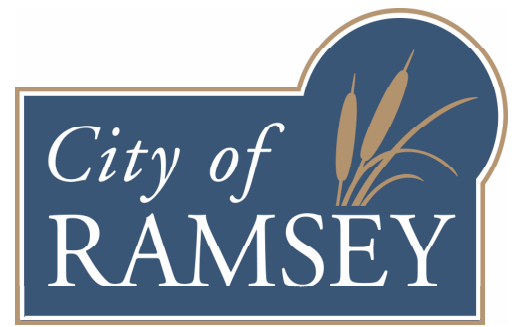




# Water Resources Appendix





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# COMPREHENSIVE WATER SYSTEM STUDY UPDATE

## IN COORDINATION WITH 2040 COMPREHENSIVE PLAN UPDATE

CITY OF RAMSEY, MN

**SEPTEMBER 2017**

**Submitted by:**

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**COMPREHENSIVE WATER PLAN UPDATE  
IN COORDINATION WITH  
2040 COMPREHENSIVE PLAN UPDATE  
  
CITY OF RAMSEY, MINNESOTA**

**A. PURPOSE**

The purpose for this report is to update the City's 2012 Comprehensive Water Plan based on current (2017) population and land use projections. The 2012 Comprehensive Water Plan included a plan for meeting the City's needs based on development projected within the City's 2030 Comprehensive Plan. The 2012 Comprehensive Water Plan outlined infrastructure needs and included an implementation schedule based on the anticipated development.

City staff has identified development which has occurred since the 2012 study was completed and has provided projections for development which is likely to occur in the next 23 years (Year 2040). This report evaluates the impact of the recent and projected development on the proposed schedule for water infrastructure implementation.

Typically water system improvements are funded through a combination of Water Availability Charges, trunk charges, and water usage fees. We have prepared one option for funding the water system which should be reviewed and discussed with the City's financial advisor prior to setting or adjusting any charges or fees.

**B. SUMMARY OF INFRASTRUCTURE REVISIONS TO 2012 COMPREHENSIVE PLAN**

Infrastructure expenditures were based on the City's Capital Improvement Plan for the years 2017 to 2020. We also identified several capital improvement projects which will need to be implemented between 2021 and 2040.

**1. Water Distribution System**

The water distribution system is depicted on Figure 1. Water wells, towers and existing and proposed water mains are shown on the graphic. A summary of revisions (when compared to the 2012 map) is as follows:

1. Removed both alternative Water Treatment Facility locations and related surface water pipes.
2. Updated the existing water main locations to match the current City water map.
3. Loop #1
  - a. Revised to reflect the Bowers Drive water main as a lateral main rather than a trunk facility.
  - b. Added a loop along Puma Street and Alpine Drive.
  - c. Added a water main on Riverdale Drive, west of Armstrong Boulevard to complete the loop in that area.
  - d. Removed the small loop east of Armstrong Boulevard on 142<sup>nd</sup> Avenue.
  - e. Revised the segment east of Armstrong Boulevard, on Riverdale Drive, from proposed to existing.
4. Loop #4 was revised to connect from one existing 12" main to another. The southern existing 12" pipe appears to have been installed since the 2012 report.

5. Loop #6 was added to the map. This is proposed work to be completed next summer. We have included a table depicting the costs of the improvements in the areas described at the back of this report.

## **2. Water Supply Wells and Storage**

Development projections from 2012 indicated a new water supply capacity would be required by 2019. With the updated development data, new water supply is now projected to be required by 2022.

Construction of new wells in 2023 and 2028 will provide adequate capacity to the year 2040 based upon projected growth rates.

In order to determine a viable location for a new well, and potential for additional water supply options utilizing groundwater sources, a well location study should be undertaken beginning in 2017.

The following capital costs, presented in 2017 dollars, should be expected for the water system:

- A new water supply well and pumphouse in 2023 at \$1,500,000,
- A new water supply well and pumphouse in 2028 at \$1,500,000, and
- Water tower rehabilitation in 2030 at \$2,000,000.

Additionally, \$100,000 per year for the years 2021 through 2028 should be allocated for well service and pump maintenance.

