Table 3-14a Watershed Data, Hydrologic Modeling, and Water Quality Modeling Summary

City of Minnetonka, Water Resources Management Plan

Bassett Creek Watershed

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City of Minnetonka, Water Resources Management Plan

Bassett Creek Watershed

		Hydrologic Modeling																	Water Quality Modeling						
		Watershed Characteristics				Existing Conditions			Proposed Conditions										Historical Elevations[C]		PondNET Information					
Subwatershed No.	Foot Notes[A]	Total Area (Ac)	Water Area (Ac)	Impervious Area (Ac)	Turf Area (Ac)	Existing Outlet Elevation	Existing Outlet Size (in)	Land-Locked?	Proposed Normal Elevation	Proposed Outlet Size (in) Approx[B]	Hydrologic Evaluation Method	1% Annual Exceedance Probability Storm (100-yr) Flood Elevation	Storage (Ac-ft)	Average Discharge (cfs)	Peak Discharge (cfs)	Critical Storm Duration (hrs)	Comments	Normal Elevation	1% Annual Exceedance Probability Storm (100-yr) Flood Elevation	Total Direct Watershed Area (Ac)	Pond Area (Ac)	Mean Depth (ft)	Runoff Coefficient	Total Phosphorus Removal (%) Pond	Total Phosphorus Removal (%) Total Watershed	Subwatershed No.
Highway 12 South																										*Highway 12 South*
401	1	36.7	1.3	7.1	28.3	975.9	OC	N	936	**6**	Volume Rtg	942.0	15	1		240	Pumped Outlet.	933.9	941	36.7	1.3	0.8	0.15	52.0	52.0	**401**
402	1	6.4	0.1	1.6	4.7	972.4	15	N	972.38	15	Volume Rtg	975.2	0.8	7		0.5		971.8	975	6.4	0.1	1.5	0.18	14.0	51.0	**402**
403	1	6.5	0.0	0.7	5.9	973.6	12	N	973.6	12	Volume Rtg	976.5	0.5	5		1		987.2	990	6.5	0.0	0.0	0.09	0.0	0.0	**403**
405	1	4.6	0.1	1.1	3.4	1012.1	12	N	1012.1	12	Volume Rtg	1014.0	0.3	5		1		1010.4	1013	4.6	0.1	0.5	0.18	21.1	21.1	**405**
406	1	13.9	0.5	3.4	10.1	950.3	12	N	950.3	12	Volume Rtg	953.8	2.8	4		1		950	953.8	13.9	0.5	1.0	0.18	31.6	33.4	**406**
407	1	4.7	1.1	0.7	2.9	951.7	15	N	951.7	15	Volume Rtg	952.6	0.9	7		1	Threatened species observed (Blanding's Turtle) June 1981. Existing pipe assumed to be adequate.	951.7	952.6	4.7	1.1	0.2	0.15	9.3	34.7	**407**
409	1	35.9	0.0	34.1	1.8	946.7	54	N	NA	54	Volume Rtg	NA	0	160		0.5		947.6	950.5	35.9	NA	NA	0.61	0.0	0.0	**409**
410	1	65.5	4.0	30.8	30.8	925.0	54	N	925	54	Volume Rtg	930.0	28	17		12	Outlet controlled by gate structure. Existing pipe assumed to be adequate.	925.6	932	65.5	4.0	5.0	0.34	55.0	58.4	**410**
410-1	1	16.5	0.7	6.3	9.5	927.5	OC	N	928.6	**18**	Volume Rtg	930.0	1.3	41		0.5		NA	NA	16.5	0.7	1.2	0.28	23.0	50.0	**410-1**
411	1	4.8	0.0	1.2	3.6	940.0	OC	N	928	**12**	Volume Rtg	935.1	0.8	1		48		928	934	4.8	0.0	0.2	0.18	6.5	6.5	**411**
412	1	7.1	0.1	1.8	5.3	925.0	OC	Y	919.4	**12**	Volume Rtg	925.0	2	1		240		920	925	7.1	0.1	0.1	0.18	4.6	4.6	**412**
413	1	22.5	0.3	5.5	16.7	925.0	OC	Y	919.1	**12**	Volume Rtg	925.0	3.5	1		12		920	925	22.5	0.3	0.4	0.18	14.1	14.1	**413**
414	1	13.6	0.9	3.2	9.6	939.2	OC	Y	932	**12**	Volume Rtg	934.6	2.7	1		48		932	934.6	13.6	0.9	3.0	0.18	53.2	53.2	**414**
415	1	10.3	0.0	2.1	8.2	931.0	OC	N	931	**12**	Volume Rtg	931.5	0.1	36		0.5		NA	NA	10.3	0.0	0.0	0.15	0.0	32.5	**415**
416	1	14.8	0.8	3.5	10.5	925.2	OC	Y	922	**36**	Volume Rtg	925.0	2.6	36		0.5		920	925	14.8	0.8	2.0	0.18	38.7	50.9	**416**
417	1	2.9	0.0	1.0	1.9	955.0	OC	N	952.9	**15**	Volume Rtg	954.0	0.1	5		0.5		952.9	954	2.9	0.0	0.0	0.24	0.0	0.0	**417**
418	1	6.0	0.0	1.5	4.5	930.0	18	N	930	18	Volume Rtg	932.4	0.4	12		0.5		939.6	932	6.0	0.0	0.0	0.18	0.0	0.0	**418**
419	3	11.8	0.4	2.8	8.6	939.1	21	N	936	24	Volume Rtg	939.4	1.46		26.12	1	Existing Conditions based on As-Builts; Modeilng from Pond 419 Analysis	957.4	939.2	11.8	0.4	0.0	0.18	26.7	26.7	**419**
420	1	5.7	0.0	2.0	3.7	941.0	OC	N	935	**21**	Volume Rtg	937.0	1.3	10	0	1		935	938.5	5.7	0.0	0.0	0.25	0.0	16.3	**420**
421	8	8.5	0.5	2.4	5.6	~~933.6~~	~~27~~	N	933.6	27	Volume Rtg	934.7	0.8	17	0	1		932.3	934	8.5	0.5	0.5	0.22	17.9	26.5	**421**
423	1	8.7	0.3	5.9	2.5	930.0	12	N	923	12	Volume Rtg	928.0	1.1	7		1		918.6	921	8.7	0.3	2.5	0.46	42.1	42.1	**423**
424	1	26.0	1.2	23.6	1.2	926.0	54	N	926	54	Volume Rtg	930.0	5.5	9		2	Outlet controlled by gate structure. Existing pipe assumed to be adequate.	926	930.5	26.0	1.2	6.0	0.61	57.9	57.9	**424**
425	1	213.9	43.0	34.2	136.7	917.1	21	N	917.1	21	Hydrograph	920.5	160	9	13	96	Crane Lake (Ridgedale Pond). Existing pipe assumed to be adequate.	917.1	919.5	213.9	43.0	2.5	0.15	41.9	63.4	**425**
425-1	1	6.6	1.2	1.1	4.3	921.0	OC	N	920.3	**12**	Volume Rtg	922.0	2.3	1		240		NA	NA	6.6	1.2	0.1	0.15	7.7	7.7	**425-1**
425-2	1	13.0	1.3	2.9	8.8	963.0	OC	N	962	**12**	Volume Rtg	963.0	1.6	5		1		NA	NA	13.0	1.3	2.0	0.18	47.4	47.4	**425-2**
425-3	1	24.5	0.5	22.8	1.2	919.0	OC	N	917.7	OC	Volume Rtg	920.5	0.5	95		0.5		NA	NA	24.5	0.5	4.0	0.61	16.1	51.8	**425-3**
Subtotal		***591.4***	***58.1***	***203.1***	***330.2***															***591.4***						***Subtotal***

