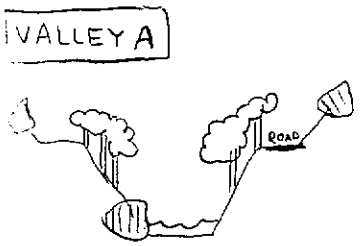
SHARMAN'S BRANCH

Team 2
Reach 2
4/15/14



VALLEY LENGTH: 188'

RIFFLE X.S.

ROAD

CULVERT

POOL X.S.

STEP

BELT WIDTH: 43,7'

VALLEY A

SCOUR

POOL X.S.

POOL X.S.

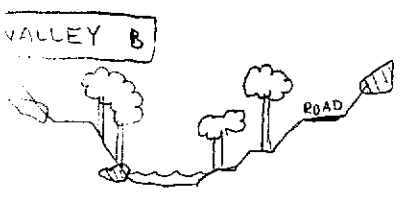
N

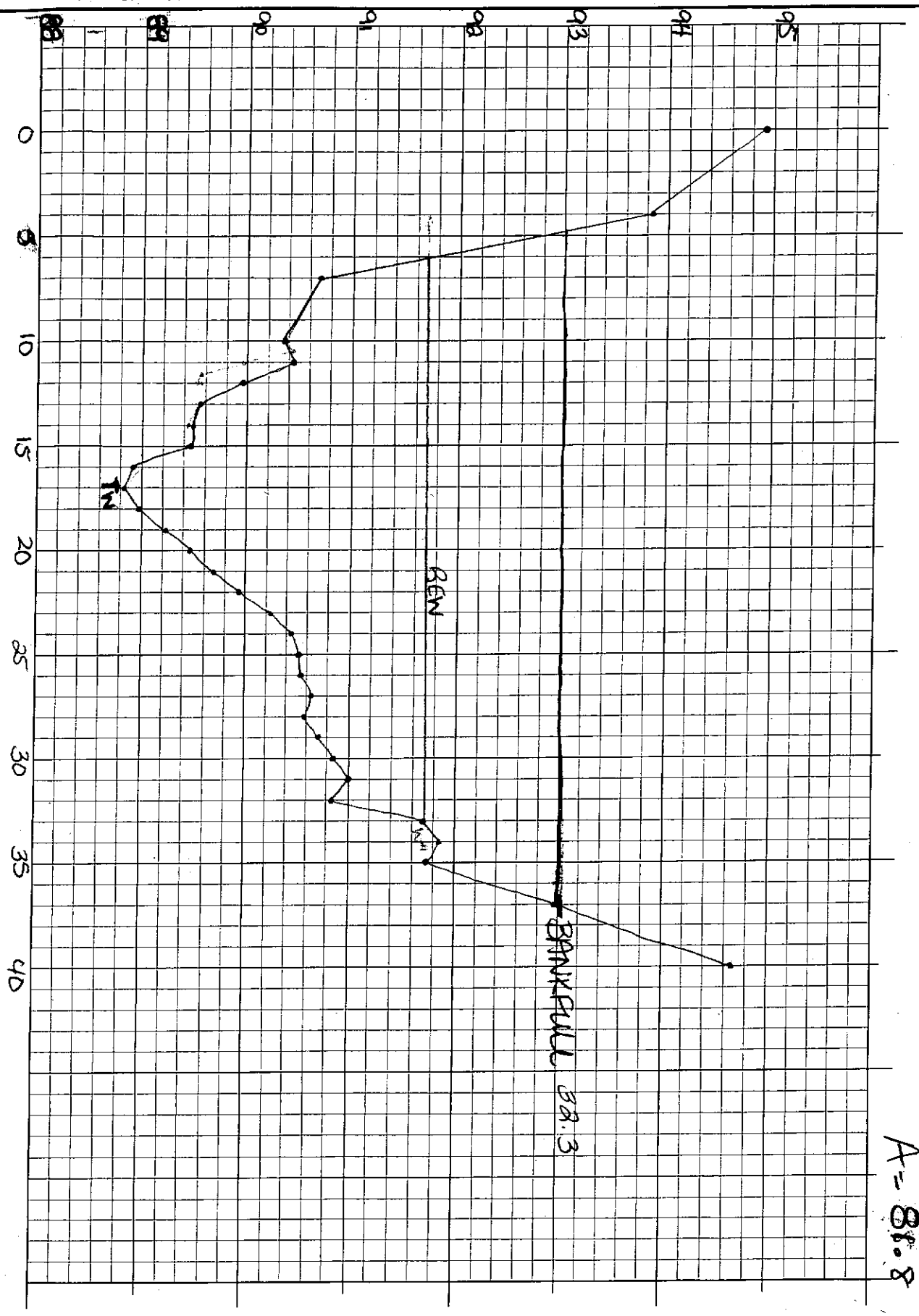
1" = 20'

STEP X.S.

RIFFLE X.S.

VALLEY B





Team 2
Reach 2
4/15/14
XS #6 POOL #3
A = 88.8

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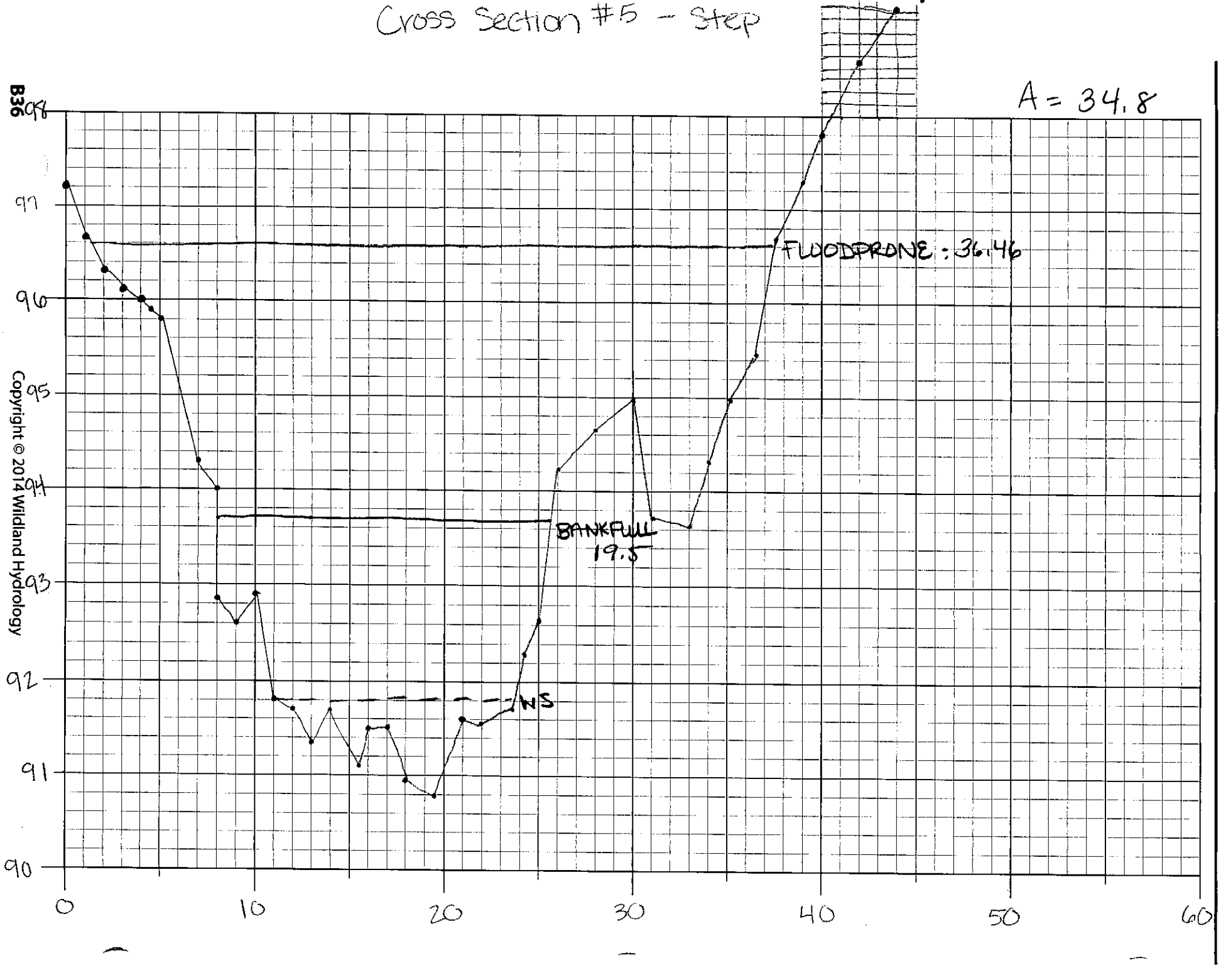
Cross Section #5 - Step



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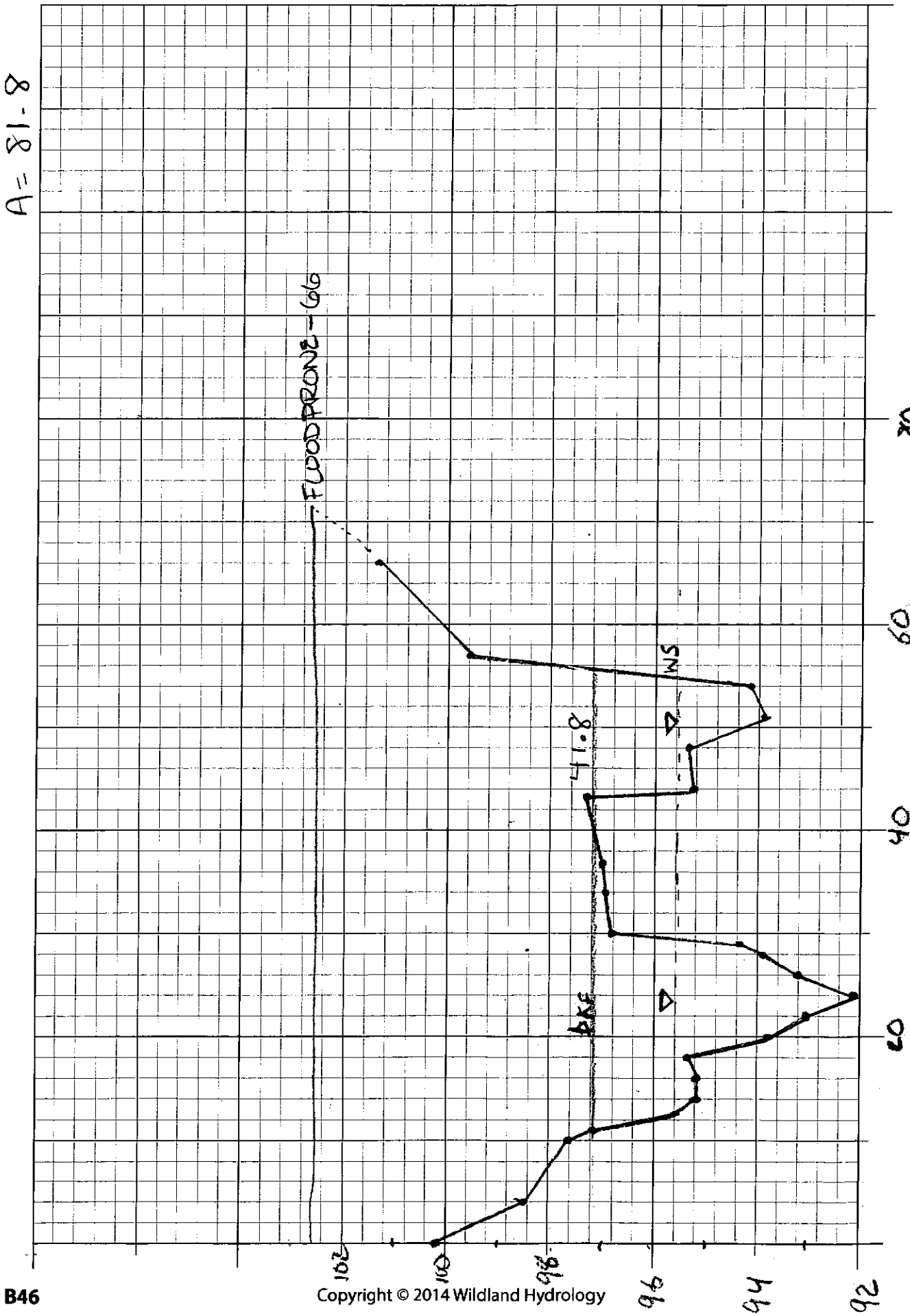