Water tower 3 is anticipated to need rehabilitation in approximately 2030. Approximately \$2,000,000 will be required for this work.

## **3. Water Treatment Facility**

In the 2012 report, a water treatment facility was identified as a means of water supply. This was intended to be a surface water treatment facility that drew raw water from the Mississippi River. Based on current discussions with regulatory agencies, there is the potential to provide more water to the system through the addition of wells. In the 2017 report, the treatment facility was removed.

A new treatment facility was added to the 2017 report to provide greater water quality than exists from the untreated well water current used in the City. The construction of the facility will depend on several factors, including: needs of business and industrial users, and acceptability of the water by residents of the community. The water treatment facility is depicted as being constructed in 2027 and 2028 at a cost of \$24,000,000. The actual timing of the construction of the facility is undetermined at this time.

### **C. TRUNK WATER MAIN COSTS**

Attached are updated cost estimates related to the water distribution system improvements, totaling \$6,574,097. These costs include 25% indirect costs such as administration, engineering, legal and financing. Additionally, we have included a 20% contingency for unforeseen improvements which may be required during the study period, for a total cost of \$7,888,916 in 2017 dollars.

The City's current Capital Improvement Plan was used to determine expenditures for the years 2017 to 2020. For the years 2021 to 2040, the above costs were spread evenly over the 20 year period, while being inflated at a rate of 3% per year.

**D. DEVELOPMENTAL IMPACT ON COMPREHENSIVE WATER PLAN**

Population and Growth

Actual and projected development within the City of Ramsey since the 2012 Comprehensive Water Plan was developed are summarized as follows:

- Connections from 2012-2015 are as follows:
  - 2012: 295
  - 2013: 164
  - 2014: 66
  - 2015: 258
  - Avg: 196
  
- Projected development is as follows:
  - 160 Residential Units/Year, (50% High Density)
  - 10 Commercial/Industrial Acres/Year
  - 567 Residential Units in NE Expansion Area

The development projections above are projected to occur from 2016 to 2040. The total projected number of new units to be served by the water system, after a high density unit adjustment of 0.7 per high density unit, is 3831 units. This represents an average of 160 units per year will be developed. The attached Table 1 provides a summary of both the 2012 comprehensive Water Plan population and water demand projected, and the updated projections based on new development information.

**E. ANALYSIS**

Our detailed analysis (depicted on a spreadsheet at the back of this report) provides an evaluation of the impact of development and proposed improvements on the current rate structure. The following assumptions were made for the analysis:

- Capital expenditures for 2017 to 2020 were taken from the City's current Capital Improvement Plan.
- Capital expenditures for the years 2021 to 2040 were based on assumptions described in Sections B and C above.
- Operating expenses of \$836,662 were used for 2017 and then inflated at a rate of 4% per year for the duration of the analysis period.
- Treatment facility operating expenses were assumed to begin in 2029 at an annual rate of \$1,000,000 per year and then inflated at 3% per year each year after 2029.
- Water usage rates of \$2.57/1,000 gallons for 2017 were used and then inflated at a rate of 2% per year after 2017.
- Water Availability Charges of \$1,236 were used for 2017 and then inflated at a rate of 2.5% per year after 2017.
- Trunk charges of \$1,720 were used for 2017 and then inflated at a rate of 2.5% per year after 2017.

**Table 1**  
**Population and Water Demand Projections**  
**Ramsey, Minnesota**  
**9/15/2017 - Updated 10/19/2020**

**2012 Comprehensive Water Plan**

<b>Year</b>	<b>2012</b>	<b>2016</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
<b>Service Area Population</b>	11,434	14,961	18,669	22,519	26,029		
<b>New Residential Customer Accounts</b>	260	323	323	260	260		
<b>People/Household</b>	2.87	2.87	2.7	2.7	2.7		
<b>Added Population</b>	746	927	872	702	702		
<b>End of Year Service Area Population</b>	12,180	15,888	19,541	23,221	26,731		
<b>Average Daily Water Demand ( gpd)</b>	1,827,030	2,383,236	2,931,206	3,483,221	4,009,721		
<b>Maximum Day Water Demand (gpd)</b>	5,481,090	7,149,708	8,793,617	10,449,662	12,029,162		

