

## **APPENDIX C**

### **Calibration - March 1998; April 1999**

- **HEC-RAS – Summary Output**

HEC-RAS Plan: calibration

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Jock River	Reach 7	0	April 1999	143.00	80.50	0.51	358.00	133.80			60.40
Jock River	Reach 7	0	March 1998	132.00	80.00	0.55	294.34	120.77			60.40
Jock River	Reach 7	158	April 1999	143.00	80.40	2.06	78.81	37.06	157.90	34.49	22.56
Jock River	Reach 7	158	March 1998	132.00	79.86	2.39	60.02	32.84	157.90	27.98	22.56
Jock River	Reach 7	166	April 1999	143.00	80.26	3.32	47.96	25.73	165.73	34.97	17.02
Jock River	Reach 7	166	March 1998	132.00	79.66	4.13	33.89	21.88	165.73	28.34	17.02
Jock River	Reach 7	177 hwy #16		Bridge							
Jock River	Reach 7	189	April 1999	143.00	80.53	2.90	55.93	27.51	188.73	36.17	17.48
Jock River	Reach 7	189	March 1998	132.00	80.31	2.94	50.02	26.07	188.73	29.36	17.48
Jock River	Reach 7	211	April 1999	143.00	80.92	1.77	87.65	38.74	211.21	37.86	28.96
Jock River	Reach 7	211	March 1998	132.00	80.73	1.77	80.21	37.76	211.21	30.89	28.96
Jock River	Reach 7	270	April 1999	143.00	80.99	2.26	66.64	32.71	269.95	42.47	26.40
Jock River	Reach 7	270	March 1998	132.00	80.81	2.27	60.79	31.91	269.95	35.09	26.40
Jock River	Reach 7	351	April 1999	143.00	81.30	2.01	76.67	44.58	350.77	48.26	31.52
Jock River	Reach 7	351	March 1998	132.00	81.15	2.01	70.08	42.81	350.77	40.38	31.52
Jock River	Reach 7	428	April 1999	143.00	81.54	2.33	62.49	37.53	427.62	53.61	34.48
Jock River	Reach 7	428	March 1998	132.00	81.42	2.31	57.94	37.02	427.62	45.30	34.48
Jock River	Reach 7	489	April 1999	143.00	81.87	2.80	54.09	40.44	489.38	57.21	32.28
Jock River	Reach 7	489	March 1998	132.00	81.78	2.76	50.51	40.05	489.38	48.65	32.28
Jock River	Reach 7	551	April 1999	143.00	82.38	3.27	45.25	29.97	551.38	60.29	25.70
Jock River	Reach 7	551	March 1998	132.00	82.32	3.14	43.38	29.69	551.38	51.56	25.70
Jock River	Reach 7	689	April 1999	143.00	83.38	1.76	87.71	50.35	689.36	69.46	35.83
Jock River	Reach 7	689	March 1998	132.00	83.28	1.71	82.63	48.86	689.36	60.25	35.83
Jock River	Reach 7	740	April 1999	143.00	83.52	1.48	101.44	52.34	740.01	74.25	41.90
Jock River	Reach 7	740	March 1998	132.00	83.42	1.43	96.06	51.19	740.01	64.78	41.90
Jock River	Reach 7	815	April 1999	143.00	83.63	1.63	96.06	54.64	814.60	81.60	34.72
Jock River	Reach 7	815	March 1998	132.00	83.52	1.58	90.54	52.10	814.60	71.72	34.72
Jock River	Reach 7	983	April 1999	143.00	83.88	1.26	118.46	49.39	982.74	99.59	42.10
Jock River	Reach 7	983	March 1998	132.00	83.77	1.21	113.13	48.82	982.74	88.80	42.10
Jock River	Reach 7	1104	April 1999	143.00	83.99	1.11	134.35	53.08	1104.32	114.83	44.74
Jock River	Reach 7	1104	March 1998	132.00	83.87	1.07	128.45	52.53	1104.32	103.37	44.74
Jock River	Reach 7	1269	April 1999	143.00	84.09	1.09	138.26	54.30	1269.08	137.33	44.20
Jock River	Reach 7	1269	March 1998	132.00	83.97	1.05	132.10	53.61	1269.08	124.88	44.20
Jock River	Reach 7	1392	April 1999	143.00	84.15	1.64	97.72	62.21	1392.25	151.86	33.90
Jock River	Reach 7	1392	March 1998	132.00	84.03	1.59	91.03	55.40	1392.25	138.62	33.90
Jock River	Reach 7	1473	April 1999	143.00	84.31	0.73	222.63	120.17	1473.07	164.81	67.26
Jock River	Reach 7	1473	March 1998	132.00	84.19	0.71	208.56	114.31	1473.07	150.73	67.26
Jock River	Reach 7	1556	April 1999	143.00	84.34	0.45	330.27	136.50	1555.85	187.69	114.46
Jock River	Reach 7	1556	March 1998	132.00	84.22	0.43	313.90	134.55	1555.85	172.35	114.46
Jock River	Reach 7	1602	April 1999	143.00	84.26	1.67	95.19	64.44	1602.28	197.57	39.91
Jock River	Reach 7	1602	March 1998	132.00	84.14	1.64	87.73	60.85	1602.28	181.67	39.91
Jock River	Reach 7	1647	April 1999	143.00	84.18	3.18	46.11	29.83	1647.37	200.76	25.84
Jock River	Reach 7	1647	March 1998	132.00	84.08	3.12	43.16	29.23	1647.37	184.62	25.84
Jock River	Reach 7	1706	April 1999	143.00	84.77	2.87	51.17	29.47	1705.64	203.59	25.22
Jock River	Reach 7	1706	March 1998	132.00	84.68	2.77	48.72	28.99	1705.64	187.30	25.22
Jock River	Reach 7	1809	April 1999	143.00	85.46	3.03	50.64	29.45	1809.26	208.87	21.61
Jock River	Reach 7	1809	March 1998	132.00	85.37	2.93	47.98	29.01	1809.26	192.31	21.61
Jock River	Reach 7	1944	April 1999	143.00	86.05	0.80	182.43	73.40	1943.98	224.57	64.78
Jock River	Reach 7	1944	March 1998	132.00	85.93	0.78	173.70	72.39	1943.98	207.24	64.78
Jock River	Reach 7	2094	April 1999	143.00	86.10	1.45	131.86	122.61	2093.81	248.11	40.84
Jock River	Reach 7	2094	March 1998	132.00	85.98	1.44	117.64	107.21	2093.81	229.07	40.84

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Jock River	Reach 7	2213	April 1999	143.00	86.28	1.80	104.00	124.81	2212.91	262.16	33.17
Jock River	Reach 7	2213	March 1998	132.00	86.17	1.79	90.53	122.33	2212.91	241.47	33.17
Jock River	Reach 7	2306	April 1999	143.00	86.51	1.01	171.60	155.61	2305.78	274.95	64.38
Jock River	Reach 7	2306	March 1998	132.00	86.41	1.00	156.36	148.56	2305.78	252.93	64.38
Jock River	Reach 7	2386	April 1999	143.00	86.42	2.82	52.87	59.45	2385.78	283.93	38.08
Jock River	Reach 7	2386	March 1998	132.00	86.33	2.82	47.73	50.61	2385.78	261.09	38.08
Jock River	Reach 7	2462	April 1999	143.00	87.13	2.32	62.44	38.87	2462.41	288.35	35.44
Jock River	Reach 7	2462	March 1998	132.00	87.07	2.23	60.06	38.59	2462.41	265.22	35.44
Jock River	Reach 7	2560	April 1999	143.00	87.69	3.55	41.37	30.44	2560.16	293.42	25.98
Jock River	Reach 7	2560	March 1998	132.00	87.62	3.44	39.24	30.06	2560.16	270.07	25.98
Jock River	Reach 7	2585	April 1999	143.00	88.42	1.88	76.11	37.23	2584.80	294.87	37.23
Jock River	Reach 7	2585	March 1998	132.00	88.31	1.83	72.21	36.58	2584.80	271.45	36.58
Jock River	Reach 7	2590	jockvale	Bridge							
Jock River	Reach 7	2595	April 1999	143.00	88.44	1.85	77.51	36.08	2595.22	295.67	36.08
Jock River	Reach 7	2595	March 1998	132.00	88.34	1.79	73.73	35.49	2595.22	272.21	35.49
Jock River	Reach 7	2601	April 1999	143.00	88.41	2.43	68.19	42.87	2601.48	296.12	25.74
Jock River	Reach 7	2601	March 1998	132.00	88.30	2.39	63.65	42.21	2601.48	272.64	25.74
Jock River	Reach 7	2672	April 1999	143.00	88.58	2.56	61.33	41.53	2672.35	300.71	26.41
Jock River	Reach 7	2672	March 1998	132.00	88.49	2.47	57.76	35.82	2672.35	276.94	26.41
Jock River	Reach 7	2776	April 1999	143.00	88.90	3.58	43.78	38.20	2775.76	306.15	26.36
Jock River	Reach 7	2776	March 1998	132.00	88.84	3.48	41.30	37.54	2775.76	282.06	26.36
Jock River	Reach 7	2848	April 1999	143.00	89.69	2.46	64.73	53.84	2847.77	310.05	33.47
Jock River	Reach 7	2848	March 1998	132.00	89.61	2.40	60.53	50.67	2847.77	285.73	33.47
Jock River	Reach 7	3027	April 1999	143.00	90.17	1.26	121.99	73.68	3027.12	326.80	51.78
Jock River	Reach 7	3027	March 1998	132.00	90.08	1.22	115.46	72.18	3027.12	301.51	51.78
Jock River	Reach 7	3219	April 1999	143.00	90.30	0.94	188.82	136.51	3219.03	356.20	54.10
Jock River	Reach 7	3219	March 1998	132.00	90.21	0.91	176.55	126.85	3219.03	329.17	54.10
Jock River	Reach 7	3389	April 1999	143.00	90.35	0.44	365.93	202.05	3388.89	401.22	108.82
Jock River	Reach 7	3389	March 1998	132.00	90.26	0.42	346.93	195.72	3388.89	371.86	108.82
Jock River	Reach 7	3633	April 1999	143.00	90.31	1.59	91.41	51.96	3632.76	455.75	47.48
Jock River	Reach 7	3633	March 1998	132.00	90.22	1.54	86.65	51.47	3632.76	423.72	47.48
Jock River	Reach 7	3672	April 1999	143.00	90.29	2.50	58.41	34.23	3671.69	458.67	30.78
Jock River	Reach 7	3672	March 1998	132.00	90.21	2.42	55.49	33.92	3671.69	426.49	30.78
Jock River	Reach 7	3677	greenbank	Bridge							
Jock River	Reach 7	3681	April 1999	143.00	90.39	2.27	63.98	34.93	3681.42	459.24	31.23
Jock River	Reach 7	3681	March 1998	132.00	90.31	2.20	60.94	34.48	3681.42	427.04	31.23
Jock River	Reach 7	3699	April 1999	143.00	90.58	1.67	89.18	46.66	3698.82	460.58	38.24
Jock River	Reach 7	3699	March 1998	132.00	90.48	1.61	84.59	45.86	3698.82	428.30	38.24
Jock River	Reach 7	3802	April 1999	140.00	90.69	2.10	71.99	51.60	3801.92	468.88	33.38
Jock River	Reach 7	3802	March 1998	129.00	90.59	2.05	67.11	48.65	3801.92	436.12	33.38
Jock River	Reach 7	3888	April 1999	140.00	90.94	1.31	128.24	88.75	3888.17	477.52	40.28
Jock River	Reach 7	3888	March 1998	129.00	90.83	1.28	119.21	85.66	3888.17	444.16	40.28
Jock River	Reach 7	4042	April 1999	140.00	91.03	0.64	230.96	99.41	4042.39	505.22	67.58
Jock River	Reach 7	4042	March 1998	129.00	90.93	0.61	220.94	92.08	4042.39	470.39	67.58
Jock River	Reach 7	4241	April 1999	140.00	91.06	0.61	258.62	139.35	4240.68	553.76	65.38
Jock River	Reach 7	4241	March 1998	129.00	90.95	0.58	245.26	117.91	4240.68	516.61	65.38
Jock River	Reach 7	4380	April 1999	140.00	91.06	0.79	200.96	106.43	4379.68	585.70	49.46
Jock River	Reach 7	4380	March 1998	129.00	90.96	0.76	190.35	93.53	4379.68	546.88	49.46
Jock River	Reach 7	4534	April 1999	140.00	91.08	0.82	198.13	158.46	4533.66	616.70	47.26
Jock River	Reach 7	4534	March 1998	129.00	90.98	0.79	183.00	95.40	4533.66	575.83	47.26

