Baseline Assessment – Stream Attributes

Reach S-B3a (Pipeline ROW)

Perennial
Spread A
Harrison County, West Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	N/A – Perennial stream
RBP Physical Characteristics Form	✓
Water Quality Data	✓
RBP Habitat Form	✓
RBP Benthic Form	✓
Benthic Identification Sheet	N/A – Lack of habitat for sufficient benthic sampling
Wolman Pebble Count	✓
Reference Reach Software Pebble Count Data	✓
Longitudinal Profile and Cross Sections	✓

Spread A Stream S-B3a (Pipeline ROW) Harrison County

Photo Type: DS, US View
Location, Orientation, Photographer Initials: Downstream Edge of ROW, Upstream View, SM/JM
Lat: 39.358871 Long: -80.493707

Spread A Stream S-B3a (Pipeline ROW) Harrison County

Photo Type: DS, DS View
Location, Orientation, Photographer Initials: Downstream Edge of ROW, Downstream View, SM/JM
Lat: 39.358871 Long: -80.493707

Spread A Stream S-B3a (Pipeline ROW) Harrison County

Photo Type: US View at Center
Location, Orientation, Photographer Initials: Center ROW, Upstream View, SM/JM
Lat: 39.358871 Long: -80.493707

Spread A Stream S-B3a (Pipeline ROW) Harrison County

Photo Type: DS View at Center
Location, Orientation, Photographer Initials: ROW Center, Downstream View, SM/JM
Lat: 39.358871 Long: -80.493707

Spread A Stream S-B3a (Pipeline ROW) Harrison County

Photo Type: US, US View
Location, Orientation, Photographer Initials: Upstream Edge of ROW, Upstream View, SM/JM
Lat: 39.358871 Long: -80.493707

Spread A Stream S-B3a (Pipeline ROW) Harrison County

Photo Type: US, DS View
Location, Orientation, Photographer Initials: Upstream Edge of ROW, Downstream View, SM/JM
Lat: 39.358871 Long: -80.493707

Spread A Stream S-B3a (Pipeline ROW) Harrison County

Photo Type: Riffle, DS View
Location, Orientation, Photographer Initials: Upstream of Riffle, Downstream View, SM/JM
Lat: 39.358871 Long: -80.493707

Spread A Stream S-B3a (Pipeline ROW) Harrison County

Photo Type: Riffle, US View
Location, Orientation, Photographer Initials: Downstream of Riffle, Upstream View, SM/JM
Lat: 39.358871 Long: -80.493707

Spread A Stream S-B3a (Pipeline ROW) Harrison County

Photo Type: Pool, DS View
Location, Orientation, Photographer Initials: Upstream of Pool, Downstream View, SM/JM
Lat: 39.358871 Long: -80.493707

Spread A Stream S-B3a (Pipeline ROW) Harrison County

Photo Type: Pool, US View
Location, Orientation, Photographer Initials: Downstream of Pool, Upstream View, SM/JM
Lat: 39.358871 Long: -80.493707

USACE FILE NO./ Project Name: (v2.1, Sept 2015)	Mountain Valley Pipeline		IMPACT COORDINATES: (in Decimal Degrees)	Lat.	39.358871	Lon.	-80.493707	WEATHER:	Sunny	DATE: 8/24/2021
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size {acreage}, unaltered or impairments)		S-B3a Pipeline ROW			MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size {acreage}, unaltered or impairments)					Comments:
STREAM IMPACT LENGTH:	97	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)

Stream Classification:	Perennial		
Percent Stream Channel Slope			0.2
HGM Score (attach data forms):			
			Average
Hydrology			0
Biogeochemical Cycling			
Habitat			
PART I - Physical, Chemical and Biological Indicators			
	Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams classifications)			
USEPA RBP (High Gradient Data Sheet)			
1. Epifaunal Substrate/Available Cover	0-20	0-1	12
2. Embeddedness	0-20		8
3. Velocity/ Depth Regime	0-20		7
4. Sediment Deposition	0-20		8
5. Channel Flow Status	0-20		14
6. Channel Alteration	0-20		20
7. Frequency of Riffles (or bends)	0-20		8
8. Bank Stability (LB & RB)	0-20		14
9. Vegetative Protection (LB & RB)	0-20		20
10. Riparian Vegetative Zone Width (LB & RB)	0-20		11
Total RBP Score	Suboptimal		122
Sub-Total			0.61
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WVDEP Water Quality Indicators (General)			
Specific Conductivity		0-1	
100-199 - 85 points	0-90		142
pH			
6.0-8.0 = 80 points	0-80		7.2
DO			
>5.0 = 30 points	10-30		7.8
Sub-Total			0.975
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)			
0	0-100	0-1	
Sub-Total			0

