APPENDIX B

SELECTED MORPHOLOGICAL CHARACTERISTICS

Selected Morphological Characteristics

No.	Variable	Symbol	Units		Existing Conditions Oxon Run		Rosgen Colorado C4 Streams	Maryland Characteristic C4 Streams	Proposed Conditions Oxon Run	
					Reach OR-2	Reach OR-10			Reach OR-2	Reach OR-9B
1	Stream type				B4c	C4	C4	C4	C4	C4
2	Drainage area		mi^2	Mean	6.3	8.2		28.9	6.3	7.0
				Range	NA	NA		5.31 - 54.8		
3	Riffle Bankfull width	W_{bkf}	feet	Mean	51.3	42.9		43.8	35.2	35.2
				Range	40.8 - 62.3	38.5 - 46.1		36.2 - 52.0		
4	Riffle Bankfull mean depth	d_{bkf}	feet	Mean	1.80	2.12		3.41	2.37	2.37
				Range	1.32 - 2.31	1.84 - 2.33		1.89 - 4.66		
5	Width depth ratio	W/d		Mean	29.1	20.5		14.3	14.9	14.9
				Range	18.4 - 47.2	16.5 - 24.4	12 - 25	9.56 - 27.0		
6	Riffle Bankfull cross sectional area	A_{bkf}	ft_2	Mean	92.1	90.7		176	83.3	83.3
				Range	78.0 - 104.1	82.7 - 105.8		96.8 - 249		
7	Bankfull mean velocity	V_{bkf}	ft/sec	Mean	4.94			4.85	5.46	5.46
				Range						
8	Bankfull discharge	Q_{bkf}	cfs	Mean	455.0			811	455	455
				Range	433 - 474			465 - 1390	433 - 474	433 - 474
9	Riffle Bankfull maximum depth	d_{max}	feet	Mean	2.80	2.89		4.47	3.25	3.25
				Range	2.45 - 3.49	2.44 - 3.17		3.11 - 5.63	3.24 -3.27	3.24 -3.27
10	Max Riffle depth/ Mean riffle depth	d_{riff}/d_{bkf}		Mean	1.56	1.36		1.36	1.37	1.37
				Range	1.30 - 2.64	1.32 - 1.46	1.2 - 1.4	1.18 - 1.65		
11	Low bank height to max d_{bkf} ratio			Mean	1.20	1.40		NA	1.0	1.0
				Range	1.00 -1.48	1.17 - 1.59				
12	Width of flood prone area	W_{fpa}	feet	Mean	90.3	273.2		517	153	180.0
				Range	73.5 - 115.8	106.3 - 440.0		118 - 1350	104 - 280	120-500
13	Entrenchment Ratio	W_{fpa}/W_{bkf}		Mean	1.82	6.97		12.7	4.35	5.11
				Range	1.22 - 2.84	2.52 - 11.4		2.86 - 36.5	3.20 - 8.62	3.69 - 15.38
14	Meander Length	L_m	feet	Mean	659	434		555	497	501
				Range	593 - 800	400 - 483		222 - 984	456 - 586	356 - 666
15	Ratio of meander length to bankfull width	L_m/W_{bkf}		Mean	12.8	10.1		13.0	14.1	14.2
				Range	11.6 - 15.6	9.3 - 11.3	9 - 14	5.7 - 27.2	12.7 - 16.6	10.1 - 18.9
16	Radius of curvature	R_c		Mean	153	131		98	136	144
				Range	69 - 257	89 - 180		52 - 151	130 - 142	140 - 150
17	Ratio: Radius of curvature to bankfull width	R_c/W_{bkf}		Mean	2.98	3.05		2.3	3.9	4.1
				Range	1.34 - 5.01	2.07 - 4.20	3.0 - 4.0 (High Bedload)	1.4 - 3.3	3.7 - 4.0	4.0 - 4.3
18	Belt Width	W_{blt}	feet	Mean	182	97		122	247	170
				Range	132 - 224	70 - 148		36 - 231	185 - 273	100 - 270
19	Meander width ratio	W_{blt}/W_{bkf}		Mean	3.55	2.3		2.8	7.0	4.8
				Range	2.57 - 4.37	1.6 - 3.4		0.97 - 4.52	5.3 - 7.8	2.8 - 7.7

