

# APPENDIX D

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July 24, 2009 storm with Ultimate Conditions Model Run

## Appendix July 2009 Storm for Ultimate Conditions

### Future Condition for July 2009 Storm

HEC-RAS Plan: FJulw3.8nHTc River: Carp River Reach: Carp Profile: Max WS

Reach	River Sta	Profile	Q Total (m <sup>3</sup> /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	Vel Chnl (m/s)	Top Width (m)	Froude #	Chl
Carp	44953	Max WS	5.74	92.75	94.24		94.24	0.25	94.38		0.08
Carp	44890	Max WS	5.74	92.63	94.22		94.23	0.29	105.04		0.1
Carp	44751	Max WS	5.74	92.38	94.19		94.2	0.27	97.55		0.09
Carp	44548	Max WS	9.49	92.43	94.14		94.14	0.21	110.87		0.06
Carp	44325	Max WS	10.83	92.12	94.06	93.15	94.07	0.49	95.05		0.13
Carp	44324	Hazeldean Culvert		Bridge							
Carp	44302	Max WS	10.83	92.45	93.95		93.97	0.72	93.11		0.22
Carp	44267.4	Max WS	10.83	92.44	93.95		93.95	0.44	112.07		0.14
Carp	44218	Max WS	10.83	92.43	93.94		93.94	0.22	156.45		0.07
Carp	44193	Max WS	10.83	92.41	93.94		93.94	0.17	147.37		0.05
Carp	44153	Max WS	10.83	92.4	93.94		93.94	0.15	134.78		0.05
Carp	44093	Max WS	10.82	92.4	93.94		93.94	0.14	120.97		0.04
Carp	44068	Max WS	10.82	92.39	93.94		93.94	0.13	147.12		0.04
Carp	44044.2	Max WS	10.82	92.38	93.94		93.94	0.14	147.16		0.04
Carp	44020.4	Max WS	10.82	92.35	93.94		93.94	0.13	144.49		0.04
Carp	44013.6	Max WS	10.82	92.35	93.94		93.94	0.11	138.63		0.04
Carp	43993.2	Max WS	10.82	92.34	93.94		93.94	0.13	145.15		0.04
Carp	43966	Max WS	10.82	92.33	93.93		93.94	0.16	142.47		0.05
Carp	43954	Max WS	11.88	92.33	93.93		93.93	0.13	144.97		0.04
Carp	43946	Max WS	11.88	92.32	93.93		93.93	0.14	147.27		0.04
Carp	43938	Max WS	11.88	92.31	93.93		93.93	0.12	147.97		0.03
Carp	43852	Max WS	11.87	92.2	93.93		93.93	0.19	151.08		0.06
Carp	43822	Max WS	11.87	92.22	93.93		93.93	0.18	157.47		0.06
Carp	43813	Max WS	11.87	92.22	93.93		93.93	0.28	144.59		0.09
Carp	43799.6	Max WS	11.87	92.22	93.93		93.93	0.25	156.14		0.08
Carp	43764	Max WS	11.86	92.21	93.93		93.93	0.19	210.71		0.06
Carp	43745.8	Max WS	13.08	92.21	93.92		93.93	0.21	211.31		0.07
Carp	43645.7	Max WS	13.08	92.2	93.92		93.92	0.2	139.26		0.06
Carp	43582	Max WS	13.07	92.17	93.92		93.92	0.18	140.14		0.05
Carp	43572.4	Max WS	13.07	92.17	93.92		93.92	0.22	127.76		0.06
Carp	43524.2	Max WS	13.33	92.15	93.91		93.92	0.26	113.45		0.07
Carp	43519.4	Max WS	13.33	92.15	93.91		93.92	0.26	97.81		0.07
Carp	43375	Max WS	13.28	92.09	93.88	93.15	93.9	0.76	75.02		0.22
Carp	43370	Maple Gr. Bridge									
Carp	43364	Max WS	13.26	92.08	93.84		93.87	0.81	81.02		0.26
Carp	43223	Max WS	13.25	92.01	93.83		93.83	0.13	117.96		0.04

