

Baseline Assessment – Stream Attributes

Reach S-KL2 (Timber Mat Crossing) Perennial Spread I Franklin County, Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	N/A – Perennial stream (not shadeable)
RBP Physical Characteristics Form	✓
Water Quality Data	✓
RBP Habitat Form	✓
RBP Benthic Form	✓
Benthic Identification Sheet	N/A – Low flow
Wolman Pebble Count	✓
RiverMorph Data Sheet	✓
USM Form (Virginia Only)	✓
Longitudinal Profile and Cross Sections	✓



Photo Type: DS VIEW

Location, Orientation, Photographer Initials: Downstream view of ROW looking SE, TC

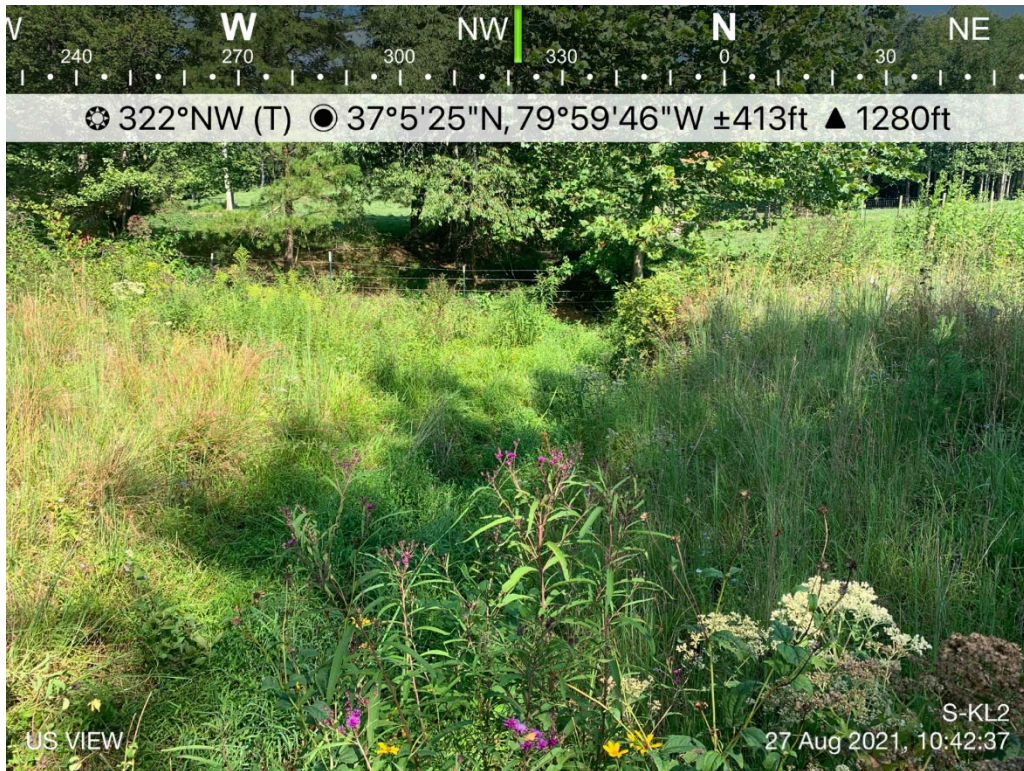


Photo Type: US VIEW

Location, Orientation, Photographer Initials: Upstream view of ROW looking NW, TC



Photo Type: LB CL

Location, Orientation, Photographer Initials: Standing on LB looking at RB along pipe centerline looking SW, TC



Photo Type: RB CL

Location, Orientation, Photographer Initials: Standing on RB looking at LB along pipe centerline looking E, TC



Photo Type: DS COND

Location, Orientation, Photographer Initials: Downstream conditions outside of ROW looking SE, TC