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20	Sinuosity	K		Mean	1.17	1.10		1.39	1.20	1.15
				Range	NA	NA		1.26 - 1.47		
21	Valley Slope	S_{val}	ft/ft		0.0065	0.0068			0.0065	0.0061
22	Average Water Surface Slope	S_{avg}	ft/ft	Mean	0.0052	0.0056		0.0026	0.0054	0.0053
				Range	NA	NA		0.0014 - 0.0059		0.00044 - 0.0079
23	Pool Water Surface Slope	S_{pool}	ft/ft	Mean	0.00039	0.00058		NA	0.0012	0.0012
				Range	0.000051 - 0.00056	0.000072 - 0.0013			0.0010 - 0.0015	0.0010 - 0.0015
24	Pool WS slope / Average WS slope	S_{pool}/S_{avg}		Mean	0.076	0.10		NA	0.22	0.23
				Range	0.010 - 0.11	0.013 - 0.23	0.20 - 0.30		0.19 - 0.28	0.19 - 0.28
25	Riffle Water Surface slope	Sriff	ft/ft	Mean	0.017	0.0095			0.0099	
				Range	0.012 - 0.022	0.0030 - 0.018			0.0097 - 0.0010	
26	Riffle WS slope / Average WS slope	S_{riff}/S_{avg}		Mean	3.4	1.7		NA	1.83	1.75
				Range	2.5 - 4.3	0.54 - 3.4	1.5 - 2.0		1.80 - 1.85	
27	Run Bed Slope	S_{run}/S_{avg}	ft/ft	Mean	0.036	0.19			0.122	0.107
				Range	0.019 - 0.053	0.074 - 0.31			0.082 - .156	0.075 - 0.173
28	Run bed slope / Average WS slope	S_{run}/S_{avg}	ft/ft	Mean	7.6	35			22.6	20.2
				Range	3.7 - 10	13 - 56			15.1 - 28.9	14.2 - 32.6
29	Glide Bed Slope	S_{glide}		Mean	-0.044	-0.027			-0.018	-0.017
				Range	(-0.056) - (-0.023)	(-0.066) - (-0.0060)			-0.044 -.032	-0.034 - -0.0044
30	Glide Bed slope / Average WS slope	S_{glide}/S_{avg}	ft/ft	Mean	-8.4	-4.8			-3.3	-3.2
				Range	(-11) - (-4.4)	(-12) - (1.1)			-0.8 -5.9	-6.4 - -0.8
31	Maximum pool depth	d_{pool}	feet	Mean	5.69	4.26		6.23	7.16	7.13
				Range	4.45 - 7.55	3.26 - 4.88		5.00 - 7.83	6.85 - 7.40	6.69 - 7.29
32	Ratio of max pool depth to average bankfull depth	d_{pool}/d_{bkf}		Mean	3.12	2.02		2.26	3.02	3.01
				Range	2.44 - 4.14	1.54 - 2.31	2.5 - 3.5	1.68 - 3.10	2.89 - 3.12	2.82 - 3.08
33	Max Run Depth	d_{run}	feet	Mean	3.15	3.49			5.21	5.19
				Range	2.86 - 3.56	3.37 - 3.61			5.02 - 5.46	5.02 - 5.39
34	Ratio of max run depth to average bankfull depth	d_{run}/d_{bkf}		Mean	1.93	1.65			2.20	2.19
				Range	1.66 - 2.31	1.59 - 1.71			2.12 - 2.30	2.12 - 2.27
35	Max Glide Depth	d_{glide}	feet	Mean	2.71	2.88			3.45	3.39
				Range	2.24 - 3.32	2.53 - 3.31			3.25 - 3.53	3.25 - 3.48
36	Ratio of max glide depth to average bankfull depth	d_{glide}/d_{bkf}	feet	Mean	1.48	1.36			1.46	1.43
				Range	1.23 - 1.82	1.20 - 1.57			1.37 - 1.49	1.37 - 1.47
37	Pool width	W_{pool}	feet	Mean	51.9	45.5		46.7	46	46
				Range	NA	42.8 - 48.1		36.5 - 57.4	42 - 52	42 - 52
38	Ratio of pool width to bankfull width	W_{pool}/W_{bkf}		Mean	1.01	1.06		1.05	1.31	1.31
				Range	NA	1.00 - 1.12	1.3 - 1.7	1.01 - 1.12	1.19 - 1.48	1.19 - 1.48
39	Ratio of pool area to bankfull area	A_{pool}/A_{bkf}		Mean	1.03	0.859		1.33	1.66	1.66
				Range	NA	0.748 - 0.970		1.25 - 1.49		
40	Point bar slope	S_{pb}		Mean	0.046	0.070			0.16	0.16
				Range	NA	0.055 - 0.085			0.13 - 0.20	0.13 - 0.20

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41	Pool to pool spacing	p-p	feet	Mean	449	206		NA	263	260
				Range	188 - 816	119 - 273			175 - 411	220-347
42	Ratio of pool to pool spacing to bankfull width	p-p/W_{bkf}		Mean	8.76	4.79		NA	7.5	7.4
				Range	3.67 - 15.92	2.77 - 6.36	5 - 7		5.0 - 11.7	6.3 - 9.8
Materials										
	Particle Size Distribution Channel	D_{16}	mm		6.2	1.3			6.2	6.2
		D_{35}	mm		13.7	6.6			13.7	13.7
		D_{50}	mm		24.6	13.0	Gravel	Gravel	24.6	24.6
		D_{84}	mm		31.4	33.2			31.4	31.4
		D_{95}	mm		41.2	42.8			41.2	41.2
	Particle Size Distribution Bar	D_{16}	mm		7.6	NA			7.6	7.6
		D_{35}	mm		14.3	NA			14.3	14.3
		D_{50}	mm		24.8	NA	Gravel	Gravel	24.8	24.8
		D_{84}	mm		34.5	NA			34.5	34.5
		D_{95}	mm		43.3	NA			43.3	43.3
	Largest Particle Size		mm		64	108			>64	>64
Sediment Transport Validation										
	Bankfull shear stress	t	lbs/ft^2		0.64	0.58			0.77	0.75
	Critical Sediment Size from Shield Curve	D_{crit}	mm		40	37			48	46
	Minimum mean dbkf using critical dimensionless shear stress	d_r	feet		Sediment material ratios not within applicable range of critical dimensionless shear stress equations				Sediment material ratios not within applicable range of critical dimensionless hear stress equations	

Note: Calculations were performed using the corresponding range of data.

Note: There is no bar sample for OR-10 because substrate composition and channel characteristics are similar to OR-2.