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Jock River	Reach 7	4803	April 1999	140.00	91.13	0.74	250.87	416.06	4803.27	676.88	50.32
Jock River	Reach 7	4803	March 1998	129.00	91.02	0.73	205.20	403.93	4803.27	628.00	50.32
Jock River	Reach 7	5002	April 1999	140.00	91.16	0.50	318.76	214.78	5001.85	735.34	75.00
Jock River	Reach 7	5002	March 1998	129.00	91.05	0.48	295.60	200.54	5001.85	678.64	75.00
Jock River	Reach 7	5289	April 1999	140.00	91.17	0.73	222.73	303.95	5288.94	811.94	51.74
Jock River	Reach 7	5289	March 1998	129.00	91.06	0.70	196.34	168.82	5288.94	748.69	51.74
Jock River	Reach 7	5538	April 1999	140.00	91.20	0.69	245.54	300.60	5537.59	870.02	47.22
Jock River	Reach 7	5538	March 1998	129.00	91.09	0.66	217.58	193.88	5537.59	800.10	47.22
Jock River	Reach 7	5737	April 1999	140.00	91.22	0.67	229.88	153.33	5736.74	917.36	47.96
Jock River	Reach 7	5737	March 1998	129.00	91.11	0.64	214.34	120.01	5736.74	843.11	47.96
Jock River	Reach 7	5910	April 1999	140.00	91.23	0.79	253.64	489.90	5910.01	959.25	38.05
Jock River	Reach 7	5910	March 1998	129.00	91.12	0.77	203.78	328.04	5910.01	879.33	38.05
Jock River	Reach 7	5950	April 1999	140.00	91.23	0.90	163.51	45.20	5950.01	967.63	35.18
Jock River	Reach 7	5950	March 1998	129.00	91.12	0.85	158.38	44.77	5950.01	886.62	35.18
Jock River	Reach 7	5956 cedarview		Bridge							
Jock River	Reach 7	5962	April 1999	140.00	91.23	0.90	161.14	44.11	5962.41	969.60	35.18
Jock River	Reach 7	5962	March 1998	129.00	91.12	0.86	156.13	43.55	5962.41	888.54	35.18
Jock River	Reach 7	6016	April 1999	140.00	91.26	0.77	218.02	173.55	6015.56	979.68	42.01
Jock River	Reach 7	6016	March 1998	129.00	91.14	0.74	200.97	165.39	6015.56	898.00	42.01
Jock River	Reach 7	6215	April 1999	140.00	91.29	0.50	348.78	618.80	6215.13	1044.50	65.48
Jock River	Reach 7	6215	March 1998	129.00	91.17	0.48	314.81	528.02	6215.13	954.01	65.48
Jock River	Reach 7	6495	April 1999	140.00	91.30	0.60	353.74	1036.92	6495.36	1187.68	49.48
Jock River	Reach 7	6495	March 1998	129.00	91.18	0.59	317.76	943.01	6495.36	1070.97	49.48
Jock River	Reach 7	6550	April 1999	140.00	91.32	0.37	387.10	1187.90	6550.44	1225.20	444.93
Jock River	Reach 7	6550	March 1998	129.00	91.20	0.38	348.72	1187.11	6550.44	1101.13	444.93
Jock River	Reach 7	6745	April 1999	137.00	91.33	0.39	426.47	989.85	6744.80	1317.27	80.88
Jock River	Reach 7	6745	March 1998	126.00	91.21	0.38	390.75	869.07	6744.80	1181.68	80.88
Jock River	Reach 7	6946	April 1999	137.00	91.32	0.75	256.73	847.97	6946.01	1411.09	39.46
Jock River	Reach 7	6946	March 1998	126.00	91.20	0.73	225.56	681.39	6946.01	1257.71	39.46
Jock River	Reach 7	7245	April 1999	137.00	91.38	0.74	278.20	879.66	7245.05	1527.46	38.80
Jock River	Reach 7	7245	March 1998	126.00	91.26	0.74	241.90	708.43	7245.05	1349.00	38.80
Jock River	Reach 7	7441	April 1999	137.00	91.45	0.53	407.85	796.19	7441.41	1690.01	37.08
Jock River	Reach 7	7441	March 1998	126.00	91.33	0.52	376.33	702.26	7441.41	1480.92	37.08
Jock River	Reach 7	7657	April 1999	137.00	91.50	0.72	272.05	669.35	7656.55	1826.85	36.08
Jock River	Reach 7	7657	March 1998	126.00	91.38	0.71	251.35	515.01	7656.55	1596.32	36.08
Jock River	Reach 7	7751	April 1999	137.00	91.56	0.81	189.65	74.80	7750.77	1917.23	40.60
Jock River	Reach 7	7751	March 1998	126.00	91.43	0.78	180.57	73.66	7750.77	1665.44	40.60
Jock River	Reach 7	7760 416 NB		Bridge							
Jock River	Reach 7	7768	April 1999	137.00	91.57	0.81	188.35	69.00	7768.14	1920.35	40.60
Jock River	Reach 7	7768	March 1998	126.00	91.45	0.77	179.91	67.92	7768.14	1668.41	40.60
Jock River	Reach 7	7776	April 1999	137.00	91.57	0.81	186.59	68.09	7776.13	1921.84	40.60
Jock River	Reach 7	7776	March 1998	126.00	91.45	0.78	178.25	67.11	7776.13	1669.84	40.60
Jock River	Reach 7	7786	April 1999	137.00	91.58	0.82	185.23	71.82	7786.37	1923.74	40.60
Jock River	Reach 7	7786	March 1998	126.00	91.45	0.78	176.48	70.18	7786.37	1671.65	40.60
Jock River	Reach 7	7797 416 SB		Bridge							
Jock River	Reach 7	7806	April 1999	137.00	91.59	0.81	186.32	71.94	7805.57	1927.14	40.60
Jock River	Reach 7	7806	March 1998	126.00	91.47	0.78	177.51	70.51	7805.57	1674.88	40.60
Jock River	Reach 7	7858	April 1999	137.00	91.65	0.71	319.21	359.66	7858.49	1966.29	44.60
Jock River	Reach 7	7858	March 1998	126.00	91.52	0.74	271.79	347.54	7858.49	1706.78	44.60

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Jock River	Reach 7	7994	April 1999	137.00	91.72	0.75	255.09	294.05	7993.54	1990.88	67.04
Jock River	Reach 7	7994	March 1998	126.00	91.60	0.78	220.05	291.52	7993.54	1729.26	67.04
Jock River	Reach 7	8164	April 1999	137.00	91.82	0.68	269.04	228.65	8164.43	2026.00	57.32
Jock River	Reach 7	8164	March 1998	126.00	91.71	0.68	244.77	226.07	8164.43	1761.79	57.32
Jock River	Reach 7	8281	April 1999	137.00	91.87	0.78	241.61	209.67	8281.41	2056.74	48.12
Jock River	Reach 7	8281	March 1998	126.00	91.77	0.76	219.89	201.05	8281.41	1789.36	48.12
Jock River	Reach 7	8549	April 1999	137.00	92.02	0.88	194.59	166.49	8548.93	2112.54	41.92
Jock River	Reach 7	8549	March 1998	126.00	91.92	0.84	178.01	148.69	8548.93	1840.69	41.92
Jock River	Reach 7	8600	April 1999	137.00	92.05	1.01	146.34	66.70	8600.04	2123.11	41.70
Jock River	Reach 7	8600	March 1998	126.00	91.95	0.97	139.64	61.40	8600.04	1850.11	41.70
Jock River	Reach 7	8648	April 1999	137.00	92.08	1.55	97.28	31.73	8647.93	2129.62	20.00
Jock River	Reach 7	8648	March 1998	126.00	91.98	1.47	93.95	31.05	8647.93	1856.30	20.00
Jock River	Reach 7	8654 moodie		Bridge							
Jock River	Reach 7	8660	April 1999	137.00	92.10	1.54	98.14	32.14	8659.76	2130.77	20.00
Jock River	Reach 7	8660	March 1998	126.00	92.00	1.46	94.71	31.61	8659.76	1857.42	20.00
Jock River	Reach 7	8693	April 1999	137.00	92.23	1.04	157.68	103.55	8692.91	2135.75	41.20
Jock River	Reach 7	8693	March 1998	126.00	92.11	1.02	145.24	100.42	8692.91	1862.00	41.20
Jock River	Reach 7	8787	April 1999	137.00	92.27	1.01	143.31	46.43	8787.48	2150.00	35.88
Jock River	Reach 7	8787	March 1998	126.00	92.15	0.96	137.78	45.83	8787.48	1875.40	35.88
Jock River	Reach 7	8811	April 1999	137.00	92.31	0.68	200.86	51.45	8810.51	2154.42	48.20
Jock River	Reach 7	8811	March 1998	126.00	92.19	0.64	195.96	51.35	8810.51	1879.68	48.20
Jock River	Reach 7	8817 railway		Bridge							
Jock River	Reach 7	8821	April 1999	137.00	92.31	0.67	204.53	51.16	8820.74	2156.62	49.46
Jock River	Reach 7	8821	March 1998	126.00	92.19	0.63	199.63	51.06	8820.74	1881.83	49.46
Jock River	Reach 7	8835	April 1999	137.00	92.32	0.58	335.21	209.18	8835.43	2170.36	46.54
Jock River	Reach 7	8835	March 1998	126.00	92.20	0.57	309.11	207.06	8835.43	1893.86	46.54
Jock River	Reach 7	9025	April 1999	137.00	92.33	0.72	263.45	284.98	9024.59	2228.52	47.92
Jock River	Reach 7	9025	March 1998	126.00	92.21	0.70	229.91	249.27	9024.59	1945.97	47.92
Jock River	Reach 7	9144	April 1999	137.00	92.34	0.83	228.10	188.01	9144.23	2258.69	43.08
Jock River	Reach 7	9144	March 1998	126.00	92.22	0.81	206.18	161.75	9144.23	1971.81	43.08
Jock River	Reach 7	9333	April 1999	137.00	92.38	0.73	252.72	191.02	9332.91	2305.88	47.56
Jock River	Reach 7	9333	March 1998	126.00	92.25	0.71	229.53	177.66	9332.91	2014.45	47.56
Jock River	Reach 7	9487	April 1999	137.00	92.40	0.77	230.82	223.97	9486.93	2348.41	49.86
Jock River	Reach 7	9487	March 1998	126.00	92.27	0.75	205.30	181.57	9486.93	2051.89	49.86
Jock River	Reach 7	9751	April 1999	137.00	92.44	0.79	241.50	134.20	9750.83	2411.97	40.64
Jock River	Reach 7	9751	March 1998	126.00	92.31	0.77	224.86	129.73	9750.83	2109.72	40.64
Jock River	Reach 7	9923	April 1999	137.00	92.46	0.74	274.51	166.36	9922.85	2442.36	42.32
Jock River	Reach 7	9923	March 1998	126.00	92.34	0.72	253.63	163.98	9922.85	2138.46	42.32
Jock River	Reach 7	10060	April 1999	137.00	92.47	0.89	212.10	170.18	10059.91	2464.88	42.38
Jock River	Reach 7	10060	March 1998	126.00	92.35	0.88	191.22	162.44	10059.91	2159.78	42.38
Jock River	Reach 7	10144	April 1999	137.00	92.51	0.56	353.52	248.14	10143.78	2488.60	60.13
Jock River	Reach 7	10144	March 1998	126.00	92.38	0.55	322.86	240.39	10143.78	2181.34	60.13
Jock River	Reach 6	10120	April 1999	129.00	92.51	0.53	351.12	248.23			60.13
Jock River	Reach 6	10120	March 1998	119.00	92.38	0.52	320.41	240.48			60.13
Jock River	Reach 6	10174	April 1999	129.00	92.49	0.95	179.35	143.97	53.85	14.28	38.86
Jock River	Reach 6	10174	March 1998	119.00	92.37	0.94	161.48	141.02	53.85	12.97	38.86
Jock River	Reach 6	10370	April 1999	129.00	92.55	0.77	212.18	107.97	249.85	45.43	47.74
Jock River	Reach 6	10370	March 1998	119.00	92.43	0.75	199.10	104.19	249.85	42.18	47.74
Jock River	Reach 6	10505	April 1999	129.00	92.57	0.91	180.61	126.06	385.43	71.27	40.48
Jock River	Reach 6	10505	March 1998	119.00	92.44	0.88	165.84	114.74	385.43	66.05	40.48