PART II - Index and Unit Score		
Index	Linear Feet	Unit Score
0.793	97	76.8725

Column No. 2- Mitigation Existing Condition - Baseline (Credit)

Stream Classification:			
Percent Stream Channel Slope			
HGM Score (attach data forms):			
			Average
Hydrology			0
Biogeochemical Cycling			
Habitat			
PART I - Physical, Chemical and Biological Indicators			
	Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams classifications)			
USEPA RBP (Low Gradient Data Sheet)			
1. Epifaunal Substrate/Available Cover	0-20	0-1	
2. Pool Substrate Characterization	0-20		
3. Pool Variability	0-20		
4. Sediment Deposition	0-20		
5. Channel Flow Status	0-20		
6. Channel Alteration	0-20		
7. Channel Sinuosity	0-20		
8. Bank Stability (LB & RB)	0-20		
9. Vegetative Protection (LB & RB)	0-20		
10. Riparian Vegetative Zone Width (LB & RB)	0-20		
Total RBP Score	Poor		0
Sub-Total			0
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WVDEP Water Quality Indicators (General)			
Specific Conductivity		0-1	
	0-90		
pH			
	5-90		
DO			
	10-30		
Sub-Total			0
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)			
	0-100	0-1	
Sub-Total			0

PART II - Index and Unit Score		
Index	Linear Feet	Unit Score
0	0	0

Column No. 3- Mitigation Projected at Five Years Post Completion (Credit)

Stream Classification:	0		
Percent Stream Channel Slope			0
HGM Score (attach data forms):			
			Average
Hydrology			0
Biogeochemical Cycling			
Habitat			
PART I - Physical, Chemical and Biological Indicators			
	Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams classifications)			
USEPA RBP (High Gradient Data Sheet)			
1. Epifaunal Substrate/Available Cover	0-20	0-1	
2. Embeddedness	0-20		
3. Velocity/ Depth Regime	0-20		
4. Sediment Deposition	0-20		
5. Channel Flow Status	0-20		
6. Channel Alteration	0-20		
7. Frequency of Riffles (or bends)	0-20		
8. Bank Stability (LB & RB)	0-20		
9. Vegetative Protection (LB & RB)	0-20		
10. Riparian Vegetative Zone Width (LB & RB)	0-20		
Total RBP Score	Poor		0
Sub-Total			0
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WVDEP Water Quality Indicators (General)			
Specific Conductivity		0-1	
	0-90		
pH			
	5-90		
DO			
	10-30		
Sub-Total			0
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)			
	0-100	0-1	
Sub-Total			0

PART II - Index and Unit Score		
Index	Linear Feet	Unit Score
0	0	0

Column No. 4- Mitigation Projected at Ten Years Post Completion (Credit)

Stream Classification:	0		
Percent Stream Channel Slope			0
HGM Score (attach data forms):			
			Average
Hydrology			0
Biogeochemical Cycling			
Habitat			
PART I - Physical, Chemical and Biological Indicators			
	Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams classifications)			
USEPA RBP (High Gradient Data Sheet)			
1. Epifaunal Substrate/Available Cover	0-20	0-1	
2. Embeddedness	0-20		
3. Velocity/ Depth Regime	0-20		
4. Sediment Deposition	0-20		
5. Channel Flow Status	0-20		
6. Channel Alteration	0-20		
7. Frequency of Riffles (or bends)	0-20		
8. Bank Stability (LB & RB)	0-20		
9. Vegetative Protection (LB & RB)	0-20		
10. Riparian Vegetative Zone Width (LB & RB)	0-20		
Total RBP Score	Poor		0
Sub-Total			0
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WVDEP Water Quality Indicators (General)			
Specific Conductivity		0-1	
	0-90		
pH			
	5-90		
DO			
	10-30		
Sub-Total			0
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)			
	0-100	0-1	
Sub-Total			0

PART II - Index and Unit Score		
Index	Linear Feet	Unit Score
0	0	0

Column No. 5- Mitigation Projected at Maturity (Credit)

