

Baseline Assessment – Stream Attributes

Reach S-L1 (Pipeline ROW) Perennial Spread F Summers County, West Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	N/A – Perennial stream (not shadeable, slope >4%)
RBP Physical Characteristics Form	✓
Water Quality Data	N/A – No flow
RBP Habitat Form	✓
RBP Benthic Form	✓
Benthic Identification Sheet	N/A –No flow
Wolman Pebble Count	N/A – Dense vegetation
Reference Reach Software Pebble Count Data	N/A – Dense vegetation
Longitudinal Profile and Cross Sections	✓

*Modified RBP – No flow

37.668076°N, -80.72347°W



Photo Type: DS

Location, Orientation, Photographer Initials: Downstream View, AJ/MB

37.668076°N, -80.72347°W



Photo Type: US

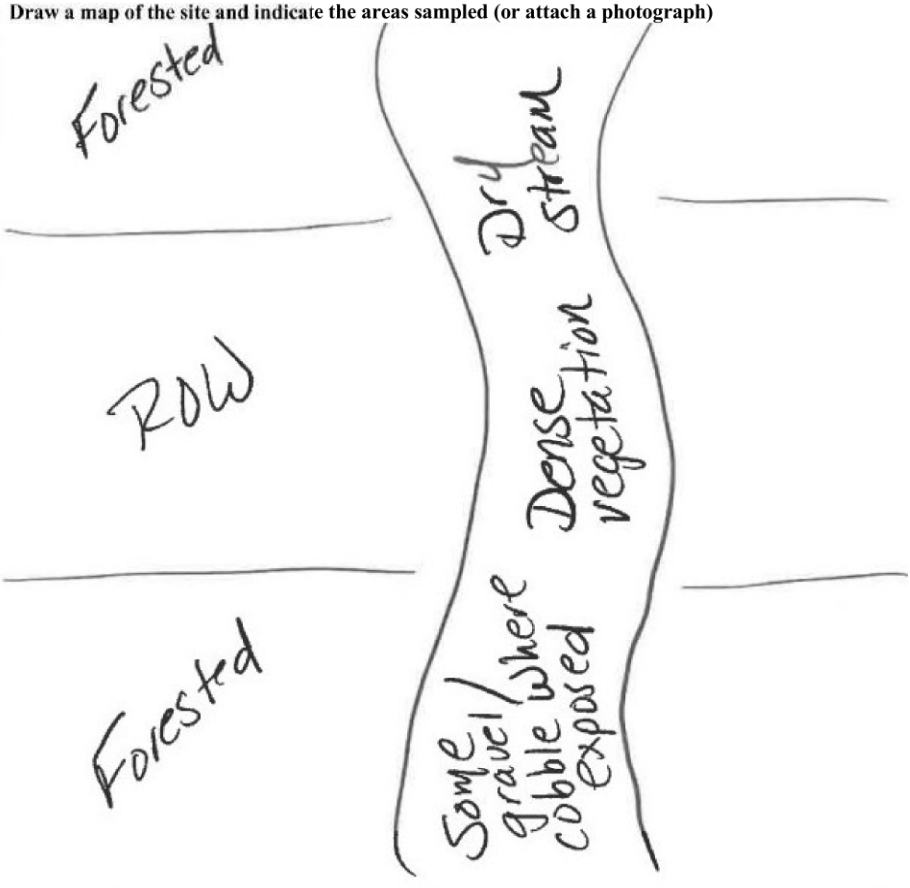
Location, Orientation, Photographer Initials: Upstream View, AJ/MB

"Q:\Charleston\2021 Projects\21-0244- MVP- STREAM AND WETLAND CONDITIONS ASSESSMENT AND SURVEY PLAN\002 - Pre-Crossing Monitoring\Spread F\S-L1"