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Jock River	Reach 6	10713	April 1999	129.00	92.62	0.66	241.43	122.26	592.56	114.36	47.60
Jock River	Reach 6	10713	March 1998	119.00	92.49	0.64	226.40	119.95	592.56	106.21	47.60
Jock River	Reach 6	10802	April 1999	129.00	92.63	0.56	284.45	157.18	681.79	140.38	55.72
Jock River	Reach 6	10802	March 1998	119.00	92.50	0.54	265.32	150.35	681.79	130.30	55.72
Jock River	Reach 6	11008	April 1999	129.00	92.65	0.54	358.62	206.50	887.52	215.51	48.44
Jock River	Reach 6	11008	March 1998	119.00	92.52	0.53	333.09	201.28	887.52	199.75	48.44
Jock River	Reach 6	11199	April 1999	129.00	92.66	0.56	368.75	214.22	1079.24	290.18	42.50
Jock River	Reach 6	11199	March 1998	119.00	92.53	0.55	342.25	208.64	1079.24	268.92	42.50
Jock River	Reach 6	11389	April 1999	129.00	92.67	0.53	368.05	226.77	1268.92	344.01	51.74
Jock River	Reach 6	11389	March 1998	119.00	92.55	0.52	340.02	221.43	1268.92	319.27	51.74
Jock River	Reach 6	11438	April 1999	129.00	92.66	0.98	241.49	179.36	1317.94	358.95	22.91
Jock River	Reach 6	11438	March 1998	119.00	92.54	0.98	219.36	172.41	1317.94	332.98	22.91
Jock River	Reach 6	11465	April 1999	129.00	92.68	0.65	280.46	173.91	1345.38	366.11	45.66
Jock River	Reach 6	11465	March 1998	119.00	92.56	0.64	259.18	169.52	1345.38	339.54	45.66
Jock River	Reach 6	11595	April 1999	129.00	92.70	0.51	329.22	186.62	1475.12	405.66	60.79
Jock River	Reach 6	11595	March 1998	119.00	92.57	0.50	306.53	179.69	1475.12	376.24	60.79
Jock River	Reach 6	11661	April 1999	129.00	92.70	0.78	326.60	223.92	1540.78	427.19	20.80
Jock River	Reach 6	11661	March 1998	119.00	92.58	0.78	299.22	215.81	1540.78	396.13	20.80
Jock River	Reach 6	11684	April 1999	129.00	92.71	0.54	379.95	241.32	1563.92	435.37	50.28
Jock River	Reach 6	11684	March 1998	119.00	92.58	0.54	350.50	233.96	1563.92	403.64	50.28
Jock River	Reach 6	11769	April 1999	129.00	92.72	0.42	472.33	250.71	1648.57	471.44	57.18
Jock River	Reach 6	11769	March 1998	119.00	92.59	0.41	441.61	246.06	1648.57	437.17	57.18
Jock River	Reach 5	11784	April 1999	126.00	92.72	0.44	469.62	250.69			57.18
Jock River	Reach 5	11784	March 1998	116.00	92.59	0.43	438.92	246.05			57.18
Jock River	Reach 5	11911	April 1999	126.00	92.72	0.44	532.15	383.85	126.53	63.38	60.30
Jock River	Reach 5	11911	March 1998	116.00	92.60	0.44	485.80	365.81	126.53	58.50	60.30
Jock River	Reach 5	11991	April 1999	126.00	92.73	0.61	498.40	393.19	206.82	104.75	24.94
Jock River	Reach 5	11991	March 1998	116.00	92.61	0.61	450.67	379.18	206.82	96.10	24.94
Jock River	Reach 5	12030	April 1999	126.00	92.73	0.48	523.04	398.63	246.13	124.83	53.18
Jock River	Reach 5	12030	March 1998	116.00	92.61	0.48	474.73	386.55	246.13	114.29	53.18
Jock River	Reach 5	12211	April 1999	126.00	92.74	0.55	330.47	182.97	426.87	201.96	57.36
Jock River	Reach 5	12211	March 1998	116.00	92.62	0.54	308.21	181.65	426.87	185.04	57.36
Jock River	Reach 5	12304	April 1999	126.00	92.76	0.72	420.35	349.28	519.71	263.46	22.26
Jock River	Reach 5	12304	March 1998	116.00	92.64	0.74	378.21	335.40	519.71	240.69	22.26
Jock River	Reach 5	12319	April 1999	126.00	92.77	0.47	519.77	352.30	534.80	276.21	49.34
Jock River	Reach 5	12319	March 1998	116.00	92.65	0.46	477.40	342.02	534.80	252.24	49.34
Jock River	Reach 5	12599	April 1999	126.00	92.78	0.36	567.09	278.66	814.53	406.71	66.66
Jock River	Reach 5	12599	March 1998	116.00	92.66	0.35	533.30	277.58	814.53	373.78	66.66
Jock River	Reach 5	12805	April 1999	126.00	92.79	0.40	506.48	241.04	1021.39	544.90	58.60
Jock River	Reach 5	12805	March 1998	116.00	92.67	0.39	477.25	240.35	1021.39	503.48	58.60
Jock River	Reach 5	12949	April 1999	126.00	92.79	0.56	265.47	96.40	1165.17	610.81	53.14
Jock River	Reach 5	12949	March 1998	116.00	92.67	0.53	253.95	94.08	1165.17	565.59	53.14
Jock River	Reach 5	13098	April 1999	126.00	92.80	0.47	366.56	143.84	1314.27	657.94	53.98
Jock River	Reach 5	13098	March 1998	116.00	92.68	0.45	349.07	143.06	1314.27	610.53	53.98
Jock River	Reach 5	13282	April 1999	126.00	92.81	0.36	499.00	216.89	1498.14	745.99	62.36
Jock River	Reach 5	13282	March 1998	116.00	92.69	0.35	472.47	216.08	1498.14	693.91	62.36
Jock River	Reach 5	13498	April 1999	126.00	92.82	0.45	362.27	151.14	1714.11	842.71	64.00
Jock River	Reach 5	13498	March 1998	116.00	92.70	0.43	343.78	150.49	1714.11	785.51	64.00
Jock River	Reach 5	13518	April 1999	126.00	92.82	0.61	207.40	46.40	1733.69	851.64	44.00
Jock River	Reach 5	13518	March 1998	116.00	92.69	0.58	201.75	46.27	1733.69	793.97	44.00
Jock River	Reach 5	13524	twin elm	Bridge							