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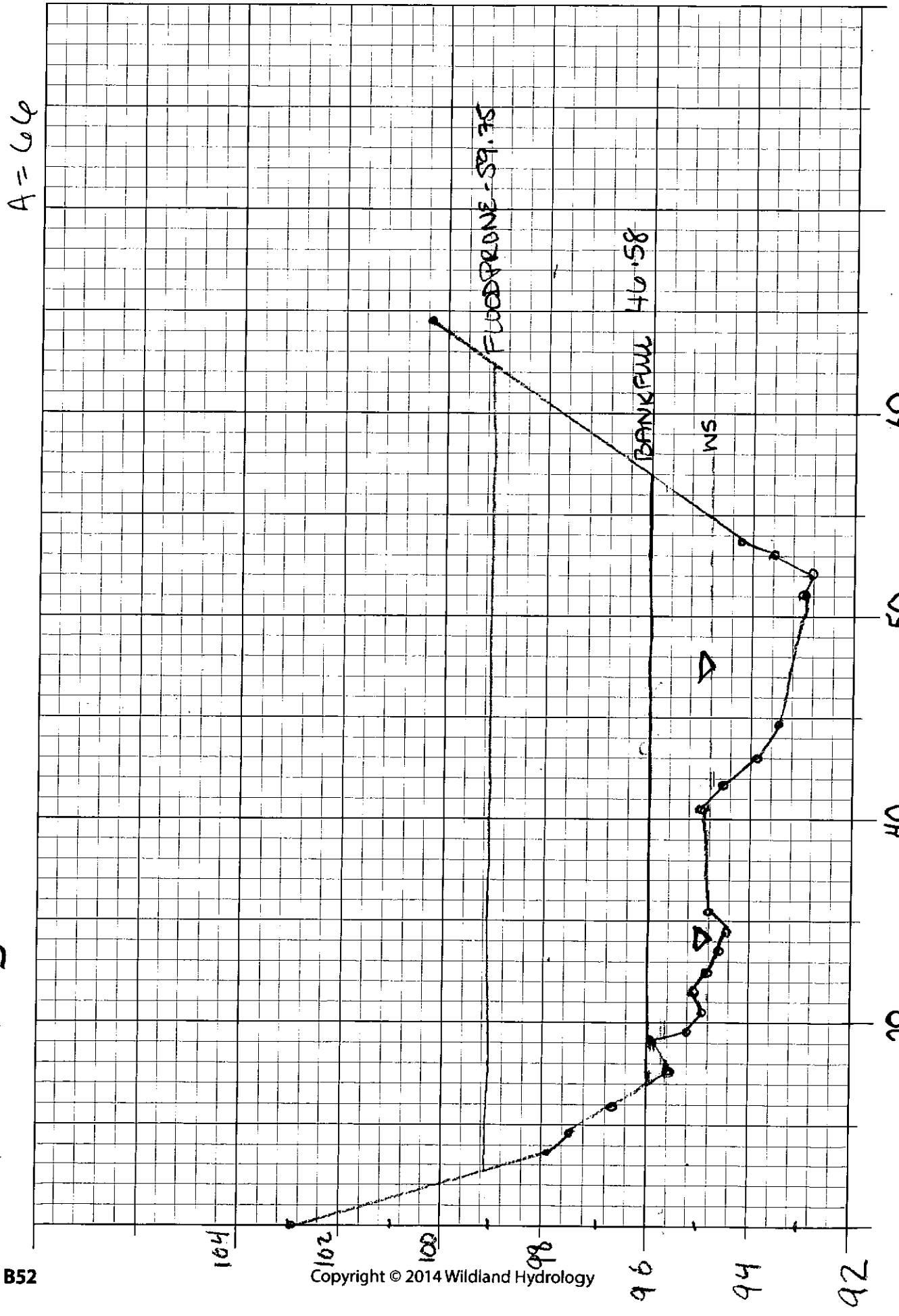

XS #3 POOL

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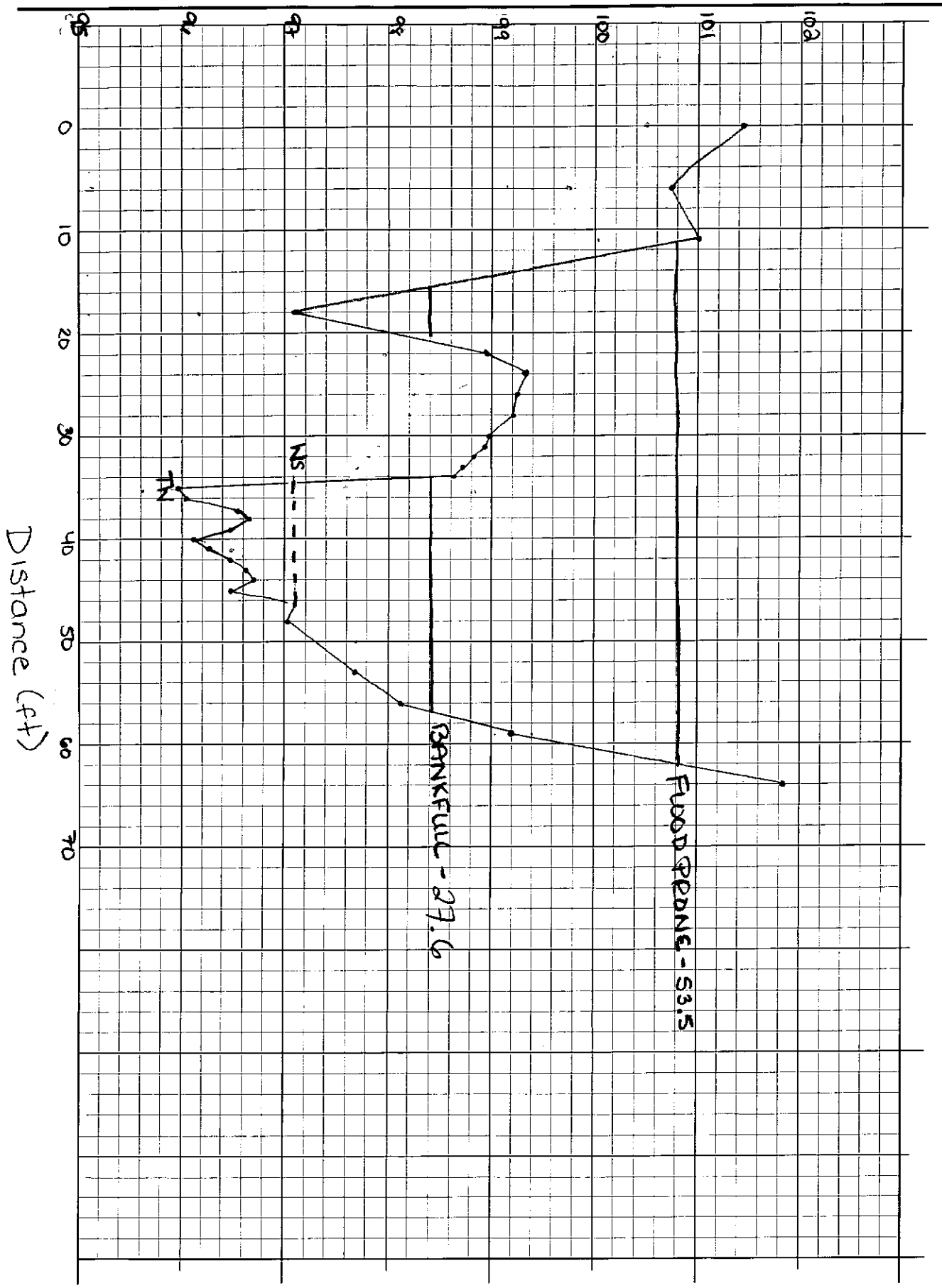

XS 2 Step

A= 35.1

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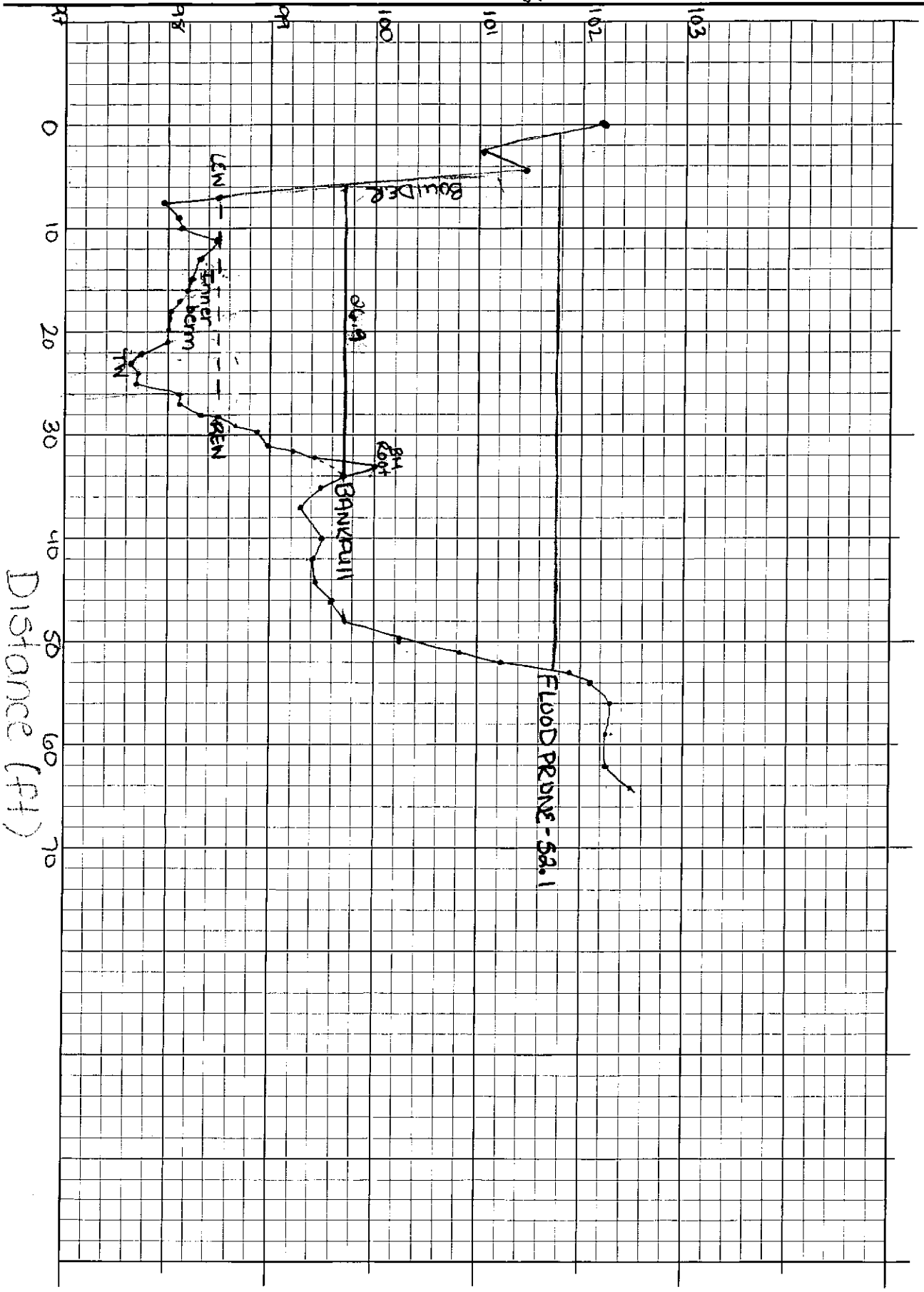