Stream Classification:	0		
Percent Stream Channel Slope			0
HGM Score (attach data forms):			
			Average
Hydrology			0
Biogeochemical Cycling			
Habitat			
PART I - Physical, Chemical and Biological Indicators			
	Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams classifications)			
USEPA RBP (High Gradient Data Sheet)			
1. Epifaunal Substrate/Available Cover	0-20	0-1	
2. Embeddedness	0-20		
3. Velocity/ Depth Regime	0-20		
4. Sediment Deposition	0-20		
5. Channel Flow Status	0-20		
6. Channel Alteration	0-20		
7. Frequency of Riffles (or bends)	0-20		
8. Bank Stability (LB & RB)	0-20		
9. Vegetative Protection (LB & RB)	0-20		
10. Riparian Vegetative Zone Width (LB & RB)	0-20		
Total RBP Score	Poor		0
Sub-Total			0
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WVDEP Water Quality Indicators (General)			
Specific Conductivity		0-1	
	0-90		
pH			
	5-90		
DO			
	10-30		
Sub-Total			0
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)			
	0-100	0-1	
Sub-Total			0

PART II - Index and Unit Score		
Index	Linear Feet	Unit Score
0	0	0

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-B3a	LOCATION Harrison County
STATION #________ RIVERMILE________	STREAM CLASS Perennial
LAT 39.358871 LONG -80.493707	RIVER BASIN None
STORET #	AGENCY WVDEP
INVESTIGATORS SM JM	
FORM COMPLETED BY SM	DATE 08-24-21 TIME 9:15 — REASON FOR SURVEY Baseline Assessment

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☑
☐	rain (steady rain)	☑
☐	showers (intermittent)	☑
____% ☐	%cloud cover	☑ 30 %
☑	clear/sunny	☐

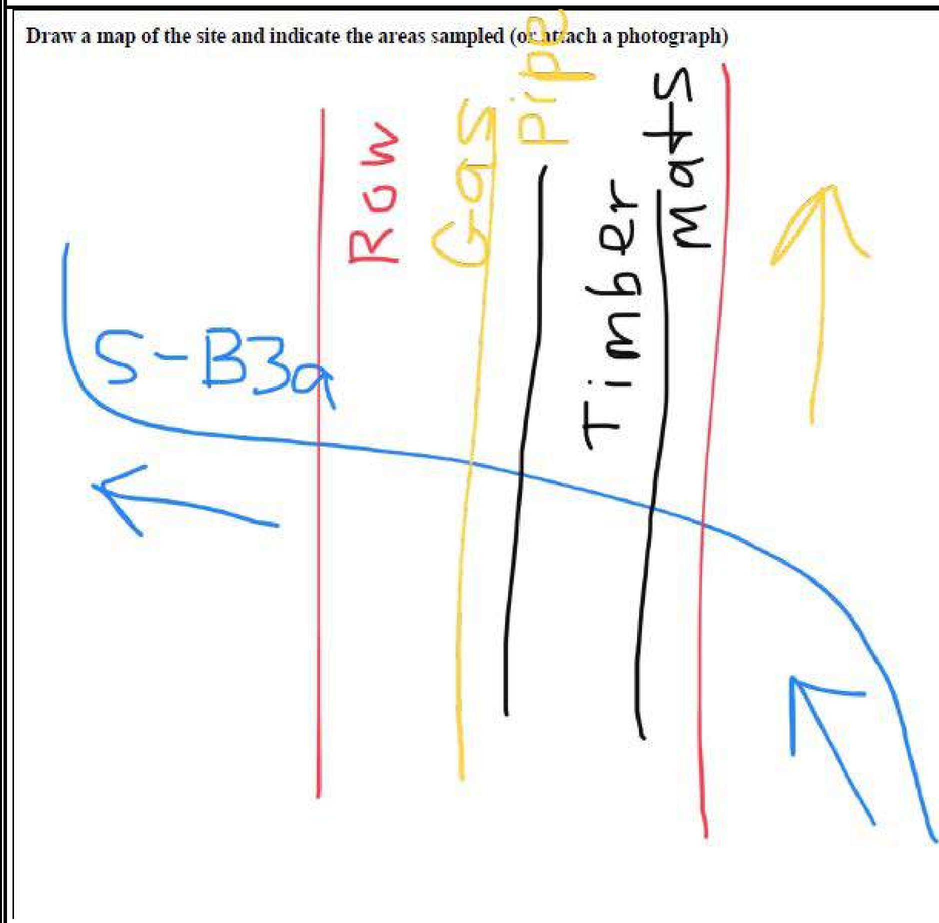
Has there been a heavy rain in the last 7 days?
☐ Yes ☐ No

Air Temperature 32.2 °C

Other________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
☑ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☑ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☑ Mixture of origins
☐ Other__________