USACE FILE NO./ Project Name: (v2.1, Sept 2015)				MOUNTAIN VALLEY PIPELINE				IMPACT COORDINATES: (in Decimal Degrees)				Lat.	37.668076				Lon.	-80.72347				WEATHER:				Sunny				DATE:				9/2/2021																									
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)												UNT to Kelly Creek (S-L1)												MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)																								Comments:											
STREAM IMPACT LENGTH:				76				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:				Perennial								Stream Classification:												Stream Classification:				0								Stream Classification:				0								Stream Classification:				0							
Percent Stream Channel Slope				4.14								Percent Stream Channel Slope												Percent Stream Channel Slope				0								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												Hydrology												Hydrology												Hydrology												Hydrology											
Biogeochemical Cycling												Biogeochemical Cycling												Biogeochemical Cycling												Biogeochemical Cycling												Biogeochemical Cycling											
Habitat												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															
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				0-1				1. Epifaunal Substrate/Available Cover				0-20				0-1				1. Epifaunal Substrate/Available Cover				0-20				0-1				1. Epifaunal Substrate/Available Cover				0-20				0-1				1. Epifaunal Substrate/Available Cover				0-20				0-1			
2. Embeddedness				0-20								2. Embeddedness				0-20								2. Embeddedness				0-20								2. Embeddedness				0-20								2. Embeddedness				0-20							
3. Velocity/ Depth Regime				0-20								3. Velocity/ Depth Regime				0-20								3. Velocity/ Depth Regime				0-20								3. Velocity/ Depth Regime				0-20								3. Velocity/ Depth Regime				0-20							
4. Sediment Deposition				0-20								4. Sediment Deposition				0-20								4. Sediment Deposition				0-20								4. Sediment Deposition				0-20								4. Sediment Deposition				0-20							
5. Channel Flow Status				0-20								5. Channel Flow Status				0-20								5. Channel Flow Status				0-20								5. Channel Flow Status				0-20								5. Channel Flow Status				0-20							
6. Channel Alteration				0-20								6. Channel Alteration				0-20								6. Channel Alteration				0-20								6. Channel Alteration				0-20								6. Channel Alteration				0-20							
7. Frequency of Riffles (or bends)				0-20								7. Frequency of Riffles (or bends)				0-20								7. Frequency of Riffles (or bends)				0-20								7. Frequency of Riffles (or bends)				0-20								7. Frequency of Riffles (or bends)				0-20							
8. Bank Stability (LB & RB)				0-20								8. Bank Stability (LB & RB)				0-20								8. Bank Stability (LB & RB)				0-20								8. Bank Stability (LB & RB)				0-20								8. Bank Stability (LB & RB)				0-20							
9. Vegetative Protection (LB & RB)				0-20								9. Vegetative Protection (LB & RB)				0-20								9. Vegetative Protection (LB & RB)				0-20								9. Vegetative Protection (LB & RB)				0-20								9. Vegetative Protection (LB & RB)				0-20							
10. Riparian Vegetative Zone Width (LB & RB)				0-20								10. Riparian Vegetative Zone Width (LB & RB)				0-20								10. Riparian Vegetative Zone Width (LB & RB)				0-20								10. Riparian Vegetative Zone Width (LB & RB)				0-20								10. Riparian Vegetative Zone Width (LB & RB)				0-20							
Total RBP Score				Marginal				67				Total RBP Score				Poor				0				Total RBP Score				Poor				0				Total RBP Score				Poor				0				Total RBP Score				Poor				0			
Sub-Total								0.335				Sub-Total								0				Sub-Total								0				Sub-Total								0				Sub-Total								0			
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)												CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)												CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)												CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)												CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)											
WVDEP Water Quality Indicators (General)												WVDEP Water Quality Indicators (General)												WVDEP Water Quality Indicators (General)												WVDEP Water Quality Indicators (General)												WVDEP Water Quality Indicators (General)											
Specific Conductivity								0-1				Specific Conductivity								0-1				Specific Conductivity								0-1				Specific Conductivity								0-1				Specific Conductivity								0-1			
100-199 - 85 points				0-90								100-199 - 85 points				0-90								100-199 - 85 points				0-90								100-199 - 85 points				0-90								100-199 - 85 points				0-90							
pH												pH												pH												pH																							