Carp	43215.2 Max WS	13.25	92.01	93.83		93.83	0.13	118.46	0.04
Carp	43199.8 Max WS	13.25	92.01	93.83		93.83	0.13	159.43	0.04
Carp	43196 Max WS	13.24	92.01	93.83		93.83	0.14	183.75	0.04
Carp	43180.6 Max WS	13.25	92.01	93.83		93.83	0.14	217.15	0.04
Carp	43173 Max WS	13.25	92.01	93.83		93.83	0.12	267.17	0.04
Carp	43163.8 Max WS	22.24	92.01	93.83		93.83	0.28	211.8	0.09
Carp	43136.4 Max WS	22.24	92.01	93.83		93.83	0.28	219.12	0.09
Carp	43131.8 Max WS	22.24	92.01	93.83		93.83	0.27	213.82	0.09
Carp	43113.6 Max WS	22.24	92	93.82		93.83	0.27	173.7	0.1
Carp	43100 Max WS	22.24	92	93.82		93.82	0.26	124.52	0.09
Carp	43072 Max WS	22.23	92	93.82		93.82	0.2	135.33	0.08
Carp	43028.3 Max WS	22.67	91.96	93.81		93.82	0.23	124.64	0.08
Carp	43018.6 Max WS	22.67	91.96	93.81		93.82	0.23	121.49	0.08
Carp	42975 Max WS	22.67	91.92	93.81		93.81	0.26	108.34	0.09
Carp	42970.1 Max WS	22.67	91.92	93.81		93.81	0.34	120.14	0.08
Carp	42951.2 Max WS	23.9	91.91	93.81		93.81	0.32	120.37	0.08
Carp	42918.2 Max WS	23.89	91.91	93.8		93.81	0.29	119.84	0.09
Carp	42913.5 Max WS	23.89	91.91	93.8		93.81	0.29	119.92	0.09
Carp	42904.1 Max WS	23.89	91.9	93.8		93.81	0.29	119.95	0.09
Carp	42890 Max WS	23.89	91.9	93.78		93.81	0.79	117.77	0.26
Carp	42889 Max WS	23.87	91.8	93.77	93.06	93.81	1.08	264.66	0.26
Carp	42885 Palladium Drive			Bridge					
Carp	42855 Max WS	23.81	91.85	93.72		93.77	0.98	215.41	0.28
Carp	42716 Max WS	23.84	91.75	93.73		93.73	0.35	152.3	0.1
Carp	42700.9 Max WS	23.84	91.74	93.73		93.73	0.37	145.27	0.11
Carp	42686 Max WS	23.83	91.73	93.72		93.73	0.39	134.29	0.11
Carp	42558 Max WS	23.83	91.71	93.69		93.7	0.44	90.32	0.14
Carp	42548.4 Max WS	25.68	91.7	93.69		93.7	0.49	85.45	0.15
Carp	42410 Max WS	25.68	91.6	93.64		93.67	0.92	78.73	0.21
Carp	42391.5 Max WS	25.68	91.59	93.64		93.66	0.93	74.49	0.22
Carp	42212 Max WS	25.69	91.52	93.57		93.58	0.7	84.1	0.16
Carp	42182 Max WS	25.68	91.51	93.48	92.94	93.58	1.39	64.87	0.41
Carp	42172 Highway 417 South			Bridge					
Carp	42154 Max WS	25.66	91.24	93.43		93.52	1.35	47.65	0.4
Carp	42134 Max WS	25.67	91.51	93.46		93.5	0.95	51.35	0.28
Carp	42124 Max WS	25.61	91.36	93.38	92.86	93.49	1.46	40.25	0.45
Carp	42119 Highway 417 North			Bridge					
Carp	42097 Max WS	25.59	91.49	93.36		93.44	1.27	20.19	0.35
Carp	42075 Max WS	25.61	91.48	93.39		93.39	0.25	105.12	0.07
Carp	42036 Max WS	25.61	91.47	93.38		93.39	0.21	151.41	0.07
Carp	42002 Max WS	25.62	91.46	93.38		93.38	0.22	147.89	0.07
Carp	41997.6 Max WS	25.85	91.46	93.38		93.38	0.25	150.8	0.07
Carp	41970.1 Max WS	25.84	91.44	93.38		93.38	0.22	149.1	0.07