**Update**

<b>Year</b>	<b>2012</b>	<b>2016</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
<b>Service Area Population</b>	11,434	13,681	15,409	17,569	19,729	21,889	24,049
<b>New Residential Customer Accounts</b>	295	160	160	160	160	160	160
<b>People/Household</b>	2.87	2.70	2.70	2.70	2.70	2.70	2.70
<b>Added Population</b>	847	432	432	432	432	432	432
<b>End of Year Service Area Population</b>	12,281	14,113	15,841	18,001	20,161	22,321	24,481
<b>End of Year Unserved Population</b>		12,138	11,709		13,189		14,669
<b>End of Year City Population</b>		26,251	27,550		33,350		39,150
<b>Average Daily Water Demand</b>	1,842,098	2,116,982	2,376,182	2,700,182	3,024,182	3,348,182	3,672,182
<b>Maximum Day Water Demand</b>	5,526,293	6,350,945	7,128,545	8,100,545	9,072,545	10,044,545	11,016,545

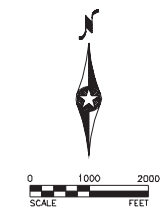
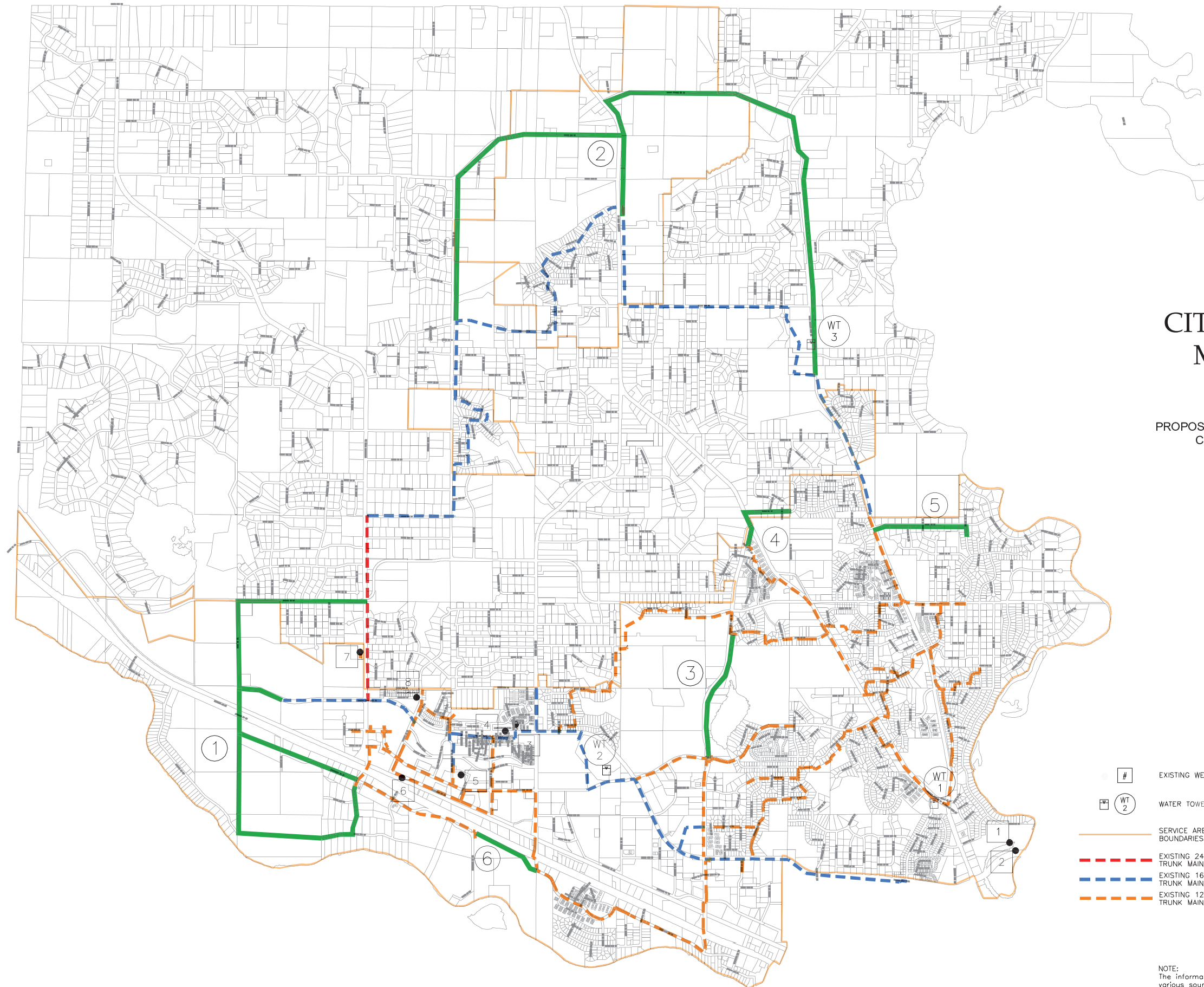
**2040 MUSA - Water System Loop Improvements (2021-2040)**