XS 1 Riffle

XS Area - 37.94

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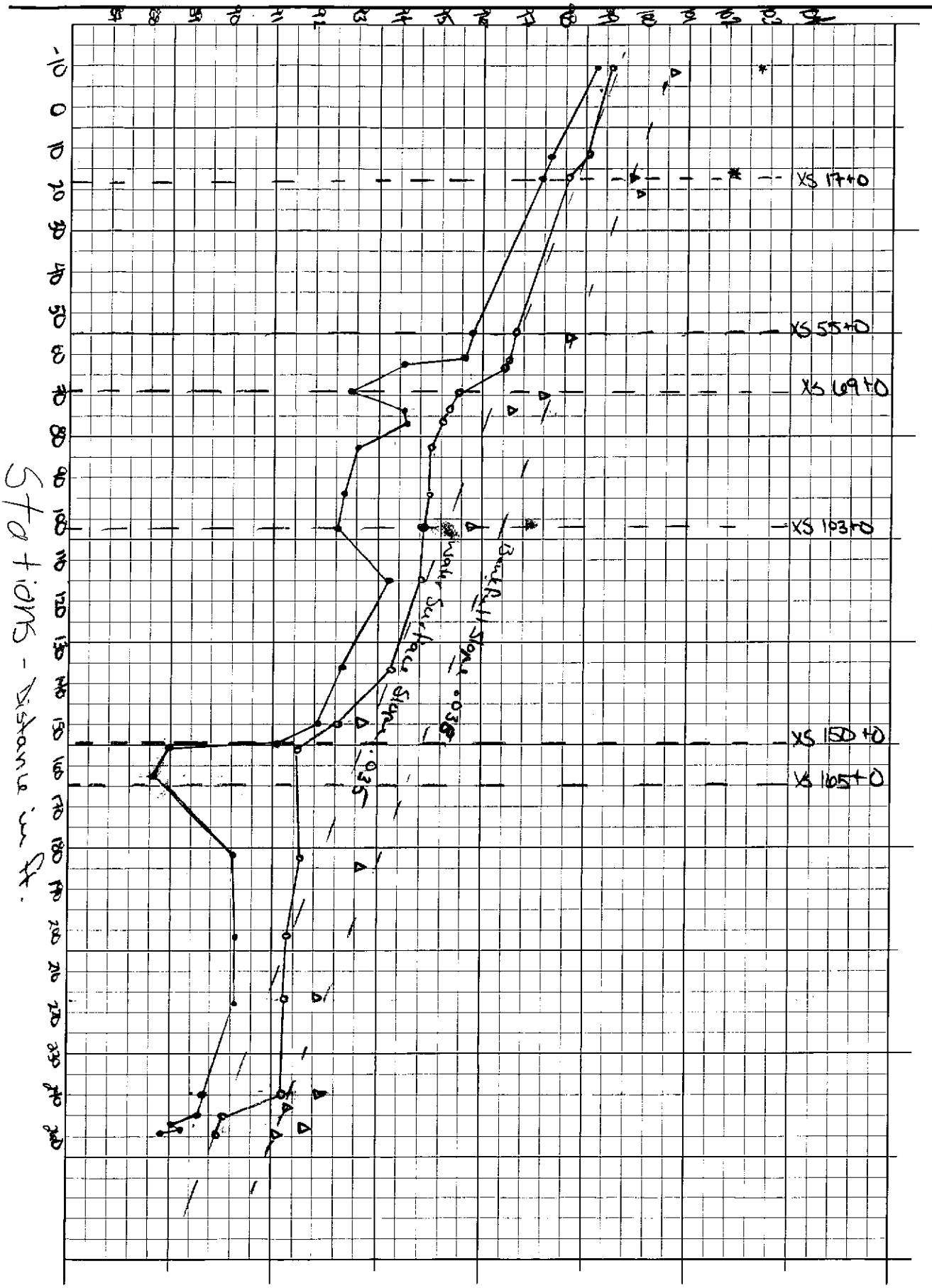

Longitudinal Profile
Team 2
Shawman's Branch
Reach 2

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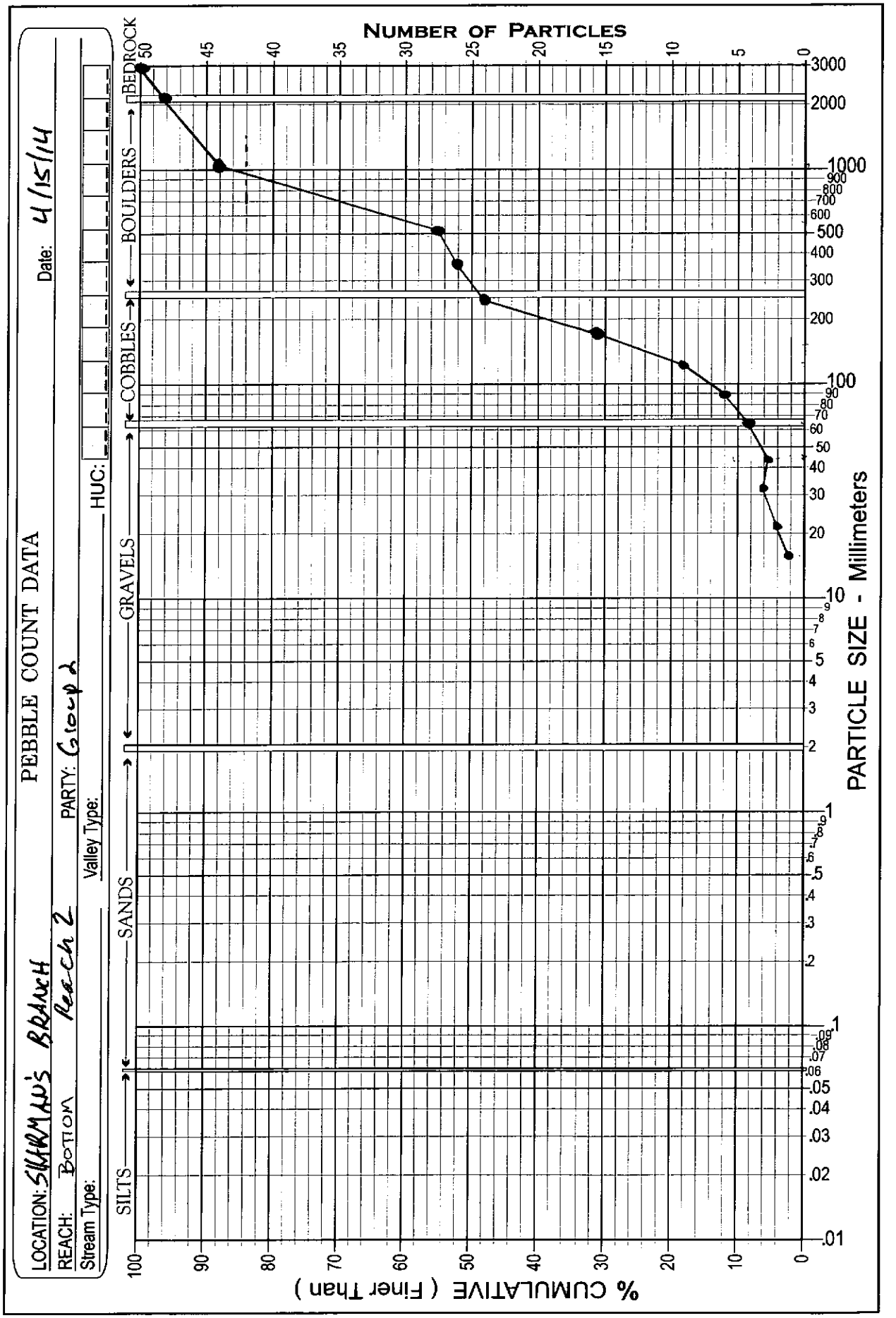