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME <u>UNT to Kelly Creek</u>		LOCATION <u>S-L1</u>
STATION # _____ RIVERMILE _____		STREAM CLASS <u>Perennial</u>
LAT <u>37.668076</u> LONG <u>-80.72347</u>		COUNTY <u>Summers</u>
STORET # _____		AGENCY <u>Edge/Potesta</u>
INVESTIGATORS <u>AJ/MB</u>		
FORM COMPLETED BY <u>AJ</u>		DATE <u>09/02/2021</u> TIME <u>2:40 PM</u>
REASON FOR SURVEY <u>Preliminary Assessment</u>		

WEATHER CONDITIONS	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Now</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> </div> <div> storm (heavy rain) rain (steady rain) showers (intermittent) %cloud cover _____ clear/sunny </div> </div> <p>_____ %</p> </div> <div style="width: 45%;"> <p>Past 24 hours</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;"> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> <div> storm (heavy rain) rain (steady rain) showers (intermittent) %cloud cover _____ clear/sunny </div> </div> <p>_____ %</p> </div> </div> <div style="margin-top: 10px;"> <p>Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Air Temperature <u>24</u> °C</p> <p>Other _____</p> </div>
SITE LOCATION/MAP	<p>Draw a map of the site and indicate the areas sampled (or attach a photograph)</p> 
STREAM CHARACTERIZATION	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal</p> <p>Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input checked="" type="checkbox"/> Other <u>unknown</u> </p> </div> <div style="width: 45%;"> <p>Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater</p> <p>Catchment Area _____ km²</p> </div> </div>

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input type="checkbox"/> Residential	Local Watershed NPS Pollution <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input checked="" type="checkbox"/> Obvious sources Local Watershed Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input checked="" type="checkbox"/> Grasses <input type="checkbox"/> Herbaceous Dominant species present _____	
INSTREAM FEATURES	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Estimated Reach Length _____ m Estimated Stream Width _____ m Sampling Reach Area _____ m² Area in km² (m²x1000) _____ km² Estimated Stream Depth _____ m Surface Velocity (at thalweg) _____ m/sec Stream Dry <input checked="" type="checkbox"/> </div> <div style="width: 50%;"> Canopy Cover <input checked="" type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded High Water Mark _____ m Proportion of Reach Represented by Stream Morphology Types Riffle _____ % Run _____ % Pool _____ % Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No </div> </div>	
LARGE WOODY DEBRIS	LWD _____ m ² Density of LWD _____ m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present <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 _____ %	
WATER QUALITY	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Temperature _____ °C Specific Conductance _____ Dissolved Oxygen _____ pH _____ Turbidity _____ WQ Instrument Used <u>no water</u> </div> <div style="width: 50%;"> Water Odors <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____ Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globs Flecks <input type="checkbox"/> None <input type="checkbox"/> Other _____ Turbidity (if not measured) <input 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>	
SEDIMENT/ SUBSTRATE	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Odors <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 _____ Oils <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse </div> <div style="width: 50%;"> Deposits <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Relict shells <input type="checkbox"/> Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? <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			Detritus	sticks, wood, coarse plant materials (CPOM)	80
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")	40			
Gravel	2-64 mm (0.1"-2.5")	50	Muck-Mud	black, very fine organic (FPOM)	
Sand	0.06-2mm (gritty)	10			
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)		Marl	grey, shell fragments	

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

STREAM NAME UNT to Kelly Creek		LOCATION S-L1	
STATION # _____ RIVERMILE _____		STREAM CLASS Intermittent	
LAT 37.668076 LONG -80.72347		COUNTY Summers	
STORET # _____		AGENCY Edge/Potesta	
INVESTIGATORS AJ/MB			
FORM COMPLETED BY AJ		DATE 09/02/2021 TIME 2:40 PM AM PM	REASON FOR SURVEY Preliminary Assessment