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Jock River	Reach 5	13529	April 1999	126.00	92.82	0.61	208.73	52.28	1745.13	853.56	44.58
Jock River	Reach 5	13529	March 1998	116.00	92.70	0.58	202.80	51.92	1745.13	795.87	44.58
Jock River	Reach 5	13548	April 1999	126.00	92.82	0.75	194.78	71.25	1764.21	857.66	41.04
Jock River	Reach 5	13548	March 1998	116.00	92.70	0.71	186.11	68.98	1764.21	799.82	41.04
Jock River	Reach 5	13572	April 1999	126.00	92.82	0.74	179.07	46.85	1788.36	862.21	36.54
Jock River	Reach 5	13572	March 1998	116.00	92.70	0.70	173.32	46.39	1788.36	804.19	36.54
Jock River	Reach 5	13593	April 1999	126.00	92.85	0.37	550.81	248.48	1809.21	891.80	49.76
Jock River	Reach 5	13593	March 1998	116.00	92.72	0.36	519.71	243.88	1809.21	831.79	49.76
Jock River	Reach 5	13855	April 1999	126.00	92.86	0.25	587.72	212.26	2070.77	1048.73	112.20
Jock River	Reach 5	13855	March 1998	116.00	92.73	0.24	561.08	209.11	2070.77	980.53	112.20
Jock River	Reach 5	14023	April 1999	126.00	92.86	0.40	456.43	206.86	2238.71	1134.91	58.62
Jock River	Reach 5	14023	March 1998	116.00	92.73	0.38	430.54	202.48	2238.71	1062.41	58.62
Jock River	Reach 5	14247	April 1999	126.00	92.87	0.40	446.49	205.81	2463.34	1232.88	62.24
Jock River	Reach 5	14247	March 1998	116.00	92.74	0.39	420.83	199.63	2463.34	1154.84	62.24
Jock River	Reach 5	14469	April 1999	126.00	92.87	0.47	396.80	180.59	2685.48	1321.79	53.68
Jock River	Reach 5	14469	March 1998	116.00	92.74	0.45	373.97	179.91	2685.48	1238.71	53.68
Jock River	Reach 5	14685	April 1999	126.00	92.88	0.53	377.20	164.32	2900.58	1407.91	41.84
Jock River	Reach 5	14685	March 1998	116.00	92.75	0.51	356.43	163.35	2900.58	1319.94	41.84
Jock River	Reach 5	14795	April 1999	126.00	92.88	0.49	366.80	147.05	3011.12	1445.24	52.62
Jock River	Reach 5	14795	March 1998	116.00	92.76	0.47	348.21	146.44	3011.12	1355.36	52.62
Jock River	Reach 5	14966	April 1999	126.00	92.89	0.51	346.24	133.53	3181.65	1506.04	48.86
Jock River	Reach 5	14966	March 1998	116.00	92.76	0.50	329.35	132.95	3181.65	1413.13	48.86
Jock River	Reach 5	15103	April 1999	126.00	92.90	0.47	358.89	165.48	3318.54	1554.30	62.98
Jock River	Reach 5	15103	March 1998	116.00	92.77	0.46	337.90	165.03	3318.54	1458.80	62.98
Jock River	Reach 5	15299	April 1999	126.00	92.90	0.50	363.77	174.72	3514.87	1625.63	59.00
Jock River	Reach 5	15299	March 1998	116.00	92.78	0.48	342.04	167.37	3514.87	1525.90	59.00
Jock River	Reach 5	15496	April 1999	126.00	92.91	0.50	349.35	208.76	3712.30	1695.64	64.76
Jock River	Reach 5	15496	March 1998	116.00	92.79	0.49	324.21	186.57	3712.30	1591.28	64.76
Jock River	Reach 5	15715	April 1999	126.00	92.92	0.47	439.18	302.89	3931.21	1787.36	63.74
Jock River	Reach 5	15715	March 1998	116.00	92.80	0.46	401.61	284.79	3931.21	1675.44	63.74
Jock River	Reach 5	15865	April 1999	126.00	92.93	0.46	430.56	289.49	4081.07	1859.20	62.42
Jock River	Reach 5	15865	March 1998	116.00	92.80	0.45	393.78	285.80	4081.07	1740.88	62.42
Jock River	Reach 5	16112	April 1999	126.00	92.94	0.42	401.82	290.28	4328.45	1941.85	76.44
Jock River	Reach 5	16112	March 1998	116.00	92.81	0.40	367.26	252.40	4328.45	1817.75	76.44
Jock River	Reach 4	16165	April 1999	123.18	92.94	0.42	386.84	290.30			76.44
Jock River	Reach 4	16165	March 1998	113.40	92.81	0.41	352.25	252.38			76.44
Jock River	Reach 4	16465	April 1999	123.18	92.95	0.49	464.49	314.13	299.96	96.38	30.00
Jock River	Reach 4	16465	March 1998	113.40	92.82	0.49	424.82	306.83	299.96	87.79	30.00
Jock River	Reach 4	16480	April 1999	123.18	92.93	1.11	118.19	39.39	315.38	143.17	30.00
Jock River	Reach 4	16480	March 1998	113.40	92.81	1.07	113.29	38.93	315.38	130.24	30.00
Jock River	Reach 4	16486 eagleson		Bridge							
Jock River	Reach 4	16493	April 1999	123.18	92.93	1.13	115.70	39.05	327.99	144.60	30.00
Jock River	Reach 4	16493	March 1998	113.40	92.81	1.08	110.85	38.49	327.99	131.61	30.00
Jock River	Reach 4	16505	April 1999	123.18	93.00	0.83	271.42	251.14	340.06	165.76	30.00
Jock River	Reach 4	16505	March 1998	113.40	92.86	0.86	237.64	244.24	340.06	149.34	30.00
Jock River	Reach 4	16627	April 1999	123.18	93.02	0.34	452.83	243.12	461.64	217.10	101.36
Jock River	Reach 4	16627	March 1998	113.40	92.89	0.33	421.07	234.55	461.64	195.38	101.36
Jock River	Reach 4	16725	April 1999	123.18	93.02	0.43	458.80	257.31	559.84	247.58	38.08
Jock River	Reach 4	16725	March 1998	113.40	92.89	0.42	425.15	248.86	559.84	223.85	38.08
Jock River	Reach 4	16872	April 1999	123.18	93.03	0.51	398.22	253.68	706.55	310.45	32.73

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Jock River	Reach 4	16872	March 1998	113.40	92.90	0.51	365.23	242.44	706.55	281.83	32.73
Jock River	Reach 3	16845	April 1999	111.18	93.03	0.46	413.84	253.71			32.73
Jock River	Reach 3	16845	March 1998	102.40	92.90	0.46	380.84	242.57			32.73
Jock River	Reach 3	16924	April 1999	111.18	93.03	0.50	342.15	181.11	79.23	29.95	37.61
Jock River	Reach 3	16924	March 1998	102.40	92.90	0.49	318.50	176.70	79.23	27.70	37.61
Jock River	Reach 3	17132	April 1999	111.18	93.03	0.82	199.01	132.48	286.71	82.07	31.48
Jock River	Reach 3	17132	March 1998	102.40	92.90	0.76	184.88	99.84	286.71	76.27	31.48
Jock River	Reach 3	17209	April 1999	111.18	93.05	0.57	274.82	178.71	363.54	96.23	46.42
Jock River	Reach 3	17209	March 1998	102.40	92.92	0.56	251.29	169.06	363.54	89.56	46.42
Jock River	Reach 3	17280	April 1999	111.18	93.07	0.30	496.87	249.28	435.05	127.06	79.58
Jock River	Reach 3	17280	March 1998	102.40	92.93	0.30	463.61	244.85	435.05	118.26	79.58
Jock River	Reach 3	17503	April 1999	111.18	93.07	0.47	484.08	461.98	658.19	223.01	36.10
Jock River	Reach 3	17503	March 1998	102.40	92.94	0.49	422.48	448.27	658.19	204.51	36.10
Jock River	Reach 3	17590	April 1999	111.18	93.06	0.99	186.10	205.87	744.50	267.49	29.52
Jock River	Reach 3	17590	March 1998	102.40	92.92	0.95	164.23	139.21	744.50	242.61	29.52
Jock River	Reach 3	17630	April 1999	111.18	93.06	1.02	169.00	177.25	784.69	274.62	30.24
Jock River	Reach 3	17630	March 1998	102.40	92.93	0.95	150.99	105.98	784.69	248.94	30.24
Jock River	Reach 3	17632		Inl Struct							
Jock River	Reach 3	17635	April 1999	111.18	93.07	1.00	176.84	200.04	790.25	275.58	31.06
Jock River	Reach 3	17635	March 1998	102.40	92.95	0.92	157.01	110.42	790.25	249.80	31.06
Jock River	Reach 3	17656	April 1999	111.18	93.09	0.86	204.08	194.99	811.18	279.57	35.10
Jock River	Reach 3	17656	March 1998	102.40	92.95	0.88	178.09	190.59	811.18	253.31	35.10
Jock River	Reach 3	17766	April 1999	111.18	93.12	0.61	279.63	202.57	920.60	306.75	40.58
Jock River	Reach 3	17766	March 1998	102.40	92.99	0.61	253.86	179.88	920.60	277.57	40.58
Jock River	Reach 3	17856	April 1999	111.18	93.06	1.67	96.36	132.72	1011.04	327.47	19.70
Jock River	Reach 3	17856	March 1998	102.40	92.93	1.65	83.39	69.12	1011.04	296.14	19.70
Jock River	Reach 3	17994	April 1999	111.18	93.22	0.47	320.84	454.52	1149.05	348.43	148.21
Jock River	Reach 3	17994	March 1998	102.40	93.09	0.51	264.17	428.17	1149.05	314.46	126.12
Jock River	Reach 3	18033	April 1999	111.18	93.22	0.37	432.21	317.97	1188.08	369.94	76.44
Jock River	Reach 3	18033	March 1998	102.40	93.10	0.37	392.63	312.71	1188.08	332.49	76.44
Jock River	Reach 3	18071	April 1999	111.18	93.22	0.63	222.89	113.73	1225.75	385.06	46.42
Jock River	Reach 3	18071	March 1998	102.40	93.09	0.61	209.14	106.68	1225.75	346.27	46.42
Jock River	Reach 3	18224	April 1999	111.18	93.20	1.21	97.24	35.20	1379.29	408.05	27.98
Jock River	Reach 3	18224	March 1998	102.40	93.08	1.17	92.98	34.80	1379.29	368.05	27.98
Jock River	Reach 3	18384	April 1999	111.18	93.25	1.16	100.99	35.08	1539.18	423.88	28.26
Jock River	Reach 3	18384	March 1998	102.40	93.12	1.11	96.69	34.58	1539.18	383.20	28.26
Jock River	Reach 3	18544	April 1999	111.18	93.32	0.34	475.64	322.14	1699.18	470.01	76.44
Jock River	Reach 3	18544	March 1998	102.40	93.19	0.34	434.34	316.73	1699.18	425.68	76.44
Jock River	Reach 3	18551	April 1999	111.18	93.27	1.48	77.82	35.17	1706.22	476.19	28.26
Jock River	Reach 3	18551	March 1998	102.40	93.15	1.42	74.56	34.67	1706.22	431.08	28.26
Jock River	Reach 3	18558 mcbean		Bridge							
Jock River	Reach 3	18564	April 1999	111.18	93.30	1.31	87.11	35.54	1719.37	477.29	24.00
Jock River	Reach 3	18564	March 1998	102.40	93.18	1.25	83.81	35.13	1719.37	432.13	24.00
Jock River	Reach 3	18571	April 1999	111.18	93.40	0.57	249.94	123.87	1725.63	484.09	46.42
Jock River	Reach 3	18571	March 1998	102.40	93.26	0.56	233.73	116.24	1725.63	438.25	46.42
Jock River	Reach 3	18677	April 1999	111.18	93.41	0.37	496.56	261.45	1831.94	523.77	32.73
Jock River	Reach 3	18677	March 1998	102.40	93.28	0.37	461.26	258.71	1831.94	475.19	32.73
Jock River	Reach 2	18671	April 1999	106.18	93.41	0.38	497.43	261.45			32.73
Jock River	Reach 2	18671	March 1998	98.40	93.28	0.38	462.12	258.70			32.73
Jock River	Reach 2	18718	April 1999	106.18	93.41	0.63	261.60	147.45	46.91	17.80	35.04



HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Jock River	Reach 2	18718	March 1998	98.40	93.27	0.63	241.85	143.81	46.91	16.51	35.04
Jock River	Reach 2	18871	April 1999	106.18	93.42	0.72	229.08	170.21	199.94	52.71	37.62
Jock River	Reach 2	18871	March 1998	98.40	93.28	0.73	206.22	167.12	199.94	48.43	37.62
Jock River	Reach 2	18972	April 1999	106.18	93.43	0.74	213.17	142.70	300.75	77.75	39.00
Jock River	Reach 2	18972	March 1998	98.40	93.29	0.74	194.30	138.72	300.75	71.03	39.00
Jock River	Reach 2	19091	April 1999	106.18	93.44	1.01	161.27	127.56	419.60	103.11	30.28
Jock River	Reach 2	19091	March 1998	98.40	93.30	1.02	144.57	122.86	419.60	93.85	30.28
Jock River	Reach 2	19245	April 1999	106.18	93.48	1.28	127.14	108.38	573.70	125.29	27.00
Jock River	Reach 2	19245	March 1998	98.40	93.35	1.30	113.43	103.48	573.70	113.60	27.00
Jock River	Reach 2	19353	April 1999	106.18	93.54	0.95	126.87	95.00	682.13	139.06	51.64
Jock River	Reach 2	19353	March 1998	98.40	93.42	0.94	115.75	88.71	682.13	126.03	51.64
Jock River	Reach 2	19457	April 1999	106.18	93.56	1.39	104.59	138.50	785.82	151.06	41.03
Jock River	Reach 2	19457	March 1998	98.40	93.44	1.45	88.04	127.22	785.82	136.59	41.03
Jock River	Reach 2	19579	April 1999	106.18	93.71	1.90	82.84	132.19	908.47	162.56	37.40
Jock River	Reach 2	19579	March 1998	98.40	93.63	1.91	72.70	112.96	908.47	146.45	37.40
Jock River	Reach 2	19791	April 1999	106.18	94.37	2.56	43.64	41.91	1120.44	175.96	34.04
Jock River	Reach 2	19791	March 1998	98.40	94.35	2.44	42.42	41.61	1120.44	158.65	34.04
Jock River	Reach 2	19861	April 1999	106.18	94.76	2.58	44.04	49.04	1189.97	179.01	35.00
Jock River	Reach 2	19861	March 1998	98.40	94.71	2.52	41.52	47.43	1189.97	161.57	35.00
Jock River	Reach 2	19930	April 1999	106.18	95.24	1.99	61.13	85.48	1258.61	182.62	40.14
Jock River	Reach 2	19930	March 1998	98.40	95.19	1.95	56.51	77.98	1258.61	164.93	40.14
Jock River	Reach 2	20275	April 1999	106.18	95.71	0.83	134.68	106.13	1603.58	215.03	68.74
Jock River	Reach 2	20275	March 1998	98.40	95.65	0.80	128.04	98.21	1603.58	195.76	68.74
Jock River	Reach 2	20408	April 1999	106.18	95.76	0.78	172.16	232.37	1737.09	235.51	69.96
Jock River	Reach 2	20408	March 1998	98.40	95.70	0.76	156.92	220.41	1737.09	214.78	69.96
Jock River	Reach 2	20686	April 1999	106.18	95.86	0.64	204.76	225.34	2014.99	287.89	93.76
Jock River	Reach 2	20686	March 1998	98.40	95.79	0.63	190.30	212.97	2014.99	263.03	93.76
Jock River	Reach 2	21097	April 1999	106.18	96.01	0.60	176.35	225.78	2426.40	360.11	191.22
Jock River	Reach 2	21097	March 1998	98.40	95.95	0.60	164.58	188.58	2426.40	330.81	188.58
Jock River	Reach 2	21178	April 1999	106.18	96.06	1.97	70.67	84.42	2506.81	377.35	33.78
Jock River	Reach 2	21178	March 1998	98.40	96.01	1.94	66.27	82.32	2506.81	346.71	33.78
Jock River	Reach 2	21359	April 1999	106.18	96.38	0.71	158.46	140.20	2687.51	398.05	107.76
Jock River	Reach 2	21359	March 1998	98.40	96.32	0.69	150.67	137.75	2687.51	366.32	107.76
Jock River	Reach 1	21537	April 1999	109.00	96.15	2.94	45.21	67.04			29.58
Jock River	Reach 1	21537	March 1998	100.00	96.09	2.89	41.22	62.62			29.58
Jock River	Reach 1	21728	April 1999	109.00	96.98	1.49	114.79	146.51	190.91	14.57	30.08
Jock River	Reach 1	21728	March 1998	100.00	96.92	1.45	105.87	139.69	190.91	13.43	30.08
Jock River	Reach 1	22026	April 1999	109.00	97.25	0.90	210.83	253.45	488.97	63.09	38.44
Jock River	Reach 1	22026	March 1998	100.00	97.18	0.89	194.90	253.33	488.97	58.25	38.44
Flowing Creek	Reach 1	0	April 1999	23.00	93.04	0.10	424.58	253.83			32.73
Flowing Creek	Reach 1	0	March 1998	21.00	92.90	0.10	391.52	243.21			32.73
Flowing Creek	Reach 1	90	April 1999	23.00	93.04	0.33	146.40	98.00	90.00	30.23	8.00
Flowing Creek	Reach 1	90	March 1998	21.00	92.90	0.33	133.42	98.00	90.00	27.73	8.00
Flowing Creek	Reach 1	96	April 1999	23.00	93.01	0.99	26.35	19.97	96.00	35.42	10.60
Flowing Creek	Reach 1	96	March 1998	21.00	92.88	0.97	23.77	19.03	96.00	32.40	10.60
Flowing Creek	Reach 1	112		Culvert							
Flowing Creek	Reach 1	116	April 1999	23.00	93.12	1.11	20.81	15.64	116.00	36.08	8.88
Flowing Creek	Reach 1	116	March 1998	21.00	92.96	1.06	19.89	13.89	116.00	33.02	8.88
Flowing Creek	Reach 1	120	April 1999	23.00	93.20	0.19	240.00	179.54	120.00	46.19	11.12
Flowing Creek	Reach 1	120	March 1998	21.00	93.04	0.20	211.10	179.54	120.00	41.71	11.12

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Flowing Creek	Reach 1	246	April 1999	23.00	93.20	0.17	189.41	163.37	246.00	96.14	45.24
Flowing Creek	Reach 1	246	March 1998	21.00	93.04	0.18	164.70	144.57	246.00	85.16	39.13
Flowing Creek	Reach 1	493	April 1999	23.00	93.21	0.38	142.03	201.83	493.00	145.55	10.38
Flowing Creek	Reach 1	493	March 1998	21.00	93.05	0.38	114.77	139.21	493.00	126.84	10.38
Flowing Creek	Reach 1	766	April 1999	23.00	93.22	0.19	144.02	152.57	766.00	187.14	86.83
Flowing Creek	Reach 1	766	March 1998	21.00	93.06	0.20	121.59	129.96	766.00	161.26	73.22
Flowing Creek	Reach 1	1088	April 1999	23.00	93.23	0.56	97.43	127.83	1088.00	218.93	5.90
Flowing Creek	Reach 1	1088	March 1998	21.00	93.08	0.63	77.94	120.57	1088.00	187.85	5.90
Flowing Creek	Reach 1	1310	April 1999	23.00	93.26	0.48	105.05	133.64	1310.00	241.66	8.45
Flowing Creek	Reach 1	1310	March 1998	21.00	93.11	0.54	85.40	130.58	1310.00	206.10	8.45
Flowing Creek	Reach 1	1485	April 1999	23.00	93.27	0.62	50.95	61.88	1485.00	255.31	13.35
Flowing Creek	Reach 1	1485	March 1998	21.00	93.13	0.63	42.08	61.88	1485.00	217.25	13.35
Flowing Creek	Reach 1	1527	April 1999	23.00	93.25	1.17	22.19	12.57	1527.00	256.95	6.72
Flowing Creek	Reach 1	1527	March 1998	21.00	93.11	1.14	20.50	11.78	1527.00	218.63	6.72
Flowing Creek	Reach 1	1535	April 1999	23.00	93.25	1.23	19.43	7.63	1535.00	257.11	6.04
Flowing Creek	Reach 1	1535	March 1998	21.00	93.11	1.18	18.40	7.38	1535.00	218.78	6.04
Flowing Creek	Reach 1	1545	April 1999	23.00	93.31	0.70	51.27	69.61	1545.00	258.79	10.06
Flowing Creek	Reach 1	1545	March 1998	21.00	93.17	0.72	41.91	57.68	1545.00	219.88	10.06
Leamy Creek	Reach 1	0	April 1999	7.00	92.72	0.02	431.46	250.96			57.18
Leamy Creek	Reach 1	0	March 1998	7.00	92.60	0.03	400.67	246.31			57.18
Leamy Creek	Reach 1	187	April 1999	7.00	92.72	0.03	433.96	299.51	187.00	81.06	7.29
Leamy Creek	Reach 1	187	March 1998	7.00	92.60	0.03	397.63	287.36	187.00	74.77	7.29
Leamy Creek	Reach 1	403	April 1999	7.00	92.72	0.03	489.71	396.54	403.00	180.79	8.32
Leamy Creek	Reach 1	403	March 1998	7.00	92.60	0.03	441.51	382.39	403.00	165.37	8.32
Leamy Creek	Reach 1	640	April 1999	7.00	92.72	0.05	276.80	261.06	640.00	249.02	8.54
Leamy Creek	Reach 1	640	March 1998	7.00	92.60	0.06	244.94	253.85	640.00	225.77	8.54
Leamy Creek	Reach 1	656	April 1999	7.00	92.72	0.05	262.15	222.35	656.00	251.95	9.46
Leamy Creek	Reach 1	656	March 1998	7.00	92.60	0.06	236.23	196.59	656.00	228.35	9.46
Leamy Creek	Reach 1	669	April 1999	7.00	92.72	0.12	113.72	96.78	669.00	260.76	7.04
Leamy Creek	Reach 1	669	March 1998	7.00	92.60	0.14	102.00	92.59	669.00	236.41	7.04
Leamy Creek	Reach 1	705	April 1999	7.00	92.72	0.12	119.86	136.59	705.00	264.13	10.82
Leamy Creek	Reach 1	705	March 1998	7.00	92.60	0.13	104.48	111.94	705.00	239.37	10.82
Leamy Creek	Reach 1	955	April 1999	7.00	92.73	0.13	149.25	227.67	955.00	291.21	6.84
Leamy Creek	Reach 1	955	March 1998	7.00	92.60	0.15	121.56	221.45	955.00	262.57	6.84
Leamy Creek	Reach 1	1080	April 1999	7.00	92.73	0.22	63.34	76.04	1080.00	306.68	7.58
Leamy Creek	Reach 1	1080	March 1998	7.00	92.60	0.25	54.49	67.86	1080.00	275.22	7.58
Leamy Creek	Reach 1	1174	April 1999	7.00	92.73	0.20	70.60	77.17	1174.00	312.27	7.22
Leamy Creek	Reach 1	1174	March 1998	7.00	92.61	0.23	61.53	71.12	1174.00	280.07	7.22
Leamy Creek	Reach 1	1213	April 1999	7.00	92.73	0.20	67.70	74.60	1213.00	314.85	7.74
Leamy Creek	Reach 1	1213	March 1998	7.00	92.61	0.23	58.99	68.02	1213.00	282.32	7.74
Leamy Creek	Reach 1	1351	April 1999	7.00	92.73	0.18	63.65	51.89	1351.00	323.81	9.76
Leamy Creek	Reach 1	1351	March 1998	7.00	92.61	0.19	57.41	50.89	1351.00	290.27	9.76
Leamy Creek	Reach 1	1418	April 1999	7.00	92.73	0.33	26.67	19.50	1418.00	326.52	8.24
Leamy Creek	Reach 1	1418	March 1998	7.00	92.61	0.35	24.37	18.31	1418.00	292.75	8.24
Leamy Creek	Reach 1	1425	April 1999	7.00	92.73	0.46	15.90	7.10	1425.00	326.81	6.26
Leamy Creek	Reach 1	1425	March 1998	7.00	92.61	0.48	15.04	7.02	1425.00	293.01	6.26
Leamy Creek	Reach 1	1428		Bridge							
Leamy Creek	Reach 1	1431	April 1999	7.00	92.73	0.48	15.21	6.92	1431.00	326.91	5.97
Leamy Creek	Reach 1	1431	March 1998	7.00	92.61	0.51	14.38	6.87	1431.00	293.10	5.97
Leamy Creek	Reach 1	1608	April 1999	7.00	92.75	0.25	43.41	44.35	1608.00	331.58	9.00
Leamy Creek	Reach 1	1608	March 1998	7.00	92.63	0.27	38.48	38.72	1608.00	297.30	9.00