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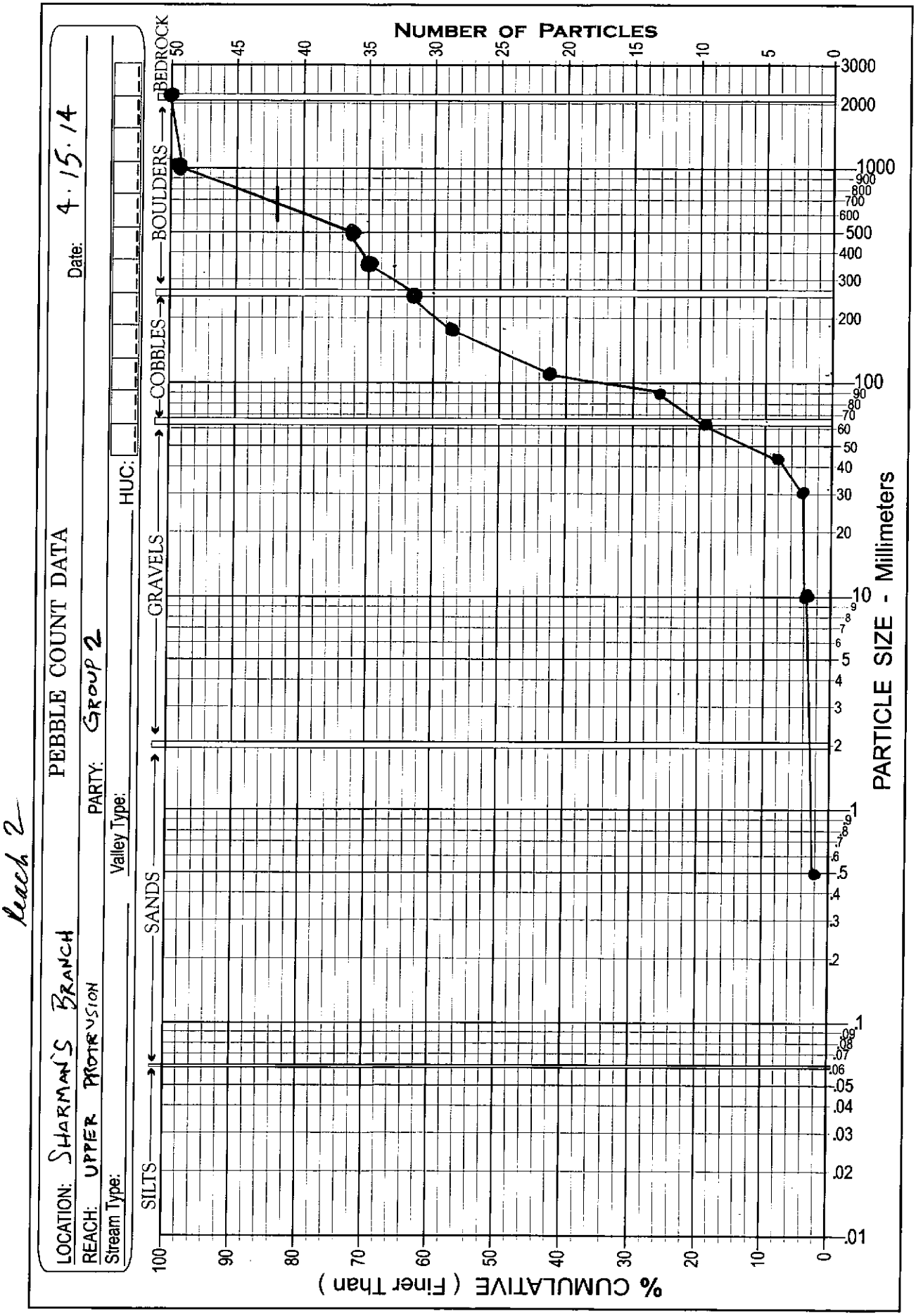
2

Dgy = 675

Reach 2



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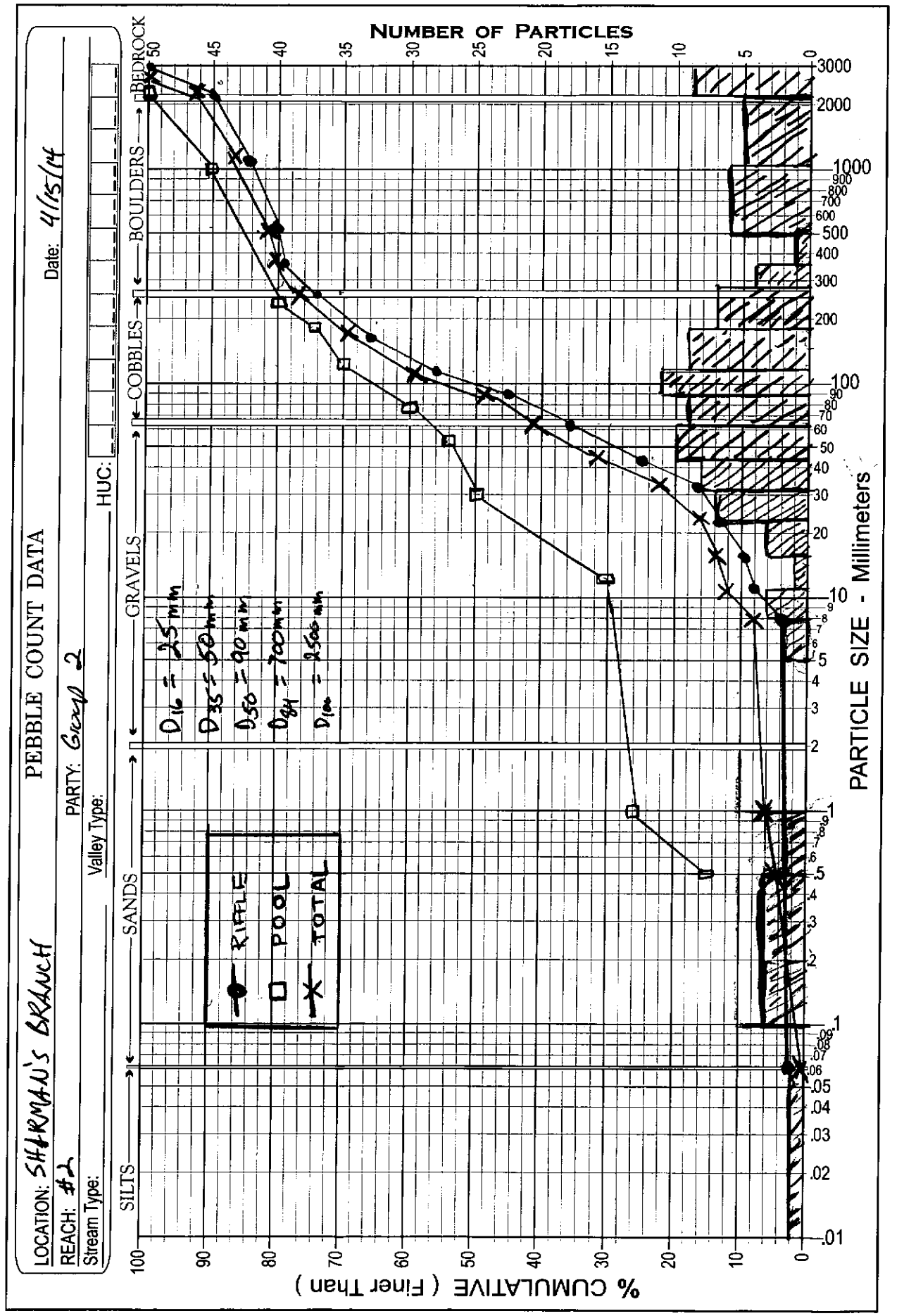

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Site: SHARMAN'S BRANCH Date: 4/15/14

Location: #2 HUC:

Party: GROUP 2

Inches	PARTICLE	Millimeters		Dot Count for RIFFLE 1	POOL 2	COMP. 3	RIFFLE (1) TOT #	RIFFLE (1) ITEM %	RIFFLE (1) % CUM	POOL (2) TOT #	POOL (2) ITEM %	POOL (2) % CUM	COMPOSITE (3) TOT #	COMPOSITE (3) ITEM %	COMPOSITE (3) % CUM
							Reach:			Reach:			Reach:		
							Date:			Date:			Date:		
	Silt / Clay	< .062	S/C	I			1	.01.25	1.25				1	1	1
	Very Fine	.062 - .125	SAND												
	Fine	.125 - .25			𝍸										
	Medium	.25 - .50			III					3	15	15	3	3	4
	Coarse	.50 - 1.0			II					2	10	25	2	2	6
.04 - .08	Very Coarse	1.0 - 2													
.08 - .16	Very Fine	2 - 4	GRAVEL												
.16 - .22	Fine	4 - 5.7													
.22 - .31	Fine	5.7 - 8		II			2	.025	3.75		~~20~~	~~45~~	2	2	8
.31 - .44	Medium	8 - 11.3		III	I		3	.0375	7.5	1	5	30	4	4	12
.44 - .63	Medium	11.3 - 16		I			1	.0125	8.75				1	1	13
.63 - .89	Coarse	16 - 22.6		III			3	3.75	12.5				3	3	16
.89 - 1.3	Coarse	22.6 - 32		III	IIII		3	3.75	16.25	4	20	50	7	7	23
1.3 - 1.8	Very Coarse	32 - 45		𝍸 II	I		7	8.75	25	1	5	55	8	8	31
1.8 - 2.5	Very Coarse	45 - 64		𝍸 IIII	I		9	11.25	36.25	1	5	60	10	10	41
2.5 - 3.5	Small	64 - 90	COBBLE	𝍸 II			7	8.75	45				7	7	48
3.5 - 5.0	Small	90 - 128		𝍸 IIII	II		9	11.25	56.25	2	10	70	11	11	59
5.0 - 7.1	Large	128 - 180		𝍸 III	I		8	10	66.25	1	5	75	9	9	68
7.1 - 10.1	Large	180 - 256		𝍸 I	I		6	7.5	73.75	1	5	80	7	7	75
10.1 - 14.3	Small	256 - 362	BOULDER	IIII			4	5	78.75				4	4	79
14.3 - 20	Small	362 - 512		I			1	.0125	80				1	1	80
20 - 40	Medium	512 - 1024		IIII	II		4	5	85	2	10	90	6	6	86
40 - 80	Large-Vry Large	1024 - 2048		III	II		3	3.75	88.75	2	10	100	5	5	91
	Bedrock		BDRK	𝍸 IIII			9	11.25	100				9	9	100
Stream Type:			**Valley Type:**			TOTAL→	80			20			100		

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Site: SHARMAN'S BRANCH Date: 4/15/14

Location: TOP HUC:

Party: GROUP 2

Inches	PARTICLE	Millimeters		Dot Count for RIFFLE 1	POOL 2	COMP. 3	RIFFLE (1) TOT #	RIFFLE (1) ITEM %	RIFFLE (1) % CUM	POOL (2) TOT #	POOL (2) ITEM %	POOL (2) % CUM	COMPOSITE (3) TOT #	COMPOSITE (3) ITEM %	COMPOSITE (3) % CUM
	Silt / Clay	< .062	S/C												
	Very Fine	.062 - .125	SAND												
	Fine	.125 - .25													
	Medium	.25 - .50		1			1	1	1						
	Coarse	.50 - 1.0													
.04 - .08	Very Coarse	1.0 - 2													
.08 - .16	Very Fine	2 - 4	GRAVEL												
.16 - .22	Fine	4 - 5.7													
.22 - .31	Fine	5.7 - 8													
.31 - .44	Medium	8 - 11.3		11			2	2	3						
.44 - .63	Medium	11.3 - 16													
.63 - .89	Coarse	16 - 22.6		X			X								
.89 - 1.3	Coarse	22.6 - 32		1			1	1	4						
1.3 - 1.8	Very Coarse	32 - 45		1111			4	4	8						
1.8 - 2.5	Very Coarse	45 - 64		THL THL 1			11	11	19						
2.5 - 3.5	Small	64 - 90	COBBLE	THL 11			7	7	26						
3.5 - 5.0	Small	90 - 128		THL THL THL 1			16	16	42						
5.0 - 7.1	Large	128 - 180		THL THL THL			15	15	57						
7.1 - 10.1	Large	180 - 256		THL 1			6	6	63						
10.1 - 14.3	Small	256 - 362	BOULDER	THL 11			7	7	70						
14.3 - 20	Small	362 - 512		11			2	2	72						
20 - 40	Medium	512 - 1024		THL THL THL THL THL			26	26	99						
40 - 80	Large-Vry Large	1024 - 2048		11			2	2	100						
	Bedrock		BDRK												
Stream Type:			**Valley Type:**			TOTAL →	100	100							