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USACE FILE NO/ Project Name: <small>(V2.1, Sept 2015)</small>		Mountain Valley Pipeline		IMPACT COORDINATES: (in Decimal Degrees)		Lat.	37.090361	Lon.	-79.996354	WEATHER:		Sunny		DATE:		August 27, 2021			
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: <small>(watershed size (acreage), unaltered or impairments)</small>				S-KL2				MITIGATION STREAM CLASS/SITE ID AND SITE DESCRIPTION: <small>(watershed size (acreage), unaltered or impairments)</small>				Comments:							
STREAM IMPACT LENGTH:		20		FORM OF MITIGATION:		RESTORATION (Levels I-III)		MIT COORDINATES: (in Decimal Degrees)		Lat.		Lon.		PRECIPITATION PAST 48 HRS:		None		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:				Stream Classification:				Stream Classification:				Stream Classification:				Stream Classification:			
Percent Stream Channel Slope				Percent Stream Channel Slope				Percent Stream Channel Slope				Percent Stream Channel Slope				Percent Stream Channel Slope			
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			
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 (High 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				1. Epifaunal Substrate/Available Cover				1. Epifaunal Substrate/Available Cover				1. Epifaunal Substrate/Available Cover				1. Epifaunal Substrate/Available Cover			
2. Embeddedness				2. Embeddedness				2. Embeddedness				2. Embeddedness				2. Embeddedness			
3. Velocity/ Depth Regime				3. Velocity/ Depth Regime				3. Velocity/ Depth Regime				3. Velocity/ Depth Regime				3. Velocity/ Depth Regime			
4. Sediment Deposition				4. Sediment Deposition				4. Sediment Deposition				4. Sediment Deposition				4. Sediment Deposition			
5. Channel Flow Status				5. Channel Flow Status				5. Channel Flow Status				5. Channel Flow Status				5. Channel Flow Status			
6. Channel Alteration				6. Channel Alteration				6. Channel Alteration				6. Channel Alteration				6. Channel Alteration			
7. Frequency of Riffles (or bends)				7. Frequency of Riffles (or bends)				7. Frequency of Riffles (or bends)				7. Frequency of Riffles (or bends)				7. Frequency of Riffles (or bends)			
8. Bank Stability (LB & RB)				8. Bank Stability (LB & RB)				8. Bank Stability (LB & RB)				8. Bank Stability (LB & RB)				8. Bank Stability (LB & RB)			
9. Vegetative Protection (LB & RB)				9. Vegetative Protection (LB & RB)				9. Vegetative Protection (LB & RB)				9. Vegetative Protection (LB & RB)				9. Vegetative Protection (LB & RB)			
10. Riparian Vegetative Zone Width (LB & RB)				10. Riparian Vegetative Zone Width (LB & RB)				10. Riparian Vegetative Zone Width (LB & RB)				10. Riparian Vegetative Zone Width (LB & RB)				10. Riparian Vegetative Zone Width (LB & RB)			
Total RBP Score				Total RBP Score				Total RBP Score				Total RBP Score				Total RBP Score			
Sub-Total				Sub-Total				Sub-Total				Sub-Total				Sub-Total			
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				Specific Conductivity				Specific Conductivity				Specific Conductivity				Specific Conductivity			
pH				pH				pH				pH				pH			
DO				DO				DO				DO				DO			
Sub-Total				Sub-Total				Sub-Total				Sub-Total				Sub-Total			
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)			
WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)			
Sub-Total				Sub-Total				Sub-Total				Sub-Total				Sub-Total			
PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score			
Index				Index				Index				Index				Index			
Linear Feet				Linear Feet				Linear Feet				Linear Feet				Linear Feet			
Unit Score				Unit Score				Unit Score				Unit Score				Unit Score			
0.765				0				0				0				0			
20				0				0				0				0			
15.3				0				0				0				0			

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-KL2	LOCATION Franklin County	
STATION # _____ RIVERMILE _____	STREAM CLASS Perennial	
LAT 37.090361 LONG -79.996354	RIVER BASIN Upper Roanoke	
STORET # _____	AGENCY VADEQ	
INVESTIGATORS KD TC		
FORM COMPLETED BY KD	DATE 8/27/21 TIME 10:30 AM	REASON FOR SURVEY Baseline Assessment

WEATHER CONDITIONS	<table style="width: 100%;"> <tr> <td style="width: 33%;"> Now <input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input type="checkbox"/> %cloud cover _____ <input checked="" type="checkbox"/> clear/sunny </td> <td style="width: 33%;"> Past 24 hours <input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input type="checkbox"/> %cloud cover _____ <input checked="" type="checkbox"/> clear/sunny </td> <td style="width: 33%;"> Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Air Temperature <u>27</u> °C Other _____ </td> </tr> </table>	Now <input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input type="checkbox"/> %cloud cover _____ <input checked="" type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input type="checkbox"/> %cloud cover _____ <input checked="" type="checkbox"/> clear/sunny	Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Air Temperature <u>27</u> °C Other _____
Now <input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input type="checkbox"/> %cloud cover _____ <input checked="" type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input type="checkbox"/> %cloud cover _____ <input checked="" type="checkbox"/> clear/sunny	Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Air Temperature <u>27</u> °C Other _____		
SITE LOCATION/MAP	<p>Draw a map of the site and indicate the areas sampled (or attach a photograph)</p>			
STREAM CHARACTERIZATION	<table style="width: 100%;"> <tr> <td style="width: 50%;"> Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input checked="" type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input type="checkbox"/> Other _____ </td> <td style="width: 50%;"> Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater Catchment Area <u>0.73</u> km² </td> </tr> </table>	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input checked="" type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input type="checkbox"/> Other _____	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater Catchment Area <u>0.73</u> km ²	
Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input checked="" type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input type="checkbox"/> Other _____	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater Catchment Area <u>0.73</u> km ²			