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover <input type="checkbox"/> N/A SCORE 0	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). 20 19 18 17 16	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). 15 14 13 12 11	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. 10 9 8 7 6	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. 5 4 3 2 1 0
2. Embeddedness SCORE 7	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. 20 19 18 17 16	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. 15 14 13 12 11	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. 10 9 8 7 6	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. 5 4 3 2 1 0
3. Velocity/Depth Regime <input type="checkbox"/> N/A SCORE 0	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.) 20 19 18 17 16	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). 15 14 13 12 11	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). 10 9 8 7 6	Dominated by 1 velocity/depth regime (usually slow-deep). 5 4 3 2 1 0
4. Sediment Deposition SCORE 5	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. 20 19 18 17 16	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. 15 14 13 12 11	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. 10 9 8 7 6	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. 5 4 3 2 1 0
5. Channel Flow Status <input type="checkbox"/> N/A SCORE 0	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. 20 19 18 17 16	Water fills >75% of the available channel; or <25% of channel substrate is exposed. 15 14 13 12 11	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. 10 9 8 7 6	Very little water in channel and mostly present as standing pools. 5 4 3 2 1 0

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

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration SCORE <u>16</u>	Channelization or dredging absent or minimal; stream with normal pattern.	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.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends) <input type="checkbox"/> N/A SCORE <u>0</u>	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.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. SCORE <u>9</u> SCORE <u>9</u>	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) SCORE <u>6</u> SCORE <u>6</u>	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.	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.	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.	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.
	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone) SCORE <u>5</u> SCORE <u>4</u>	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 67

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME <u>UNT to Kelly Creek</u>		LOCATION <u>S-L1</u>
STATION # <u> </u> RIVERMILE <u> </u>		STREAM CLASS <u>Intermittent</u>
LAT <u>37.668076</u> LONG <u>-80.72347</u>		COUNTY <u>Summers</u>
STORET # <u> </u>		AGENCY <u>Edge/Potesta</u>
INVESTIGATORS <u>AJ/MB</u>		LOT NUMBER <u> </u>
FORM COMPLETED BY <u>AJ</u>		DATE <u>09/02/2021</u> TIME <u>2:40 PM</u>
		REASON FOR SURVEY <u>Preliminary Assessment</u>

HABITAT TYPES	Indicate the percentage of each habitat type present <input checked="" type="checkbox"/> Cobble <u>10</u> % <input type="checkbox"/> Snags <u> </u> % <input type="checkbox"/> Vegetated Banks <u> </u> % <input checked="" type="checkbox"/> Sand <u>10</u> % <input type="checkbox"/> Submerged Macrophytes <u> </u> % <input checked="" type="checkbox"/> Other (<u>in stream vegetation</u>) <u>80</u> %
SAMPLE COLLECTION	Gear used <input type="checkbox"/> D-frame <input type="checkbox"/> kick-net <input type="checkbox"/> Other <u> </u> How were the samples collected? <input type="checkbox"/> wading <input type="checkbox"/> from bank <input type="checkbox"/> from boat Indicate the number of jabs/kicks taken in each habitat type. <input type="checkbox"/> Cobble <u> </u> <input type="checkbox"/> Snags <u> </u> <input type="checkbox"/> Vegetated Banks <u> </u> <input type="checkbox"/> Sand <u> </u> <input type="checkbox"/> Submerged Macrophytes <u> </u> <input type="checkbox"/> Other (<u> </u>) <u> </u>
GENERAL COMMENTS	No sampled. Dry Stream.

