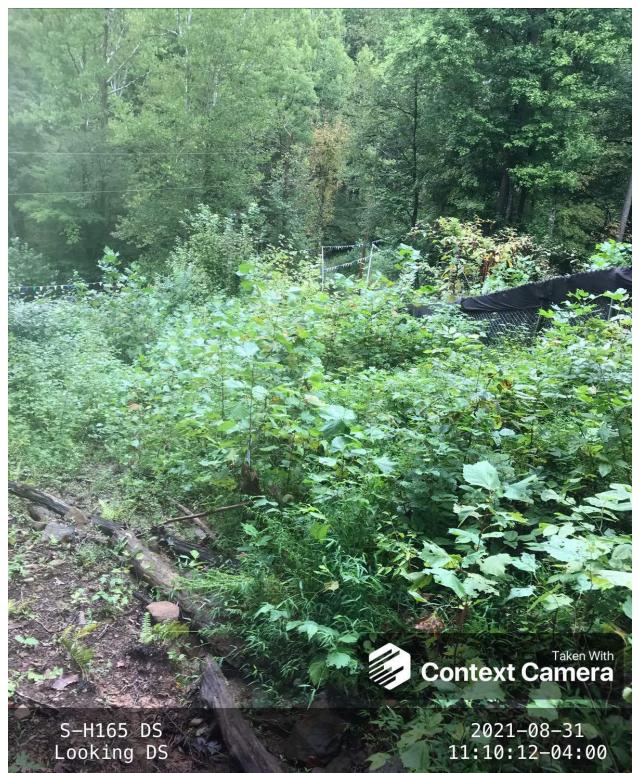
Reach S-H165 (Pipeline ROW) Ephemeral Spread B Lewis County, West Virginia

Data	Included
Photos	\checkmark
SWVM Form	\checkmark
FCI Calculator and HGM Form	\checkmark
RBP Physical Characteristics Form	\checkmark
Water Quality Data	N/A - Now flow
RBP Habitat Form	\checkmark
RBP Benthic Form	\checkmark
Benthic Identification Sheet	N/A – No flow
Wolman Pebble Count	\checkmark
Reference Reach Software Pebble Count Data	\checkmark
Longitudinal Profile and Cross Sections	\checkmark



Spread B Stream S-H165 (Pipeline ROW) Lewis County

Photo Type: DS, US View Location, Orientation, Photographer Initials: Downstream Edge of ROW, Upstream View, AJE/PEL Lat: 38.918602 Long: -80.573256



Spread B Stream S-H165 (Pipeline ROW) Lewis County

Photo Type: DS, DS View Location, Orientation, Photographer Initials: Downstream Edge of ROW, Downstream View, AJE/PEL Lat: 38.918602 Long: -80.573256



Spread B Stream S-H165 (Pipeline ROW) Lewis County

Photo Type: US View at Center Location, Orientation, Photographer Initials: Center ROW, Upstream View, AJE/PEL Lat: 38.918602 Long: -80.573256



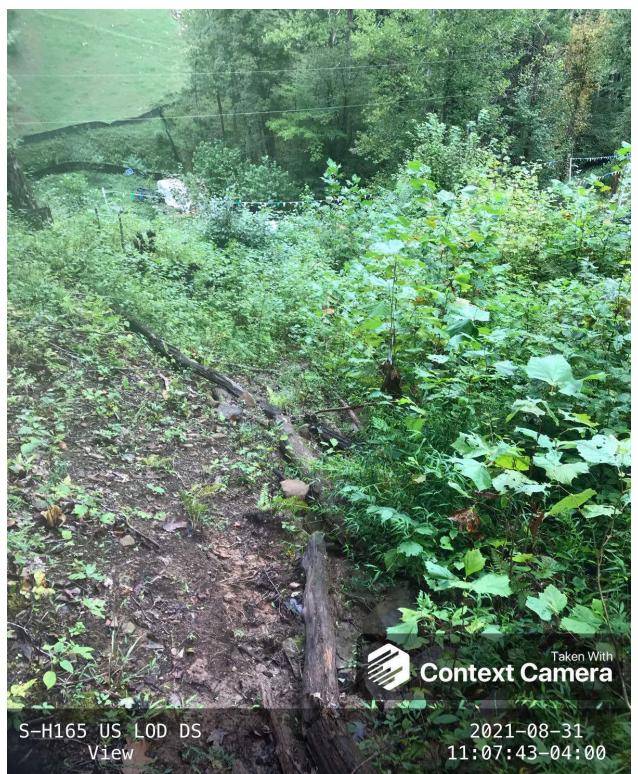
Spread B Stream S-H165 (Pipeline ROW) Lewis County

Photo Type: DS View at Center Location, Orientation, Photographer Initials: ROW Center, Downstream View, AJE/PEL Lat: 38.918602 Long: -80.573256



Spread B Stream S-H165 (Pipeline ROW) Lewis County

Photo Type: US, US View Location, Orientation, Photographer Initials: Upstream Edge of ROW, Upstream View, AJE/PEL Lat: 38.918602 Long: -80.573256



Spread B Stream S-H165 (Pipeline ROW) Lewis County

Photo Type: US, DS View Location, Orientation, Photographer Initials: Upstream Edge of ROW, Downstream View, AJE/PEL Lat: 38.918602 Long: -80.573256