Notes: Low flow

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse <input 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 checked="" type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources Local Watershed Erosion <input checked="" type="checkbox"/> None <input 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 Soft rush _____	
INSTREAM FEATURES	Estimated Reach Length 16.8 _____ m Estimated Stream Width 0.5 _____ m Sampling Reach Area 8.4 _____ m ² Area in km² (m²x1000) _____ km ² Estimated Stream Depth 0.2 _____ m Surface Velocity (at thalweg) 0.1 _____ m/sec	Canopy Cover <input checked="" type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded High Water Mark 0.2 _____ m Proportion of Reach Represented by Stream Morphology Types Riffle ⁰ _____ % Run ⁹⁵ _____ % Pool ⁵ _____ % Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
LARGE WOODY DEBRIS	LWD 0 _____ m ² Density of LWD N/A _____ m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present <input checked="" 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 <i>Persicaria punctata</i> _____ Portion of the reach with aquatic vegetation 100 _____ %	
WATER QUALITY (DS, US)	Temperature 23.2, 23.4 _____ °C Specific Conductance 86.8, 89.2 uS/cm Dissolved Oxygen 5.33, 5.63 mg/L pH 6.91, 7.03 _____ Turbidity _____ WQ Instrument Used VA-2 _____	Water Odors <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 _____ Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globs Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____ Turbidity (if not measured) <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
SEDIMENT/SUBSTRATE	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 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	

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)	0
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	25	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	60			
Clay	< 0.004 mm (slick)	15			

Notes: Low flow

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

STREAM NAME S-KL2		LOCATION Franklin County	
STATION # _____ RIVERMILE _____		STREAM CLASS Perennial	
LAT 37.090361 LONG -79.996354		RIVER BASIN Upper Roanoke	
STORET # _____		AGENCY VADEQ	
INVESTIGATORS KD TC			
FORM COMPLETED BY KD		DATE 8/27/21 TIME 10:30 AM AM PM	REASON FOR SURVEY Baseline Assessment

	Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor	
Parameters to be evaluated in sampling reach	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 <u>not</u> new fall and <u>not</u> transient). SCORE 9	20 19 18 17 16 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).	15 14 13 12 11 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).	10 9 8 7 6 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	5 4 3 2 1 0 Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	2. Embeddedness Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. SCORE 3	20 19 18 17 16 Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	15 14 13 12 11 Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	10 9 8 7 6 Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	5 4 3 2 1 0 Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	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.) SCORE 4	20 19 18 17 16 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.)	15 14 13 12 11 Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	10 9 8 7 6 Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	5 4 3 2 1 0 Dominated by 1 velocity/depth regime (usually slow-deep).
	4. Sediment Deposition Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. SCORE 17	20 19 18 17 16 Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	15 14 13 12 11 Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	10 9 8 7 6 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.	5 4 3 2 1 0 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. Channel Flow Status Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. SCORE 17	20 19 18 17 16 Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	15 14 13 12 11 Water fills >75% of the available channel; or <25% of channel substrate is exposed.	10 9 8 7 6 Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	5 4 3 2 1 0 Very little water in channel and mostly present as standing pools.

Notes: Low flow

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

	Habitat Parameter	Condition Category																			
		Optimal					Suboptimal					Marginal					Poor				
Parameters to be evaluated broader than sampling reach	6. Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern. SCORE <u>18</u>	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. SCORE <u>4</u>	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>7</u> SCORE <u>9</u>	Left 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. SCORE <u>5</u> SCORE <u>5</u>	Left 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. SCORE <u>4</u> SCORE <u>4</u>	Left Bank 10 9					8 7 6					5 4 3					2 1 0				

Total Score 106 Notes: Low flow

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME S-KL2	LOCATION Franklin County	
STATION # _____ RIVERMILE _____	STREAM CLASS Perennial	
LAT <u>37.090361</u> LONG <u>-79.996354</u>	RIVER BASIN Upper Roanoke	
STORET # _____	AGENCY VADEQ	
INVESTIGATORS KD TC	LOT NUMBER _____	
FORM COMPLETED BY KD	DATE <u>8/27/21</u> TIME <u>10:30 AM</u>	REASON FOR SURVEY Baseline Assessment

HABITAT TYPES	Indicate the percentage of each habitat type present <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 (_____) _____%
SAMPLE COLLECTION	Gear used <input type="checkbox"/> D-frame <input type="checkbox"/> kick-net <input type="checkbox"/> Other _____ 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 _____ <input type="checkbox"/> Snags _____ <input type="checkbox"/> Vegetated Banks _____ <input type="checkbox"/> Sand _____ <input type="checkbox"/> Submerged Macrophytes _____ <input type="checkbox"/> Other (_____) _____
GENERAL COMMENTS	Low flow & no riffle habitat to sample

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	Zygotera	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: Franklin County
 Stream Name: UNT to Little Creek
 HUC Code: 03010101
 Survey Date: 8/27/2021
 Surveyors: KD, TC
 Type: Representative