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Leamy Creek	Reach 1	1698	April 1999	7.00	92.75	0.18	70.08	71.77	1698.00	336.52	9.90
Leamy Creek	Reach 1	1698	March 1998	7.00	92.63	0.20	62.01	64.84	1698.00	301.68	9.90
Leamy Creek	Reach 1	1833	April 1999	7.00	92.75	0.20	65.46	58.92	1833.00	346.50	6.62
Leamy Creek	Reach 1	1833	March 1998	7.00	92.63	0.22	58.71	55.98	1833.00	310.56	6.62
Leamy Creek	Reach 1	1888	April 1999	7.00	92.75	0.32	47.90	60.89	1888.00	349.56	4.34
Leamy Creek	Reach 1	1888	March 1998	7.00	92.63	0.37	41.02	55.77	1888.00	313.26	4.34
Leamy Creek	Reach 1	1905	April 1999	7.00	92.75	0.26	53.66	60.38	1905.00	350.30	5.80
Leamy Creek	Reach 1	1905	March 1998	7.00	92.64	0.29	46.87	55.52	1905.00	313.90	5.80
Leamy Creek	Reach 1	2035	April 1999	7.00	92.76	0.25	60.80	72.64	2035.00	358.46	4.77
Leamy Creek	Reach 1	2035	March 1998	7.00	92.64	0.27	52.95	62.83	2035.00	320.99	4.77
Leamy Creek	Reach 1	2270	April 1999	7.00	92.76	0.23	51.89	48.46	2270.00	370.32	8.02
Leamy Creek	Reach 1	2270	March 1998	7.00	92.65	0.25	46.45	46.45	2270.00	331.54	8.02
Leamy Creek	Reach 1	2317	April 1999	7.00	92.75	0.80	8.72	29.33	2317.00	372.31	6.92
Leamy Creek	Reach 1	2317	March 1998	7.00	92.63	0.84	8.37	28.01	2317.00	333.34	6.92
Leamy Creek	Reach 1	2350		Culvert							
Leamy Creek	Reach 1	2363	April 1999	7.00	92.77	0.93	7.50	8.15	2363.00	373.36	3.70
Leamy Creek	Reach 1	2363	March 1998	7.00	92.65	0.98	7.15	7.54	2363.00	334.31	3.70
Leamy Creek	Reach 1	2409	April 1999	7.00	92.81	0.65	13.17	8.38	2409.00	373.91	3.70
Leamy Creek	Reach 1	2409	March 1998	7.00	92.70	0.69	12.26	7.79	2409.00	334.83	3.70
Leamy Creek	Reach 1	2500	April 1999	7.00	92.84	0.20	61.55	63.66	2500.00	377.31	8.59
Leamy Creek	Reach 1	2500	March 1998	7.00	92.73	0.21	54.95	56.55	2500.00	337.89	8.59
Leamy Creek	Reach 1	2520	April 1999	7.00	92.84	0.16	77.78	68.79	2520.00	378.91	8.84
Leamy Creek	Reach 1	2520	March 1998	7.00	92.73	0.18	70.39	66.14	2520.00	339.31	8.84
Leamy Creek	Reach 1	2534	April 1999	7.00	92.84	0.16	80.63	76.29	2534.00	380.34	9.02
Leamy Creek	Reach 1	2534	March 1998	7.00	92.73	0.18	72.54	71.50	2534.00	340.59	9.02
Leamy Creek	Reach 1	2546	April 1999	7.00	92.84	0.19	67.97	74.04	2546.00	381.24	8.59
Leamy Creek	Reach 1	2546	March 1998	7.00	92.73	0.21	60.22	67.37	2546.00	341.40	8.59
Leamy Creek	Reach 1	2615	April 1999	7.00	92.84	0.17	81.63	93.95	2615.00	386.93	8.67
Leamy Creek	Reach 1	2615	March 1998	7.00	92.73	0.19	71.88	84.45	2615.00	346.41	8.67
Leamy Creek	Reach 1	2702	April 1999	7.00	92.84	0.21	75.79	125.97	2702.00	393.11	7.39
Leamy Creek	Reach 1	2702	March 1998	7.00	92.73	0.23	63.16	105.37	2702.00	351.73	7.39
Leamy Creek	Reach 1	2725	April 1999	7.00	92.84	0.22	70.21	103.68	2725.00	395.52	6.31
Leamy Creek	Reach 1	2725	March 1998	7.00	92.73	0.24	59.65	89.86	2725.00	353.70	6.31
Leamy Creek	Reach 1	2769	April 1999	7.00	92.84	0.19	81.57	103.45	2769.00	399.21	6.30
Leamy Creek	Reach 1	2769	March 1998	7.00	92.73	0.22	70.78	95.20	2769.00	356.91	6.30
Leamy Creek	Reach 1	2809	April 1999	7.00	92.84	0.17	80.84	113.64	2809.00	405.14	10.63
Leamy Creek	Reach 1	2809	March 1998	7.00	92.73	0.18	69.34	98.74	2809.00	362.05	10.63
Leamy Creek	Reach 1	2822	April 1999	7.00	92.84	0.18	71.75	91.90	2822.00	408.67	10.26
Leamy Creek	Reach 1	2822	March 1998	7.00	92.73	0.19	62.42	80.42	2822.00	364.87	10.26
Leamy Creek	Reach 1	2843	April 1999	7.00	92.84	0.20	63.20	91.25	2843.00	412.85	9.22
Leamy Creek	Reach 1	2843	March 1998	7.00	92.73	0.22	54.06	77.39	2843.00	368.30	9.22
Leamy Creek	Reach 1	2922	April 1999	7.00	92.84	0.14	119.37	168.75	2922.00	420.15	8.79
Leamy Creek	Reach 1	2922	March 1998	7.00	92.74	0.16	101.88	155.31	2922.00	374.49	8.79
Leamy Creek	Reach 1	2984	April 1999	7.00	92.84	0.18	76.63	141.28	2984.00	424.81	10.19
Leamy Creek	Reach 1	2984	March 1998	7.00	92.74	0.20	62.85	114.24	2984.00	378.47	10.19
Leamy Creek	Reach 1	3026	April 1999	7.00	92.85	0.15	73.79	87.09	3026.00	428.09	13.31
Leamy Creek	Reach 1	3026	March 1998	7.00	92.74	0.17	65.00	76.36	3026.00	381.23	13.31
Leamy Creek	Reach 1	3041	April 1999	7.00	92.85	0.10	76.80	102.18	3041.00	429.62	68.11
Leamy Creek	Reach 1	3041	March 1998	7.00	92.74	0.12	66.47	90.00	3041.00	382.53	60.05
Leamy Creek	Reach 1	3063	April 1999	7.00	92.85	0.15	78.10	96.89	3063.00	431.48	14.70

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Leamy Creek	Reach 1	3063	March 1998	7.00	92.74	0.16	68.29	85.65	3063.00	384.14	14.70
Leamy Creek	Reach 1	3162	April 1999	7.00	92.85	0.11	104.27	125.09	3162.00	439.92	16.94
Leamy Creek	Reach 1	3162	March 1998	7.00	92.74	0.12	91.73	108.91	3162.00	391.57	16.94
Leamy Creek	Reach 1	3221	April 1999	7.00	92.85	0.16	86.34	149.61	3221.00	444.59	11.47
Leamy Creek	Reach 1	3221	March 1998	7.00	92.74	0.18	70.99	136.51	3221.00	395.62	11.47
Leamy Creek	Reach 1	3233	April 1999	7.00	92.85	0.17	92.02	156.18	3233.00	447.94	9.83
Leamy Creek	Reach 1	3233	March 1998	7.00	92.74	0.19	75.86	145.15	3233.00	398.20	9.83
Leamy Creek	Reach 1	3247	April 1999	7.00	92.85	0.16	103.64	194.21	3247.00	451.08	11.00
Leamy Creek	Reach 1	3247	March 1998	7.00	92.74	0.18	83.78	176.34	3247.00	400.64	11.00
Leamy Creek	Reach 1	3272	April 1999	7.00	92.85	0.15	94.69	167.98	3272.00	454.73	12.86
Leamy Creek	Reach 1	3272	March 1998	7.00	92.74	0.16	78.22	139.90	3272.00	403.51	12.86
Leamy Creek	Reach 1	3476	April 1999	7.00	92.85	0.12	142.77	210.20	3476.00	472.01	11.36
Leamy Creek	Reach 1	3476	March 1998	7.00	92.74	0.13	121.64	186.65	3476.00	418.23	11.36
Leamy Creek	Reach 1	3576	April 1999	7.00	92.85	0.10	152.55	295.66	3576.00	488.14	18.08
Leamy Creek	Reach 1	3576	March 1998	7.00	92.74	0.12	122.51	269.55	3576.00	431.48	18.08
Leamy Creek	Reach 1	3644	April 1999	7.00	92.85	0.17	83.39	124.03	3644.00	495.41	11.22
Leamy Creek	Reach 1	3644	March 1998	7.00	92.74	0.18	71.07	107.81	3644.00	437.50	11.22
Leamy Creek	Reach 1	3660	April 1999	7.00	92.85	0.14	91.81	131.53	3660.00	496.47	13.85
Leamy Creek	Reach 1	3660	March 1998	7.00	92.74	0.16	78.79	113.83	3660.00	438.42	13.85
Leamy Creek	Reach 1	3691	April 1999	7.00	92.85	0.11	109.48	133.24	3691.00	501.43	18.23
Leamy Creek	Reach 1	3691	March 1998	7.00	92.75	0.12	95.98	121.73	3691.00	442.61	18.23
Leamy Creek	Reach 1	3812	April 1999	7.00	92.85	0.14	92.54	134.62	3812.00	518.66	14.19
Leamy Creek	Reach 1	3812	March 1998	7.00	92.75	0.16	79.21	117.33	3812.00	457.25	14.19
Leamy Creek	Reach 1	3907	April 1999	7.00	92.85	0.19	78.82	122.54	3907.00	526.76	7.63
Leamy Creek	Reach 1	3907	March 1998	7.00	92.75	0.22	66.60	108.88	3907.00	464.20	7.63
Leamy Creek	Reach 1	3978	April 1999	7.00	92.85	0.19	72.57	123.39	3978.00	533.34	10.71
Leamy Creek	Reach 1	3978	March 1998	7.00	92.75	0.22	60.52	105.92	3978.00	469.73	10.71
Leamy Creek	Reach 1	4029	April 1999	7.00	92.86	0.18	83.58	130.95	4029.00	538.68	8.27
Leamy Creek	Reach 1	4029	March 1998	7.00	92.75	0.21	70.82	112.71	4029.00	474.19	8.27
Leamy Creek	Reach 1	4067	April 1999	7.00	92.86	0.12	72.32	147.05	4067.00	543.48	73.65
Leamy Creek	Reach 1	4067	March 1998	7.00	92.75	0.15	58.18	124.22	4067.00	478.07	64.81
Leamy Creek	Reach 1	4197	April 1999	7.00	92.86	0.22	71.83	137.60	4197.00	549.95	6.56
Leamy Creek	Reach 1	4197	March 1998	7.00	92.76	0.25	58.93	112.51	4197.00	483.34	6.56
Leamy Creek	Reach 1	4338	April 1999	7.00	92.86	0.27	61.29	128.71	4338.00	560.42	6.47
Leamy Creek	Reach 1	4338	March 1998	7.00	92.76	0.31	49.19	108.67	4338.00	491.86	6.47
Leamy Creek	Reach 1	4490	April 1999	7.00	92.87	0.18	45.64	107.38	4490.00	568.33	54.60
Leamy Creek	Reach 1	4490	March 1998	7.00	92.77	0.22	36.08	87.44	4490.00	498.19	48.13
Leamy Creek	Reach 1	4506	April 1999	7.00	92.87	0.28	59.47	154.06	4506.00	570.44	6.92
Leamy Creek	Reach 1	4506	March 1998	7.00	92.77	0.32	45.87	123.51	4506.00	499.74	6.92
Leamy Creek	Reach 1	4515	April 1999	7.00	92.87	0.35	51.93	141.17	4515.00	571.16	4.43
Leamy Creek	Reach 1	4515	March 1998	7.00	92.77	0.43	39.24	115.86	4515.00	500.26	4.43
Tributary D	Reach 1	0	April 1999	2.82	92.95	0.01	337.27	292.99			76.44
Tributary D	Reach 1	0	March 1998	2.60	92.82	0.01	302.24	254.95			76.44
Tributary D	Reach 1	232	April 1999	2.82	92.95	0.01	523.55	472.14	231.50	106.72	114.30
Tributary D	Reach 1	232	March 1998	2.60	92.82	0.01	465.22	440.18	231.50	95.91	114.30
Tributary D	Reach 1	255		Culvert							
Tributary D	Reach 1	261	April 1999	2.82	92.95	0.01	518.35	467.49	260.66	117.16	108.28
Tributary D	Reach 1	261	March 1998	2.60	92.82	0.01	460.71	434.26	260.66	105.58	108.28
Tributary D	Reach 1	277	April 1999	2.82	92.95	0.01	451.53	344.20	277.06	140.34	118.24
Tributary D	Reach 1	277	March 1998	2.60	92.82	0.01	409.50	313.36	277.06	126.39	118.24

