Baseline Assessment – Stream Attributes

Reach S-C14 (Pipeline ROW) 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	✓
Wolman Pebble Count	✓
RiverMorph Data Sheet	✓
USM Form (Virginia Only)	✓
Longitudinal Profile and Cross Sections	✓



Photo Type: RB DS VIEW

Location, Orientation, Photographer Initials: Standing on RB looking downstream along the ROW looking SE, AO



Photo Type: LB DS VIEW

Location, Orientation, Photographer Initials: Standing on LB looking downstream along the ROW looking SE, AO



Location, Orientation, Photographer Initials: Standing on RB looking upstream along the ROW looking NW, AO



Location, Orientation, Photographer Initials: Standing on LB looking upstream along the ROW looking NW, AO



Location, Orientation, Photographer Initials: Standing on RB looking at LB along pipe centerline looking NE, AO



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



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

USACE FILE NO./ Project Name: (v2.1, Sept 2015)		м	ountain V	alley Pipeline		cimal Degrees)	Lat.	37.063956	Lon.	-79.921985	WEATHER:		Sunny	DATE:	August	t 28, 2021
IMPACT STREAM/SITE (watershed size (acreage				s	-C14			MITIGATION STREAM CLAS (watershed size {acre						Comments:		
STREAM IMPACT LENGTH:	90	FORM MITIGAT		RESTORATION (Levels I-III)		OORDINATES: cimal Degrees)	Lat.		Lon.		PRECIPITATION PAST 48 HRS:		None	Mitigation Length:		
Column No. 1- Impact Existi	ng Condition (Deb	oit)		Column No. 2- Mitigation Existing C	Condition - Base	eline (Credit)		Column No. 3- Mitigation Post Comple	Projected at Fiv tion (Credit)	re Years	Column No. 4- Mitigation Pro Post Completion	jected at Ten Ye (Credit)	ears	Column No. 5- Mitigation Project	ted at Maturity (Credit)
Stream Classification:	Pere	nnial		Stream Classification:				Stream Classification:		0	Stream Classification:		0	Stream Classification:		0
Percent Stream Channel	Slope	1.16		Percent Stream Channel Si	оре			Percent Stream Channel	Slope	0	Percent Stream Channel S	Slope	0	Percent Stream Channel	Slope	0
HGM Score (attach	data forms):			HGM Score (attach	data forms):			HGM Score (atta	ch data forms)	:	HGM Score (attach o	data forms):		HGM Score (attach	data forms):	
		Average				Average				Average			Average			Average
Hydrology Biogeochemical Cycling Habitat		0		Hydrology Biogeochemical Cycling Habitat		0		Hydrology Biogeochemical Cycling Habitat		0	Hydrology Biogeochemical Cycling Habitat		0	Hydrology Biogeochemical Cycling Habitat		0
PART I - Physical, Chemical an	nd Biological Indic	ators		PART I - Physical, Chemical ar	nd Biological Inc	dicators		PART I - Physical, Chemica	I and Biological	Indicators	PART I - Physical, Chemical and	d Biological Indi	icators	PART I - Physical, Chemical an	d Biological Indi	cators
	Points Scale Range	Site Score			Points Scale Range	Site Score			Points Scale Ra	ange Site Score		Points Scale Range	s Site Score		Points Scale Range	e Site Score
PHYSICAL INDICATOR (Applies to all stream	ms classifications)			PHYSICAL INDICATOR (Applies to all streams	classifications)			PHYSICAL INDICATOR (Applies to all stres	ams classifications))	PHYSICAL INDICATOR (Applies to all stream	ns classifications)	•	PHYSICAL INDICATOR (Applies to all stream	s classifications)	
USEPA RBP (High Gradient Data Sheet)		47		USEPA RBP (Low Gradient Data Sheet)	1 1			USEPA RBP (High Gradient Data Sheet			USEPA RBP (High Gradient Data Sheet)			USEPA RBP (High Gradient Data Sheet)		
Epifaunal Substrate/Available Cover Embeddedness	0-20	17 18		Epifaunal Substrate/Available Cover Pool Substrate Characterization	0-20			Epifaunal Substrate/Available Cover Embeddedness	0-20		Epifaunal Substrate/Available Cover Embeddedness	0-20		Epifaunal Substrate/Available Cover Embeddedness	0-20	——————————————————————————————————————
Velocity/ Depth Regime	0-20	14		3. Pool Variability	0-20			Velocity/ Depth Regime	0-20		Velocity/ Depth Regime	0-20		Velocity/ Depth Regime	0-20	
Sediment Deposition	0-20	14		Sediment Deposition	0-20			Sediment Deposition	0-20		Sediment Deposition	0-20		Sediment Deposition	0-20	
5. Channel Flow Status	0-20	13		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	19		6. Channel Alteration	0-20			6. Channel Alteration	0-20	-1	6. Channel Alteration	0-20		Channel Alteration	0-20	
7. Frequency of Riffles (or bends)	0-20	18		7. Channel Sinuosity	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	16		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	12		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	
 Riparian Vegetative Zone Width (LB & RB) 		16		10. Riparian Vegetative Zone Width (LB & RB)	0-20			 Riparian Vegetative Zone Width (LB & RB 			 Riparian Vegetative Zone Width (LB & RB) 			 Riparian Vegetative Zone Width (LB & RB) 	0-20	
Total RBP Score	Suboptimal	157		Total RBP Score	Poor	0		Total RBP Score	Poor	0	Total RBP Score	Poor	0	Total RBP Score	Poor	0
Sub-Total CHEMICAL INDICATOR (Applies to Intermit	tent and Perennial St	0.785		Sub-Total CHEMICAL INDICATOR (Applies to Intermitter	at and Derennial St	O reame)		Sub-Total CHEMICAL INDICATOR (Applies to Interm	ittent and Perennia	0	Sub-Total CHEMICAL INDICATOR (Applies to Intermitte	ent and Derennial S	O Streame)	Sub-Total CHEMICAL INDICATOR (Applies to Intermitted)	ent and Perennial S	0 Streame)
WVDEP Water Quality Indicators (Gener		,		WVDEP Water Quality Indicators (General		/		WVDEP Water Quality Indicators (Gene			WVDEP Water Quality Indicators (General			WVDEP Water Quality Indicators (Gener		
Specific Conductivity				Specific Conductivity				Specific Conductivity			Specific Conductivity			Specific Conductivity		
100-199 - 85 points	0-90	108.5			0-90				0-90			0-90			0-90	
100-199 - 85 points	_			nH				nH	_		nH			nH		
	0-80	8.11			5-90 0-1				5-90	м		5-90 0-1			5-90	
8.1-9.0 = 45 points	0-80	0.11			5-90				5-90			5-90			5-90	
DO	_			DO	_			DO			DO	_		DO	_	
>5.0 = 30 points Sub-Total	10-30	10.89 0.8		Sub-Total	10-30	0		Sub-Total	10-30	0	Sub-Total	10-30	•	Sub-Total	10-30	
BIOLOGICAL INDICATOR (Applies to Intern	mittent and Perennial			BIOLOGICAL INDICATOR (Applies to Intermit	tent and Perennial	Streams)		BIOLOGICAL INDICATOR (Applies to Inte	ermittent and Pere	ennial Streams)	BIOLOGICAL INDICATOR (Applies to Inter	mittent and Peren	nnial Streams)	BIOLOGICAL INDICATOR (Applies to Inter	mittent and Perent	nial 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)		
Good	0-100 0-1	74.4			0-100 0-1				0-100 0	м		0-100 0-1			0-100 0-1	
Sub-Total		0.744		Sub-Total		0		Sub-Total		0	Sub-Total		0	Sub-Total		0
PART II - Index and	Unit Score		li	PART II - Index and	Unit Score	n		PART II - Index	and Unit Score	_11	PART II - Index and	Unit Score		PART II - Index and	Unit Score	
T ALL II - III GEX BIIG				Part it allues and				i Assi ii - iiidex i	Jiii Goole		1 ALC II / III UBA BIIU			T ALC: IT HILLER BILL	G.G.C	
Index	Linear Feet	Unit Score		Index	Linear Feet	Unit Score		Index	Linear Fe	et Unit Score	Index	Linear Feet	Unit Score	Index	Linear Feet	Unit Score
0.776	90	69.87		0	0	0		0	0	0	0	0	0	0	0	0