Stream ID: S-KL2
 Basin: Upper Roanoke

PEBBLE COUNT							
Inches	PARTICLE	Millimeters		Particle Count	Total #	Item %	% Cum
	Silt/Clay	< .062	S/C	▲ ▼	32	32.00	32.00
	Very Fine	.062-.125	S A N D	▲ ▼	11	11.00	43.00
	Fine	.125-.25		▲ ▼	2	2.00	45.00
	Medium	.25-.5		▲ ▼	0	0.00	45.00
	Coarse	.50-1.0		▲ ▼	8	8.00	53.00
.04-.08	Very Coarse	1.0-2		▲ ▼	18	18.00	71.00
.08 - .16	Very Fine	2 -4		G R A V E L	▲ ▼	14	14.00
.16 - .22	Fine	4 -5.7	▲ ▼		0	0.00	85.00
.22 - .31	Fine	5.7 - 8	▲ ▼		0	0.00	85.00
.31 - .44	Medium	8 -11.3	▲ ▼		0	0.00	85.00
.44 - .63	Medium	11.3 - 16	▲ ▼		1	1.00	86.00
.63 - .89	Coarse	16 -22.6	▲ ▼		3	3.00	89.00
.89 - 1.26	Coarse	22.6 - 32	▲ ▼		0	0.00	89.00
1.26 - 1.77	Vry Coarse	32 - 45	▲ ▼		2	2.00	91.00
1.77 -2.5	Vry Coarse	45 - 64	▲ ▼		3	3.00	94.00
2.5 - 3.5	Small	64 - 90	C O B B L E		▲ ▼	3	3.00
3.5 - 5.0	Small	90 - 128		▲ ▼	3	3.00	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	B O U L D E R	▲ ▼	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:							

RIVERMORPH PARTICLE SUMMARY

 River Name: UNT to Little Creek
 Reach Name: S-KL2
 Sample Name: Representative
 Survey Date: 08/27/2021

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	32	32.00	32.00
0.062 - 0.125	11	11.00	43.00
0.125 - 0.25	2	2.00	45.00
0.25 - 0.50	0	0.00	45.00
0.50 - 1.0	8	8.00	53.00
1.0 - 2.0	18	18.00	71.00
2.0 - 4.0	14	14.00	85.00
4.0 - 5.7	0	0.00	85.00
5.7 - 8.0	0	0.00	85.00
8.0 - 11.3	0	0.00	85.00
11.3 - 16.0	1	1.00	86.00
16.0 - 22.6	3	3.00	89.00
22.6 - 32.0	0	0.00	89.00
32 - 45	2	2.00	91.00
45 - 64	3	3.00	94.00
64 - 90	3	3.00	97.00
90 - 128	3	3.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.03
D35 (mm)	0.08
D50 (mm)	0.81
D84 (mm)	3.86
D95 (mm)	72.67
D100 (mm)	128
Silt/Clay (%)	32
Sand (%)	39
Gravel (%)	23
Cobble (%)	6
Boulder (%)	0
Bedrock (%)	0

Total Particles = 100.


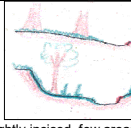
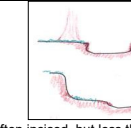
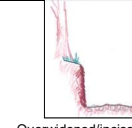
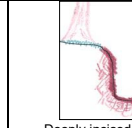
Stream Assessment Form (Form 1)

Unified Stream Methodology for use in Virginia

For use in wadeable channels classified as intermittent or perennial

Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR #	Impact Length	Impact Factor	
22865.07	Mountain Valley Pipeline (Mountain Valley Pipeline, LLC)	Franklin County	R3	03010101	8/27/21	S-KL2	20	1	
Name(s) of Evaluator(s)		Stream Name and Information					SAR Length		
KB/TC		UNT to Little Creek					73		

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

	Conditional Category					
	Optimal	Suboptimal	Marginal	Poor	Severe	
Channel Condition	 Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars / bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	 Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	 Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% Sediment may be temporary / transient, contribute to instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	 Overwidened/incised. Vertically / laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	 Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth. Majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	CI
Scores	3	2.4	2	1.6	1	2.40
NOTES>>						

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

	Conditional Category							
	Optimal	Suboptimal	Marginal	Poor				
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover. Wetlands located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>
Scores	1.5	High	Low	High	Low	High	Low	
1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.							Ensure the sums of % Riparian Blocks equal 100	
Right Bank	% Riparian Area >	80%	20%				100%	
	Score >	0.75	0.5					
								<small>CI = (Sum % RA * Scores*0.01)/2</small>
Left Bank	% Riparian Area >	80%	20%				100%	Rt Bank CI >
	Score >	0.75	0.5					0.70
								CI
								Lt Bank CI >
								0.70
								CI

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddedness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features.