Loop	LOCATION	SIZE (IN.)	LENGTH (FT.)	COST PER FOOT*	COST
<u>1</u>	Southwest Loop	12"	19,000	\$124	\$2,352,313
		3,000 LF Constructed in 2017		<b>TOTAL LOOP 1</b>	<b>\$2,352,313</b>
<u>2</u>	North Central Loop	12"	28,000	\$124	\$3,466,567
				<b>TOTAL LOOP 2</b>	<b>\$3,466,567</b>
<u>3</u>	County Road 57	12"	4,100	<b>INCLUDED IN YEAR 2020 OF CIP</b>	
<u>4</u>	CSAH 5/157TH AVE NW	12"	2,700	\$124	\$334,276
				<b>TOTAL LOOP 4</b>	<b>\$334,276</b>
<u>5</u>	158TH LANE NW	12"	3,400	\$124	\$420,940
				<b>TOTAL LOOP 5</b>	<b>\$420,940</b>
<u>6</u>	RIVERDALE BOULEVARD	12"	2,300	<b>INCLUDED IN YEAR 2017 OF CIP</b>	
				<b>SUB-TOTAL</b>	<b>\$6,574,097</b>
				<b>20% CONTINGENCIES FOR UNFORSEEN IMPROVEMENTS</b>	<b>\$1,314,819</b>
				<b>TOTAL IMPROVEMENT COSTS</b>	<b>\$7,888,916</b>
				<b>AVERAGE YEAR FOR 20 YEARS (2017 DOLLARS)</b>	<b>\$394,446</b>
				<b>INFLATED AT 3% PER YEAR TO YEAR 2021</b>	<b>\$443,952</b>