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-C14	LOCATION Franklin County					
STATION # RIVERMILE	STREAM CLASS Perennial					
LAT <u>37.063956</u> LONG <u>-79.921985</u>	RIVER BASIN Upper Roand	RIVER BASIN Upper Roanoke				
STORET#	AGENCY VADEQ					
INVESTIGATORS AO, AW						
FORM COMPLETED BY AW	DATE 8/28/2021 TIME 9.51 AM	REASON FOR SURVEY Baseline Assessment				

WEATHER CONDITIONS SITE LOCATION/MAP	Now Past 24 hours Yes ✓ No storm (heavy rain) rain (steady rain) showers (intermittent) %cloud cover clear/sunny Draw a map of the site and indicate the areas sampled (or attach a photograph)
	LOCATION/MAP Draw a map of the site and indicate the areas sampled (or attach a photograph) RB Going Price RB Steep VEG. Slope Bd Rx
CTDE AM	DENSE VEG ACCESS BRIDGE ACCESS SILL SOCH STATEMENT OF THE STATEMENT OF T
STREAM CHARACTERIZATION	Stream Subsystem Perennial Intermittent Tidal Stream Origin Glacial Spring-fed Non-glacial montane Swamp and bog Stream Type Coldwater Catchment Area 14.34 km² Catchment Area 14.34 km²

Notes:

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERS FEATURI		✓ Fores	Pasture Industri	ercial al	Local Watershed NPS ☑ No evidence ☐ Son ☐ Obvious sources Local Watershed Erosi ☑ None ☐ Moderate	ne potential sources				
RIPARIA VEGETA (18 meter	TION		e the dominant type and S VS		minant species present ☐ Grasses ☐ He	rbaceous				
INSTREA FEATURI		Estimat Samplin Area in Estimat	ted Reach Length ed Stream Width ng Reach Area km² (m²x1000) ted Stream Depth evelocity	High Water Mark	✓ Partly open ☐ Partly shaded ☐ Shaded High Water Mark 0.2 m Proportion of Reach Represented by Stream Morphology Types Riffle 70 % Run 10 % Pool 20 7% Very No Channelized ☐ Yes ☑ No					
LARGE WOODY DEBRIS LWD o m² Density of LWD N/A m²/km² (LWD/ reach area)										
AQUATIC VEGETATION Indicate the dominant type and record the dominant species present Rooted submergent Rooted floating Free floating Algae Dominant species present Murdannia keisak, Leersia oryzoides, Persicaria sp. Portion of the reach with aquatic vegetation 3 %										
WATER ((DS, US)	QUALITY	Specific Dissolve pH 8.11.2 Turbidi		-	Water Odors Normal/None					
SEDIMEN SUBSTRA		Odors								
INC		STRATE (COMPONENTS (00%)		ORGANIC SUBSTRATE C (does not necessarily add					
Substrate Type	Diamet	er	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area				
Bedrock			10	Detritus	sticks, wood, coarse plant	1				
Boulder	> 256 mm (10")		2		materials (CPOM)	<u> </u>				
Cobble	64-256 mm (2.5	5"-10")	25	Muck-Mud	black, very fine organic					
Gravel	2-64 mm (0.1"-2	2.5")	45		(FPOM)	0				
Sand	0.06-2mm (gritt	y)	15	Marl	grey, shell fragments	0				
Silt	0.004-0.06 mm		3							
Clay	< 0.004 mm (sli	ck)	n	1						

Notes:

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

STREAM NAME S-C14	LOCATION Franklin County					
STATION # RIVERMILE	STREAM CLASS Perennial					
LAT <u>37.063956</u> LONG <u>-79.921985</u>	RIVER BASIN Upper Roanoke					
STORET#	AGENCY VADEQ					
INVESTIGATORS AO, AW						
FORM COMPLETED BY AW	DATE 8/28/2021 TIME 9:51 AM PM REASON FOR SURVEY Baseline Assessment					

	Habitat		Condition	Category	
	Parameter	Optimal	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 17	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
n sampling reach	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.
ted in	SCORE 18	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	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).
ıram	SCORE 14	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
P ₂	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 14	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 13	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)

	Habitat	Condition Category												
	Habitat Parameter	Optimal	Suboptima	1	N	Iargina	ıl		Poor					
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in of bridge abutment evidence of past channelization, i.e. dredging, (greater past 20 yr) may be present, but recent channelization is no present.	areas ts; , than	Channeliz extensive: or shoring present or and 40 to reach cha- disrupted.	emban structu both b 80% of nnelized	kments ires anks; stream	Banks sh or cemer the streat channelit disrupted habitat g removed	nt; over m reach zed and l. Instru reatly a	eam Itered or				
	SCORE 19	20 19 18 17 16	15 14 13 1	2 11	10 9	8	7 6	5 4	3 2	1 0				
oling reach	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 riffl infrequent; distance between riffles diverget the width of the strength between 7 to 15.	e ided by	Occasiona bottom co some hab between r the width between 1	ontours jitat; distiffles ditudent	provide tance vided by tream is	shallow	riffles; plistance vided by the stre	between the				
samp	SCORE 18	20 19 18 17 16	15 14 13 1	2 11	10 9	8	7 6	5 4	3 2	1 0				
Parameters to be evaluated broader than sampling reach	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 a erosion mostly hea over. 5-30% of ba reach has areas of	reas of led nk in	Moderate 60% of ba areas of e erosion po floods.	ank in rosion;	each has high	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.						
e eva	SCORE 7	Left Bank 10 9	8 7	6	5	4	3	2	1	0				
to be	SCORE 9	Right Bank 10 9	8 7	6	5	4	3	2	1	0				
Parameters	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 surface covered by native vegetation, but one of plants is not wel represented; disrupe vident but not afffull plant growth p to any great extent than one-half of the potential plant stull height remaining.	e class l- otion ecting otential ; more	50-70% o streambar covered b disruption patches of closely en common; half of the stubble he	nk surfa y vegeta n obviou f bare so opped v less that e potent	ation; as; oil or regetation n one- ial plant	Less that streamba covered disruptio vegetatio removed 5 centim average	by vege on of strong is ver on has b to eters or	aces tation; eambank y high; een				
	SCORE 6	Left Bank 10 9	8 7	6	5	4	3	2	1	0				
	SCORE 6	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 a 12-18 meters; hum activities have imp zone only minimal	an acted	Width of 12 meters activities zone a gre	; humai have im	n ipacted	meters: 1	ittle or i vegetati	on due to				
	SCORE 8	Left Bank 10 9	8 7	6	5	4	3	2	1	0				
	SCORE 8	Right Bank 10 9	8 7	6	5	4	3	2	1	0				

Total Score 157 Notes:

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME S-C	214						LOC	ATIO	N Fr	ank	lin C	oun	ty							
STATION #	R	IVE	RM	ILE			STR	EAM (CLAS	SS F	ere	nnia	ı							
LAT 37.063956	L	ONO] - 79.	92198	5		RIVI	ER BA	SIN	Up	per	Roa	noke	Э						
STORET#							AGE	ENCY'	VADI	EQ										
INVESTIGATORS A	O. A'	W												LOT	NUMBER					
FORM COMPLETED			W	1			DAT TIM		28/2021 51 AM	_			+		SON FOR SURVEY	Baselir	ne A	sse	ssm	ent
HABITAT TYPES	✓	Cob	ble_2	25	%	tage of Sna	ags	%	t type	71 V	eget	ated	Ban (grav	ks_98_	%	%				
SAMPLE COLLECTION						ame v			√wa			ther			nk 🔲 from bo					
	✓	Cob	ble 4			r of jab ☐Sna phytes_	ags	s take	n in e	$\Box V$	eget	oitat ated other	Ban	ks	Sand					
GENERAL COMMENTS			_		& : bita		ı rer	nov	ed	fro	m	be	entl	hic	sample. 4 kic	ks c	om	ıple	ete	d
QUALITATIVE I Indicate estimated Dominant									rved	, 1	= 1	Rare	e, 2	: = C	Common, 3= Abun	dant,	4 =	:		
Periphyton					0	1 2	2 3	4			Sliı	nes				0	1	2	3	4
Filamentous Algae					0	1 2	2 3	4			Ma	croi	nve	rtebi	rates	0	1	2	3	4
Macrophytes					0	1 2	2 3	4			Fis	h				0	1	2	3	4
			anc	e:	0 = org	Absen	t/Not	Obse		ıt (>		org	anis	sms)	rganisms), 2 = Co				ıs)	
Porifera	0	1	2	3	4		optera			0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygo	_			0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemi	_			0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coled	_			0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	_	dopte	:a		0	1	2	3	4						
Oligochaeta Isopoda	0	1	2	3	4 4	Sialio	dae dalida	20		0	1	2 2	3	4						
Amphipoda	0	1	2	3	4	Tipul		ic		0	1		3	4						
Ampnipoda Decapoda	0	1	2	3	4	_	maae ididae			0	1	2 2	3	4						
Gastropoda	0	1	2	3	4	_ ^	ididae iliidae			0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabir				0	1	2	3	4						
Divatvia	U	1	_	J	7	Culci				0	1	2	3	4						
										~	_	_			•			_		_