QUALITATIVE LISTING OF AQUATIC BIOTA

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

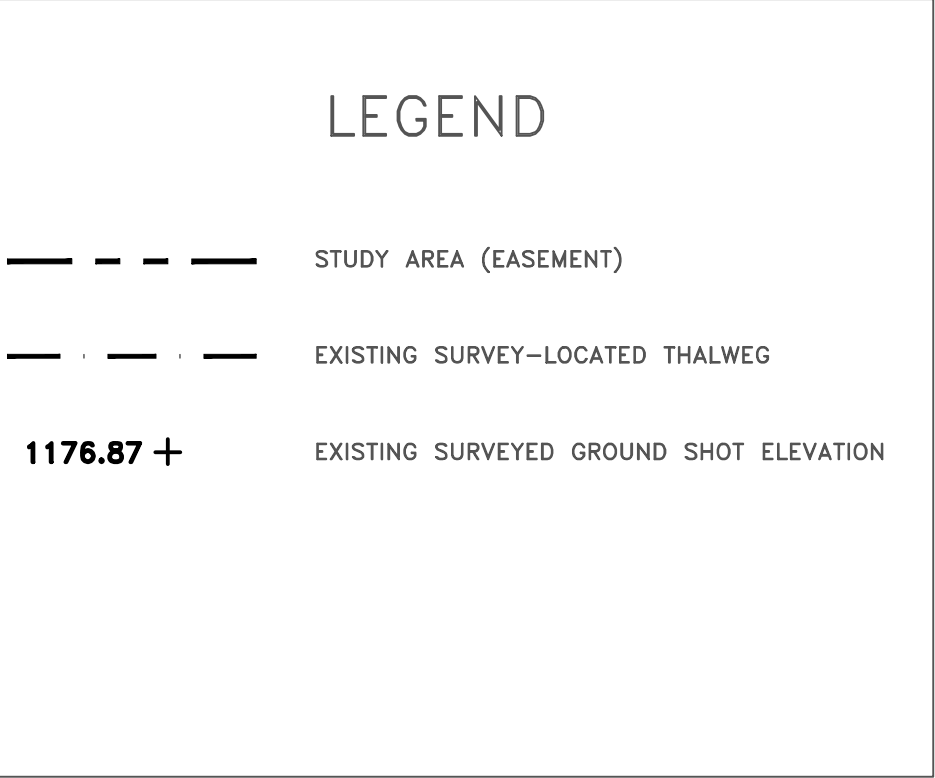
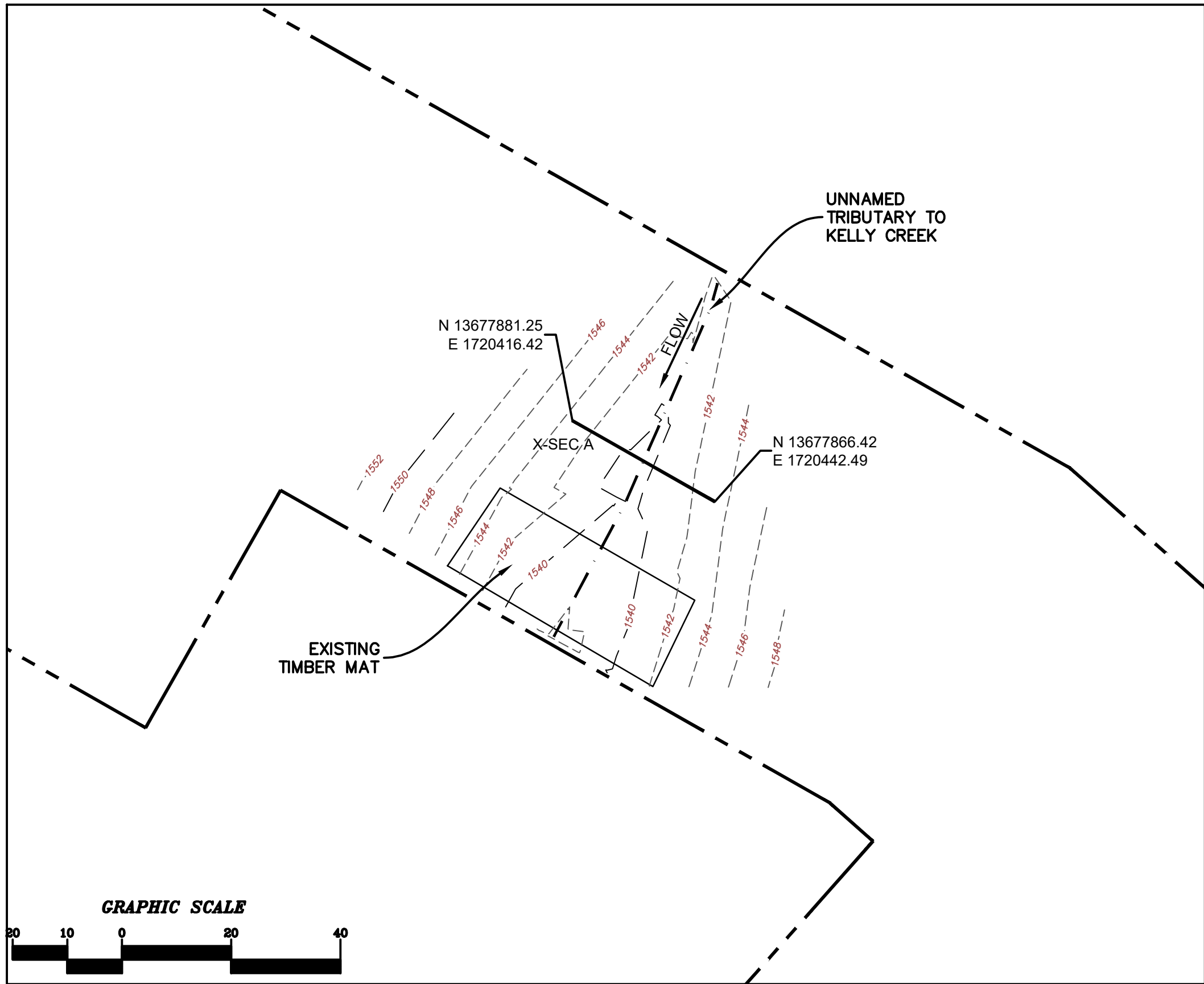
Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