	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	
Instream Habitat/ Available Cover	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	NOTES>>
Scores	1.5	1.2	0.9	0.5	Stream Gradient
					High
					CI
					0.90

Stream Impact Assessment Form Page 2

Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR #	Impact Length	Impact Factor
22865.07	Mountain Valley Pipeline (Mountain Valley Pipeline, LLC)	Franklin County	R3	03010101	8/27/21	S-KL2	20	1

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

Channel Alteration	Conditional Category					NOTES>>
	Negligible	Minor	Moderate	Severe		
Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.	
Scores	1.5	1.3	1.1	0.9	0.7	0.5

CI
1.50

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>	1.10
RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)	
COMPENSATION REQUIREMENT (CR) >>	22
CR = RCI X L _i X IF	

INSERT PHOTOS:

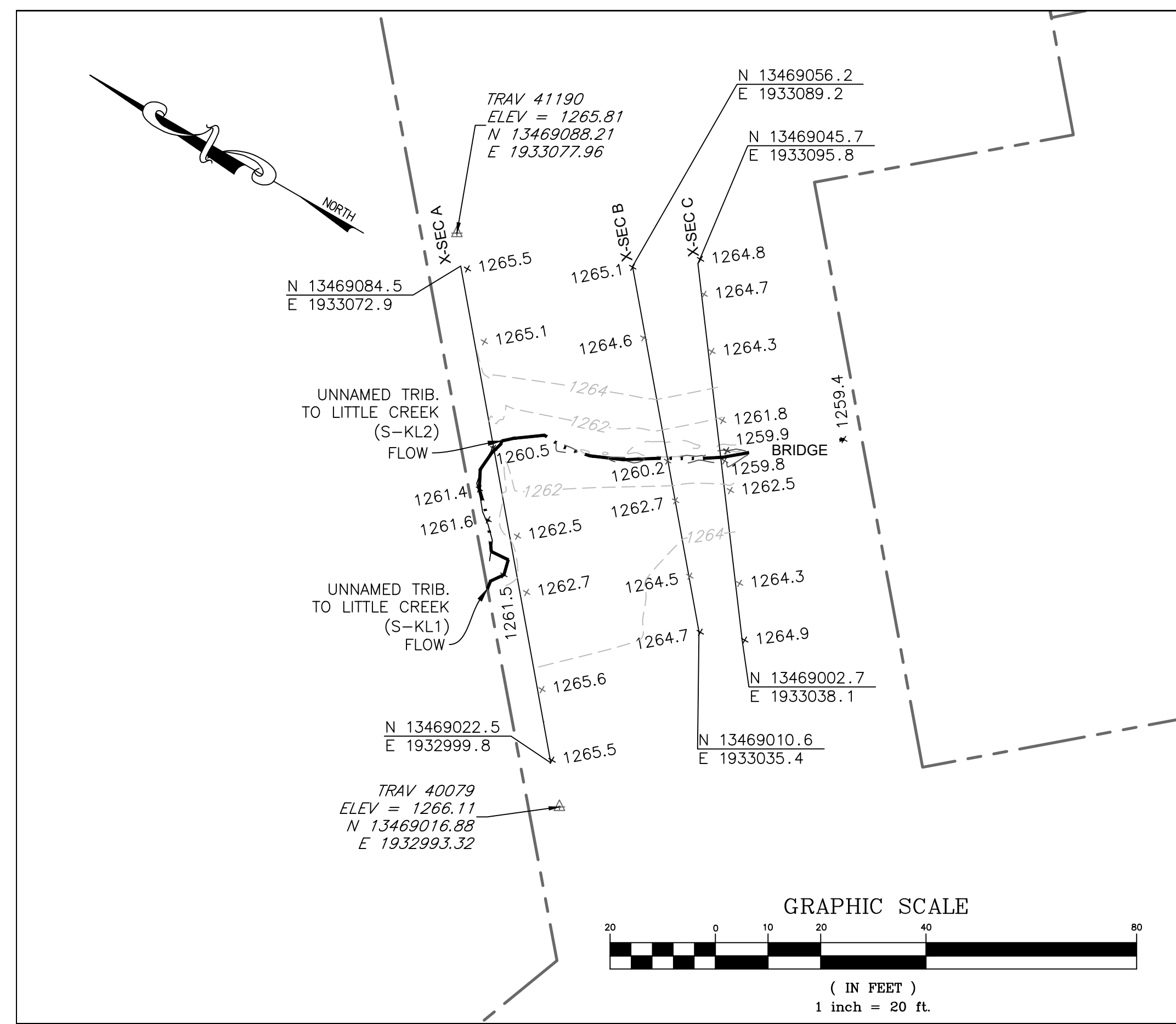
(WSSI Photo Location "L:\22000s\22800\22865.06\Admin\05-ENVR\Field Data\Spread I\Field Forms\S-KL2\Photos\US VIEW.JPG")



Upstream view looking NW within the ROW. Assessment is limited to areas within the temporary ROW.