Mountain Valley Pipeline Data are not adjusted for subsampling



LIFE IN WATE

	Sample ID Collection Date	S-C14 08-28-2021
ORDER	GENUS/SPECIES	COUNT
Ephemeroptera	•	5
Ephemeroptera		2
Ephemeroptera	,	8
	Maccaffertium sp.	19
Ephemeroptera		2
Epnemeroptera Plecoptera	Teloganopsis deficiens	4
	Cheumatopsyche sp.	59
	Chimarra sp.	3
	Hydropsyche sp.	5
	Hydroptila sp.	2
	Enochrus sp.	1
	Macronychus glabratus	1
Coleoptera	Optioservus sp.	3
Coleoptera	Oulimnius sp.	1
Coleoptera	Psephenus sp.	11
Megaloptera	Corydalus sp.	2
Megaloptera	Nigronia sp.	1
Diptera-Chironomidae		1
Diptera-Chironomidae	, ,	5
·	Thienemannimyia gr. sp.	2
Diptera	Antocha sp.	3
Diptera	Empididae	1
Diptera	Ephydridae	2
Diptera	Simulium sp.	1
Diptera	Tabanidae .	1
Annelida	Lumbricina	2
Bivalvia	Corbicula sp.	1
Gastropoda	'	75
Other Organisms	'	1
. 3.	TOTAL	226

Mountain Valley Pipeline WV SCI Metrics



Sample ID Collection Date	
WVSCI Metric Values	
Total taxa	23
EPT taxa	9
% EPT	47.8
% Chironomidae	4.9
% 2 Dominant	61.5
HBI	5.10
WVSCI Metric Scores Total taxa EPT taxa % EPT % Chironomidae % 2 Dominant HBI	109.5 69.2 52.0 96.1 60.1 69.0
WVSCI Metric Scores Total taxa EPT taxa EPT Chironomidae 2 Dominant HBI	100.0 69.2 52.0 96.1 60.1 69.0
WVSCI Total Score	74.4

WVSCI Thresholds

Unimpaired = > 68.00 Gray Zone = 60.61 to 68.00 Impaired = <60.61

WOLMAN PEBBLE COUNT FORM

County: Franklin County Stream ID: S-C14

Stream Name: Teels Creek

HUC Code: 03010101 Basin: Upper Roanoke

Survey Date: 8/28/2021 Surveyors: AW, AO Type: Representative

	1		LE COUNT				1
Inches	PARTICLE	Millimeters		Particle Count	Total #	Item %	% Cum
	Silt/Clay	< .062	S/C	^	3	3.00	3.00
	Very Fine	.062125		^	5	5.00	8.00
	Fine	.12525	1	A	2	2.00	10.00
	Medium	.255	SAND	A	0	0.00	10.00
	Coarse	.50-1.0	1	A	8	8.00	18.00
.0408	Very Coarse	1.0-2	-	4	4	4.00	22.00
.0816	Very Fine	2 -4		^	4	4.00	26.00
.1622	Fine	4 -5.7		A	1	1.00	27.00
.2231	Fine	5.7 - 8		^	2	2.00	29.00
.3144	Medium	8 -11.3	GRAVEL	A	4	4.00	33.00
.4463	Medium	11.3 - 16		A	7	7.00	40.00
.6389	Coarse	16 -22.6		A	2	2.00	42.00
.89 - 1.26	Coarse	22.6 - 32	1	A	2	2.00	44.00
1.26 - 1.77	Vry Coarse	32 - 45	1	A	6	6.00	50.00
1.77 -2.5	Vry Coarse	45 - 64		A	15	15.00	65.00
2.5 - 3.5	Small	64 - 90		<u> </u>	12	12.00	77.00
3.5 - 5.0	Small	90 - 128	1	<u> </u>	6	6.00	83.00
5.0 - 7.1	Large	128 - 180	COBBLE	<u> </u>	3	3.00	86.00
7.1 - 10.1	Large	180 - 256	1	<u> </u>	4	4.00	90.00
10.1 - 14.3	Small	256 - 362		<u> </u>	0	0.00	90.00
14.3 - 20	Small	362 - 512	1	<u> </u>	1	1.00	91.00
20 - 40	Medium	512 - 1024	BOULDER	<u> </u>	0	0.00	91.00
40 - 80	Large	1024 -2048	1	-	0	0.00	91.00
80 - 160	Vry Large	2048 -4096	1	A	0	0.00	91.00
	Bedrock		BDRK	<u> </u>	9	9.00	100.00
				Totals	100		

RIVERMORPH PARTICLE SUMMARY

River Name: Teels Creek
Reach Name: S-C14
Sample Name: Representative
Survey Date: 08/28/2021

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062 0.062 - 0.125 0.125 - 0.25 0.25 - 0.50 0.50 - 1.0 1.0 - 2.0 2.0 - 4.0 4.0 - 5.7 5.7 - 8.0 8.0 - 11.3 11.3 - 16.0 16.0 - 22.6 22.6 - 32.0 32 - 45 45 - 64 64 - 90 90 - 128 128 - 180 180 - 256 256 - 362 362 - 512 512 - 1024 1024 - 2048 Bedrock	3 5 2 0 8 4 4 1 2 4 7 2 2 6 15 12 6 3 4 0 0 9	3.00 5.00 2.00 0.00 8.00 4.00 4.00 1.00 2.00 4.00 7.00 2.00 2.00 6.00 15.00 12.00 6.00 3.00 4.00 0.00 0.00 0.00 0.00 0.00	3.00 8.00 10.00 10.00 18.00 22.00 26.00 27.00 29.00 33.00 40.00 42.00 44.00 50.00 65.00 77.00 83.00 86.00 90.00 91.00 91.00 91.00 91.00
D16 (mm) D35 (mm) D50 (mm) D84 (mm) D95 (mm) D100 (mm) Silt/Clay (%) Sand (%) Gravel (%) Cobble (%) Boulder (%) Bedrock (%)	0.88 12.64 45 145.33 Bedrock Bedrock 3 19 43 25 1		

Total Particles = 100.