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)

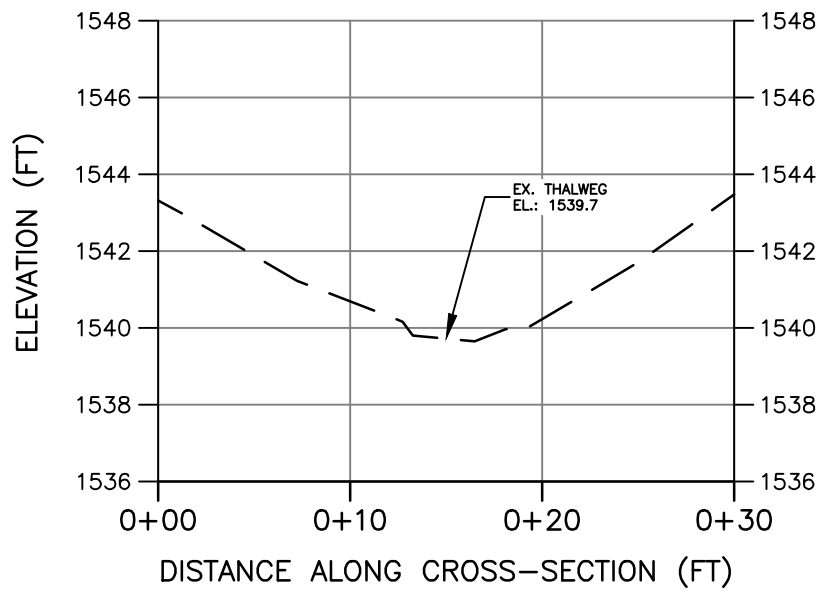
Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
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						

This drawing was prepared by Tetra Tech, Inc. for the purpose of providing information only. It is not to be used for construction or any other purpose without the written consent of Tetra Tech, Inc. The information contained herein is confidential and proprietary to Tetra Tech, Inc. and is not to be disclosed to any third party without the written consent of Tetra Tech, Inc. The information contained herein is not to be used for any purpose other than that for which it was prepared. The information contained herein is not to be used for any purpose other than that for which it was prepared. The information contained herein is not to be used for any purpose other than that for which it was prepared.