Catchment Area__________km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☑ Forest ☐ Commercial
☐ Field/Pasture ☐ Industrial
☐ Agricultural ☐ Other ________
☐ Residential

Local Watershed NPS Pollution
☑ No evidence ☐ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☑ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☐ Shrubs ☐ Grasses ☑ Herbaceous

Dominant species present Verbasin, alternifolia, impatiens capensis

INSTREAM FEATURES

Estimated Reach Length 19.2024 m

Estimated Stream Width 7.40664 m

Sampling Reach Area 142.2253 m^2

Area in km² (m^2x1000) - km^2

Estimated Stream Depth 0.1524 m

Surface Velocity (at thalweg) 0.2 m/sec

Canopy Cover
☑ Partly open ☐ Partly shaded ☐ Shaded

High Water Mark 0.3302 m

Proportion of Reach Represented by Stream Morphology Types
Riffle 5 % Run 35 %
Pool 60 %

Channelized ☐ Yes ☑ No

Dam Present ☐ Yes ☑ No

LARGE WOODY DEBRIS

LWD 5 m^2

Density of LWD 2.5 m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☑ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

Dominant species present Nasturtium officinale

Portion of the reach with aquatic vegetation 20 %

WATER QUALITY (DS, US)

Temperature U23.9D24.0 ^{0} C

Specific Conductance U141D142us/cm

Dissolved Oxygen U7.95D7.80mg/L

pH U7.20D7.20

Turbidity -

WQ Instrument Used YSI

Water Odors
☑ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other ________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs Flecks
☑ None ☐ Other ________

Turbidity (if not measured)
☑ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other ________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☑ None
☐ Other ________

Oils
☑ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☑ Other none

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☑ No

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)	3
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	17	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	64			
Sand	0.06-2mm (gritty)	19	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	0			
Clay	< 0.004 mm (slick)	0			

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

STREAM NAME S-B3a	LOCATION Harrison County
STATION #__________ RIVERMILE__________	STREAM CLASS Perennial
LAT 39.358871 LONG -80.493707	RIVER BASIN None
STORET #	AGENCY WVDEP
INVESTIGATORS SM JM	
FORM COMPLETED BY SM	DATE 08-24-21 TIME 9:15 AM PM
REASON FOR SURVEY Baseline Assessment	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category: Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	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 not new fall and not 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.
SCORE 12	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	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.
SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	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).
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	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.
SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	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.
SCORE 14	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Notes:

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

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category: Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	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.
SCORE 20	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)	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.
SCORE 8	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.	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.
SCORE 7	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 7	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	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.
SCORE 10	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 10	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	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.
SCORE 7	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 4	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 122

Notes:

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME S-B3a	LOCATION Harrison County
STATION #________ RIVERMILE________	STREAM CLASS Perennial
LAT 39.358871 LONG -80.493707	RIVER BASIN None
STOREET #	AGENCY WVDEP
INVESTIGATORS SM JM	LOT NUMBER
FORM COMPLETED BY SM	DATE 08-24-21 TIME 9:15
REASON FOR SURVEY Baseline Assessment	

HABITAT TYPES	**Indicate the percentage of each habitat type present** ☐Cobble____% ☐Snags____% ☐Vegetated Banks____% ☐Sand____% ☐Submerged Macrophytes____% ☐Other ( )____%
SAMPLE COLLECTION	**Gear used** ☐D-frame ☐kick-net ☐Other ________ **How were the samples collected?** ☐wading ☐from bank ☐from boat **Indicate the number of jabs/kicks taken in each habitat type.** ☐Cobble____ ☐Snags____ ☐Vegetated Banks____ ☐Sand____ ☐Submerged Macrophytes____ ☐Other ( )____
GENERAL COMMENTS	At the time of the stream assessment, a benthic sample could not be collected. Not enough benthic habitat.