Project Name (Applicant) Cocility Covered as Market Name of Locality Covered as Name (Applicant) College County College County Coun			(Strear	Unified S	tream Method	lology for use	in Virginia		1)		
Automated Condition Cond	Project #	Projec	t Name (App			Cowardin						
AW, AO Channel Condition: Assess the cross-section of the sitems and prevailing condition (excellent aggregations) Optimal Optimal Suboptimal Suboptimal Suboptimal Suboptimal Optimal Suboptimal Optimal Optima	22865.06			•		R3	03010101	8/28/21	S-C14	90	1	
Channel Condition: Association of the stream and provising controllers (created and conditions) Channel Conditions Change of the Condition of Change of Chan	Name	e(s) of Evaluat	or(s)	Stream Name	and Informa	tion				SAR Length		
Optimal Suboptimal Caregory Way in recast or a ratio and coace, 15, 100 per coace of a ratio of the coace o		AW, AO		Teels Creek						90		
Channel Condition Channel Condi	. Channel C	ondition: Asses	ss the cross-section	on of the stream a								
Charmon (Charmon (Cha		Opti	mal	Subo			•	Po	oor	Sev	ere	
Transpert sed ment deposition coverage Transpert sed ment of the property of procession in production of the property of procession in the property of the procession of the property of t		100% stable banks. protection or natura (80-100%). AND/OR bankfull benches an to their original fle developed wide bank	Vegetative surface al rock, prominent Stable point bars / e present. Access codplain or fully kfull benches. Mid-	erosion or unprotect of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar	eted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR ures contribute to akfull and low flow	Poor. Banks more or Poor due to k Erosion may be pr both banks. Vege 40-60% of banks. S vertical or und	stable than Severe ower bank slopes. esent on 40-60% of tative protection on streambanks may be ercut. AND/OR	laterally unstable further. Majority of vertical. Erosion pre banks. Vegetative on 20-40% of bank to prevent erosion.	e. Likely to widen both banks are near esent on 60-80% of protection present s, and is insufficient AND/OR 60-80% of	vertical/lateral in r incision, flow contair Streambed below av majority of banks Vegetative protect f than 20% of banks	stability. Severe ned within the banks. erage rooting depth, vertical/undercut. ion present on less s, is not preventing	
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 Warginal Poor High Suboptimals Riparian areas with Riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Delemente riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Delemente square footage for each by measuring or estimating length and width. Calculators are provided for you below. Enter the % Riparian Areas and Score for each riparian category in the blocks below. Right Bank Riparian Areas with Riparia		Transient sediment	deposition covers	has access to ba newly developed portions of the r sediment covers 1	nkfull benches,or floodplains along each. Transient 0-40% of the stream	transient, contriber control of the	ribute instability. ntribute to stability, resent. AND/OR V- s have vegetative % of the banks and res which contribute	Sediment is temp nature, and contri AND/OR V-shap vegetative protect 40% of the banks a	orary / transient in buting to instability. bed channels have ion is present on > and stable sediment	present. Erosion/rav AND/OR Aggradin than 80% of stream deposition, contrib Multiple thread	w banks on 80-100%. Ig channel. Greater In bed is covered by buting to instability. It channels and/or	CI
Conditional Category Optimal Suboptimal High Suboptimal High Suboptimal Proor Suboptimal P	Scores	3		2	.4		2	1	.6		1	3.00
Riparian Buffers High Suboptimal, Repairan areas with earnoy cover. Wetlands located within the riparian areas. Wetlands located within the riparian area. Wetlands located	NIPARIAN			Con	ditional Cate	gory	ginal	Po				
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Delemine square footage for each by measuring or estimating length and width. Calculators are provided for you below. Delemine square footage for each by measuring or estimating length and width. Calculators are provided for you below. Delemine square footage for each by measuring or estimating length and width. Calculators are provided for you below. Delemine square footage for each by measuring or estimating length and width. Calculators are provided for you below. Blocks equal 100		with > 60% tree Wetlands located v	canopy cover. within the riparian	Riparian areas with tree stratum (dbh z 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (db - 3 inches) present, with 30% to 60% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	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.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. Enter the % Riparian Area and Score for each riparian category in the blocks below. Right Bank % Riparian Area> 68% 15% 15% 2% 100% Score > 0.75 0.85 0.5 1.5 CI= (Sum % RA * Scores*0.01)/2 Left Bank % Riparian Area> 85% 15% 15% 100% Rt Bank CI > 0.74 Lt Bank CI > 0.80 S. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool omplexes, stable features. Conditional Category Instream Habitat/ Available Cover Optimal Suboptimal Marginal Poor Habitat elements are typically present in 90.50% 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. Stream Gradient	Scores	1	5					·		-		
Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. Enter the % Riparian Area and Score for each riparian category in the blocks below. Right Bank % Riparian Area > 68% 15% 15% 2% 100% Score > 0.75 0.85 0.5 1.5	300162			1.4	1.1	0.00	0.10	0.0	U.0	1		
Right Bank	. Determine squ											
Right Bank Score > 0.75 0.85 0.5 1.5 CI= (Sum % RA * Scores*0.01)/2 Left Bank % Riparian Area> 85% 15% 15% 100% Rt Bank CI > 0.74 Lt Bank CI > 0.80 NOTES> Instream Habitat/ Available Cover Habitat elements are typically present in greater than 50% of the reach. Stable habitat elements are typically present in 10-50% of the reach and are adequate for maintenance of populations. Stream Gradient	Enter the % R					2%		BIOCKS 6	r			
Left Bank % Riparian Area> 85% 15% 0.5 Lt Bank Cl> 0.80 NOTES>> Instream Habitat/Available Cover Habitat elements are typically present in greater than 50% of the reach.	Right Bank								100 /0			
Score > 0.85 0.5 0.5 Lt Bank Cl > 0.80 INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle/pool omplexes, stable features. Conditional Category Instream Habitat/ Available Cover Undercut banks; root mats; SAV; riffle/pool omplexes, stable features. 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. Stream Gradient		% Bincries *····	050/	A E 0/					4000/			C
Instream Habitat/ Available Cover Habitat elements are typically present in greater than 50% of the reach. Conditional Category Stable habitat elements are typically present in greater than 50% of the reach. Cover Stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool of the reach and leafly debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool of the reach and sequence for maintenance of populations. Conditional Category NOTES>> Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations. Stream Gradient	Left Bank								100%			0.77
Instream Habitat/ Available Cover Habitat elements are typically present in 30-50% 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 10-30% of the reach and are adequate for maintenance of populations. Stream Gradient		I HABITAT: Var					stable substrate;	low embededness	; shade; undercut	t banks; root mats; \$		0.11
Habitat/ Available Cover Habitat elements are typically present in 30-50% of the reach. Stable habitat elements are typically present in 10-30% 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 10-30% of the reach and are adequate for maintenance of populations. Stream Gradient	Instream	Opti	mal	Subo			ginal	Po	oor			
	Habitat/ Available	Habitat elements ar	e typically present	Stable habitat eler present in 30-50% o adequate for n	ments are typically of the reach and are naintenance of	Stable habitat ele present in 10-30% adequate for i	ments are typically of the reach and are maintenance of	Habitat elements lacking or are u elements are typic	s listed above are nstable. Habitat ally present in less	Stroam (Gradient	CI
000103 1.0 1.2 0.0 0.0 Iligii	Scores	1.5	5	1.	.2	0	.9	0	.5			1.50