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D84 = 1000mm

Reach 2

Site: SHARMAN'S BRANCH Date: 4/15/14

Location: Lower Protrusion HUC:

Party: GROUP 2

Inches	PARTICLE	Millimeters		Dot Count for RIFFLE 1	POOL 2	COMP. 3	RIFFLE (1) TOT #	RIFFLE (1) ITEM %	RIFFLE (1) % CUM	POOL (2) TOT #	POOL (2) ITEM %	POOL (2) % CUM	COMPOSITE (3) TOT #	COMPOSITE (3) ITEM %	COMPOSITE (3) % CUM
	Silt / Clay	< .062	S/C												
	Very Fine	.062 - .125	SAND												
	Fine	.125 - .25													
	Medium	.25 - .50													
	Coarse	.50 - 1.0													
.04 - .08	Very Coarse	1.0 - 2													
.08 - .16	Very Fine	2 - 4	GRAVEL												
.16 - .22	Fine	4 - 5.7													
.22 - .31	Fine	5.7 - 8													
.31 - .44	Medium	8 - 11.3													
.44 - .63	Medium	11.3 - 16		1			1	1	1						
.63 - .89	Coarse	16 - 22.6		1			1	1	2						
.89 - 1.3	Coarse	22.6 - 32		1			1	1	3						
1.3 - 1.8	Very Coarse	32 - 45		II			2	2	5						
1.8 - 2.5	Very Coarse	45 - 64		II			2	2	7						
2.5 - 3.5	Small	64 - 90	COBBLE	𝍸			5	5	12						
3.5 - 5.0	Small	90 - 128		𝍸 II			7	7	19						
5.0 - 7.1	Large	128 - 180		𝍸 𝍸 II			12	12	~~24~~ 31						
7.1 - 10.1	Large	180 - 256		𝍸 𝍸 𝍸 II			17	17	~~36~~ 48						
10.1 - 14.3	Small	256 - 362	BOULDER	IIII			4	4	~~46~~ 52						
14.3 - 20	Small	362 - 512		III			3	3	~~53~~ 55						
20 - 40	Medium	512 - 1024		𝍸 𝍸 𝍸 𝍸 𝍸 III			33	33	~~86~~ 88						
40 - 80	Large-Vry Large	1024 - 2048		𝍸 III			8	8	96						
	Bedrock		BDRK	IIII			4	4	100						
Stream Type:			**Valley Type:**			TOTAL →	100	100							

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DA=3.6 mi² Reach 2

Worksheet B-1. Field Form for Level II Stream Classification (*First Field Day*).

Stream: Sharman Creek.			
Basin:	Drainage Area:	acres 3.65	mi²
Location: Intersection Fern Rock Ln & Burnside Bridge rd		Washington Co., MO	
Twp.&Rge:	Sec.&Qtr.:		
Cross-Section Monuments (Lat./Long.):		Date: 4-15-14	
Observers: Group 2		Valley Type: C & B2	

Bankfull WIDTH (W_{bkf}) WIDTH of the stream channel at bankfull stage elevation, in a riffle section.	26.89	ft
Bankfull DEPTH (d_{bkf}) Mean DEPTH of the stream channel cross-section, at bankfull stage elevation, in a riffle section ($d_{bkf} = A_{bkf} / W_{bkf}$).	1.41	ft
Bankfull X-Section AREA (A_{bkf}) AREA of the stream channel cross-section, at bankfull stage elevation, in a riffle section.	37.96	ft²
Width/Depth Ratio (W_{bkf} / d_{bkf}) Bankfull WIDTH divided by bankfull mean DEPTH, in a riffle section.	19.07	ft/ft
Maximum DEPTH (d_{max}) Maximum depth of the bankfull channel cross-section, or distance between the bankfull stage and Thalweg elevations, in a riffle section.	2.71	ft
WIDTH of Flood-Prone Area (W_{fpa}) Twice maximum DEPTH, or ($2 \times d_{mbkf}$) = the stage/elevation at which flood-prone area WIDTH is determined in a riffle section.	52.12	ft
Entrenchment Ratio (ER) The ratio of flood-prone area WIDTH divided by bankfull channel WIDTH (W_{fpa} / W_{bkf}) (riffle section).	1.94	ft/ft
Channel Materials (Particle Size Index) D_{50} The D_{50} particle size index represents the median or dominant diameter of channel materials, as sampled proportionately from the channel surface, between the bankfull stage and Thalweg elevations.	90	mm
Water Surface SLOPE (S) Channel slope = "rise over run" for a reach approximately 20–30 bankfull channel widths in length, with the "riffle-to-riffle" water surface slope representing the gradient at bankfull stage.	0.035 0.038 BKF, .056	ft/ft
Channel SINUOSITY (k) Sinuosity is an index of channel pattern, determined from a ratio of stream length divided by valley length (SL / VL); or estimated from a ratio of valley slope divided by channel slope (S_{val} / S).	1.02	

Stream Type B3/E1 **See Classification Key (Figure B-2)**

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Worksheet B-2. Computations of velocity and discharge using various methods (*First Field Day*).

Bankfull VELOCITY & DISCHARGE Estimates

Stream:	Sharman's Branch	Location:	Reach 2
Date:	4-15-14	Stream Type:	B3/1
Valley Type:	C-BC-BR		
Observers:	Team 2	HUC:	

INPUT VARIABLES			OUTPUT VARIABLES		
Bankfull Riffle Cross-Sectional AREA	37.96	A_{bkf} (ft²)	Bankfull Riffle Mean DEPTH	1.41	d_{bkf} (ft)
Bankfull Riffle WIDTH	26.89	W_{bkf} (ft)	Wetted PERIMETER ~ (2 * d_{bkf}) + W_{bkf}	29.71	W_p (ft)
D_{84} at Riffle	875	Dia. (mm)	D_{84} (mm) / 304.8	2.21	D_{84} (ft)
Bankfull SLOPE	0.038	S_{bkf} (ft / ft)	Hydraulic RADIUS A_{bkf} / W_p	1.28	R (ft)
Gravitational Acceleration	32.2	g (ft / sec²)	Relative Roughness R(ft) / D_{84} (ft)	0.578	R / D_{84}
Drainage Area	3.65	DA (mi²)	Shear Velocity $u^* = (gRS)^{1/2}$	1.25	u* (ft/sec)

ESTIMATION METHODS	Bankfull VELOCITY		Bankfull DISCHARGE	
1. Friction Factor / Relative Roughness $\bar{u} = [\,2.83 + 5.66 * Log\{R / D_{84}\}\,]\,u^*$	1.86	ft / sec	70.75	cfs
2. Roughness Coefficient: a) Manning's *n* from Friction Factor / Relative Roughness (Figs. B-34, B-35) $\bar{u} = 1.49*R^{2/3}*S^{1/2}/n$ n = .045	2.95	ft / sec	193.00	cfs
2. Roughness Coefficient: b) Manning's *n* from Stream Type (Fig. B-36) $\bar{u} = 1.49*R^{2/3}*S^{1/2}/n$ B2-.044 B3 n = .059	7.78 5.80	ft / sec	295.32 220.17	cfs
2. Roughness Coefficient: c) Manning's *n* from Jarrett (USGS): $\bar{u} = 1.49*R^{2/3}*S^{1/2}/n$ $n = 0.39*S^{0.38}*R^{-0.16}$ n = .108 Note: This equation is applicable to steep, step/pool, high boundary roughness, cobble- and boulder-dominated stream systems; i.e., for Stream Types A1, A2, A3, B1, B2, B3, C2 & E3	3.17	ft / sec	120.33	cfs
3. Other Methods (Hey, Darcy-Weisbach, Chezy C, etc.)	NA	ft / sec	NA	cfs
3. Other Methods (Hey, Darcy-Weisbach, Chezy C, etc.)	NA	ft / sec	NA	cfs
4. Continuity Equations: a) USGS Gage Data $\bar{u} = Q / A$ Return Period for Bankfull Discharge Q = ____ year		ft / sec		cfs
4. Continuity Equations: b) Regional Curves $\bar{u} = Q / A$	2.99	ft / sec	113.87	cfs

Protrusion Height Options for the D_{84} Term in the Relative Roughness Relation (R/D_{84}) – Estimation Method 1

Option 1.	For **sand-bed** channels: Measure 100 **"protrusion heights"** of sand dunes from the downstream side of feature to the top of feature. Substitute the D_{84} sand dune protrusion height in ft for the D_{84} term in method 1.
Option 2.	For **boulder-dominated** channels: Measure 100 **"protrusion heights"** of boulders on the sides from the bed elevation to the top of the rock on that side. Substitute the D_{84} boulder protrusion height in ft for the D_{84} term in method 1.
Option 3.	For **bedrock-dominated** channels: Measure 100 **"protrusion heights"** of rock separations, steps, joints or uplifted surfaces above channel bed elevation. Substitute the D_{84} bedrock protrusion height in ft for the D_{84} term in method 1.
Option 4.	For **log-influenced** channels: Measure **"protrustion heights"** proportionate to channel width of log diameters or the height of the log on upstream side if embedded. Substitute the D_{84} protrusion height in ft for the D_{84} term in method 1.

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Worksheet B-3a. Morphological relations, including dimensionless ratios (*First Field Day*).

Stream: SHARMAN'S BRANCH — Location: Fern Dock Ln & Burnside Bridge Rd

Observers: Group 2 — Date: 4-15-14 — Valley Type: C B C B2 — Stream Type:

River Reach Dimension Summary Data.....1

Riffle Dimensions*, **, *

Riffle Dimensions*, **, ***	Mean	Min	Max		Riffle Dimensions & Dimensionless Ratios****	Mean	Min	Max
Riffle Width (W_{bkf})	26.89	26.89	26.89	ft	Riffle Cross-Sectional Area (A_{bkf}) (ft^2)	3[illegible]6		
Riffle Mean Depth (d_{bkf})	1.41	1.75	1.76	ft	Riffle Width/Depth Ratio (W_{bkf} / d_{bkf})	19.07		
Riffle Maximum Depth (d_{max})	2.05			ft	Riffle Max Depth to Riffle Mean Depth (d_{max} / d_{bkf})	1.45		
Width of Flood-Prone Area (W_{fpa})	52.12			ft	Entrenchment Ratio (W_{fpa} / W_{bkf})	1.94		
Riffle Inner Berm Width (W_{ib})	13.61			ft	Riffle Inner Berm Width to Riffle Width (W_{ib} / W_{bkf})	.65		
Riffle Inner Berm Depth (d_{ib})	0.44			ft	Riffle Inner Berm Depth to Mean Depth (d_{ib} / d_{bkf})	.31		
Riffle Inner Berm Area (A_{ib})	7.52			ft^2	Riffle Inner Berm Area to Riffle Area (A_{ib} / A_{bkf})	.19		
Riffle Inner Berm W/D Ratio (W_{ib} / d_{ib})	40							