\* INCLUDES 25% INDIRECT COST

**Table 2**  
**Water Utility Rate Impact Summary**  
**City of Ramsey, Minnesota**  
**9/15/2017**

	Actual 2016	Projected / Actual 2017	Projected 2018	Projected 2019	Projected 2020	Projected 2021	Projected 2022	Projected 2023	Projected 2024	Projected 2025	Projected 2026	Projected 2027	Projected 2028	Projected 2029	Projected 2030	Projected 2035	Projected 2040
<b>Beginning Balance</b>		\$ 18,440,114	\$ 18,249,021	\$ 17,702,048	\$ 19,553,332	\$ 20,635,777	\$ 22,190,135	\$ 23,779,713	\$ 23,704,661	\$ 25,339,597	\$ 27,009,720	\$ 28,876,172	\$ 18,784,291	\$ 6,426,591	\$ 7,126,392	\$ 7,072,941	\$ 9,587,285
<b>Water System Revenue</b>																	
New Customers		160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160
Annual Water Sales (gallons/year)		994,500,000	1,006,500,000	1,018,500,000	1,030,500,000	1,042,500,000	1,054,500,000	1,066,500,000	1,078,500,000	1,090,500,000	1,102,500,000	1,114,500,000	1,126,500,000	1,138,500,000	1,150,500,000	1,210,500,000	1,270,500,000
Water Rates (\$/1000 gallons) (Inflated at 2% per year)		\$ 2.57	2.62	2.67	2.73	2.78	2.84	2.89	2.95	3.01	3.07	3.13	3.20	3.26	3.32	3.67	4.05
Water Availability Charge (WAC) (\$/connection) (Inflated at 2.5% per year)		\$ 1,236	1,267	1,299	1,331	1,364	1,398	1,433	1,469	1,506	1,544	1,582	1,622	1,662	1,704	1,928	2,181
Connection/Trunk Charge (\$/connection) (Inflated at 2.5% per year)		\$ 1,720	1,763	1,807	1,852	1,899	1,946	1,995	2,045	2,096	2,148	2,202	2,257	2,313	2,371	2,683	3,035
Water Rate Revenue (Inflated at 2.5% per year)		\$ 2,087,443	\$ 2,139,629	\$ 2,193,120	\$ 2,247,948	\$ 2,304,146	\$ 2,361,750	\$ 2,420,794	\$ 2,481,314	\$ 2,543,347	\$ 2,606,930	\$ 2,672,104	\$ 2,738,906	\$ 2,807,379	\$ 2,877,563	\$ 3,255,699	\$ 3,683,524
WAC Revenue		\$ 197,760	\$ 202,704	\$ 207,772	\$ 212,966	\$ 218,290	\$ 223,747	\$ 229,341	\$ 235,074	\$ 240,951	\$ 246,975	\$ 253,150	\$ 259,478	\$ 265,965	\$ 272,614	\$ 308,438	\$ 348,969
Trunk Revenue		\$ 290,575	\$ 294,230	\$ 297,976	\$ 301,816	\$ 305,752	\$ 309,787	\$ 313,922	\$ 318,161	\$ 322,506	\$ 326,951	\$ 331,496	\$ 336,141	\$ 340,886	\$ 345,731	\$ 399,218	\$ 453,653
Interest Earnings		\$ 184,401	\$ 273,735	\$ 265,531	\$ 293,300	\$ 309,537	\$ 332,852	\$ 356,696	\$ 381,040	\$ 405,484	\$ 430,028	\$ 454,672	\$ 479,416	\$ 504,260	\$ 529,204	\$ 609,948	\$ 690,692
<b>Total Water System Revenue</b>		\$ 2,760,179	\$ 2,910,298	\$ 2,964,398	\$ 3,056,030	\$ 3,137,726	\$ 3,228,136	\$ 3,320,753	\$ 3,414,119	\$ 3,508,284	\$ 3,603,156	\$ 3,700,000	\$ 3,798,926	\$ 3,899,945	\$ 4,003,172	\$ 4,611,924	\$ 5,220,676
<b>Water Utility Expenses - Capital Improvement Projects</b>																	
<b>Miscellaneous Projects</b>																	
Fire Station #1 Extension of Water					\$ 55,000												
County Radio Station ( 3 -Year Funding)		\$ 1,700															
Public Works Campus			\$ 1,715,750														
3/4 Ton Truck				\$ 43,000													
Utility Truck		\$ 25,000	\$ 23,500														
<b>Water Supply &amp; Treatment Improvements</b>																	
Renovate Pump House #3			\$ 60,000														
Construct Well & Pumphouse #9					\$ 75,000		\$ 1,700,000										
Well #1 Rehabilitation		\$ 38,000	\$ 41,000	\$ 44,000	\$ 47,000												
Emergency Supply for Well #3		\$ 115,000															
Well Location Study		\$ 75,000															
Water Treatment Facility - 10 MGD Groundwater											\$ 12,000,000	\$ 12,000,000					
<b>Water Storage Improvements</b>																	
Refurbish Water Tower #1		\$ 1,300,000															
Refurbish Water Tower #2			\$ 700,000														
Maintain Water Tower #3				\$ 75,000													
<b>Distribution System Improvements</b>																	
River Pines Lift Station Water Connection					\$ 20,000												
<b>Distribution System Maintenance Improvements</b>																	
Watermain Looping Bunker Lake Blvd.					\$ 340,000												
Watermain Looping Sunfish Lake Blvd.					\$ 450,000												