Carp	41948.9 Max WS	25.9	91.44	93.38		93.38	0.31	181.48	0.09
Carp	41896 Max WS	25.91	91.42	93.37		93.38	0.33	183.86	0.08
Carp	41845.2 Max WS	26.03	91.4	93.37		93.37	0.31	149.02	0.08
Carp	41836 Max WS	26.02	91.4	93.37		93.37	0.42	125.42	0.12
Carp	41776 Max WS	26	91.38	93.36		93.36	0.55	148.32	0.14
Carp	41769 Max WS	26.01	91.38	93.36		93.36	0.5	138.59	0.13
Carp	41744 Max WS	26.06	91.36	93.35		93.36	0.26	148.27	0.09
Carp	41743 Max WS	26.02	91.36	93.33	92.61	93.38	1.04	123.82	0.28
Carp	41738 Fut Transitway		Bridge						
Carp	41725.5 Max WS	26.03	91.35	93.34		93.36	0.66	173.76	0.16
Carp	41671 Max WS	26.04	91.35	93.34		93.35	0.51	101.04	0.14
Carp	41608 Max WS	29.76	91.32	93.32	92.15	93.34	0.64	109.3	0.16
Carp	41602 Future Campeau C		Bridge						
Carp	41572 Max WS	29.65	91.31	93.29		93.31	0.65	110.1	0.16
Carp	41374.8 Max WS	28.75	91.26	93.14		93.31	2	93.08	0.53
Carp	41357 Max WS	28.21	91.26	93.1		93.23	1.65	115.5	0.65
Carp	41349.4 Max WS	29.06	91.25	93.13		93.14	0.12	251.53	0.05
Carp	41338 Max WS	29.05	91.24	93.13		93.14	0.11	216.93	0.04
Carp	41320 Max WS	29.05	91.24	93.13		93.14	0.15	248.24	0.04
Carp	41198 Max WS	29.03	91.21	93.13		93.13	0.17	210.48	0.05
Carp	41180 Max WS	29.02	91.21	93.13		93.13	0.15	213.92	0.04
Carp	41125.4 Max WS	29.01	91.21	93.13		93.13	0.2	199.56	0.05
Carp	41117 Max WS	28.97	91.2	93.13		93.13	0.41	194.6	0.13
Carp	41071 Max WS	29.08	91.18	93.13		93.13	0.15	238.46	0.05
Carp	40965.2 Max WS	29.17	91.14	93.13		93.13	0.17	179.42	0.05
Carp	40956 Max WS	29.17	91.14	93.12		93.13	0.23	175.22	0.07
Carp	40919.2 Max WS	29.14	91.12	93.12		93.12	0.37	186.91	0.1
Carp	40910 Max WS	29.15	91.12	93.12		93.12	0.12	206.55	0.03
Carp	40703 Max WS	29.15	91.05	93.12		93.12	0.15	199.25	0.04
Carp	40688.5 Max WS	29.77	91.04	93.11		93.12	0.48	188.4	0.13
Carp	40640.2 Max WS	29.75	91.03	93.11		93.11	0.33	312.07	0.09
Carp	40505 Max WS	29.73	91	93.1		93.1	0.26	255.12	0.07
Carp	40423.5 Max WS	29.72	90.97	93.1		93.1	0.22	300.2	0.06
Carp	40415 Max WS	29.72	90.96	93.1		93.1	0.21	368.03	0.05
Carp	40348.1 Max WS	29.74	90.95	93.1		93.1	0.17	340.75	0.04
Carp	40339.7 Max WS	29.74	90.95	93.1		93.1	0.1	338.05	0.03
Carp	40298 Max WS	29.73	90.93	93.1		93.1	0.11	377.46	0.03
Carp	40262.9 Max WS	30.16	90.92	93.1		93.1	0.13	353.18	0.03
Carp	40113.9 Max WS	30.15	90.88	93.09		93.1	0.57	275.98	0.14
Carp	40092 Max WS	30.15	90.87	93.08		93.09	0.56	270.58	0.14
Carp	40077.6 Max WS	30.66	91.07	93.03		93.08	1.08	259.84	0.28
Carp	40071.5 Max WS	30.47	91.15	92.9		93.06	1.82	198.2	0.49
Carp	40070 Richardson Side		Culvert						