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)

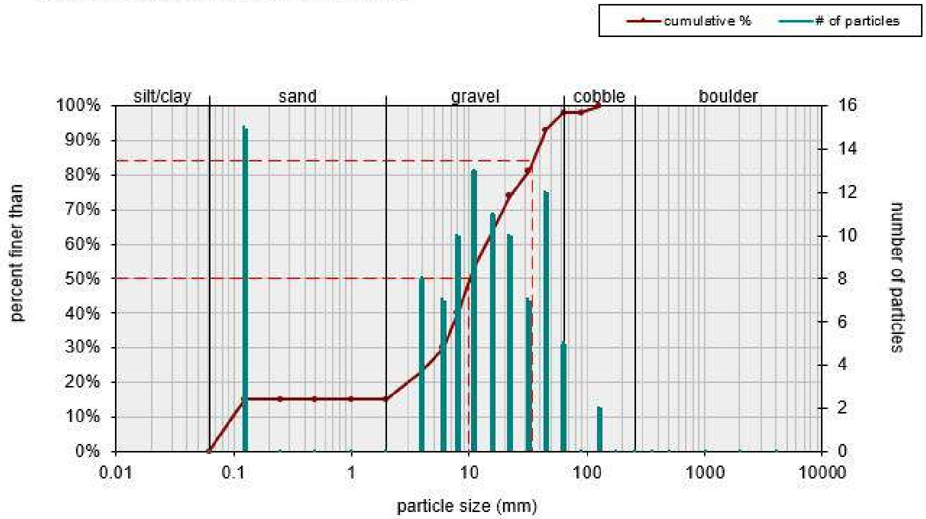
Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
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: Harrison
Stream ID: S-B3a Pipeline ROW
Stream Name: Rockcamp Run
HUC Code:
Basin:
Survey Date: 8/24/2021
Surveyors: JM SM
Type: Bankfull Channel

PEBBLE COUNT							
Inches	PARTICLE	Millimeters		Particle Count	Total #	Item %	% Cum
	Silt/Clay	< .062	S/C		0	0.00	0.00
	Very Fine	.062-.125	SAND		15	15.00	15.00
	Fine	.125-.25			0	0.00	15.00
	Medium	.25-.5			0	0.00	15.00
	Coarse	.50-1.0			0	0.00	15.00
.04-.08	Very Coarse	1.0-2			0	0.00	15.00
.08 -.16	Very Fine	2 -4	GRAVEL		8	8.00	23.00
.16 - .22	Fine	4 -5.7			7	7.00	30.00
.22 - .31	Fine	5.7 - 8			10	10.00	40.00
.31 - .44	Medium	8 -11.3			13	13.00	53.00
.44 - .63	Medium	11.3 - 16			11	11.00	64.00
.63 - .89	Coarse	16 -22.6			10	10.00	74.00
.89 - 1.26	Coarse	22.6 - 32			7	7.00	81.00
1.26 - 1.77	Vry Coarse	32 - 45			12	12.00	93.00
1.77 -2.5	Vry Coarse	45 - 64			5	5.00	98.00
2.5 - 3.5	Small	64 - 90	COBBLE		0	0.00	98.00
3.5 - 5.0	Small	90 - 128			2	2.00	100.00
5.0 - 7.1	Large	128 - 180			0	0.00	100.00
7.1 - 10.1	Large	180 - 256			0	0.00	100.00
10.1 - 14.3	Small	256 - 362	BOULDER		0	0.00	100.00
14.3 - 20	Small	362 - 512			0	0.00	100.00
20 - 40	Medium	512 - 1024			0	0.00	100.00
40 - 80	Large	1024 -2048			0	0.00	100.00
80 - 160	Vry Large	2048 -4096			0	0.00	100.00
	Bedrock		BDRK		0	0.00	100.00
				Totals:	100		
	Total Tally:						