Watermain Looping Ramsey Blvd to Traprock		\$ 129,250															
Watermain Bunker Lake Boulevard - Business Park		\$ 162,842															
Watermain Puma Street - Business Park		\$ 220,226															
<b>2021 through 2040 Projected Improvements</b>																	
Distribution System					\$ 443,952	\$ 457,271	\$ 470,989	\$ 485,118	\$ 499,672	\$ 514,662	\$ 530,102	\$ 546,005	\$ 562,385	\$ 579,257	\$ 671,517	\$ 778,473	
Construct Well & Pumphouse #10											\$ 2,138,641						
Storage Tower 3 Rehabilitation														\$ 3,025,179			
Well Service and Pump Maintenance (8 wells)					\$ 115,927	\$ 119,405	\$ 122,987	\$ 126,677	\$ 130,477	\$ 134,391	\$ 138,423	\$ 142,576					
<b>Subtotal- Capital Expenses</b>		\$ 2,067,018	\$ 2,540,250	\$ 162,000	\$ 987,000	\$ 559,879	\$ 576,675	\$ 2,293,976	\$ 611,795	\$ 630,149	\$ 649,053	\$ 12,668,525	\$ 14,827,222	\$ 562,385	\$ 3,604,436	\$ 671,517	\$ 778,473
<b>Operational Expenses</b>																	
<b>Operating Expense- Distribution and Administration (Inflated at 4% per year)</b>		\$ 836,662	\$ 870,128	\$ 904,934	\$ 941,131	\$ 978,776	\$ 1,017,927	\$ 1,058,644	\$ 1,100,990	\$ 1,145,030	\$ 1,190,831	\$ 1,238,464	\$ 1,288,003	\$ 1,339,523	\$ 1,393,104	\$ 1,694,924	\$ 2,062,134
<b>Operating Expense- Treatment (Inflated at 3% per year)</b>													\$ 1,000,000	\$ 1,030,000	\$ 1,194,052	\$ 1,384,234	
<b>Subtotal- Operating Expense</b>		\$ 836,662	\$ 870,128	\$ 904,934	\$ 941,131	\$ 978,776	\$ 1,017,927	\$ 1,058,644	\$ 1,100,990	\$ 1,145,030	\$ 1,190,831	\$ 1,238,464	\$ 1,288,003	\$ 2,339,523	\$ 2,423,104	\$ 2,888,976	\$ 3,446,368
<b>Total Annual Expenses</b>		\$ 2,903,680	\$ 3,410,378	\$ 1,066,934	\$ 1,928,131	\$ 1,538,655	\$ 1,594,603	\$ 3,352,620	\$ 1,712,785	\$ 1,775,178	\$ 1,839,884	\$ 13,906,989	\$ 16,115,224	\$ 2,901,908	\$ 6,027,539	\$ 3,560,493	\$ 4,224,840
<b>Finance Adjustments</b>																	
Trunk Charges Returned per John Peterson's agreement (thru 2025)		\$ (144,375)	\$ (144,375)	\$ (144,375)	\$ (144,375)	\$ (144,375)	\$ (144,375)	\$ (144,375)	\$ (144,375)	\$ (144,375)							
PW Land/Building - Internal Loan 2009-2028 @2%		\$ 34,930	\$ 35,629	\$ 36,341	\$ 37,068	\$ 37,810	\$ 38,566	\$ 39,337	\$ 40,124	\$ 40,926	\$ 41,745	\$ 42,580	\$ 54,436				
Internal Loan to offset Muni Center Debt beginning year 2011-2030@2%		\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853	\$ 61,853		
Internal Loan for RTC Land Purchase- 10 yr@2% when land sold																	
Net Finance Adjustments		\$ (47,592)	\$ (46,893)	\$ (46,181)	\$ (45,454)	\$ (44,712)	\$ (43,956)	\$ (43,185)	\$ (42,398)	\$ (41,596)	\$ 103,598	\$ 104,433	\$ 116,289	\$ 61,853	\$ 61,853		
<b>Water System Working Capital Balance</b>																	
Total Annual Expenses		\$ 2,903,680	\$ 3,410,378	\$ 1,066,934	\$ 1,928,131	\$ 1,538,655	\$ 1,594,603	\$ 3,352,620	\$ 1,712,785	\$ 1,775,178	\$ 1,839,884	\$ 13,906,989	\$ 16,115,224	\$ 2,901,908	\$ 6,027,539	\$ 3,560,493	\$ 4,224,840
Total System revenue		\$ 2,712,587	\$ 2,863,405	\$ 2,918,217	\$ 3,010,576	\$ 3,093,014	\$ 3,184,180	\$ 3,277,568	\$ 3,347,721	\$ 3,445,301	\$ 3,706,336	\$ 3,815,108	\$ 3,757,524	\$ 3,601,709	\$ 3,698,293	\$ 4,099,449	\$ 4,661,924
Net Income (loss)		\$ (191,093)	\$ (546,973)	\$ 1,851,284	\$ 1,082,445	\$ 1,554,358	\$ 1,589,578	\$ (75,052)	\$ 1,634,936	\$ 1,670,123	\$ 1,866,452	\$ (10,091,881)	\$ (12,357,700)	\$ 699,801	\$ (2,329,247)	\$ 538,956	\$ 437,084
Beginning Water Working Capital Balance		\$ 18,440,114	\$ 18,249,021	\$ 17,702,048	\$ 19,553,332	\$ 20,635,777	\$ 22,190,135	\$ 23,779,713	\$ 23,704,661	\$ 25,339,597	\$ 27,009,720	\$ 28,876,172	\$ 18,784,291	\$ 6,426,591	\$ 7,126,392	\$ 7,072,941	\$ 9,587,285
<b>Remaining Working Capital Balance</b>		\$ 18,440,114	\$ 18,249,021	\$ 17,702,048	\$ 19,553,332	\$ 20,635,777	\$ 22,190,135	\$ 23,779,713	\$ 23,704,661	\$ 25,339,597	\$ 27,009,720	\$ 28,876,172	\$ 18,784,291	\$ 6,426,591	\$ 7,126,392	\$ 4,797,145	\$ 10,024,369