USACE FILE NO./ Project Name: (v2.1, Sept 2015)		ľ	Mountain V	/alley Pipeline			OORDINATE mal Degrees)
IMPACT STREAM/SITE ID (watershed size {acreage}				S	H165		
STREAM IMPACT LENGTH:	144	Form Mitiga		RESTORATION (Levels I-III)			ORDINATES mal Degrees)
Column No. 1- Impact Existing	g Condition (De	bit)		Column No. 2- Mitigation Existing (Condition -	Baselii	ne (Credit)
Stream Classification:	Ephe	meral	=	Stream Classification:			
Percent Stream Channel SI	оре	41		Percent Stream Channel S	ope		
HGM Score (attach d	ata forms):			HGM Score (attach	data form	is):	
		Average					Average
łydrology	0.6			Hydrology			
Biogeochemical Cycling	0.48	0.5		Biogeochemical Cycling			0
Habitat	0.42			Habitat			
PART I - Physical, Chemical and	Biological India	ators		PART I - Physical, Chemical ar	nd Biologic	al Indic	ators
	Points Scale Range	Site Score	1		Points Scale	Range	Site Score
PHYSICAL INDICATOR (Applies to all streams	s classifications)		1	PHYSICAL INDICATOR (Applies to all streams	classification	ns)	
JSEPA RBP (High Gradient Data Sheet)				USEPA RBP (Low Gradient Data Sheet)		-	
. Epifaunal Substrate/Available Cover	0-20	0	_	1. Epifaunal Substrate/Available Cover	0-20		
. Embeddedness	0-20	14	_	2. Pool Substrate Characterization	0-20		
. Velocity/ Depth Regime	0-20	0	-	3. Pool Variability	0-20		
. Sediment Deposition	0-20	<u>15</u> 0	-	4. Sediment Deposition	0-20		
. Channel Flow Status . Channel Alteration	0-20 0-1	20		5. Channel Flow Status 6. Channel Alteration	0-20	0-1	
. Channel Alteration . Frequency of Riffles (or bends)	0-20	0		6. Channel Alteration 7. Channel Sinuosity	0-20		
Bank Stability (LB & RB)	0-20	18	-	8. Bank Stability (LB & RB)	0-20		
. Vegetative Protection (LB & RB)	0-20	18	-	9. Vegetative Protection (LB & RB)	0-20		
0. Riparian Vegetative Zone Width (LB & RB)	0-20	18	-	10. Riparian Vegetative Zone Width (LB & RB)	0-20		
Total RBP Score	Optimal	103		Total RBP Score	Poo	r	0
Sub-Total		0.85833333		Sub-Total			0
CHEMICAL INDICATOR (Applies to Intermitter	nt and Perennial St	reams)		CHEMICAL INDICATOR (Applies to Intermitter	t and Perenn	ial Strea	ms)
WVDEP Water Quality Indicators (General)		-	WVDEP Water Quality Indicators (General)		
Specific Conductivity				Specific Conductivity			
100-199 - 85 points	0-90				0-90		
bH				pH			0
	0-80				5-90	0-1	
5.6-5.9 = 45 points			-	DO			
00				DO			
	10-30				10-30		
Sub-Total	_ _			Sub-Total			0
BIOLOGICAL INDICATOR (Applies to Intermit	tent and Perennial	Streams)		BIOLOGICAL INDICATOR (Applies to Intermit	ent and Pere	nnial Str	eams)
VV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)			
0	0-100 0-1				0-100	0-1	
Sub-Total	<u> </u>	0		Sub-Total			0
		-	_	u			
PART II - Index and U	Init Score			PART II - Index and	Unit Score)	
la dese						Fast	
Index	Linear Feet	Unit Score		Index	Linear	reet	Unit Score