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		Watershed Characteristics				Existing Conditions			Proposed Conditions									Historical Elevations[C]		PondNET Information						
Subwatershed No.	Foot Notes[A]	Total Area (Ac)	Water Area (Ac)	Impervious Area (Ac)	Turf Area (Ac)	Existing Outlet Elevation	Existing Outlet Size (in)	Land-Locked?	Proposed Normal Elevation	Proposed Outlet Size (in) Approx[B]	Hydrologic Evaluation Method	1% Annual Exceedance Probability Storm (100-yr) Flood Elevation	Storage (Ac-ft)	Average Discharge (cfs)	Peak Discharge (cfs)	Critical Storm Duration (hrs)	Comments	Normal Elevation	1% Annual Exceedance Probability Storm (100-yr) Flood Elevation	Total Direct Watershed Area (Ac)	Pond Area (Ac)	Mean Depth (ft)	Runoff Coefficient	Total Phosphorus Removal (%) Pond	Total Phosphorus Removal (%) Total Watershed	Subwatershed No.
Highway 12 Northwest																										***Highway 12 Northwest***
426	1	6.6	0.5	4.9	1.2	990.5	15	N	993	15	Volume Rtg	996.0	1.3	1		6		998.3	1001	6.6	0.5	1.5	0.52	42.6	42.6	**426**
428	1	12.2	0.0	9.2	3.1	INA	INA	N	NA	**24**	Volume Rtg	NA	0	50		0.5	Existing outlet assumed to be adequately sized during design.	985.3	987.4	12.2	NA	NA	0.49	0.0	0.0	**428**
429	1	8.7	0.0	6.5	2.2	979.5	12	N	979.5	12	Volume Rtg	983.5	1.4	4		2		980.3	984.5	8.7	0.0	0.0	0.49	0.0	0.0	**429**
430	1	4.0	0.5	0.9	2.6	978.3	12	N	982.5	12	Volume Rtg	983.5	0.5	1		1	Restriction may be required on existing pipe.	980.1	983.9	4.0	0.5	1.1	0.18	38.2	38.2	**430**
431	1	6.3	0.0	1.6	4.7	987.5	OC	N	984.5	**18**	Volume Rtg	987.5	0.6	5		2		984.5	987	6.3	0.0	0.0	0.19	0.0	0.0	**431**
432	1	18.5	0.3	4.6	13.7	974.3	OC	N	976	**15**	Volume Rtg	979.0	2.5	5		2	Need to construct a berm.	977.4	979.5	18.5	0.3	0.3	0.18	10.0	10.0	**432**
433	1	20.5	0.0	5.2	15.3	INA	INA	N	NA	**48**	Volume Rtg	NA	0	70		0.5		NA	NA	20.5	NA	NA	0.19	0.0	5.4	**433**
434	1	10.0	0.0	2.5	7.5	916.6	15	N	916.6	**30**	Volume Rtg	919.0	0.5	17		0.5		917.2	919	10.0	0.0	0.0	0.19	0.0	0.0	**434**
435	1	1.6	0.2	0.4	1.1	928.0	OC	N	929	**12**	Volume Rtg	930.4	0.2	1		1	Need to construct a berm. Wetland elevation was not surveyed.	925.7	928	1.6	0.2	0.9	0.18	38.2	38.2	**435**
439	1	11.1	0.0	2.7	8.4	922.4	OC	N	920	**30**	Volume Rtg	922.5	0.3	24		0.5		920	922.5	11.1	0.0	0.0	0.18	0.0	0.0	**439**
440	1	10.0	1.8	2.1	6.2	918.8	12	N	918.8	12	Volume Rtg	922.2	3	1		1		918.5	920.5	10.0	1.8	2.0	0.18	50.0	45.4	**440**
441	1	122.7	38.0	21.2	63.5	914.0	27x43	N	914	27x43	Hydrograph	917.1	52		20	24	Oak Knoll Pond. Cost estimate assumes $20,000 to flood protect the low house. Final pipe size will be based on allowable discharge to Plymouth.	914	917.9	122.7	38.0	0.5	0.18	14.2	59.0	**441**
441-1	1	4.2	0.2	1.4	2.6	917.7	OC	Y	915.7	**12**	Volume Rtg	917.0	0.5	1		3		NA	NA	4.2	0.2	0.5	0.25	23.7	23.7	**441-1**
442	1	2.5	0.3	0.5	1.6	917.1	6	N	918	**12**	Volume Rtg	919.0	0.4	1		1		918	920	2.5	0.3	0.3	0.18	15.7	15.7	**442**
443	1	1.3	0.2	0.3	0.8	927.6	OC	N	925	**12**	Volume Rtg	926.0	0.2	1		0.5		923	925.7	1.3	0.2	1.4	0.18	42.6	42.5	**443**
444	8	15.4	3.8	2.3	9.3	~~912.4~~	~~36~~	N	912.4	36	Volume Rtg	916.8	20.6	20		96	Final pipe size based on allowable discharge to Plymouth.	912.4	917.8	15.4	3.8	0.5	0.15	4.9	55.7	**444**
444A	1	23.8	3.5	5.1	15.2	917.3	OC	Y	915.7	**12**	Volume Rtg	916.8	4.1	1		12		NA	NA	23.8	3.5	0.9	0.18	34.4	34.4	**444A**
445	1	18.8	3.0	4.0	11.9	984.4	OC	N	969.2	**12**	Volume Rtg	971.2	6	3		1		960	964	18.8	3.0	7.0	0.18	67.2	67.2	**445**
446	1	6.6	0.0	1.7	5.0	INA	INA	N	NA	**21**	Volume Rtg	NA	0	15		0.5		NA	NA	6.6	NA	NA	0.18	0.0	0.0	**446**
Subtotal		***304.8***	***52.3***	***76.8***	***175.7***															***304.8***						***Subtotal***