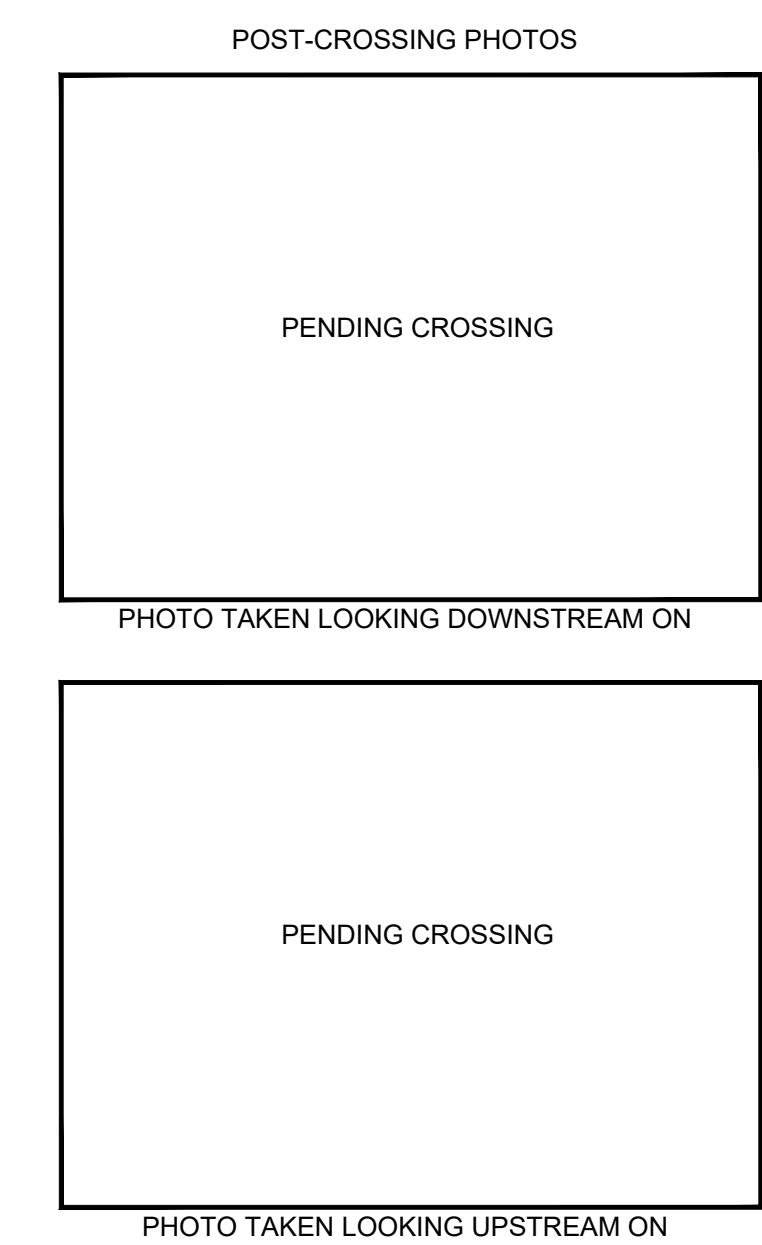
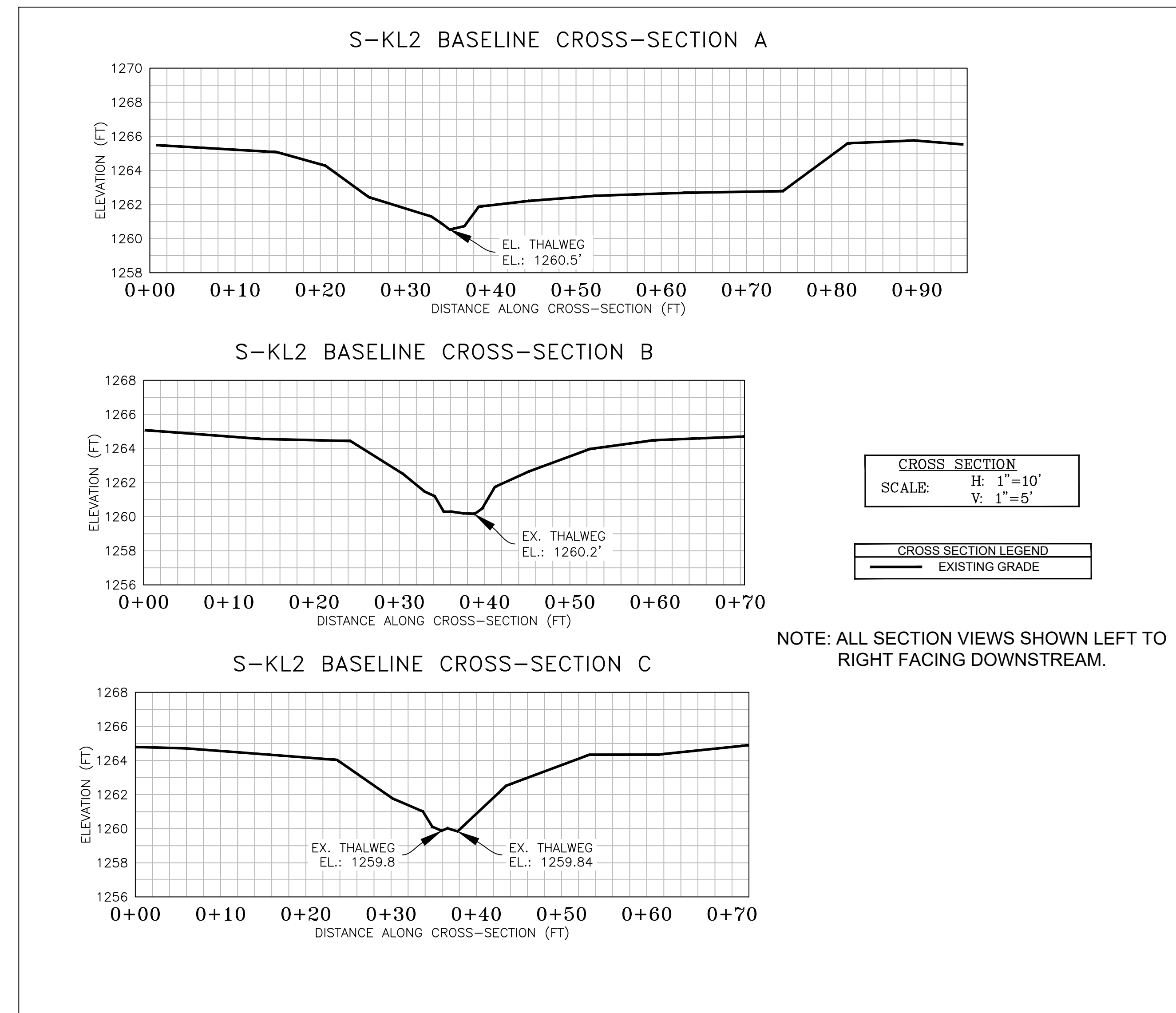