0

0

0

Index	Linear Feet	Unit Score
0.665	144	95.7

38.918602	Lon.	-80.573256	WEATHER:		Sunny	DATE:	0.1	
							8/3	31/2021
MITIGATION STREAM C (watershed siz	CLASS./SITE ID / e {acreage}, unaltered		DN:			Comments:		
	Lon.		PRECIPITATION PAST 48 HRS:			Mitigation Length:		
Column No. 3- Mitig Post Co	ation Projected a mpletion (Credit)		Column No. 4- Mitigation P Post Completio		ars	Column No. 5- Mitigation Projec	ted at Maturity	/ (Credit)
Stream Classification:		0	Stream Classification:)	Stream Classification:		0
Percent Stream Cha	annel Slope	0	Percent Stream Channel	Slope	0	Percent Stream Channel S	Slope	C
HGM Score	(attach data for	ms):	HGM Score (attach	n data forms):		HGM Score (attach o	data forms):	
		Average			Average			Ave
Hydrology Biogeochemical Cycling		0	Hydrology Biogeochemical Cycling		ο	Hydrology Biogeochemical Cycling		0
Habitat PART I - Physical, Che	mical and Biolog	ical Indicators	Habitat PART I - Physical, Chemical a	nd Biological Indic	ators	Habitat PART I - Physical, Chemical and	d Biological In	dicators
	Points Scale	Range Site Score		Points Scale Range	Site Score		Points Scale Ra	ange Site S
PHYSICAL INDICATOR (Applies to a	III streams classificati	ions)	PHYSICAL INDICATOR (Applies to all stress	ams classifications)		PHYSICAL INDICATOR (Applies to all stream	s classifications)	
USEPA RBP (High Gradient Data	Sheet)		USEPA RBP (High Gradient Data Sheet	t)		USEPA RBP (High Gradient Data Sheet)		
1. Epifaunal Substrate/Available Cov	ver 0-20		1. Epifaunal Substrate/Available Cover	0-20		1. Epifaunal Substrate/Available Cover	0-20	
2. Embeddedness	0-20	_	2. Embeddedness	0-20		2. Embeddedness	0-20	
3. Velocity/ Depth Regime	0-20		3. Velocity/ Depth Regime	0-20		3. Velocity/ Depth Regime	0-20	
4. Sediment Deposition	0-20		4. Sediment Deposition	0-20		4. Sediment Deposition	0-20	
5. Channel Flow Status	0-20	0-1	5. Channel Flow Status	0-20 0-1		5. Channel Flow Status		D-1
6. Channel Alteration	0-20		6. Channel Alteration	0-20		6. Channel Alteration	0-20	
7. Frequency of Riffles (or bends)	0-20	-	7. Frequency of Riffles (or bends)	0-20		7. Frequency of Riffles (or bends)	0-20	
8. Bank Stability (LB & RB) 9. Vegetative Protection (LB & RB)	0-20		8. Bank Stability (LB & RB) 9. Vegetative Protection (LB & RB)	0-20		8. Bank Stability (LB & RB) 9. Vegetative Protection (LB & RB)	0-20	
10. Riparian Vegetative Zone Width (LB	0-20 & RB) 0-20	-	10. Riparian Vegetative Zone Width (LB & RB)	0-20		10. Riparian Vegetative Zone Width (LB & RB)	0-20	
Total RBP Score		or 0	Total RBP Score	Poor	0	Total RBP Score	Poor	
Sub-Total		0	Sub-Total	1 001	0	Sub-Total	1 001	
CHEMICAL INDICATOR (Applies to	Intermittent and Pere	nnial Streams)	CHEMICAL INDICATOR (Applies to Interm	ittent and Perennial Str	eams)	CHEMICAL INDICATOR (Applies to Intermitte	ent and Perennial	
WVDEP Water Quality Indicators ((General)		WVDEP Water Quality Indicators (Gene	eral)		WVDEP Water Quality Indicators (Genera	ıl)	
Specific Conductivity			Specific Conductivity			Specific Conductivity		
	0-90			0-90			0-90	
рН		0-1	pH	0-1		рН		0-1
	5-90			5-90			5-90	
DO			DO			DO		
	10-30			10-30			10-30	
<u> </u>	10-00							
Sub-Total		0	Sub-Total		0	Sub-Total		
BIOLOGICAL INDICATOR (Applies		Perennial Streams)	BIOLOGICAL INDICATOR (Applies to Int	ermittent and Perenr	ial Streams)	BIOLOGICAL INDICATOR (Applies to Interr	nittent and Pere	ennial Strea
WV Stream Condition Index (WVS	,	0.1	WV Stream Condition Index (WVSCI)	0.100		WV Stream Condition Index (WVSCI)	0.100	
Sub-Total	0-100	0-1	Sub-Total	0-100 0-1	0	Sub-Total	0-100 0	D-1
<u> </u>								
PART II - In	idex and Unit Sco	pre	PART II - Index and	d Unit Score		PART II - Index and	Unit Score	

Index	Linear Feet	Unit Score
0	0	0

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

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

FCI Calculator for the High-Gradient Headwater Streams in Appalachia

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

Project Name: MVP Stream Assessment Location: Lewis, Spread B Sampling Date: 08/31/21	Project Site	Before Project
Subclass for this SAR: Ephemeral Stream		
Uppermost stratum present at this SAR: Shrub/Herb Strata	SAR number:	S-H165

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.60
Biogeochemical Cycling	0.48
Habitat	0.42

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
VCCANOPY	Percent canpoy over channel.	Not Used, <20%	Not Used
V _{EMBED}	Average embeddedness of channel.	2.87	0.77
V _{SUBSTRATE}	Median stream channel substrate particle size.	1.50	0.75
V _{BERO}	Total percent of eroded stream channel bank.	0.00	1.00
V _{LWD}	Number of down woody stems per 100 feet of stream.	0.00	0.00
V _{TDBH}	Average dbh of trees.	Not Used	Not Used
V _{SNAG}	Number of snags per 100 feet of stream.	0.00	0.10
V _{SSD}	Number of saplings and shrubs per 100 feet of stream.	5.81	0.09
V _{SRICH}	Riparian vegetation species richness.	0.00	0.00
V _{DETRITUS}	Average percent cover of leaves, sticks, etc.	36.25	0.44
V _{HERB}	Average percent cover of herbaceous vegetation.	63.75	0.85
V _{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.79	0.83