	Stream Impact Assessment Form Page 2								
Project #	Project # Project Name (Applicant) Locality Class. HUC Date SAR # Impact Length Factor							•	
22865.06	Mountain Valley Pipeline (Mountain Valley Pipeline, LLC)	Franklin County	R3	03010101	8/28/21	S-C14	90	1	

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

	Conditional Category NOTES>>							
	Negligible	Mi	nor	Moderate		Severe		I
Channel Alteration	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.	disrupted by any of the channel	is disrupted by any of the channel alterations listed in	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.			CI
Scores	s 1.5 1.3 1.1 0.9 0.7 0.5							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) >>

RCI= (Sum of all Cl's)/5, except if stream is ephemeral RCI = (Riparian Cl/2)

COMPENSATION REQUIREMENT (CR) >>

122

CR = RCI X L_I X IF

INSERT PHOTOS:

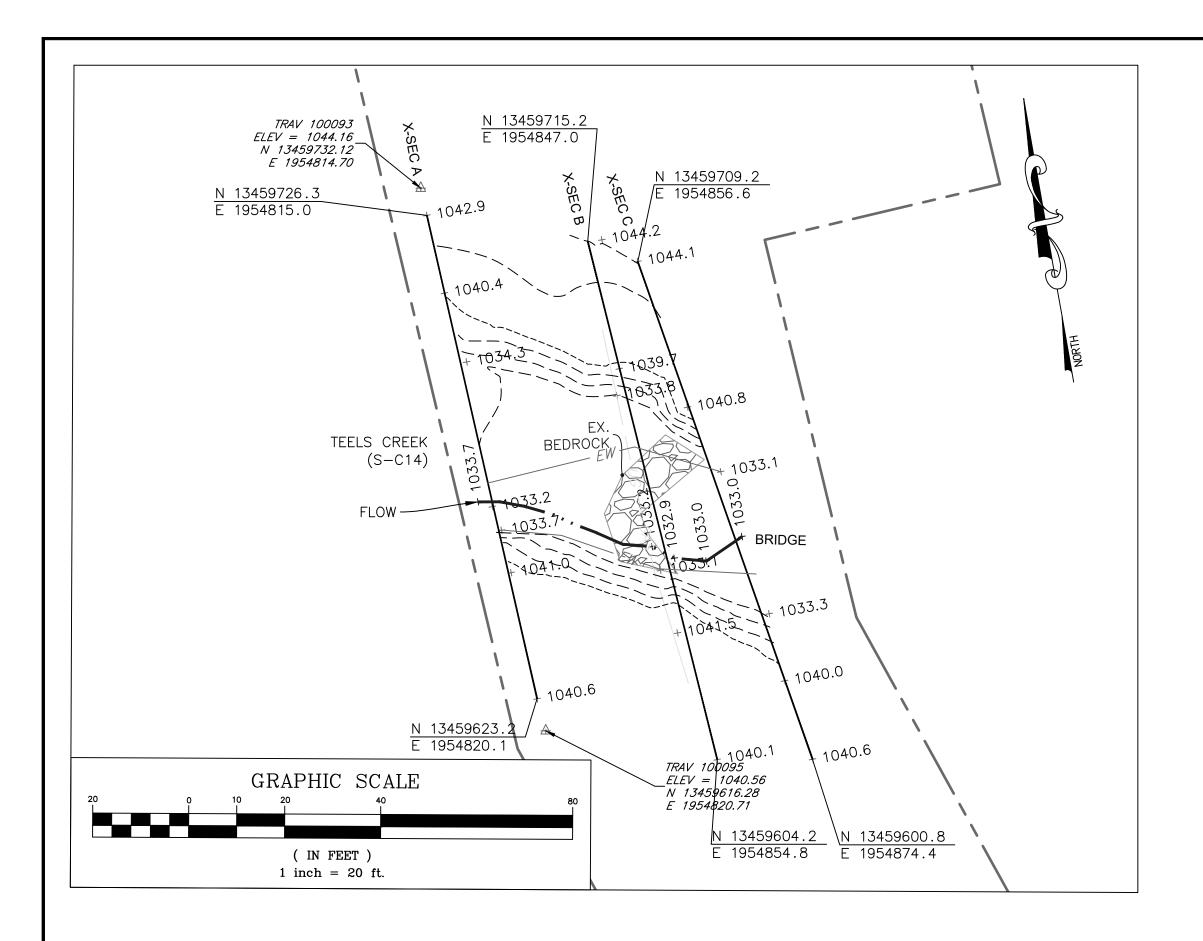
(WSSI Photo Location L:\22000s\22800\22865.06\Admin\05-ENVR\Field Data\Spread |\Field Forms\S-C14\Photos\S-C14_RB US VIEW_2021-08-28.jpg |