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Highway 12 Northeast																										*Highway 12 Northeast*
422	2, 3	13.1	1.2	10.1	1.8	908.0	15	N	908	15	Hydrograph	911.9	3.85		12.79	6	Existing pipe assumed to be adequate; Modeling from Pond 419 Analysis	916	918.3	13.1	1.2	2.0	0.55	46.9	46.9	**422**
436	2, 3	5.1	0.0	3.3	1.8	923.9	OC	N	922.5	**12**	Hydrograph	923.4	0.93		2.24	2	Modeling from Pond 419 Analysis	921	922	5.1	0.0	0.0	0.43	0.0	0.0	**436**
437	2, 3	9.2	0.4	4.4	4.4	923.9	OC	N	919.6	**21**	Hydrograph	921.5	1.96		4.83	12	Modeling from Pond 419 Analysis	918	921.2	9.2	0.4	0.6	0.34	23.0	23.0	**437**
438	2, 3	7.0	0.0	4.9	2.1	918.0	15	N	918	15	Hydrograph	923.8	0.13		20.59	1	Existing pipe assumed to be adequate; Modeling from Pond 419 Analysis	919	922	7.0	0.0	0.0	0.46	0.0	0.0	**438**
447	2, 3	8.6	0.0	6.4	2.2	918.5	24	N	918.5	24	Hydrograph	921.9	0.78		22.71	1	Existing pipe assumed to be adequate; Modeling from Pond 419 Analysis	918	920	8.6	0.0	0.0	0.49	0.0	0.0	**447**
448	2, 3	5.6	0.4	3.9	1.3	INA	INA	N	916.9	**12**	Hydrograph	920.2	2.75		7.23	6	Existing pipe assumed to be adequately sized during designed; Modeling from Pond 419 Analysis	916.9	920	5.6	0.4	0.9	0.49	29.4	29.4	**448**
449	2, 3	10.2	1.5	4.3	4.4	908.0	15	N	908	15	Hydrograph	910.0	2.43		7.71	12	Existing pipe assumed to be adequate; Modeling from Pond 419 Analysis	NA	NA	10.2	1.5	2.0	0.33	42.5	46.4	**449**
449A	1	4.1	0.1	1.0	3.0	919.5	24	N	919.5	24	Volume Rtg	921.5	0.3	7		0.5		NA	NA	4.1	0.1	1.4	0.18	37.8	37.8	**449A**
450	2, 3	8.4	0.0	3.4	5.0	INA	INA	N	911	**18**	Hydrograph	917.5	0.17		45.65	0.5	Existing pipe assumed to be adequately sized during I-394 upgrade; Modeling from Pond 419 Analysis	911	916.4	8.4	0.0	0.0	0.28	0.0	0.0	**450**
451	2, 3	12.1	1.7	2.6	7.8	INA	INA	N	915.9	**36**	Hydrograph	916.5	0.77		48.4	1	Existing pipe assumed to be adequately sized during I-394 upgrade; Modeling from Pond 419 Analysis	914	915.9	12.1	1.7	1.0	0.18	38.5	38.5	**451**