			High-G			ter Strea				а	Vereio	n 10-20-17
	Team:	AJE, PEL		i loid E			aicu		-	M Northina:	38.918602	
Pr	oject Name:		m Assessm	ent						0	-80.573256	;
	Location:	Lewis, Spre	ead B						Sam	pling Date:	08/31/21	
SA	AR Number:	S-H165	Reach	Length (ft):	155	Stream Ty	/pe:	Ephe	meral Stream	E.		•
	Top Strata:	Sh	rub/Herb St	rata	(determine	d from perce	ent calo	culate	ed in V _{CCANC}	_{PPY})		
	and Timing:	100000000000000000000000000000000000000				\bullet	Before	Proje	ct			•
1	e Variables V _{CCANOPY} List the per	Average pe equidistant	points alon at least one	over chanr g the strear value betw	n. Measure veen 0 and 1	nd sapling o only if tree, 19 to trigger	sapling	g cov	er is at leas			Not Used, <20%
	0											
2	V _{EMBED}	points alon the surface according t rating score	g the strear and area s to the follow e of 1. If the	n. Select a urrounding ing table. If bed is con	particle from the particle the bed is a posed of be	el. Measure n the bed. I that is cove an artificial edrock, use	Before red by surface a rating	movi fine s e, or c g scc	ng it, detern sediment, ar composed o pre of 5.	nine the per- nd enter the f fine sedim	centage of rating ents, use a	2.9
		Minshall 19	983)		oddie and r	ooulder part	icies (r	esca	led from Pla	tts, Megana	in, and	
		Rating 5	Rating Des <5 percent		overed. sur	rounded, or	burier	l bv f	ine sedimer	t (or bedroo	:k)	
		4				l, surrounde					1	
		3				d, surround						
		2				d, surround					al surface)	
	List the rat	ings at each					or build	Juby			ar ouridoo)	
	4	4	4	2	2	1	2		4	3	2	
	2	3	5	3	2	2	3		5	3	2	
	4	4	4	2	2	1	2		4	3	2	
3	V _{SUBSTRATE}	Median stre along the s				e. Measure rticles as us				ghly equidis	stant points	1.50 in
		cle size in ir concrete as					w (bed	lrock	should be o	counted as §	99 in,	-
	4.00	0.80	0.50	1.00	6.00	1.50	4.0	0	1.50	2.00	5.00	
	1.50	1.20	0.80	2.50	3.00	1.50	1.2		0.80	2.50	3.00	
	4.00	0.80	0.50	1.00	6.00	1.50	4.0	00	1.50	2.00	5.00	
4	V _{BERO}	Total perce	ent of erode	d stream ch	annel bank.	Enter the t	otal nu	mbei	of feet of e	roded bank	on each	
		side and th may be up	to 200%.	-		d If both ba					ne stream	0 %
			Left Bank:	0	ft		Right B	ank:	0	ft		
5	e Variables V _{LWD}	Number of stream rea	down wood	y stems (at ie number fi	least 4 inch	jacent to th es in diame re 50'-wide	ter and	36 ir	nches in len	gth) per 100) feet of	0.0
					Number of	downed wo)		
6	V _{TDBH}	inches (10	cm) in diam n measurem	eter. Enter	tree DBHs i	_{PY} tree/sapli in inches. (at least 4 i						Not Used
			Left Side						Right Side			
								_				
_									F (
7	V _{SNAG}					per 100 fee et will be ca			Enter num	ber of snag:	s on each	0.0
			Left Side:		D		Right S	Side:		D		
8	V _{SSD}	if tree cove	r is <20%).	Enter numb	per of saplin	up to 4 incl lgs and shru	nes dbł	n) pe				5.8
		amount per	100 ft of st Left Side:		calculated.		Right S	Side [.]		3		