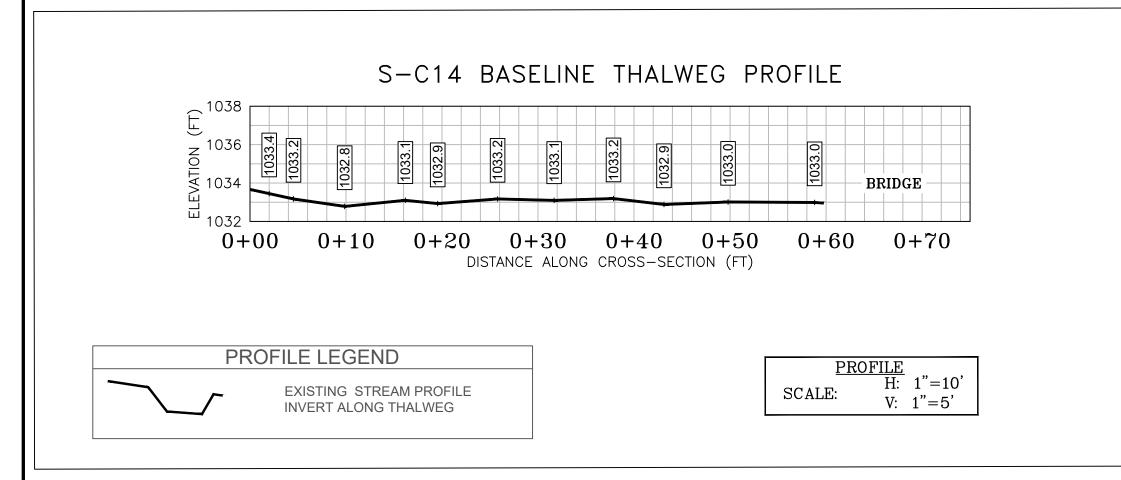


Upstream view from the right bank facing W. Assessment is limited to areas within the temporary ROW.

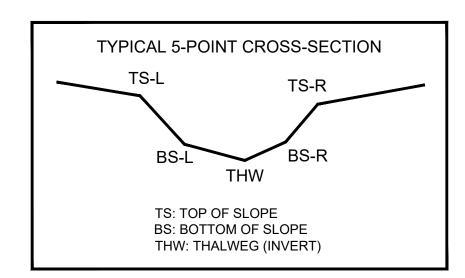
DESCRIBE PROPOSED IMPACT	Г	:
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PROVIDED UNDER SEPARATE COVER



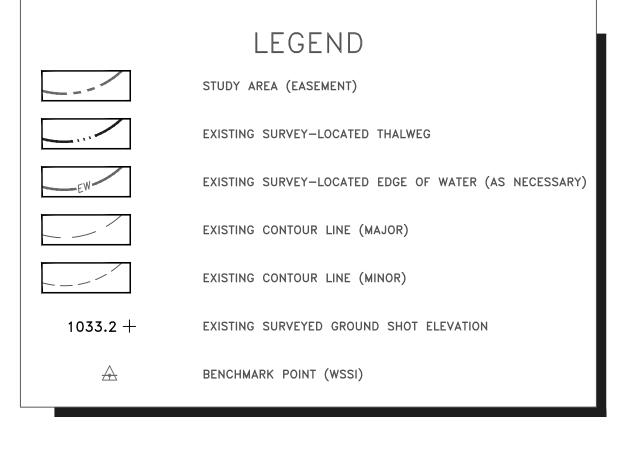


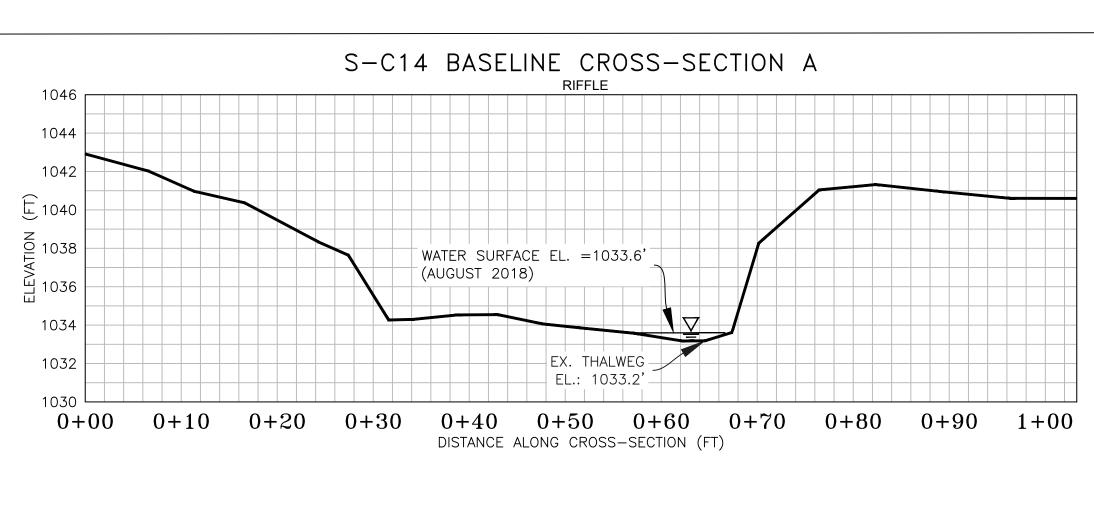
CL STAKEOUT POINTS: S-C14 CROSS SECTION B (PIPE CL)						
	PR	E-CROSSING		POST-C	ROSSING	
PT. LOC.	NORTHING	EASTING	ELEV	VERT.	HORZ.	
P1. LOC.	NORTHING	EASTING	CLCV	DIFF.	DIFF.	
TS-L	13459687.90	1954848.87	1039.74			
BS-L	13459682.45	1954847.45	1033.80			
THW	13459647.72	1954850.17	1032.99			
BS-R	13459645.06	1954850.02	1033.11			
TS-R	13459631.59	1954851.29	1041.51			