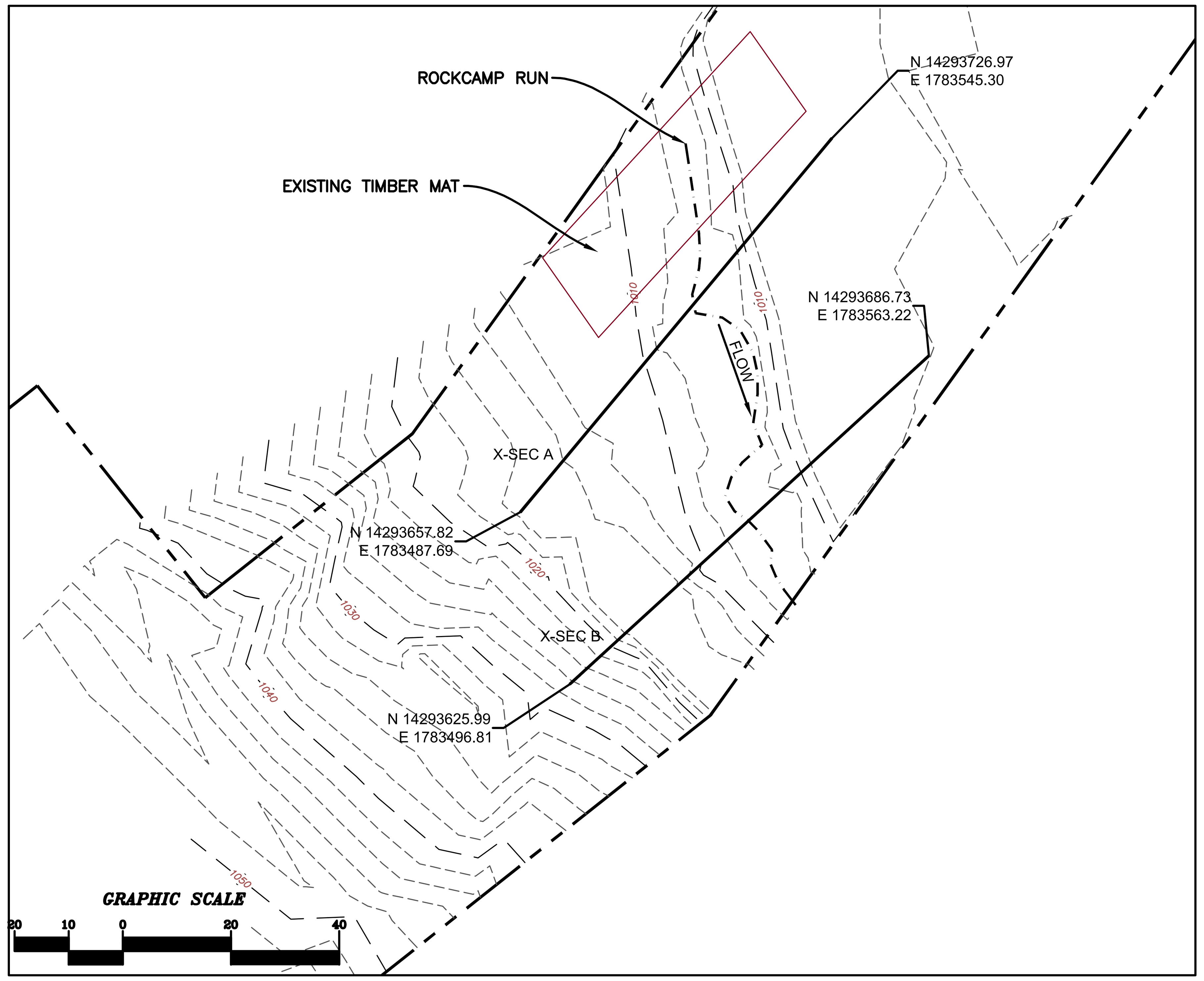
Bankfull Channel Pebble Count, S-B3a



Size (mm)		
D16	2.2	3.4
D35	6.9	12
D50	10	17
D65	17	20
D84	35	29
D95	52	39

Size Distribution	
mean	8.8
dispersion	4.0
skewness	-0.05

Type	
silt/clay	0%
sand	15%
gravel	83%
cobble	2%
boulder	0%



S-B3A

NORTH

LEGEND

— · — · — STUDY AREA (EASEMENT)

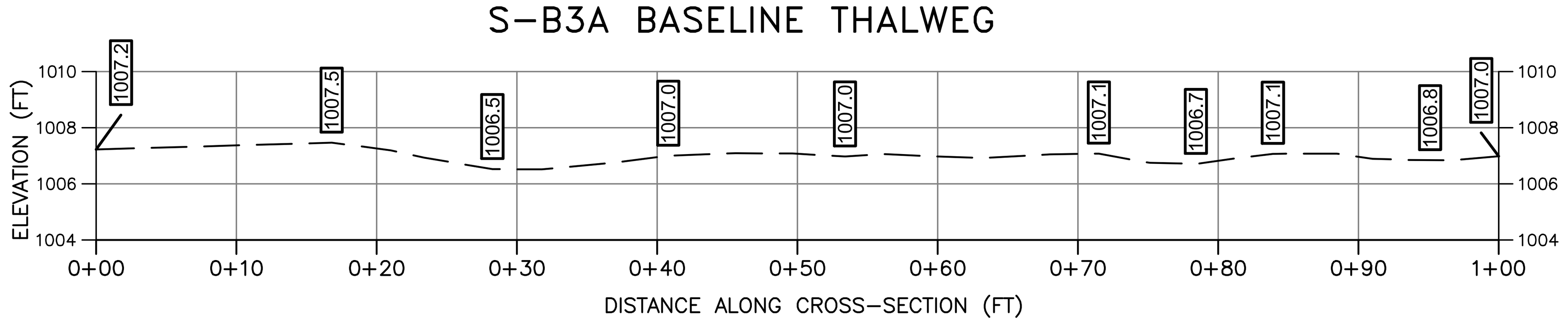
— — — EXISTING SURVEY-LOCATED THALWEG

1176.87 + EXISTING SURVEYED GROUND SHOT ELEVATION

SURVEY NOTES:

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 AUGUST 24, 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.