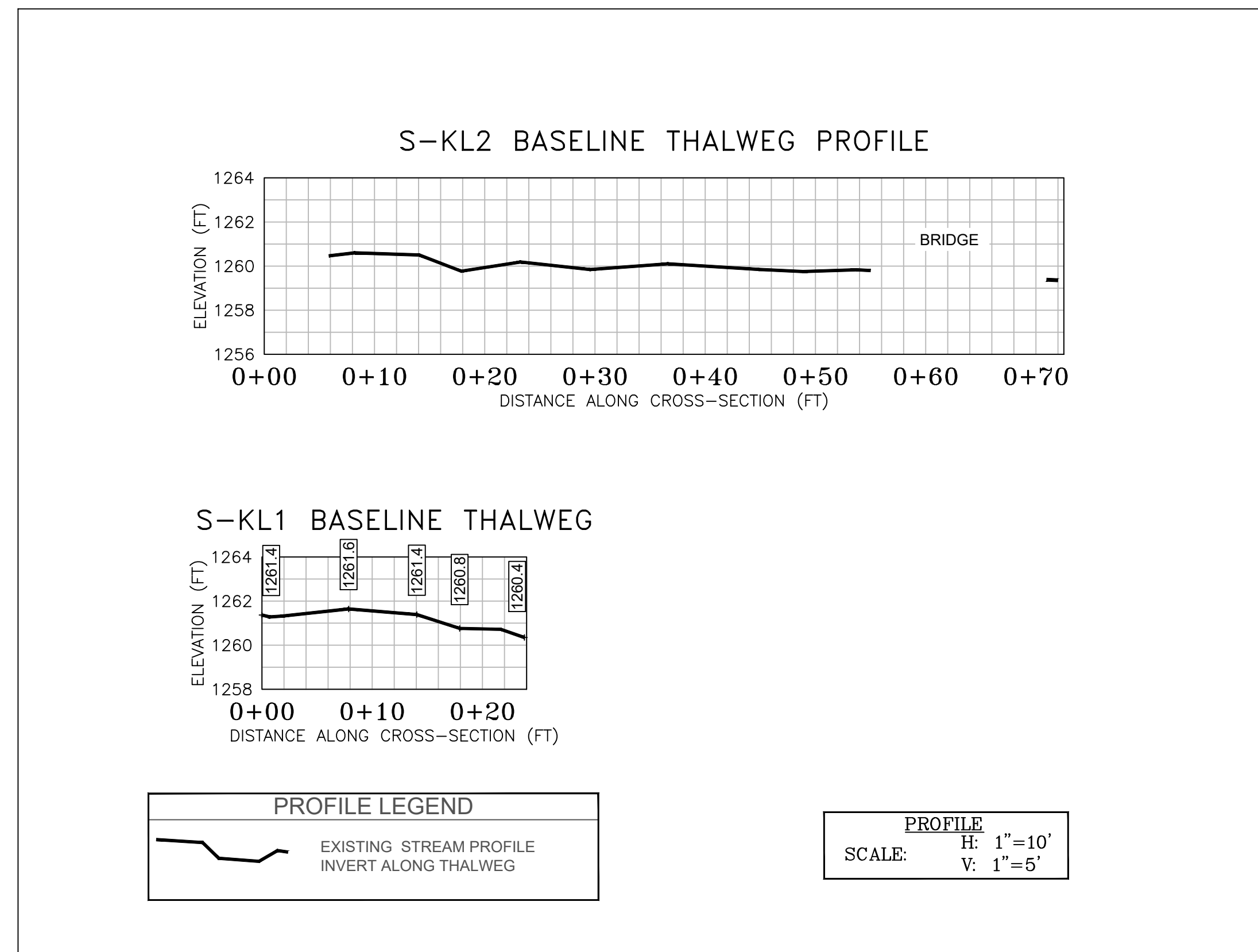
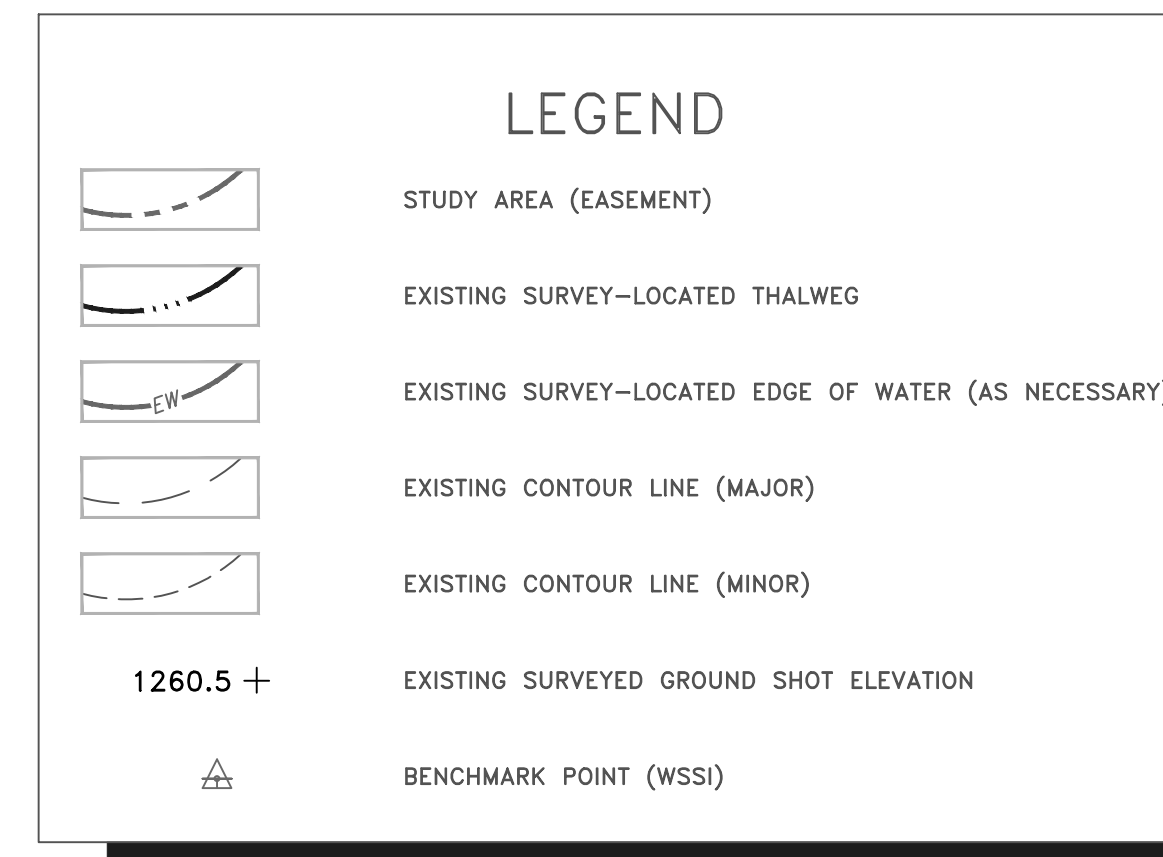
DESCRIBE PROPOSED IMPACT:

PROVIDED UNDER SEPARATE COVER



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 a Real Time Network (RTN) GPS. Field locations were completed on October 8, 2018.
- Monumentation, including traverse stations and fly points, shown on this drawing should be used to orient any future boundary, topographic, or location survey.
- Easement lines shown on plan view were provided by Mountain Valley Pipeline (MVP).
- WSSI Contour Interval = 2.0'. Contours within the channel were interpolated using stream channel breaklines (i.e. top of slopes, toe of slopes, thalweg) and cross-sectional points. Contours outside the channel were interpolated using cross-sectional spot shots.
- Profile and cross-section data shown hereon is based on post-pipeline installation to convey the baseline assessment data requested. Information regarding pre-crossing and restoration conditions will be provided to the agencies as applicable.
- All section views shown are left to right facing downstream.
- Cross-section B shot at location of pipe centerline (based on best professional judgement).



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 www.wetlands.com

Profile and Cross-Sections Baseline Survey

Prepared For: MVP

Crossing S-KL1 & S-KL2 - Unamed Trib. to Little Creek (MP 256.0)

Franklin County, Virginia

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REVISIONS		No.	Date	Description	Rev. By	App. By

DATE: October 2021

SCALE: AS NOTED

Horizontal Datum: NAD 1983 UTM ZONE 17N

Vertical Datum: NAVD 88

Boundary and Topo Source: MVP WSSI 2' C.I. Topo

Design	Draft	Approved
PFS	TLK	PFS

Sheet #
1 of 1

Computer File Name: ...