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Tributary D	Reach 1	524	April 1999	2.82	92.95	0.01	611.50	474.00	523.80	250.01	42.40
Tributary D	Reach 1	524	March 1998	2.60	92.82	0.01	551.63	462.59	523.80	225.51	42.40
Tributary D	Reach 1	684	April 1999	2.82	92.95	0.01	389.75	234.27	684.32	335.56	40.58
Tributary D	Reach 1	684	March 1998	2.60	92.82	0.01	359.82	233.94	684.32	303.24	40.58
Tributary D	Reach 1	930	April 1999	2.82	92.95	0.01	464.42	287.08	930.11	397.86	48.70
Tributary D	Reach 1	930	March 1998	2.60	92.82	0.01	427.74	286.77	930.11	360.76	48.70
Tributary D	Reach 1	981	April 1999	2.82	92.95	0.01	353.45	255.16	980.65	431.43	34.94
Tributary D	Reach 1	981	March 1998	2.60	92.82	0.01	320.83	255.16	980.65	391.44	34.94
Tributary D	Reach 1	1096	April 1999	2.82	92.95	0.13	21.46	63.82	1095.96	464.21	32.00
Tributary D	Reach 1	1096	March 1998	2.60	92.82	0.13	20.59	63.82	1095.96	421.46	32.00
Tributary D	Reach 1	1112		Culvert							
Tributary D	Reach 1	1128	April 1999	2.82	92.95	0.13	22.09	88.62	1127.90	468.75	32.00
Tributary D	Reach 1	1128	March 1998	2.60	92.82	0.12	21.22	86.75	1127.90	425.72	32.00
Tributary D	Reach 1	1132	April 1999	2.82	92.95	0.04	115.27	75.54	1132.39	471.13	14.00
Tributary D	Reach 1	1132	March 1998	2.60	92.82	0.04	105.90	70.94	1132.39	427.89	14.00
Tributary D	Reach 1	1305	April 1999	2.82	92.95	0.05	91.02	107.42	1305.16	488.27	22.90
Tributary D	Reach 1	1305	March 1998	2.60	92.82	0.05	78.31	91.23	1305.16	443.28	22.90
Tributary D	Reach 1	1453	April 1999	2.82	92.95	0.05	87.33	79.03	1452.64	502.48	18.82
Tributary D	Reach 1	1453	March 1998	2.60	92.82	0.05	77.62	72.79	1452.64	455.65	18.82
Tributary D	Reach 1	1644	April 1999	2.82	92.95	0.04	105.99	130.21	1644.20	519.47	32.86
Tributary D	Reach 1	1644	March 1998	2.60	92.82	0.04	90.45	112.70	1644.20	470.53	32.86
Tributary D	Reach 1	1862	April 1999	2.82	92.95	0.13	38.74	54.37	1862.10	535.63	8.06
Tributary D	Reach 1	1862	March 1998	2.60	92.82	0.14	31.91	52.42	1862.10	484.15	8.06
Tributary D	Reach 1	1943	April 1999	2.82	92.95	0.25	19.40	31.61	1942.67	539.93	4.82
Tributary D	Reach 1	1943	March 1998	2.60	92.82	0.26	15.71	26.42	1942.67	487.56	4.82
Tributary D	Reach 1	1957	April 1999	2.82	92.95	0.23	14.17	10.62	1956.68	541.03	7.00
Tributary D	Reach 1	1957	March 1998	2.60	92.83	0.23	12.84	10.51	1956.68	488.33	7.00
Tributary D	Reach 1	1959		Bridge							
Tributary D	Reach 1	1964	April 1999	2.82	92.95	0.23	13.32	9.65	1964.38	541.14	7.00
Tributary D	Reach 1	1964	March 1998	2.60	92.83	0.23	12.11	9.40	1964.38	488.43	7.00
Tributary D	Reach 1	1971	April 1999	2.82	92.96	0.14	25.89	29.30	1971.10	541.45	10.00
Tributary D	Reach 1	1971	March 1998	2.60	92.83	0.14	22.43	25.18	1971.10	488.67	10.00
Tributary D	Reach 1	1985	April 1999	2.82	92.96	0.01	569.78	474.27	1985.11	545.58	114.30
Tributary D	Reach 1	1985	March 1998	2.60	92.83	0.01	511.58	442.53	1985.11	492.37	114.30
Tributary D	Reach 1	2087	April 1999	2.82	92.96	0.06	53.91	51.01	2086.59	576.82	26.92
Tributary D	Reach 1	2087	March 1998	2.60	92.83	0.06	47.68	47.10	2086.59	520.52	26.92
Tributary D	Reach 1	2128	April 1999	2.82	92.96	0.17	20.06	18.53	2127.88	578.73	9.00
Tributary D	Reach 1	2128	March 1998	2.60	92.83	0.17	17.81	16.89	2127.88	522.15	9.00
Tributary D	Reach 1	2150	April 1999	2.82	92.95	0.25	11.51	41.41	2149.82	579.46	9.00
Tributary D	Reach 1	2150	March 1998	2.60	92.83	0.24	10.78	40.70	2149.82	522.79	9.00
Tributary D	Reach 1	2159		Culvert							
Tributary D	Reach 1	2170	April 1999	2.82	92.96	0.23	12.47	39.48	2170.82	581.82	22.86
Tributary D	Reach 1	2170	March 1998	2.60	92.83	0.22	11.73	38.41	2170.82	524.81	22.86
Tributary D	Reach 1	2353	April 1999	2.82	92.96	0.05	67.73	68.38	2354.43	592.38	35.68
Tributary D	Reach 1	2353	March 1998	2.60	92.83	0.05	59.24	65.34	2354.43	534.11	35.68
Tributary D	Reach 1	2622	April 1999	2.82	92.95	0.50	5.60	30.44	2623.48	602.20	30.44
Tributary D	Reach 1	2622	March 1998	2.60	92.85	0.98	2.65	26.97	2623.48	542.38	26.97
Tributary D	Reach 1	2821	April 1999	2.82	93.11	0.21	13.55	51.71	2822.19	604.10	51.71
Tributary D	Reach 1	2821	March 1998	2.60	93.10	0.20	13.03	51.24	2822.19	543.94	51.24
Tributary D	Reach 1	3008	April 1999	2.82	93.20	0.34	8.42	36.57	3008.66	606.15	36.57