Pool Dimensions*, **, *

Pool Dimensions*, **, ***	Mean	Min	Max		Pool Dimensions & Dimensionless Ratios****	Mean	Min	Max
Pool Width (W_{bkfp})	40.23	32.3	46.6	ft	Pool Width to Riffle Width (W_{bkfp} / W_{bkf})	1.[illegible]	1.20	1.73
Pool Mean Depth (d_{bkfp})	2.01	1.92	2.53	ft	Pool Mean Depth to Riffle Mean Depth (d_{bkfp} / d_{bkf})	1.42	1.36	1.79
Pool Cross-Sectional Area (A_{bkfp})	78.03	66.1	86.3	ft	Pool Area to Riffle Area (A_{bkfp} / A_{bkf})	2.05	1.73	2.27
Pool Maximum Depth (d_{maxp})	4.14	3.13	5.09	ft	Pool Max Depth to Riffle Mean Depth (d_{maxp} / d_{bkf})	2.93	2.21	3.60
Pool Inner Berm Width (W_{ibp})				ft	Pool Inner Berm Width to Pool Width (W_{ibp} / W_{bkfp})			
Pool Inner Berm Depth (d_{ibp})				ft	Pool Inner Berm Depth to Pool Depth (d_{ibp} / d_{bkfp})			
Pool Inner Berm Area (A_{ibp})				ft^2	Pool Inner Berm Area to Pool Area (A_{ibp} / A_{bkfp})			
Point Bar Slope (S_{pb})				ft/ft	Pool Inner Berm Width/Depth Ratio (W_{ibp} / d_{ibp})			

N/A

Run Dimensions*

Run Dimensions*	Mean	Min	Max		Run Dimensionless Ratios****	Mean	Min	Max
Run Width (W_{bkfr})				ft	Run Width to Riffle Width (W_{bkfr} / W_{bkf})			
Run Mean Depth (d_{bkfr})				ft	Run Mean Depth to Riffle Mean Depth (d_{bkfr} / d_{bkf})			
Run Cross-Sectional Area (A_{bkfr})				ft	Run Area to Riffle Area (A_{bkfr} / A_{bkf})			
Run Maximum Depth (d_{maxr})				ft	Run Max Depth to Riffle Mean Depth (d_{maxr} / d_{bkf})			
Run Width/Depth Ratio (W_{bkfr} / d_{bkfr})				ft				

N/A

Glide Dimensions*

Glide Dimensions*	Mean	Min	Max		Glide Dimensions & Dimensionless Ratios****	Mean	Min	Max
Glide Width (W_{bkfg})				ft	Glide Width to Riffle Width (W_{bkfg} / W_{bkf})			
Glide Mean Depth (d_{bkfg})				ft	Glide Mean Depth to Riffle Mean Depth (d_{bkfg} / d_{bkf})			
Glide Cross-Sectional Area (A_{bkfg})				ft	Glide Area to Riffle Area (A_{bkfg} / A_{bkf})			
Glide Maximum Depth (d_{maxg})				ft	Glide Max Depth to Riffle Mean Depth (d_{maxg} / d_{bkf})			
Glide Width/Depth Ratio (W_{bkfg} / d_{bkfg})				ft/ft	Glide Inner Berm Width/Depth Ratio (W_{ibg} / d_{ibg})			
Glide Inner Berm Width (W_{ibg})				ft	Glide Inner Berm Width to Glide Width (W_{ibg}/W_{bkfg})			
Glide Inner Berm Depth (d_{ibg})				ft	Glide Inner Berm Depth to Glide Depth (d_{ibg} / d_{bkfg})			
Glide Inner Berm Area (A_{ibg})				ft^2	Glide Inner Berm Area to Glide Area (A_{ibg} / A_{bkfg})			

Step**

Step Dimensions**	Mean	Min	Max		Step Dimensionless Ratios****	Mean	Min	Max
Step Width (W_{bkfs})	23.55	19.5	27.6	ft	Step Width to Riffle Width (W_{bkfs} / W_{bkf})	0.84	.72	1.02
Step Mean Depth (d_{bkfs})	1.53	1.27	1.78	ft	Step Mean Depth to Riffle Mean Depth (d_{bkfs} / d_{bkf})	1.08	.90	1.26
Step Cross-Sectional Area (A_{bkfs})	34.95	34.8	35.1	ft	Step Area to Riffle Area (A_{bkfs} / A_{bkf})	.92	.91	.92
Step Maximum Depth (d_{maxs})	2.69	2.45	2.93	ft	Step Max Depth to Riffle Mean Depth (d_{maxs} / d_{bkf})	1.90	1.73	[illegible]
Step Width/Depth Ratio (W_{bkfs} / d_{bkfs})	16.36	10.98	21.74					

*Riffle–Pool system (i.e., C, E, F stream types) bed features include riffles, runs, pools and glides.

**Step–Pool system (i.e., A, B, G stream types) bed features include riffles, rapids, chutes, pools and steps (note: include rapids and chutes in riffle category).

***Convergence-Divergence system (i.e., D stream types) bed features include riffles and pools; cross-sections taken at riffles for classification purposes.

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Worksheet B-3b. Morphological relations, including dimensionless ratios (*First Field Day*).

Stream: SHERMAN'S BRANCH Location: Fern Park Ln & Braside Bridge Rd

Observers: Group 2 Date: 4-15-21 Valley Type: C BC BR Stream Type: B / 1

Hydraulics

River Reach Summary Data.....2

Streamflow: Estimated Mean Velocity at Bankfull Stage ($\bar{u}_{bkf}$)		ft/sec	Estimation Method		
Streamflow: Estimated Discharge at Bankfull Stage (Q_{bkf})		cfs	Drainage Area	3.65	mi^2

Channel Pattern

Geometry	Mean	Min	Max		Dimensionless Geometry Ratios	Mean	Min	Max
~~Linear Wavelength (λ)~~				ft	Linear Wavelength to Riffle Width (λ / W_{bkf})			
~~Stream Meander Length (L_m)~~				ft	Stream Meander Length Ratio (L_m / W_{bkf})			
~~Radius of Curvature (R_c)~~	43.7			ft	Radius of Curvature to Riffle Width (R_c / W_{bkf})			
Belt Width (W_{blt})	43.7			ft	Meander Width Ratio (W_{blt} / W_{bkf})	1.63		
~~Arc Length (L_a)~~				ft	Arc Length to Riffle Width (L_a / W_{bkf})			
Riffle Length (L_r)	50.8	35	72.5	ft	Riffle Length to Riffle Width (L_r / W_{bkf})	2.11	1.3	2.65
Individual Pool Length (L_p)	47.25	27	67.5	ft	Individual Pool Length to Riffle Width (L_p / W_{bkf})	1.76	1.00	2.5
Pool to Pool Spacing (P_s)	46.3	30	62.5	ft	Pool to Pool Spacing to Riffle Width (P_s / W_{bkf})	1.72	1.12	2.32

Channel Profile

Valley Slope (S_{val})	0.033	ft/ft	Average Water Surface Slope (S)	.032	ft/ft	Sinuosity (S_{val} / S)	1.03
Stream Length (SL)	258	ft	Valley Length (VL)	188	ft	Sinuosity (SL / VL)	1.37
Low Bank Height (LBH) of 31.5 FT.	start 3.84 / end	ft	Max Depth (d_{max})	start 1.81 / end	ft	Bank-Height Ratio (BHR) (LBH / d_{max})	start 2.12 / end	

Facet Slopes	Mean	Min	Max		Dimensionless Facet Slope Ratios	Mean	Min	Max
Riffle Slope (S_{rif})	.074	.005	.029	ft/ft	Riffle Slope to Average Water Surface Slope (S_{rif} / S)	0.75	0.06	.906
~~Run Slope (S_{run})~~				ft/ft	Run Slope to Average Water Surface Slope (S_{run} / S)			
Pool Slope (S_p)	.007			ft/ft	Pool Slope to Average Water Surface Slope (S_p / S)	.219	.003	
Glide Slope (S_g)				ft/ft	Glide Slope to Average Water Surface Slope (S_g / S)			
Step Slope (S_s)	.067			ft/ft	Step Slope to Average Water Surface Slope (S_s / S)	.093	.07	.17

Max Depths[a]	Mean	Min	Max		Dimensionless Depth Ratios	Mean	Min	Max
Max Riffle Depth (d_{maxrif})	2.76	2.10	3.98	ft	Max Riffle Depth to Mean Riffle Depth (d_{maxrif} / d_{bkf})	1.52	1.15	2.19
~~Max Run Depth (d_{maxrun})~~				ft	Max Run Depth to Mean Riffle Depth (d_{maxrun} / d_{bkf})			
Max Pool Depth (d_{maxp})	4.79	3.81	6.02	ft	Max Pool Depth to Mean Riffle Depth (d_{maxp} / d_{bkf})	3.32	2.42	4.26
Max Glide Depth (d_{maxg})	2.36	1.82	3.03	ft	Max Glide Depth to Mean Riffle Depth (d_{maxg} / d_{bkf})	1.67	1.29	2.14
Max Step Depth (d_{maxs})	3.1	1.5	4.3	ft	Max Step Depth to Mean Riffle Depth (d_{maxs} / d_{bkf})	2.19	1.06	3.04

Channel Materials

	Reach[b]	Riffle[c]	Bar		Reach[b]	Riffle[c]	Bar	Protrusion Height[d]	
% Silt/Clay	1	0		D_{16}	25	55			mm
% Sand	5	1		D_{35}	50	100			mm
% Gravel	35	18		D_{50}	90	150			mm
% Cobble	34	44		D_{84}	700	675			mm
% Boulder	16	37		D_{95}	~~1500~~ 1000	900			mm
% Bedrock	9	2		D_{100}	2500	2000			mm

[a] Min, max & mean depths are measured from Thalweg to bankfull at mid-point of feature for riffles, runs & steps, the deepest part of pools, & at the tail-out of glides.

[b] Composite sample of riffles and pools within the designated reach. [c] Active bed of a riffle. [d] Height of roughness feature above bed.