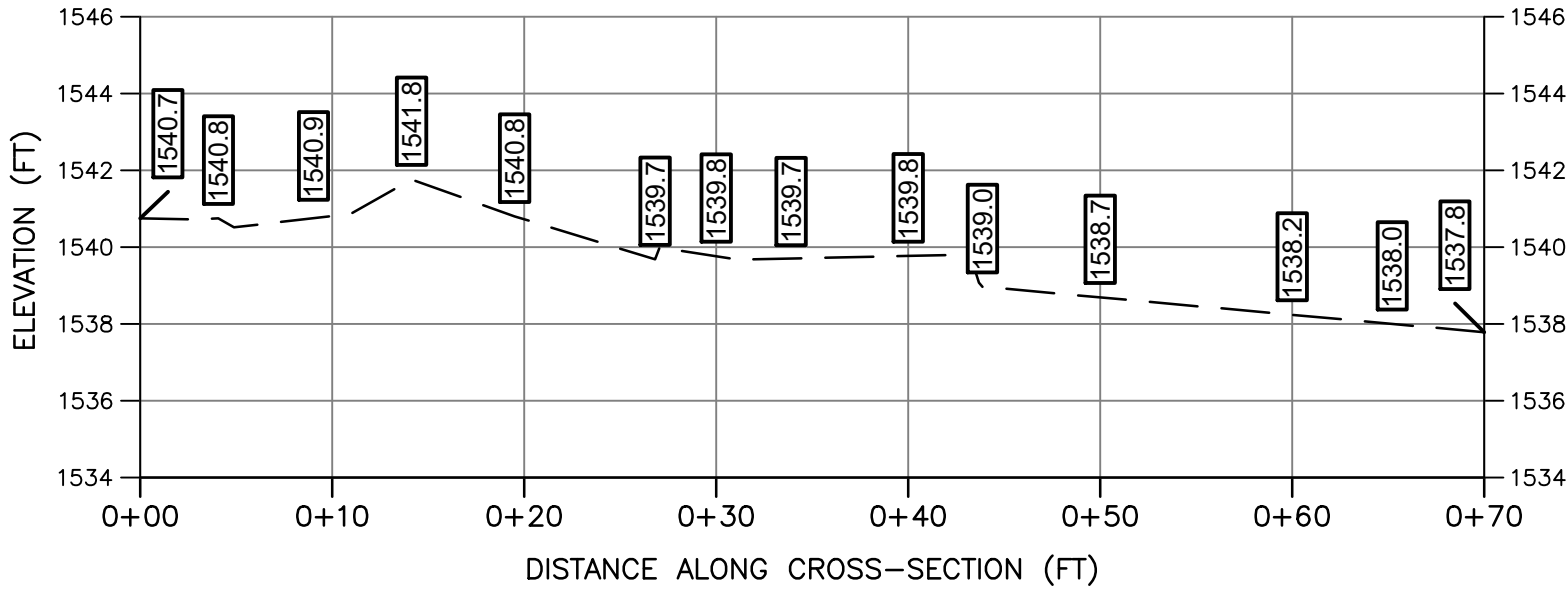


- SURVEY NOTES:
- THIS MAP HAS BEEN ORIENTED TO NAD 1983 UTM ZONE 17N, AND VERTICALLY TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), USING REAL TIME DGPS. FIELD LOCATIONS WERE COMPLETED ON SEPTEMBER 13, 2021.
 - EASEMENT LINES SHOWN ON PLAN VIEW WERE PROVIDED BY MOUNTAIN VALLEY PIPELINE.
 - 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.
 - ALL SECTION VIEWS SHOWN LEFT TO RIGHT FACING DOWNSTREAM.
 - POST-CROSSING SURVEY INFORMATION SHOWN IN RED. DATA PENDING.
 - POST-CROSSING SURVEY POINTS FOR CROSS SECTIONS AND THALWEG ARE PROJECTED ONTO PRE-CROSSING SECTION AND PROFILE VIEWS FOR COMPARISON.