S-B3A BASELINE THALWEG



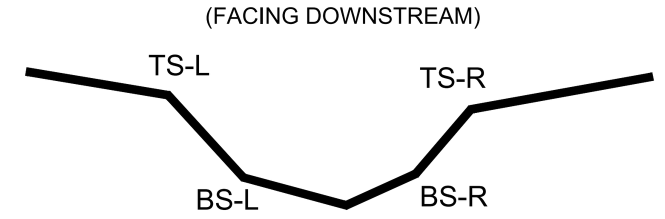
PROFILE LEGEND

EXISTING STREAM PROFILE INVERT ALONG THALWEG

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

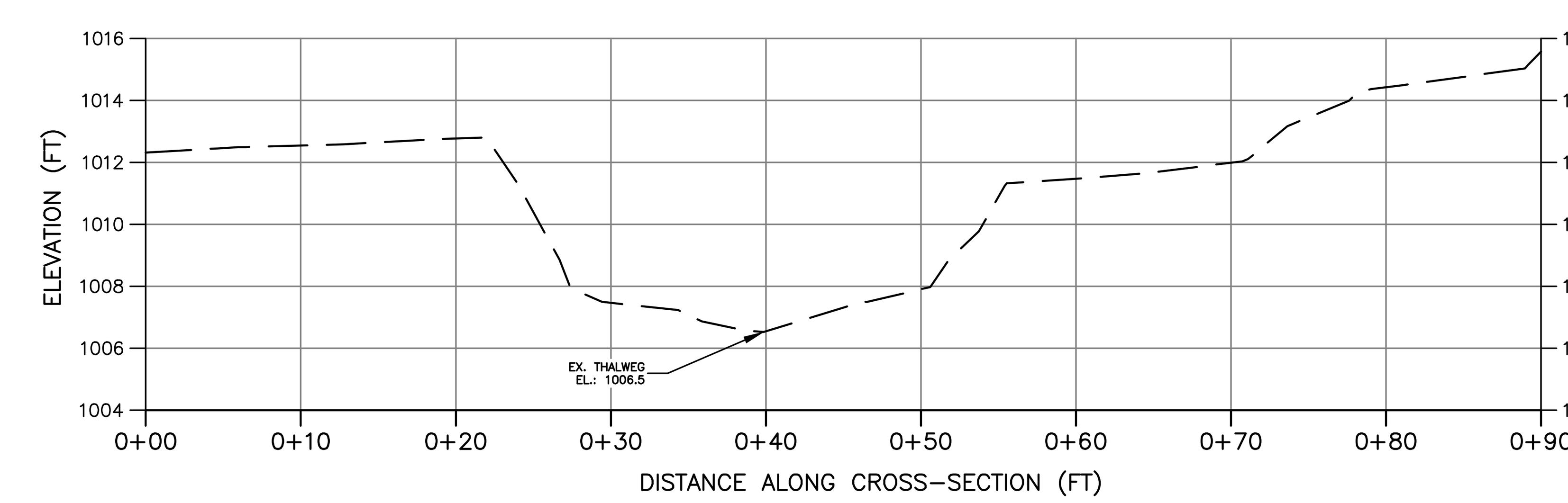
AS-BUILT TABLE: S-B3A CROSS SECTION A					
	PRE-CROSSING			AS-BUILT	
PT. LOC.	NORTHING	EASTING	ELEV	VERT. DIFF.	HORZ. DIFF.
TS-L	14293709.48	1783530.73	1012.22		
BS-L	14293706.46	1783528.21	1008.85		
THW	14293696.35	1783519.79	1006.52		
BS-R	14293687.17	1783512.15	1008.85		
TS-R	14293684.40	1783509.84	1011.24		

TYPICAL 5-POINT CROSS-SECTION
(FACING DOWNSTREAM)