Weightalion percentages up through 200% are accepted. Enter the percent over of ground vegetation at each subplot. Left Side Right Side 20 20 10 90 90 90 100 mple Variable 12 within the entire catchment of the stream. U Image: Colspan="2">Output the stream. 12 V _{WLUSE} Weighted Average of Runoff Score for watershed: 0.7 Image: Choose From Drop List Runoff Score Runoff Catch-ment Catchment (not > Newly graded areas (bare soil, no vegetation or pavement) 0 7.7 7.7 Forest and native range (>75% ground cover) 1 73.4 81.	Acer rubrum Magnole bipefale Aderthus altissima Lonicere japonica Acer rubrum Nysas synketice Altitissima Lonicere italing Assculus finava Oyvendum antoine Altitissima Lonicere italing Assculus finava Oyvendum antoine Altitissima Lonicere italing Assculus finava Oyvendum antoine Altitissima Lonice concludus Betule entry financial Quercus abba Aternambers Lonice concludus Betule entry Quercus printe Cersatium fontanum Pulayonum custolitie Carya gabara Quercus printe Cersatium fontanum Pulayonum custolitie Carya ovaita Quercus printe Cersatium fontanum Pulayonum custolitie Carya ovaita Quercus printe Lespedeza suceata Rosa multifors Carya ovaita Quercus printe Ligus furm abbense Variana bialism Carya ovaita Quercus printe Ligus furm abbense Variana bialism Carya ovaita Quercus printe Ligus furm abbense Variana bialism Corrus forde Sasafara abbiality Logade caronata Quercus printe Quercus abbia	9 V _{SRICH}		the tallest s	stratum. Check and the subind	k all exoti	c and inva	isive species	present in a			0.00		
A car saccharum Aysa sylvatica Abital juliorisan Cubic	Ader saccharum Nyssa sylvatica Abbia julkivissin Loncera tatarica Ader saccharum Oryemoum androum Allera patiolata Lutica comiculatorica Adminia filos Oryemoum androum Allera patiolata Lutica comiculatorica Beluia lateria Ouercus aba Aster staticus Pationambran Beluia lateria Ouercus aba Aster staticus Pationambran Carya gibbra Ouercus aba Coroelle varia Pationambran Carya gibbra Ouercus veluina Espedea blockor Sorghum helpert Corros forde Tata americana Programotical Sorghum helpert Paciaria Orsecus veluina Lespedea abolo Sorghum helpert Corros forde Tata americana Uninus americana Uninus americana Uninus americana Magnola acuminatic Uninus americana Uninus americana Uninus americana Uninus americana Vermus Average protent core of lenses, atulas, o nither organic mattantal. Woody debits of d'a matter and valoe		Grou	p 1 = 1.0					Group	2 (-1.0)				
Assentius flives □ Orydendum arboreum □ Alleria petiolatis □ Lotus corriculatus Astina tribba □ Prunus servina □ Alleria petiolatis □ Lotus corriculatus Betual elingenerias □ Quercus alba □ Alleria petiolatis □ Prunus elingenerias □ Prunus elingenerias Carya gibba □ Quercus inbrinens □ Carya gibba □ Quercus inbrinens □ Carya gibba □ Prunus elingenerias □ Prunus elingenelingenerias □ Prunus elinge	Associals fleve Opdendrum andoreum Alliants petiolate Lotus constructuotus Assimilar hilos Ouercus acedia Alliants petiolate Lotus constructuotus Bebla allignamenasis Ouercus concines Aster fataricus Paluavirals forman Carya albe Ouercus concines Carsa contine values Paluavirals forman Carya albe Ouercus notines Carsa contine values Palearais montana Carya ovalis Ouercus notines Carsa contine values Palearais montana Carya ovalis Ouercus notines Espedeza bocion Songurum halpen Carya ovalis Ouercus notines Ligustrum obeatablum Resentant montana Frasius americana Tilia americana Ligustrum obeatablum Resentant montana Associals acumeata Unitrus americana Ligustrum obeatablum Songurum Name Vermina Songurum Name Ligustrum obeatablum Songurum Name Vermina Langu contantana Ligustrum obeatablum Songurum Name Vermina Songurum Name Songurum Name Songurum Name Vermina Songurum Name Songurum Name Songurum Name <	Acer rub	rum		Magnolia tripe	etala		Ailanthus a	ltissima		Lonicera ja	aponica		
A similar biloca Prunus serotine Capa allas	Astimica finitional alignmentationalizationalinalizationalizationalizationalizationalizat	Acer sa	charum		Nyssa sylvati	ica		Albizia julibi	rissin		Lonicera ta	atarica		
Astimite triloce Betuia elleghamenasa Quercus abe Betuia elleghamenasa Quercus abe Betuia elleghamenasa Quercus abe Betuia elleghamenasa Quercus abe Carya gibta Quercus subtra Quercus subtra Carya ovala Quercus subtra Quercus subtra Carya ovala Quercus Carya Quercus Carya Quercus Carya Quercus Carya Quercus Carya Querus Carya Quercus Carya	Astimic risio Prurus serotina Alternantiera Lythrum salicaria Betula alignaminata Quercus anbinaria Alternantiera Patulowini minina Betula alignaminata Quercus anbinaria Corrunal instancia Patulowini minina Carya alia Quercus anbinaria Corrunal instancia Patulowini Minina Carya ovialis Quercus anbinaria Corrunal instancia Patulowini Minina Carya ovialis Quercus anbinaria Corrunal instancia Patulowini Minina Carya ovialis Quercus anbinaria Corrunal instancia Patulowini Minina Pagua grandibila Trial americana Lepadezia functiona Vertea brasilian Figua grandibila Trial americana Lepadezia Vertea brasilian Magnolia acuminata Umus americana Lepadezia Vertea brasilian Magnolia acuminata Trial americana Lepadezia Vertea brasilian Vertables 16-11 within at least 8 subplots (40° x 40°; or trix 1 mj in the ripartanbuffer zone within 25 feet from acc Trial americana Lepadezia Vertable 12 within the enter catchment cort core of the detatal layor at each subplot. Vertable 12 within the paternanticous as acceledia layor at each subplot. Areage percen	Aesculu	s flava		Oxydendrum a	arboreum	П	Alliaria petio	olata		Lotus corn	iculatus		
Betula alleghaniensis Quercus alba Philoseroides Monostegium vinim Betula alleghaniensis Quercus abba Aster traincus Paulownia tormin Carya alba Quercus prinus Caroalile varia Paulownia tormin Carya alba Quercus prinus Caroalile varia Pression montens Carya avaitis Quercus prinus Caroanile varia Pression montens Carya avaitis Quercus prinus Caroanile varia Pression montens Carya avaitis Quercus prinus Caroanile varia Presegous motensie Carya avaitis Quercus prinus Lappedaza curied Present antensien Pragues grandfolia Tilla americana Lugustum sheense Verbens brasilient Pragues grandfolia Ulmus americana Lugustum sheense 20 The four subplots should be phaced roughy equidistantly slong sach she of the stream. 36 24 10 Vertens Average percentage over of the taceous vegetation (measure only if the cover is <20%). Do not include woody stems at least 40 and 30% tat Eaclause there may be saveral layers of ground cover or noucleaves application propagain induction of ground scale application or pamerement	Betula slephaniansia Ouercus alba Philoseroides Microstegium vinin Betula slephaniansia Ouercus abba Philoseroides Phi	Asimina	triloba		Prunus seroti	ina				_	Lvthrum s	alicaria		
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VDETRITUS 36.3 % 0.44	VDETRITUS 36.3 % 0.44 VHERB 64 % 0.85	2 V _{WLUSE} Newly gr Forest an Open spa Forest an Open spa Forest an Open spa Forest an Open spa Forest an Open spa Vorest an Open spa Variable Variable Variable Variable Variable Variable Vsubstraa VBERO VLWD VTDBH VSNAG	20 a 12 within the Weighted / Weighted / ided areas (bare d native range (: ce (pasture, lawn ce (pasture, lawn S-H165 Value Not Used, 2.9 re 1.50 in 0 % 0.0 Not Used 0.0	Left 20 e entire cat Average of F Land soil, no vege >75% ground ns, parks, etc. VSI Not Used 0.77 0.75 1.00 0.00 Not Used 0.10	10 chment of the Runoff Score f Use (Choose tation or pavern I cover)	e stream. for waters From Dro nent)	hed:	90	90 • • • •	Runoff Score 0 1	Catch- ment 7.7 73.4	Runnin Percen (not >10 7.7 81.1		
	V _{HERB} 64 % 0.85	2 V _{WLUSE} Newly gr Forest an Open spa Forest an Open spa Veriable Vccanopy VEMBED Vsubstraa VBERO VLWD VLWD VTDBH VSNAG VSSD	20 a 12 within the Weighted / Weighted / Ided areas (bare d native range (: ce (pasture, lawn S-H165 Value Not Used, 2.9 TE 1.50 in 0 % 0.0 Not Used 0.0 5.8	Left 20 e entire cat Average of F Land soil, no vege 75% ground ns, parks, etc. VSI Not Used 0.77 0.75 1.00 0.00 Not Used 0.10 0.09	10 chment of the Runoff Score f Use (Choose tation or pavern I cover)	e stream. for waters From Dro nent)	hed:	90	90 • • • •	Runoff Score 0 1	Catch- ment 7.7 73.4	Runnin Percen (not >10 7.7 81.1		
		2 V _{WLUSE} Newly gr. Forest an Open spa Open spa Voriable Vccanopy VEMBED VcCANOPY VEMBED VsuBSTRA VBERO VLWD VTDBH VSNAG VSSD VSRICH	20 a 12 within the Weighted / Weighted / ided areas (bare d native range (: ce (pasture, lawn Ce (pasture, lawn S-H165 Value Not Used, 2.9 re 1.50 in 0 % 0.0 Not Used 0.0 5.8 0.00	Left 20 e entire cat Average of F Land soil, no vege 75% ground ns, parks, etc. VSI Not Used 0.77 0.75 1.00 0.00 Not Used 0.10 0.09 0.00	10 chment of the Runoff Score f Use (Choose tation or pavern I cover)	e stream. for waters From Dro nent)	hed:	90	90 • • • •	Runoff Score 0 1	Catch- ment 7.7 73.4	Runnin Percen (not >10 7.7 81.1		
	V _{WLUSE} 0.79 0.83	2 V _{WLUSE} Newly gr. Forest an Open spa Open spa Variable Vccanopy VEMBED VsuBstra VBERO VLWD VTDBH VSNAG VSSD VSRICH VDETRITUS	20 a 12 within the Weighted / Weighted / Ided areas (bare d native range (: ce (pasture, lawn Ce (pasture, lawn S-H165 Value Not Used, 2.9 re 1.50 in 0 % 0.0 Not Used 0.0 5.8 0.00 36.3 %	Left 20 e entire cat Average of F Land soil, no vege >75% ground ns, parks, etc. VSI Not Used 0.77 0.75 1.00 0.00 Not Used 0.10 0.09 0.00 0.44	10 chment of the Runoff Score f Use (Choose tation or pavern I cover)	e stream. for waters From Dro nent)	hed:	90	90 • • • •	Runoff Score 0 1	Catch- ment 7.7 73.4	Runnin Percen (not >10 7.7 81.1		