Carp	40050 Max WS	30.55	91.15	92.93		93.06	1.61	195.31	0.41
Carp	40035.1 Max WS	30.61	91.13	92.98		92.99	0.52	228.04	0.14
Carp	39892 Max WS	30.58	90.99	92.93		92.94	0.57	181.17	0.15
Carp	39695 Max WS	30.51	90.78	92.85		92.87	0.6	187.06	0.18
Carp	39400 Max WS	30.36	90.66	92.7		92.72	0.78	226.07	0.2
Carp	39202 Max WS	30.17	90.57	92.61		92.62	0.65	323.8	0.16
Carp	39102 Max WS	30.06	90.47	92.57		92.58	0.66	401.77	0.16
Carp	39002 Max WS	29.93	90.37	92.53		92.54	0.72	289.93	0.18
Carp	38902 Max WS	29.8	90.27	92.49		92.5	0.58	304.18	0.14
Carp	38697 Max WS	29.68	90.07	92.46		92.46	0.31	346.56	0.08
Carp	38692.5 Max WS	30.2	90.07	92.46		92.46	0.3	342.58	0.08
Carp	38236 Max WS	29.15	90.16	92.35		92.37	0.79	287.74	0.18
Carp	37894 Max WS	30.04	90.03	92.26		92.27	0.56	307.71	0.14
Carp	37869.5 Max WS	29.91	90.01	92.25		92.26	0.56	306.6	0.13
Carp	37390.4 Max WS	28.87	89.68	92.17		92.18	0.38	291.39	0.09
Carp	37380.4 Max WS	28.36	89.67	92.14	90.99	92.22	1.25	284.09	0.28
Carp	37370 Huntmar	Bridge							
Carp	37355.4 Max WS	27.12	89.66	92.07		92.15	1.24	262.86	0.28
Carp	37101 Max WS	27.2	89.48	92.07		92.07	0.31	275.07	0.07
Carp	36580 Max WS	26.76	89.1	92.04		92.04	0.3	372.33	0.06
Carp	35288 Max WS	26.24	89.05	91.88		91.89	0.62	148.27	0.13
Carp	35073 Max WS	26.21	89.27	91.84		91.85	0.53	96.68	0.11
Carp	34555 Max WS	26.06	89.06	91.73		91.75	0.74	74.18	0.15
Carp	33472 Max WS	25.84	88.54	91.59		91.59	0.38	157.64	0.07
Carp	33201 Max WS	26.01	89.15	91.53	90.1	91.56	0.73	165.15	0.17
Carp	33197 March Road	Bridge							
Carp	33181 Max WS	25.93	89.16	91.51		91.54	0.74	162.31	0.17
Carp	32609 Max WS	13.67	89.56	91.43		91.43	0.27	212.51	0.07
Carp	32096 Max WS	13.65	88.9	91.41		91.41	0.21	237.9	0.05
Carp	31662 Max WS	13.7	88.74	91.39	89.49	91.4	0.37	132.01	0.07
Carp	31658 Carp Road	Bridge							
Carp	31642 Max WS	13.7	88.74	91.39		91.39	0.37	131.99	0.07
Carp	31414 Max WS	13.17	88.89	91.38	89.75	91.38	0.26	121.85	0.06