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SURVEY DATA ⟹ **CROSS - SECTION 4**

SITE: VS-1 - riffle LPRO Sta **Date:** 4/15/14

Item	STATION ft	B S ft	H I ft	F S ft	Elevation ft	NOTES COMMENTS REMARKS
29	0	3.1				gr
30	2.4	4.48				gr
31	4.1					gr, LB
32	4.2	4.05				rock
33	7	7.01				LEW
34	7.5	7.55				ch
35	9	7.37				ch
36	10	7.35				pile rocks cobble
37	11.5	7.01				
38	13	7.13				
39	15	7.22				
40	16	7.3				
41	17	7.37				
42	17.1	7.44				
43	19	7.45				
44	20	7.46				
45	21	7.49				
46	22	7.73				
47	23	7.85				TW
48	24.1	7.76				
49	25	7.78				
50	26	7.36				
51	27	7.36				
52	28	7.14				
53	28.6	6.96				REW - better, no rapid
54	29	6.82				IB
55	29.8	6.64				
56	31	6.51				
57	31.7	6.29				
58	32.5	6.09				
59	33	5.50				top roof

VS = 6.11
bkf? = 6.24
6.11/5.95

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Sta	Elev	Notes
34	5.8	BKF ?
35	5.95	
37.8	6.14	
40	5.98	
42.5	6.09	bench
44.3	6.05	
46	5.9	
48	5.73	
49.5	5.25	
51	4.65	
52	4.25	
53.6	3.61	
54	3.40	
56	~~3.16~~	3.2
~~59~~	3.27	
62	3.22	
64.3	2.97	

7.85
5.8
2.05
x2.05
4.10

7
5.8 6.10
-2.05
3.75

SURVEY DATA ⟹ **CROSS - SECTION** 1

SITE: UPPER SHARMAN'S BRANCH Date: 15APR2014

Location: GROUP #2 NORTH BRIDGE

Party / Notes: UPPER STEP POOL HUC: _____

HI: 106.99

Item	Distance, Point, or STATION ft	Back-Sight BS ft	Height of Instrument HI ft	Fore-Sight FS ft	Elevation ft	REMARKS / COMMENTS / NOTES
1	0+00			5.54	101.45	GRND
2	0+6.0			6.22	100.77	EOF ROCK
3	0+11.0			5.98	101.01	TOP ROCK
4	0+18.0			9.80	97.19	TOP ROCK
5	0+22.0			8.02	98.97	TOP ROCK
6	0+24.0			7.63	99.36	TOP ROCK
7	0+26.0			7.73	99.26	TOP ROCK
8	0+28.0			7.78	99.21	TOP ROCK
9	0+30.0			8.00	98.99	TOP ROCK
10	0+31.0			8.06	98.93	TOP ROCK
11	0+32.0			8.17	98.82	TOP ROCK
12	0+33.0			8.27	98.72	TOP ROCK
13	0+34.0			8.33	98.66	TOP ROCK
14	0+35.0			11.03	95.96	EDGE ROCK
15	0+36.0			10.95	96.04	GRADE
16	0+37.0			10.40	96.59	GRADE
17	0+38.0			10.35	96.64	GRADE
18	0+39.0			10.50	96.49	"
19	0+46			10.85	96.14	"
20	0+41			10.73	96.26	"
21	0+42			10.55	96.44	"
22	0+43			10.37	96.62	"
23	0+44			10.27	96.72	"
24	0+45			10.43	96.56	GRADE
25	0+46.7			9.88	97.11	WATER SURFACE
26	0+48			9.91	97.08	EDGE OF WATER
27	0+53			9.29	97.70	GROUND
28	0+56			8.83	98.16	TOS

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SURVEY DATA ⟹ **CROSS - SECTION** 2

SITE: UPPER STEP POOL XS #2 Date:

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES / COMMENTS / REMARKS
29	0+59			7.79	99.20	GRND?
30	0+64			5.13	101.86	GRND
31						
32						
33						
34						
35						
36						
37						
38						
39						
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59						

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SURVEY DATA ⟹ **CROSS - SECTION** 4

SITE: POOL HI = 106.99 Date: 15APR2014

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES / COMMENTS / REMARKS
29	0+00			4.07	102.92	GRND
30	0+01.5			9.04	97.95	GRADE
31	0+09			9.46	97.53	GRADE BREAK
32	0+12.			10.31	96.68	GRADE
33	0+15			11.43	95.56	BOTTOM ROCK
34	0+18			11.20	95.79	TOP ROCK
35	0+19			11.86	95.13	BOTTOM ROCK
36	0+21			12.04	94.95	GRADE
37	0+23			11.95	95.04	GRADE
38	0+25			12.16	94.83	GRADE
39	0+27			12.34	94.65	GRADE
40	0+29			12.53	94.46	"
41	0+31			12.17	94.82	EDGE OF WATER
42	0+41			11.93	95.06	BAR
43	0+43.5			12.36	94.63	EDGE OF WATER
44	0+46			13.02	93.97	GRADE
45	0+49			13.41	93.58	"
46	0+52			14.00	92.99	"
47	0+54			14.12	92.87	"
48	0+56			13.41	93.58	"
49	0+57.5			12.78	94.21	BOTTOM BANK
50	0+69			5.68	101.31	GROUND
51						
52						
53						
54						
55						
56						
57						
58						
59						

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XS # 4

SURVEY DATA ⟹ **CROSS - SECTION** 3

SITE: [illegible] POOL HI: 106.99 Date: 15APR2014

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES / COMMENTS / REMARKS
29	0+00			6.71	100.28	GRND
30	0+04			8.83	98.16	GRADE BREAK
31	0+10			9.38	97.61	TOB
32	0+11			9.81	97.18	BKF
33	0+12			11.43	95.56	E OF WATER
34	0+14			11.82	95.17	GRADE
35	0+16			11.75	95.24	"
36	0+18			11.70	95.29	"
37	0+20			13.24	93.75	"
38	0+22			13.95	93.04	"
39	0+24			14.90	92.09	"
40	0+26			13.86	93.13	"
41	0+28			13.10	93.89	"
42	0+29.6			12.72	94.27	BOTTOM ROCK
43	0+30			10.22	96.77	TOP ROCK
44	0+34			10.00	96.99	TOP ROCK
45	0+37			9.99	97.00	TOP ROCK
46	0+43.5			9.67	97.32	"
47	0+44			11.83	95.16	BOTTOM ROCK
48	0+48			11.69	95.30	GRADE
49	0+51			13.08	93.91	GRADE
50	0+54			12.76	94.23	BB
51	0+57			7.40	99.59	TB
52	0+66			5.69	101.30	GRADE
53						
54						
55						
56						
57						
58						
59						

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SURVEY DATA ⟹ **CROSS - SECTION**

SITE: XS-5 step **Date:** 4/15/14

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES / COMMENTS / REMARKS
29	BM		100.41			benchmark
30	0			3.20	97.21	GS
31	1			3.78	96.63	
32	2			4.12	96.29	
33	3			4.34	96.07	
34	4			4.42	95.99	L-TOB
35	4.6			4.49	95.92	top of rock
36	5			4.6	95.81	↓
37	7			6.14	94.27	
38	8			6.4	94.01	
39	8			7.56	92.85	GS
40	9			7.79	92.62	begin rocks in ch.
41	10			7.47	92.94	
42	11			8.63	91.78	
43	11			7.98	92.43	water shot
44	12			8.71	91.7	CS
45	13			9.06	91.35	step start
46	14			8.72	91.69	
47	15.5			9.28	91.13	
48	16			8.92	91.49	
49	17			8.86	91.55	
50	18			9.47	90.94	
51	19.5			9.63	90.78	
52	21			8.8	91.61	
53	22			8.87	91.54	
54	23.5			8.65	91.76	
55	24.2			8.12	92.29	
56	26			6.14	94.27	top rock (end step)
57	28			5.79	94.62	↓
58	30			5.46	94.95	
59	25			7.79	92.62	

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SURVEY DATA ⟹ **CROSS - SECTION** 2

SITE: Date: 4/15/14

Location: XS-5 step

Party / Notes: HUC:

Item	Distance, Point, or STATION (ft)	Back-Sight BS (ft)	Height of Instrument HI (ft)	Fore-Sight FS (ft)	Elevation (ft)	REMARKS / COMMENTS / NOTES
1	31		100.41	6.69	93.72	GR
2	33			6.77	93.64	
3	34.3			6.08	94.33	
4	35.7			5.42	94.99	
5	36.5			4.99	95.42	
6	37.5			3.69	96.72	
7	39			3.12	97.29	
8	40			2.61	97.8	
9	42.2			1.93	98.48	
10	44			1.24	99.17	
11	46			0.52	99.89	
12						
13						
14						
15						
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21						
22						
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24						
25						
26						
27						
28						

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SURVEY DATA → **CROSS - SECTION 6**

SITE: POOL XS #6 HI = 98.18 Date: 15 APR 2014

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES / COMMENTS / REMARKS
29	0+00			3.25	94.93	GRND
30	0+04			4.30	93.88	GRADE BREAK
31	0+07			7.48	90.70	
32	0+10			7.80	90.38	
33	0+11			7.76	90.42	
34	0+12			8.20	89.98	
35	0+13			8.62	89.56	
36	0+14			8.65	89.53	
37	0+15			8.65	89.53	
38	0+16			9.24	88.91	
39	0+17			9.35	88.83	
40	0+18			9.20	88.98	
41	0+19			8.95	89.23	
42	0+20			8.65	89.53	
43	0+21			8.50	89.68	
44	0+22			8.23	89.95	
45	0+23			7.95	90.23	
46	0+24			7.75	90.43	
47	0+25			7.67	90.51	
48	0+26			7.60	90.58	
49	0+27			7.85	90.63	
50	0+28			7.59	90.59	
51	0+29			7.46	90.72	
52	0+30			7.30	90.88	
53	0+31			7.18	91.00	
54	0+32			7.30	90.88	
55	0+33			6.48	91.70	REW
56	0+34			6.30	91.88	
57	0+35			6.40	91.78	
58	0+37			5.20	92.98	
59	0+40			3.52	94.66	

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SURVEY DATA ⟹ **CROSS - SECTION 7**

SITE: XS 7 Riffle Date: 4/15/14

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES COMMENTS REMARKS
29	BM	5.50	105.5		100	Benchmark
30	0			3.1	102.4	GS
31	2.4			4.48	101.02	GS
32	4.2			4.05	101.45	Rock
33	7.0			7.01	98.49	LEW
34	7.5			7.55	97.95	CS
35	9.0			7.37	98.13	CS
36	10			7.35	98.15	Cobble bar
37	11.5			7.01	98.49	"
38	13			7.13	98.37	"
39	15			7.22	98.28	"
40	16			7.3	98.2	CS
41	17			7.37	98.13	CS
42	18.1			7.44	98.06	CS
43	19			7.45	98.05	CS
44	20			7.46	98.04	CS
45	21			7.49	98.01	CS
46	22			7.73	97.77	CS
47	23			7.85	97.65	TW
48	24.1			7.76	97.74	CS
49	25			7.78	97.72	CS
50	26			7.36	98.14	CS
51	27			7.36	98.14	CS
52	28			7.14	98.36	CS
53	28.6			6.96	98.54	REW - no rapid/better shot
54	29			6.82	98.68	GS - pt bar?
55	29.8			6.64	98.86	"
56	31			6.51	98.99	"
57	31.7			6.29	99.21	"
58	32.5			6.09	99.41	"
59	33			5.50	100.00	Top of root

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Station	Foresight	Elevation	Comment
34	5.8	99.7	Bankfull
35	5.95	99.55	GS
37.8	6.14	99.36	GS
40	5.98	99.52	GS
42.5	6.09	99.41	Bench
44.3	6.05	99.45	GS
46	5.9	99.6	GS
48	5.73	99.77	GS
49.5	5.25	100.25	GS
51	4.68	100.82	GS
52	4.25	101.25	GS
53.6	3.61	101.89	GS
54	3.40	102.1	GS
56	3.2	102.3	GS
59	3.27	102.23	GS
62	3.22	102.28	GS
64.3	2.97	102.53	GS

Inner berm

$\frac{1}{1.5}$

98.335
.205
.9225

$\frac{2}{8}$

98.058
$\boxed{.482}$
2.48

97.804
5 .736
368

98.295
.245
.49 = 7.5 ft²

26.89 W_{BKF}

1.41 d_{bkf}

37.96 A_{bkf}

19.07 W/d

2.71 d_{max}

52.12 W_{fpa}

1.94 ER

90 DSD

0.035 S

1.02 K

D_{84} 675

29.71

$\bar{u} = 2.83 + 5.66$

3.81

$\bar{h} =$ [illegible] 0.085

$R^{2/3} = 1.18$

0.19

$2.57 = 97.5$

SURVEY DATA ⟹ **CROSS - SECTION 5**

SITE: Step Date:

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES / COMMENTS / REMARKS
29	0	3.20				GS
30	1	3.78				
31	2	4.12				
32	3	4.34				
33	4	4.42				LTOB
34	4.6	4.49				Top of Rock
35	5	4.6				"
36	7	6.14				"
37	8	6.4				"
38	8	7.56				GS
39	9	7.79				Rock
40	10	7.47				"
41	11	8.63				[illegible]
42	11	7.98				LEW
43	12	8.71				CS
44	13	9.06				Step
45	14	8.72				
46	15.5	9.28				
47	16	8.92				
48	~~17~~	~~8.8~~				
49	~~18.6~~	~~9.22~~				
50	17	8.86				
51	18	9.47				
52	19.5	9.63				
53	21	8.8				
54	22	8.87				
55	23.5	8.65				
56	24.2	8.12				
57	26	6.14				Top Rock
58	28	5.79				rock
59	30	5.46				rock

check

25 7.79

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Sta	Elev	Gr
31	6.69	
33	6.77	
34.3	4.08	
35.7	5.42	
36.5	4.99	
37.5	3.69	
39	3.12	
40	2.61	
42.2	1.93	
44	1.24	
46	0.52	

HI from LRO
100.41
~~101.~~

1.39

SURVEY DATA ⟹ **LONGITUDINAL PROFILE 1** Page 2

SITE: Shavmons Date: 04/15/14

Location: Team 2.

Party / Notes: Amy, Cassie, Chad HUC: _____

	Distance, Point, or STATION ft	Back-Sight BS ft	Height of Instru-ment HI ft	Thalweg Fore-Sight FS ft	Thalweg Elevation Elev. ft	Water Surface Fore-Sight FS ft	Water Surface Elevation Elev. ft	Bankfull Fore-Sight FS ft	Bankfull Elevation Elev. ft	Low Bank HI Fore-Sight FS ft	Low Bank HI Elevation Elev. ft	NOTES e.g. Riffle Run Pool Glide
1	-9+5	6.79	106.77	9.11	98.66	[illegible]	[illegible]					top Riffle
2	-9+5					7.72	99.27					top water
3	-9+5							6.29	100.7			BKF 1.43
4	-9+5									4.76	102.73	LB
5	12+0			9.20	97.76							Rapped.
6	12+0					8.46	98.53					water
7	22+0									4.9	102.09	LB
8	17+0			9.40	97.59							cross 2
9	17+0					8.46	98.54					Cross 2
10	22+5							7.24	99.71			BKF 1.2
11	55+0			11.11	95.88							cross 2 step (TOS)
12	55+5					10.02	96.97					water
13	55+5							8.97	98.02			BKF cross2 1.05
14	63+0			11.47	95.52							step.
15	63+7			12.67	94.32							Bottom step.
16	63+0					10.33	96.66					water
17	69+0			14.05	92.94							Bottom Pool
18	69+0					11.49	95.5					water
19	69+0							9.49	97.5			BKF 2 to high
20	74+0			12.80	94.19							Rapped top
21	74+0					11.79	95.2					water
22	74+0							10.27	96.72			BKF 1.52
23	78+0			12.97	94.02							Rapped mid
24	78+0					11.82	95.17					water
25	83+0			13.47	93.52							Rapped end
26	83+0					12.13	94.46					water
27	94+0			14.14	92.85							Beg Pool

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SURVEY DATA ⟹ LONGITUDINAL PROFILE 2

Lg 2

SITE: Date:

Location:

Party / Notes: HUC:

	Distance, Point, or STATION ft	Back-Sight BS ft	Height of Instrument HI ft	Thalweg Fore-Sight FS ft	Thalweg Elevation Elev. ft	Water Surface Fore-Sight FS ft	Water Surface Elevation Elev. ft	Bankfull Fore-Sight FS ft	Bankfull Elevation Elev. ft	Low Bank HI Fore-Sight FS ft	Low Bank HI Elevation Elev. ft	NOTES e.g. Riffle Run Pool Glide
28	94+0		106.99			12.25	94.95					water
29	103+0			4.3	92.69							XSect 3 Pool
30	103+0					12.30	94.69					water - Mid Riffle
31	103+0							11.1	95.89			X-Sect 3 BF 1.2 deep
32	102+0			13.22				11.8	95.19			? XSect 3 BF
33	115+0			13.22	93.77							End Pool
34	115+0					12.4	94.59					Bar
35	130+0			14.34	92.65							Mid Rapid
36	130+0					13.25	93.71					water surface
37	150+0			14.91	92.08							End Rapid.
38	150+0					14.46	92.53					water
39	150+0							13.69	93.3			BKF
40	155+0			15.94	91.05							mid step.
41	156+0					12.3	93.96					water
42	155+5			14.99	92.55							bottom step.
43	155+5					15.3	91.69					water bottom step.
44	162+0			16.76	90.22							mid pool
45	162+0			16.42	90.57							~~End pool~~ Ripple top.
46	162+0					15.39	91.69					water.
47	165+0							13.79	93.2			cross section : 1.5'
48	202+0			16.84	90.15							mid Ripple
49	202+0					15.64	91.35					water.
50	240+0			17.51	89.44							Cross Section TOS
51	241+0					15.71	91.24					water
52	240+0							14.6	92.39			BKF 1.11
53	250+0			14.13						14.13	92.46	turn A
54										4.85	92.46	turn B

106.99

New HI = 97.71

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SURVEY DATA ⟹ **LONGITUDINAL PROFILE 3** Page 3

SITE: Date:

Location:

Party / Notes: HUC:

	Distance, Point, or STATION ft	Back-Sight BS ft	Height of Instrument HI ft	Thalweg Fore-Sight FS ft	Thalweg Elevation Elev. ft	Water Surface Fore-Sight FS ft	Water Surface Elevation Elev. ft	Bankfull Fore-Sight FS ft	Bankfull Elevation Elev. ft	Low Bank HI Fore-Sight FS ft	Low Bank HI Elevation Elev. ft	NOTES e.g. Riffle Run Pool Glide
55	256+0		97.71	7.95	89.76							mid step.
56	256+0			9.07	88.64							bottom step.
57	255+0			7.93		7.93	89.78					water
58	254+0			9.01	88.7							Rapped
59												
60	254+0					7.90	89.81					water
61	254+0							6.27	91.44			BKF 1.63
62	254+0							5.93	91.78			BKF 1.97
63	254+0			9.34	88.37							mid rif
64	254+0					7.96	89.75					water
65	254+0							6.57	91.14			BKF 1.39
66	217+0							14.40	92.59			cross section XS 1
67	217+0					15.5	91.49					water on XS
68	217+0			16.4	90.19							mid Rapped into
69												
70												Team 2 XS
71										13.03	93.96	turn 2
72										4.22	93.96	
73										New HI	96.18	
74												
75												
76												Team 2 XS
77										16.39	HI 100.41	
78										Rod 7.97	elev - 92.02	
79												
80												
81												

106.99

1.24

4.09/5.55

106.99
6.68
100.31

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Site: Shannon
Location: Reach 2
Party: Team 2
HUC:

Date:

Dot Count for RIFFLE POOL COMP.

Inches	PARTICLE	Millimeters	S/C:	RIFFLE 1	POOL 2	COMP. 3
	Silt / Clay	< .062		top of Bedrock	Flow Rock	
	Very Fine	.062 - .125	SAND			
	Fine	.125 - .25				
	Medium	.25 - .50				
	Coarse	.50 - 1.0				
.04 - .08	Very Coarse	1.0 - 2				
.08 - .16	Very Fine	2 - 4	GRAVEL			
.16 - .22	Fine	4 - 5.7				
.22 - .31	Fine	5.7 - 8				
.31 - .44	Medium	8 - 11.3				
.44 - .63	Medium	11.3 - 16				
.63 - .89	Coarse	16 - 22.6				
.89 - 1.3	Coarse	22.6 - 32				
1.3 - 1.8	Very Coarse	32 - 45				
1.8 - 2.5	Very Coarse	45 - 64				
2.5 - 3.5	Small	64 - 90	COBBLE			
3.5 - 5.0	Small	90 - 128				
5.0 - 7.1	Large	128 - 180				
7.1 - 10.1	Large	180 - 256				
10.1 - 14.3	Small	256 - 362	BOULDER			
14.3 - 20	Small	362 - 512				
20 - 40	Medium	512 - 1024				
40 - 80	Large-Vry Large	1024 - 2048				
	Bedrock		BDRK			

Stream Type: **Valley Type:**

Big Rock: 4,800'
6,000'

RIFFLE (1)			POOL (2)			COMPOSITE (3)		
Reach:			Reach:			Reach:		
Date:			Date:			Date:		
TOT #	ITEM %	% CUM	TOT #	ITEM %	% CUM	TOT #	ITEM %	% CUM

TOTAL →

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Site: Sharmans Branch Date:

Location: Reach 2 HUC:

Party: Team B

Inches	PARTICLE	Millimeters		Dot Count for RIFFLE 1	POOL 2	COMP. 3	RIFFLE (1) TOT #	RIFFLE (1) ITEM %	RIFFLE (1) % CUM	POOL (2) TOT #	POOL (2) ITEM %	POOL (2) % CUM	COMPOSITE (3) TOT #	COMPOSITE (3) ITEM %	COMPOSITE (3) % CUM
	Silt / Clay	< .062	S/C												
	Very Fine	.062 - .125	SAND												
	Fine	.125 - .25	SAND												
	Medium	.25 - .50	SAND				7								
	Coarse	.50 - 1.0	SAND												
.04 - .08	Very Coarse	1.0 - 2	SAND												
.08 - .16	Very Fine	2 - 4	GRAVEL												
.16 - .22	Fine	4 - 5.7	GRAVEL												
.22 - .31	Fine	5.7 - 8	GRAVEL												
.31 - .44	Medium	8 - 11.3	GRAVEL												
.44 - .63	Medium	11.3 - 16	GRAVEL												
.63 - .89	Coarse	16 - 22.6	GRAVEL												
.89 - 1.3	Coarse	22.6 - 32	GRAVEL												
1.3 - 1.8	Very Coarse	32 - 45	GRAVEL												
1.8 - 2.5	Very Coarse	45 - 64	GRAVEL												
2.5 - 3.5	Small	64 - 90	COBBLE												
3.5 - 5.0	Small	90 - 128	COBBLE												
5.0 - 7.1	Large	128 - 180	COBBLE												
7.1 - 10.1	Large	180 - 256	COBBLE												
10.1 - 14.3	Small	256 - 362	BOULDER												
14.3 - 20	Small	362 - 512	BOULDER												
20 - 40	Medium	512 - 1024	BOULDER												
40 - 80	Large-Vry Large	1024 - 2048	BOULDER												
	Bedrock		BDRK												
Stream Type:			**Valley Type:**			TOTAL→									

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