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME	LOCATION			
STATION # RIVERMILE	STREAM CLASS			
LAT LONG	RIVER BASIN			
STORET #	AGENCY			
INVESTIGATORS				
FORM COMPLETED BY	DATE TIME	REASON FOR SURVEY		

WEATHER CONDITIONS	Now storm (heavy rain) rain (steady rain) showers (intermittent) %%cloud cover clear/sunny	rast 24 hours	Has there been a heavy rain in the last 7 days? Yes No Air Temperature ⁰ C Other
SITE LOCATION/MAP	Flow Out	e the areas sampl	led (or attach a photograph)
	Flow In LOD		S-H165 LOE 150x2 ft
STREAM CHARACTERIZATION	Stream Origin Glacial Sprinț Non-elacial montane Mixtu		Stream Type Coldwater Warmwater Catchment Areakm ²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES RIPARIAN VEGETATION (18 meter buffer)	Predominant Surrounding Landuse Local Watershed NPS Pollution Forest Commercial Field/Pasture Industrial Agricultural Other Residential Other Indicate the dominant type and record the dominant species present Herbaceous Trees Shrubs Grasses Dominant species present Herbaceous
INSTREAM FEATURES	Dominant species present
LARGE WOODY	LWDm ²
DEBRIS	Density of LWDm ² /km ² (LWD/ reach area)
AQUATIC	Indicate the dominant type and record the dominant species present
VEGETATION	Rooted emergent Rooted submergent Rooted floating Free floating Floating Algae Attached Algae Booted floating Free floating Free floating Dominant species present
WATER QUALITY (DS, US)	Temperature0 C Water Odors Normal/None Sewage Specific Conductance Petroleum Fishy Chemical Other Dissolved Oxygen Water Surface Oils Slick Sheen None Globs Flecks pH Turbidity (if not measured) Clear Slightly turbid Turbid Turbid Turbid Opaque Turbid
SEDIMENT/	Odors
SUBSTRATE	Normal Sewage Petroleum Deposits Chemical Anaerobic None Sludge Sawdust Paper fiber Sand Other Other Epoking at stones which are not deeply embedded are the undersides black in color? How are the undersides black in color?

