (FT)	Elevation (FT)
0+05	2189.7
0+41	2182.6
0+46	2180.7
0+59	2179.9
0+62	2178.5
0+68	2177.5
0+78	2174.9
0+97	2171.1

EXISTING STREAM PROFILE

**PROFILE**

**SCALE:** H: 1"=10'  
V: 1"=5'

CAD File No. \_\_\_\_\_  
 JZ \_\_\_\_\_  
 Drawn \_\_\_\_\_  
 GH \_\_\_\_\_  
 Checked \_\_\_\_\_  
 DW \_\_\_\_\_  
 Approved \_\_\_\_\_  
 NOTED \_\_\_\_\_  
 Scale: \_\_\_\_\_  
 SEPT. 2021 \_\_\_\_\_  
 Date: \_\_\_\_\_  
 112IC07157 \_\_\_\_\_  
 Project No. \_\_\_\_\_

**TETRA TECH, INC.**  
661 ANDERSEN DRIVE FOSTER PLAZA 7  
PITTSBURGH, PA 15220  
TEL: (412) 921-7090 FAX: (412) 921-4040  
E-Mail Address: [WWW.TETRA-TECH.COM](mailto:WWW.TETRA-TECH.COM)



**TETRA TECH**

[www.tetrattech.com](http://www.tetrattech.com)

OUNTAIN VALLEY PIPELINE, LLC  
O ENERGY DRIVE, 2ND FLOOR  
CANONSBURG, PA 15317

Profile PROFILE AND CROSS-SECTIONS  
BASELINE SURVEY  
CROSSING S-A69 (1) - UNNAMED TRIB.  
TO BIG BEAVER CREEK (MP 115.47)  
NICHOLAS COUNTY, WV

1  
Drawing No.

PRELIMINARY

The X-00A - Mustang / EX71167 - MP/Crossing Female/Vest Virginia NWS Crossing/Groesbeak/OH - Completed/Completed/2021-09-07 -- 9-149 STEWART TOPD\_LRP 118.6°S-149 -- WP 118.6 -- ZSSA/Lag  
The first date/time Col 07\_2021 = 3:53pm  
This record was created by jmlmccracker