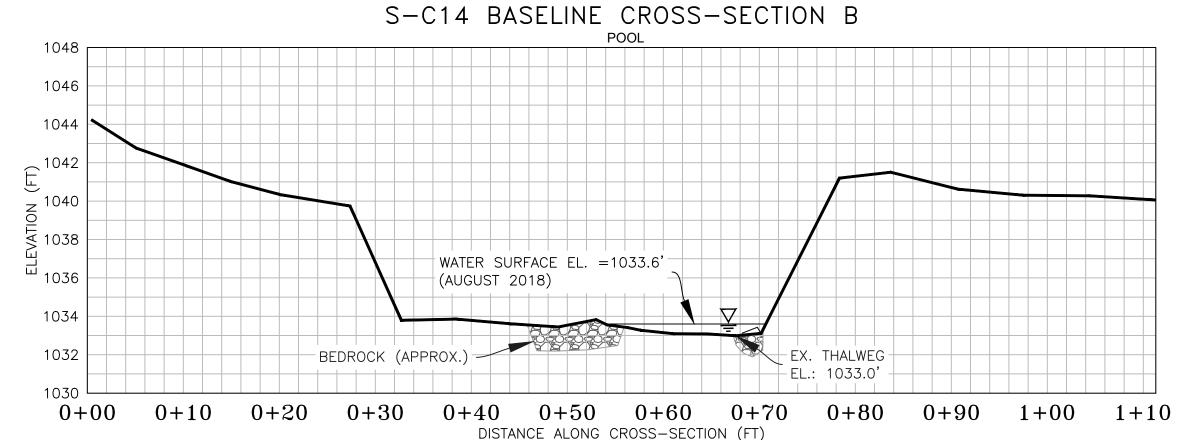


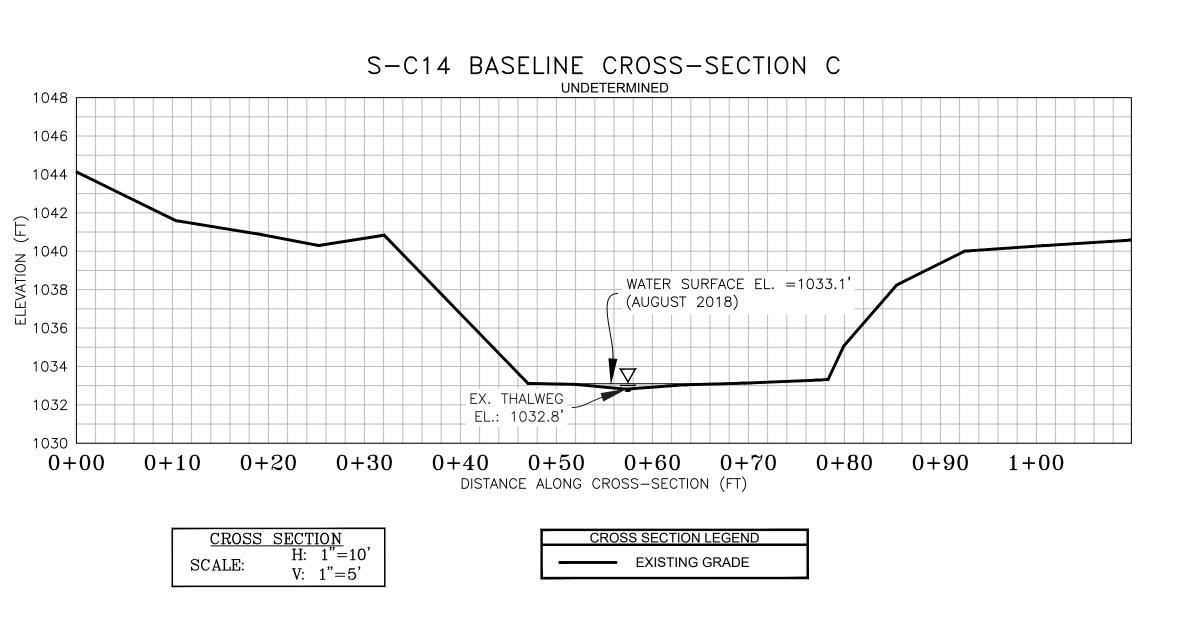
SURVEY NOTES:

- 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 a Real Time Network (RTN) GPS. Field locations were completed on August 28, 2018.
- 2. Monumentation, including traverse stations and fly points, shown on this drawing should be used to orient any future boundary, topographic, or location survey.
- 3. Easement lines shown on plan view were provided by Mountain Valley Pipeline (MVP).
- 4. 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.
- 5. All section views shown are left to right facing downstream.
- 6. Cross-section B shot at location of pipe centerline (based on field stakes).









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







PHOTO TAKEN LOOKING UPSTREAM ON 08/28/2018

POST-CROSSING PHOTOS

PENDING CROSSING	



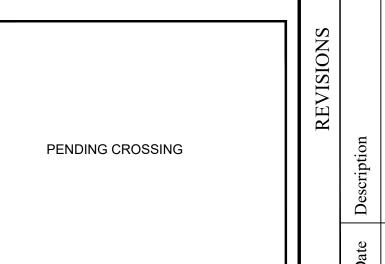


PHOTO	TAKENI	OOKING	

PENDING CROSSING

Horizontal Datum: NAD 1983 UTM ZONE 1 Vertical Datum: NAVD 88 Boundary and Topo Source:

9.

261

WSSI 2' C.I. Topo Approved

NAS NAS PFS Sheet # 1 of 1

Computer File Name: PHOTO TAKEN LOOKING

C:\WSSI-L\22865.03\Spread I Work Dwgs 22865_03 S-I MP 254-267 Sheets.dwg