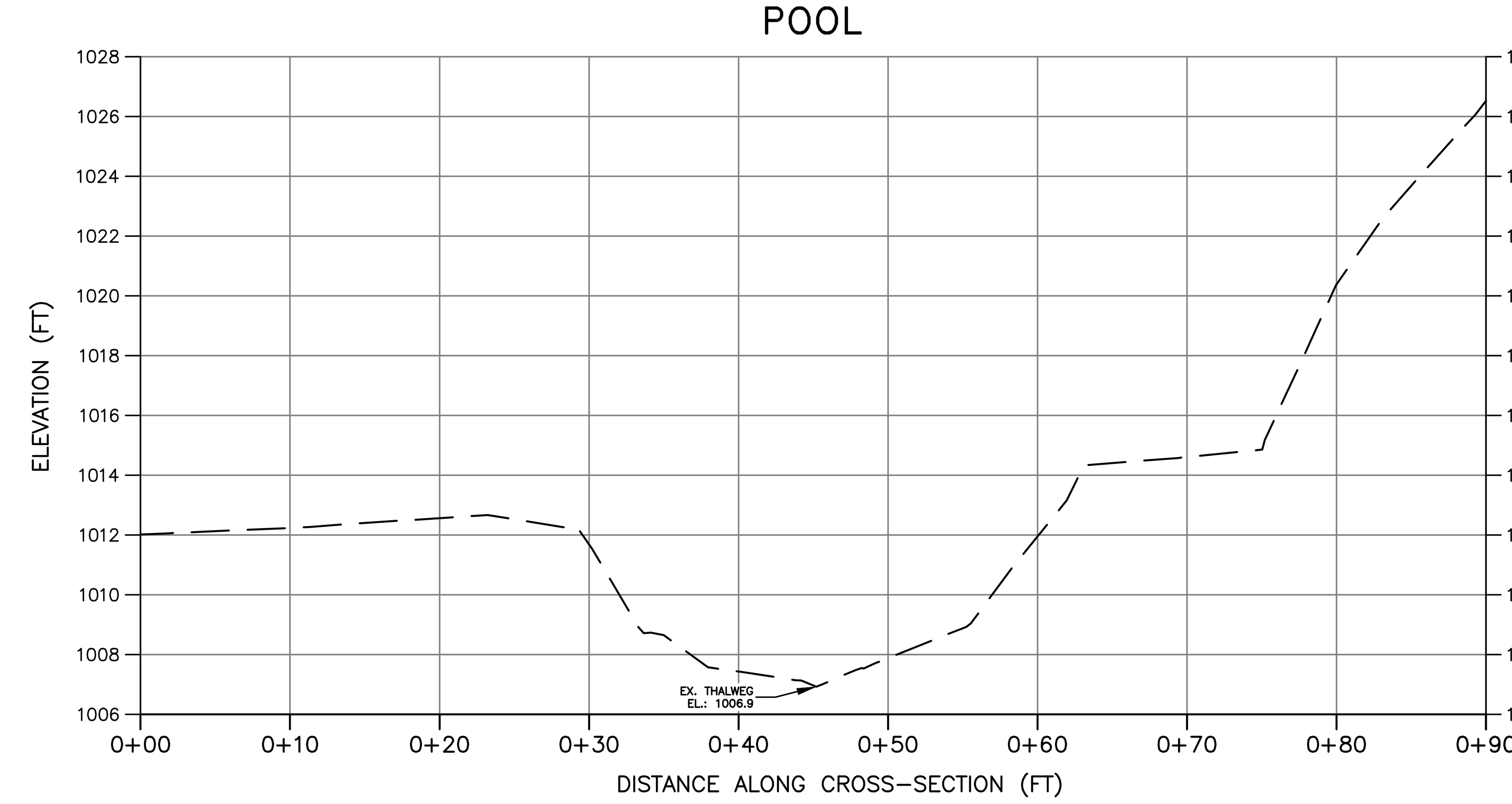


TS: TOP OF SLOPE
BS: BOTTOM OF SLOPE
THW: THALWEG (INVERT)

S-B3A BASELINE CROSS-SECTION A RIFFLE



S-B3A BASELINE CROSS-SECTION B POOL



CROSS SECTION LEGEND

— — EXISTING GRADE

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

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

PRELIMINARY

PRE-CROSSING

CAD File No.	-
Drawn	MP
Checked	GH
Approved	DW
Scale:	NOTED
Date:	OCT. 2021
Project No.	112IC07157

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

TETRA TECH
www.tetratech.com

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

Title
PROFILE AND CROSS-SECTIONS
BASELINE SURVEY
CROSSING S-B3A - ROCKCAMP RUN
(MP 18.76)
HARRISON COUNTY, WV

Drawing No. 1