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

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

STREAM NAME	LOCATION	
STATION # RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE TIME AM PM	REASON FOR SURVEY

	Habitat		Condition	ı Category	
	Parameter	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 <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	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 iı	SCORE	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).
Iram	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
P	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	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	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 2

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

Habitat		Condition	ı Category	
Parameter	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 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	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
 SCORE 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. SCORE (LB) SCORE (RB) 9. Vegetative Protection (score each bank) 	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 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	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 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	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 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE(RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score _____

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME		LOCATION	
STATION #	_ RIVERMILE	STREAM CLASS	
LAT	LONG	RIVER BASIN	
STORET #		AGENCY	
INVESTIGATORS			LOT NUMBER
FORM COMPLETED	BY	DATE TIME	REASON FOR SURVEY
HABITAT TYPES	Indicate the percentage of Cobble% Sn Submerged Macrophytes	ags% Vegetated B	anks% Sand%)%
SAMPLE COLLECTION	Indicate the number of jab	lected? wading fi ps/kicks taken in each habitat ty lags Vegetated B	anks Sand
GENERAL COMMENTS			

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)

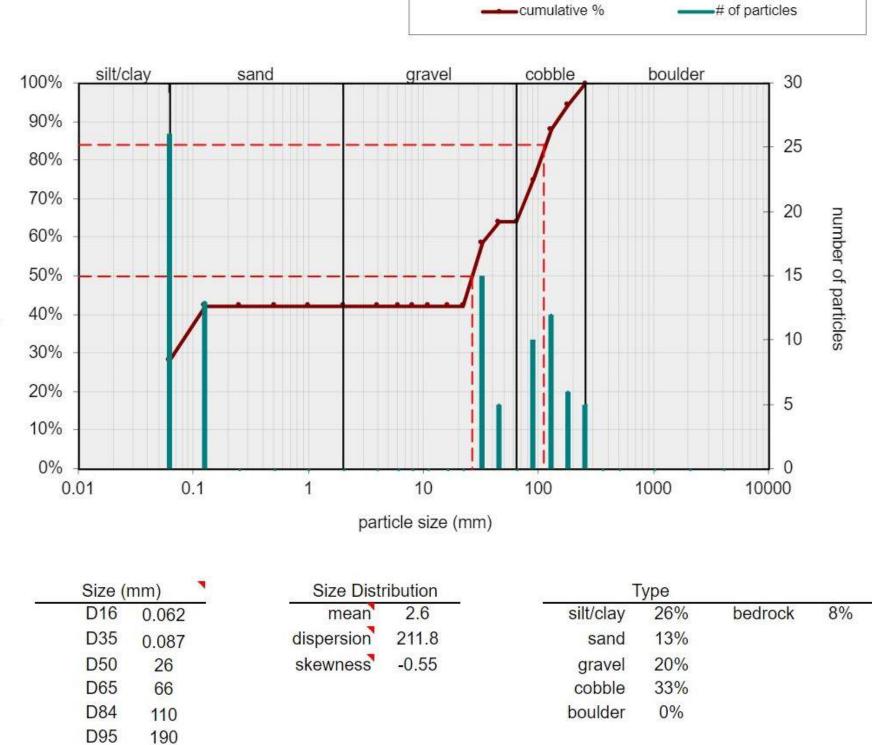
Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
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:	Lewis	Stream ID:	S-H165
Stream Name:	UNT to Indian Fork		
HUC Code:		Basin:	
Survey Date:	8/31/2021		
Surveyors:	AJE, PEL	Impact Reach:	47.24 m
Type:	Bankfull Channel		