S-L1 BASELINE CROSS-SECTION A
PIPELINE

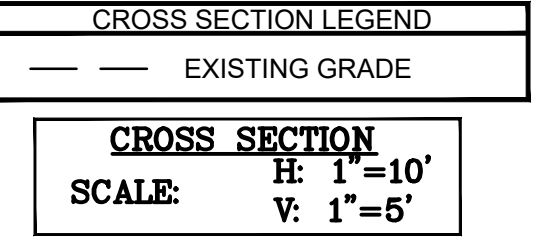
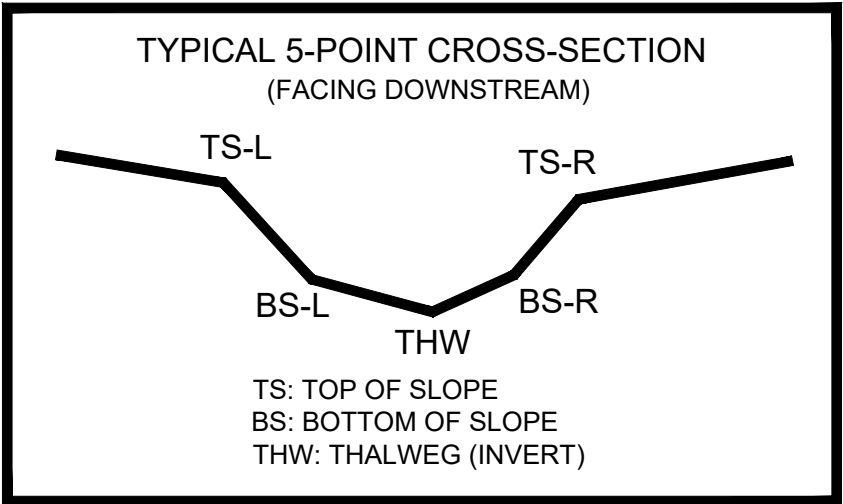


S-L1 BASELINE THALWEG PROFILE



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

AS-BUILT TABLE: S-L1 CROSS SECTION A					
PT. LOC.	PRE-CROSSING			AS-BUILT	
	NORTHING	EASTING	ELEV.	VERT. DIFF.	HORZ. DIFF.
TS-L	13677865.7114	1720428.0760	1539.899'		
BS-L	13677865.4798	1720427.3060	1539.036'		
THW	13677865.9545	1720426.0059	1538.968'		
BS-R	13677866.5339	1720425.3337	1539.143'		
TS-R	13677866.9305	1720424.8136	1540.072'		



NOTE: ALL SECTIONS VIEWS SHOWN LEFT TO RIGHT FACING DOWNSTREAM.

PRE-CROSSING PHOTOS



PHOTO TAKEN LOOKING DOWNSTREAM FROM UPSTREAM IMPACT LIMITS



PHOTO TAKEN LOOKING UPSTREAM FROM DOWNSTREAM IMPACT LIMITS

POST-CROSSING PHOTOS

PENDING CROSSING

PHOTO TAKEN LOOKING DOWNSTREAM FROM UPSTREAM IMPACT LIMITS

PENDING CROSSING

PHOTO TAKEN LOOKING UPSTREAM FROM DOWNSTREAM IMPACT LIMITS

PRE-CROSSING

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

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



MOUNTAIN VALLEY PIPELINE, LLC
2200 ENERGY DRIVE, 2ND FLOOR
CANONSBURG, PA 15317

Client
MOUNTAIN VALLEY PIPELINE, LLC
2200 ENERGY DRIVE, 2ND FLOOR
CANONSBURG, PA 15317
Title
PROFILE AND CROSS-SECTIONS
BASELINE SURVEY
CROSSING S-L1 - UNNAMED TRIBUTARY
TO KELLY CREEK (MP 172.57)
SUMMERS COUNTY, WV

1
Drawing No.