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		Watershed Characteristics				Existing Conditions			Proposed Conditions									Historical Elevations[C]		PondNET Information						
Subwatershed No.	Foot Notes[A]	Total Area (Ac)	Water Area (Ac)	Impervious Area (Ac)	Turf Area (Ac)	Existing Outlet Elevation	Existing Outlet Size (in)	Land-Locked?	Proposed Normal Elevation	Proposed Outlet Size (in) Approx[B]	Hydrologic Evaluation Method	1% Annual Exceedance Probability Storm (100-yr) Flood Elevation	Storage (Ac-ft)	Average Discharge (cfs)	Peak Discharge (cfs)	Critical Storm Duration (hrs)	Comments	Normal Elevation	1% Annual Exceedance Probability Storm (100-yr) Flood Elevation	Total Direct Watershed Area (Ac)	Pond Area (Ac)	Mean Depth (ft)	Runoff Coefficient	Total Phosphorus Removal (%) Pond	Total Phosphorus Removal (%) Total Watershed	Subwatershed No.
452	1	9.3	0.0	8.8	0.5	919.0	OC	N	NA	**42**	Volume Rtg	NA	0	41		0.5		NA	NA	9.3	NA	NA	0.61	0.0	0.0	**452**
454	2, 3	46.1	2.9	25.9	17.3	897.0	36	N	897	36	Hydrograph	900.8	14.26		19.71	1	To develop storage, a restriction may be considered; Modeling from Pond 419 Analysis	899	901.8	46.1	2.9	2.5	0.40	54.2	54.2	**454**
454-1	2, 3	4.0	0.1	2.3	1.6	900.5	12	N	900.5	12	Hydrograph	903.0	0.47		6.09	6	Existing pipe assumed to be adequate; Modeling from Pond 419 Analysis	NA	NA	4.0	0.1	1.0	0.40	28.0	27.9	**454-1**
456	1	236.4	12.4	56.0	168.0	887.7	24	N	887.7	24	Volume Rtg	891.5	50	9		12		888.6	891.7	236.4	12.4	1.0	0.18	35.9	37.4	**456**
456-1	1	14.3	2.4	3.0	8.9	888.2	12	N	888.2	36	Volume Rtg	891.5	0.1	39		0.5		NA	NA	14.3	2.4	0.5	0.19	26.9	26.9	**456-1**
457	1	6.4	0.0	2.2	4.2	INA	INA	N	NA	42	Volume Rtg	NA	0	23		0.5		NA	NA	6.4	NA	0.0	0.25	0.0	27.8	**457**
458	1	24.5	0.0	6.2	18.3	943.0	12	N	NA	48	Volume Rtg	NA	0	70		0.5		NA	NA	24.5	NA	0.0	0.19	0.0	0.0	**458**
459	1	6.1	0.0	1.5	4.6	948.9	12	N	NA	30	Volume Rtg	NA	0	20		0.5		950.5	952	6.1	NA	0.0	0.18	0.0	0.0	**459**
Subtotal		***430.5***	***23.2***	***150.3***	***257.1***															***430.5***						***Subtotal***
TOTAL		***1327***	***133.6***	***430.2***	***762.9***															***1326.7***						***TOTAL***