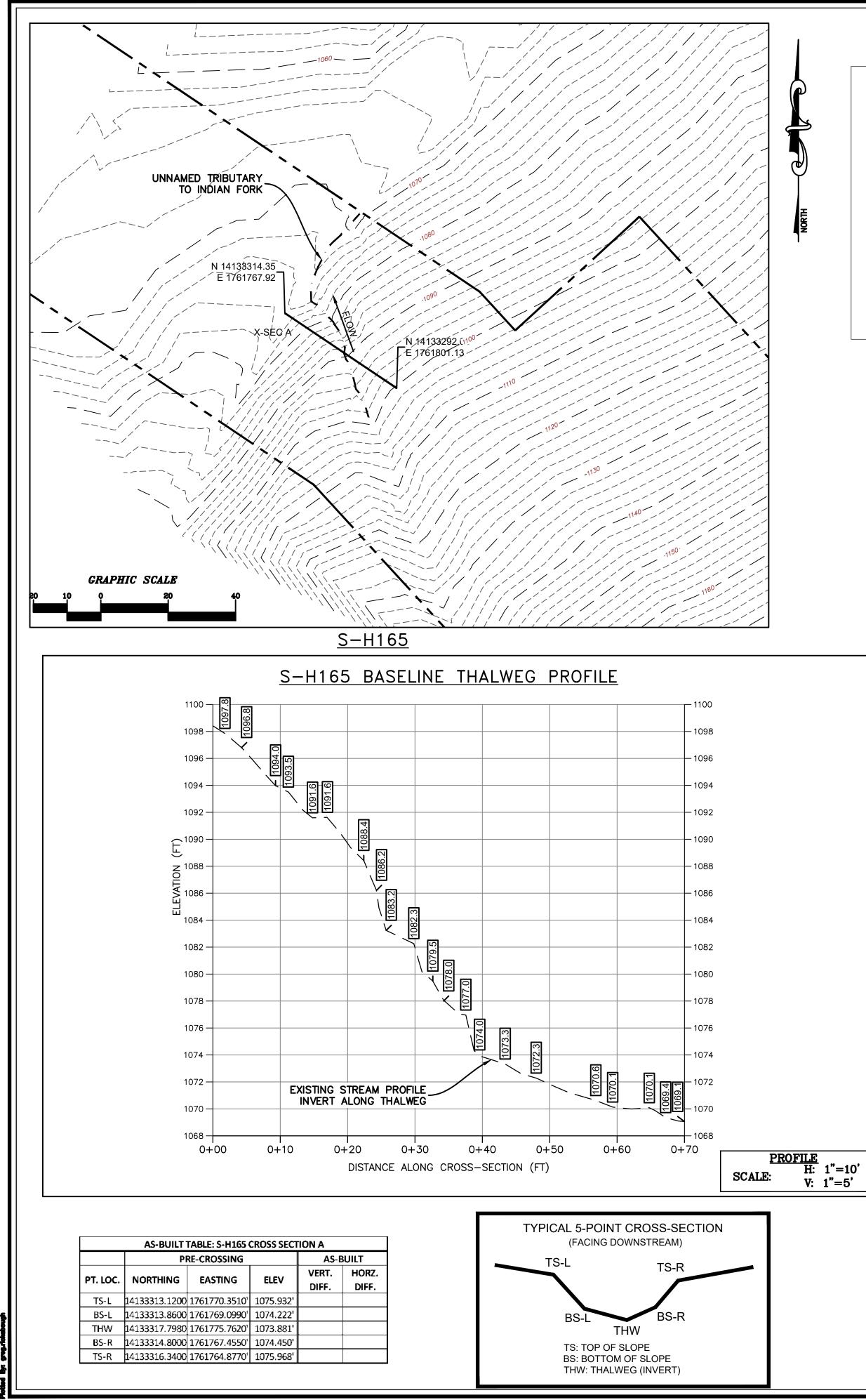
Inches	PARTICLE	Millimeters		Particle Count	Total #	Item %	% Cun
	Silt/Clay	< .062	S/C	_	26	26.00	26.00
	Very Fine	.062125		▼	13	13.00	39.00
	Fine	.12525		▼	0	0.00	39.00
	Medium	.255	S A N D	▼			
	Coarse	.50-1.0	SAND	▼	0	0.00	39.00
.0408	Very Coarse	1.0-2	-	▼	0	0.00	39.00
.0816	Very Fine	2 -4			0	0.00	39.00
	-			▲ ▼	0	0.00	39.00
.1622	Fine	4 -5.7		▲ ▼	0	0.00	39.00
.2231	Fine	5.7 - 8		▲ ▼	0	0.00	39.00
.3144	Medium	8 -11.3		▲ ▼	0	0.00	39.00
.4463	Medium	11.3 - 16	GRAVEL	▲ ▼	0	0.00	39.00
.6389	Coarse	16 -22.6		▲ ▼	0	0.00	39.00
.89 - 1.26	Coarse	22.6 - 32		▲ ▼	15	15.00	54.00
1.26 - 1.77	Vry Coarse	32 - 45		▲ ▼	5	5.00	59.00
1.77 -2.5	Vry Coarse	45 - 64	-		0	0.00	59.00
2.5 - 3.5	Small	64 - 90		▼	10	10.00	69.00
3.5 - 5.0	Small	90 - 128		▼	12	12.00	81.00
5.0 - 7.1	Large	128 - 180	COBBLE	▼	6	6.00	87.00
7.1 - 10.1	Large	180 - 256	-		5	5.00	92.00
10.1 - 14.3	Small	256 - 362			0	0.00	92.00
14.3 - 20	Small	362 - 512	-	▼	0	0.00	92.00
20 - 40	Medium	512 - 1024	BOULDER	▼	0	0.00	92.00
40 - 80	Large	1024 -2048		▼	0	0.00	92.00
80 - 160	Vry Large	2048 -4096	-	▼	0	0.00	92.00
	Bedrock		BDRK	▼	8	8.00	100.0
				▼ Totals:	100	0.00	100.0

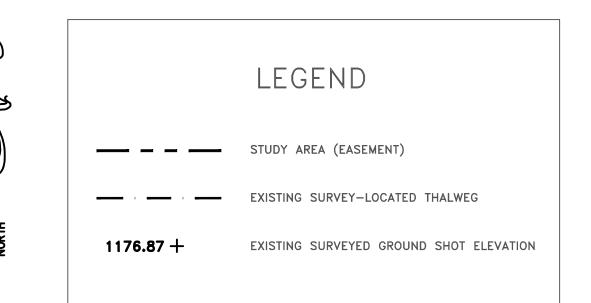
Bankfull Channel Pebble Count, S-H165



percent finer than

per





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 31, 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.