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Tributary D	Reach 1	3008	March 1998	2.60	93.19	0.33	7.95	35.71	3008.66	545.90	35.71
Tributary D	Reach 1	3075	April 1999	2.82	93.21	0.31	9.12	22.35	3075.97	607.17	10.00
Tributary D	Reach 1	3075	March 1998	2.60	93.20	0.29	9.05	21.83	3075.97	546.88	10.00
Tributary D	Reach 1	3090		Culvert							
Tributary D	Reach 1	3105	April 1999	2.82	93.22	0.29	9.89	17.51	3105.68	607.89	10.00
Tributary D	Reach 1	3105	March 1998	2.60	93.21	0.26	9.82	17.18	3105.68	547.57	10.00
Tributary D	Reach 1	3137	April 1999	2.82	93.22	0.25	11.40	31.63	3137.79	608.40	31.63
Tributary D	Reach 1	3137	March 1998	2.60	93.21	0.24	10.93	30.72	3137.79	548.06	30.72
Tributary D	Reach 1	3307	April 1999	2.82	93.33	0.44	6.43	33.31	3308.14	609.92	33.31
Tributary D	Reach 1	3307	March 1998	2.60	93.31	0.44	5.86	32.24	3308.14	549.49	32.24
Tributary D	Reach 1	3383	April 1999	2.82	93.47	0.47	6.03	24.85	3384.08	610.39	24.85
Tributary D	Reach 1	3383	March 1998	2.60	93.46	0.45	5.78	24.58	3384.08	549.93	24.58
Tributary D	Reach 1	3406	April 1999	2.82	93.51	0.70	4.05	14.61	3407.43	610.51	14.38
Tributary D	Reach 1	3406	March 1998	2.60	93.50	0.67	3.89	14.41	3407.43	550.05	14.38
Tributary D	Reach 1	3450	April 1999	2.82	93.57	0.25	11.31	34.89	3450.95	610.84	31.90
Tributary D	Reach 1	3450	March 1998	2.60	93.55	0.24	10.82	34.28	3450.95	550.37	31.90
Tributary D	Reach 1	3575	April 1999	2.82	93.62	0.33	8.74	30.42	3576.39	612.11	25.24
Tributary D	Reach 1	3575	March 1998	2.60	93.60	0.32	8.28	29.77	3576.39	551.57	25.24
Tributary D	Reach 1	3682	April 1999	2.82	93.69	0.35	8.55	34.87	3683.48	613.03	27.32
Tributary D	Reach 1	3682	March 1998	2.60	93.68	0.34	8.04	34.29	3683.48	552.44	27.32
Tributary D	Reach 1	3797	April 1999	2.82	93.77	0.35	11.28	47.43	3798.19	614.09	15.68
Tributary D	Reach 1	3797	March 1998	2.60	93.75	0.34	10.61	46.30	3798.19	553.44	15.68
Tributary D	Reach 1	3986	April 1999	2.82	93.90	0.52	6.35	18.29	3987.45	615.72	10.26
Tributary D	Reach 1	3986	March 1998	2.60	93.88	0.50	6.06	17.96	3987.45	554.98	10.26
Tributary D	Reach 1	4177	April 1999	2.82	94.21	0.80	4.29	22.74	4178.49	616.69	11.20
Tributary D	Reach 1	4177	March 1998	2.60	94.19	0.79	3.93	21.83	4178.49	555.89	11.20
Tributary D	Reach 1	4348	April 1999	2.82	94.88	0.89	3.85	12.86	4349.06	617.45	6.70
Tributary D	Reach 1	4348	March 1998	2.60	94.86	0.85	3.69	12.66	4349.06	556.60	6.70
Tributary D	Reach 1	4563	April 1999	2.82	95.09	0.22	13.36	59.38	4564.27	619.32	51.78
Tributary D	Reach 1	4563	March 1998	2.60	95.07	0.21	12.53	58.17	4564.27	558.36	51.78
Tributary D	Reach 1	4926	April 1999	2.82	95.45	1.06	3.00	34.95	4926.65	622.25	17.10
Tributary D	Reach 1	4926	March 1998	2.60	95.45	1.00	2.91	32.01	4926.65	561.14	17.10
Tributary D	Reach 1	4973	April 1999	2.82	95.85	1.62	1.74	21.55	4973.59	622.56	21.55
Tributary D	Reach 1	4973	March 1998	2.60	95.82	1.55	1.67	20.94	4973.59	561.42	20.94
Tributary D	Reach 1	4983		Culvert							
Tributary D	Reach 1	4992	April 1999	2.82	96.33	1.00	2.83	135.50	4993.19	624.83	24.21
Tributary D	Reach 1	4992	March 1998	2.60	96.28	0.96	2.70	133.84	4993.19	563.50	24.21
Tributary D	Reach 1	5175	April 1999	2.82	96.40	0.08	49.83	85.04	5176.36	637.06	29.58
Tributary D	Reach 1	5175	March 1998	2.60	96.35	0.08	45.25	81.09	5176.36	574.68	29.58
Van Gaal Drain	Reach 1	0	April 1999	8.00	93.42	0.03	475.65	261.53			32.73
Van Gaal Drain	Reach 1	0	March 1998	8.00	93.28	0.03	440.34	258.78			32.73
Van Gaal Drain	Reach 1	226	April 1999	8.00	93.41	0.37	42.73	50.23	225.61	58.48	4.00
Van Gaal Drain	Reach 1	226	March 1998	8.00	93.28	0.43	36.29	44.04	225.61	53.77	4.00
Van Gaal Drain	Reach 1	263	April 1999	8.00	93.40	0.86	9.35	12.23	262.84	59.71	6.34
Van Gaal Drain	Reach 1	263	March 1998	8.00	93.26	0.91	8.80	11.03	262.84	54.82	6.34
Van Gaal Drain	Reach 1	269 fowler		Culvert							
Van Gaal Drain	Reach 1	275	April 1999	8.00	93.43	0.85	9.47	6.21	274.83	59.87	4.82
Van Gaal Drain	Reach 1	275	March 1998	8.00	93.29	0.90	8.90	5.76	274.83	54.97	4.82
Van Gaal Drain	Reach 1	277	April 1999	8.00	93.45	0.71	22.34	45.49	277.37	60.12	4.50
Van Gaal Drain	Reach 1	277	March 1998	8.00	93.31	0.84	16.45	33.75	277.37	55.13	4.50

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Van Gaal Drain	Reach 1	521	April 1999	8.00	93.50	0.35	37.48	46.41	520.74	67.57	8.98
Van Gaal Drain	Reach 1	521	March 1998	8.00	93.38	0.39	32.03	42.00	520.74	61.16	8.98
Van Gaal Drain	Reach 1	592	April 1999	8.00	93.51	0.25	59.32	51.71	591.70	71.77	3.00
Van Gaal Drain	Reach 1	592	March 1998	8.00	93.39	0.28	53.12	50.97	591.70	64.83	3.00
Van Gaal Drain	Reach 1	645	April 1999	8.00	93.50	0.65	16.07	14.38	645.47	73.14	6.00
Van Gaal Drain	Reach 1	645	March 1998	8.00	93.38	0.72	14.34	13.77	645.47	66.07	6.00
Van Gaal Drain	Reach 1	647	April 1999	8.00	93.48	1.15	6.93	12.45	647.34	73.20	6.00
Van Gaal Drain	Reach 1	647	March 1998	8.00	93.35	1.24	6.43	11.86	647.34	66.11	6.00
Van Gaal Drain	Reach 1	656 fortune		Culvert							
Van Gaal Drain	Reach 1	666	April 1999	8.00	93.50	1.26	6.37	20.35	665.86	73.49	5.65
Van Gaal Drain	Reach 1	666	March 1998	8.00	93.38	1.36	5.89	17.46	665.86	66.36	5.65
Van Gaal Drain	Reach 1	668	April 1999	8.00	93.58	0.92	15.68	33.37	667.54	73.80	4.66
Van Gaal Drain	Reach 1	668	March 1998	8.00	93.45	1.19	11.66	29.33	667.54	66.57	4.66
Smith Drain	Reach 1	0	April 1999	8.00	92.54	0.19	73.12	67.19			8.89
Smith Drain	Reach 1	0	March 1998	7.00	92.41	0.19	64.82	63.48			8.89
Smith Drain	Reach 1	110	April 1999	8.00	92.54	0.25	55.33	41.65	109.56	7.04	4.68
Smith Drain	Reach 1	110	March 1998	7.00	92.42	0.24	50.17	39.97	109.56	6.30	4.68
Smith Drain	Reach 1	424	April 1999	8.00	92.55	0.24	60.33	72.29	424.06	24.16	5.70
Smith Drain	Reach 1	424	March 1998	7.00	92.43	0.24	51.65	66.59	424.06	21.40	5.70
Smith Drain	Reach 1	610	April 1999	8.00	92.56	0.32	44.35	51.16	610.05	33.48	4.52
Smith Drain	Reach 1	610	March 1998	7.00	92.44	0.32	38.31	46.29	610.05	29.42	4.52
Smith Drain	Reach 1	824	April 1999	8.00	92.58	0.77	20.86	43.07	824.19	39.85	4.24
Smith Drain	Reach 1	824	March 1998	7.00	92.45	0.81	15.98	35.57	824.19	34.61	4.24
Smith Drain	Reach 1	1148	April 1999	8.00	92.67	0.57	24.92	38.70	1147.57	47.46	5.50
Smith Drain	Reach 1	1148	March 1998	7.00	92.57	0.57	20.93	36.37	1147.57	40.77	5.50
Smith Drain	Reach 1	1153	April 1999	8.00	92.61	1.72	4.65	24.71	1152.77	48.06	9.70
Smith Drain	Reach 1	1153	March 1998	7.00	92.52	1.58	4.42	21.52	1152.77	41.23	9.70
Smith Drain	Reach 1	1162		Culvert							
Smith Drain	Reach 1	1171	April 1999	8.00	92.70	1.64	4.87	27.68	1171.26	48.41	6.70
Smith Drain	Reach 1	1171	March 1998	7.00	92.59	1.52	4.60	23.99	1171.26	41.54	6.70
Smith Drain	Reach 1	1179	April 1999	8.00	92.87	0.48	24.90	25.63	1178.83	48.73	6.40
Smith Drain	Reach 1	1179	March 1998	7.00	92.73	0.47	21.58	23.49	1178.83	41.80	6.40
Monaghan Drain	Reach 2	0	April 1999	15.00	92.52	0.06	340.45	248.98			60.13
Monaghan Drain	Reach 2	0	March 1998	14.00	92.40	0.06	309.61	241.27			60.13
Monaghan Drain	Reach 2	47	April 1999	15.00	92.52	0.08	213.81	105.89	46.91	13.00	71.78
Monaghan Drain	Reach 2	47	March 1998	14.00	92.40	0.08	200.72	102.32	46.91	11.97	71.78
Monaghan Drain	Reach 2	214	April 1999	15.00	92.52	0.11	172.64	85.48	214.46	42.84	42.63
Monaghan Drain	Reach 2	214	March 1998	14.00	92.40	0.10	162.05	83.69	214.46	40.07	42.63
Monaghan Drain	Reach 2	252	April 1999	15.00	92.52	0.46	37.10	16.53	252.08	47.37	9.84
Monaghan Drain	Reach 2	252	March 1998	14.00	92.39	0.45	35.04	16.16	252.08	44.31	9.84
Monaghan Drain	Reach 2	257		Bridge							
Monaghan Drain	Reach 2	261	April 1999	15.00	92.52	0.60	28.65	12.31	260.76	47.62	7.44
Monaghan Drain	Reach 2	261	March 1998	14.00	92.39	0.59	27.10	12.12	260.76	44.56	7.44
Monaghan Drain	Reach 2	277	April 1999	15.00	92.54	0.12	181.42	106.28	276.92	61.04	30.04
Monaghan Drain	Reach 2	277	March 1998	14.00	92.41	0.11	168.27	100.49	276.92	56.64	30.04
Monaghan Drain	Reach 2	411	April 1999	15.00	92.54	0.28	84.81	55.37	411.29	85.80	10.69
Monaghan Drain	Reach 2	411	March 1998	14.00	92.41	0.27	78.26	50.37	411.29	79.65	10.69
Monaghan Drain	Reach 2	508	April 1999	15.00	92.54	0.30	83.25	67.12	507.54	93.89	11.69
Monaghan Drain	Reach 2	508	March 1998	14.00	92.41	0.30	74.95	63.40	507.54	87.02	11.69

HEC-RAS Plan: calibration (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	W.S. Elev (m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Cum Ch Len (m)	Volume (1000 m3)	Top W Chnl (m)
Monaghan Drain	Reach 1	0	April 1999	7.00	92.54	0.16	79.49	67.20			8.89
Monaghan Drain	Reach 1	0	March 1998	6.00	92.41	0.15	71.20	63.48			8.89
Monaghan Drain	Reach 1	197	April 1999	7.00	92.54	0.10	105.66	80.20	197.33	18.27	19.06
Monaghan Drain	Reach 1	197	March 1998	6.00	92.41	0.09	96.49	69.78	197.33	16.54	19.06
Monaghan Drain	Reach 1	420	April 1999	7.00	92.54	0.22	65.11	77.24	420.28	29.43	6.68
Monaghan Drain	Reach 1	420	March 1998	6.00	92.42	0.21	56.03	69.29	420.28	26.80	6.68
Monaghan Drain	Reach 1	652	April 1999	7.00	92.55	0.17	89.46	111.29	652.11	42.10	5.82
Monaghan Drain	Reach 1	652	March 1998	6.00	92.42	0.17	75.91	102.17	652.11	37.78	5.82
Monaghan Drain	Reach 1	894	April 1999	7.00	92.55	0.23	58.53	86.98	893.67	55.32	9.32
Monaghan Drain	Reach 1	894	March 1998	6.00	92.42	0.23	48.49	76.08	893.67	49.18	9.32
Monaghan Drain	Reach 1	1213	April 1999	7.00	92.56	0.27	43.20	61.86	1213.14	68.94	9.90
Monaghan Drain	Reach 1	1213	March 1998	6.00	92.43	0.26	36.43	49.37	1213.14	60.70	9.90
Monaghan Drain	Reach 1	1398	April 1999	7.00	92.57	0.45	25.73	47.08	1397.81	74.38	7.10
Monaghan Drain	Reach 1	1398	March 1998	6.00	92.44	0.45	20.19	39.99	1397.81	65.26	7.10