Abbreviations: INA - Information Not Available; OC - Outlet is an Open Channel; NA - Not Available; Y - Yes; N - No; HFP - High Flood Potential; DNR- Minnesota Department of Natural Resources; PWC - DNR Public Watercourse; PD - DNR Public Ditch; US - Upstream; WQ - Water Quality; Const. - Construction

A -

1 - Numbers shown are preliminary estimates taken from the 1999 WRMP. A detailed hydrologic and hydraulic analysis considering multiple storm durations should be performed as part of final design.

2 - Numbers shown are preliminary estimates taken from the 1999 WRMP, as revised by updated modeling to evaluate changes in upstream watersheds (no change in proposed outlet from 1999 WRMP). A detailed hydrologic and hydraulic analysis considering multiple storm durations should be performed as part of final design.

3 - Minor revisions to modeling required based upon review of as-built information.

4 - Modeling may need to be updated based on as-built information.

5 - As-builts reflect conditions similar to 1999 WRMP proposed conditions, therefore modeling results from 1999 WRMP assumed to hold true. Updated modeling should be reviewed.

6 - Information regarding peak storage volume in updated modeling should be obtained.

7 - Information regarding the critical storm duration based upon updated modeling should be obtained.

8 - Assumed outlet size and invert installed as proposed in 1999 WRMP. Needs to be verified with as-builts.

9 - Modeled outlet size and invert not provided

10 - As-built provided but no updated modeling information

11 - Outlets observed in the field; no modeling information related to flood elevations or discharge - modeling required

B - Bold Values in this column indicate that the proposed outlet conditions are different than the existing outlet conditions

C - From City of Minnetonka 1982 Water Resource Management Plan

- Values shown in Strikeout are taken from the 1999 WRMP, but may no longer be applicable. As-builts and modeling may be required to update stricken values.