# CITY OF RAMSEY MINNESOTA

## FIGURE 1

PROPOSED WATER SYSTEM IMPROVEMENTS  
COMPREHENSIVE WATER PLAN  
SEPTEMBER 2017

### LEGEND

	EXISTING WELL		12" PROPOSED WATERMAIN
	WATER TOWER	<b>LOOP</b>	<b>LOCATION</b>
	SERVICE AREA BOUNDARIES	①	SOUTHWEST LOOP
	EXISTING 24" TRUNK MAIN	②	NORTH CENTRAL LOOP
	EXISTING 16" TRUNK MAIN	③	COUNTY ROAD 57
	EXISTING 12" TRUNK MAIN	④	CSAH 5/157th AVE NW
		⑤	158th LANE NW
		⑥	RIVERDALE BOULEVARD

NOTE:  
The information for this map was obtained from various sources of existing maps, construction plans, and City records, some of which were prepared by others. While this information is believed to be reliable Bolton & Menk, Inc. is not responsible for its accuracy nor for errors or omissions which may have been incorporated into this document as a result.

**Submittal to DNR and Metropolitan Council Incorporating DNR comments**

# City of Ramsey Local Water Supply Plan Third Generation for 2016-2018

*Formerly called Water Emergency & Water Conservation Plan*





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This information is available in an alternative format upon request.

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DEPARTMENT OF NATURAL RESOURCES – DIVISION OF ECOLOGICAL AND  
WATER RESOURCES AND METROPOLITAN COUNCIL

## **INTRODUCTION TO WATER SUPPLY PLANS (WSP)**

### **Who needs to complete a Water Supply Plan**

Public water suppliers serving more than 1,000 people, large private water suppliers in designated Groundwater Management Areas, and all water suppliers in the Twin Cities metropolitan area are required to prepare and submit a water supply plan.

The goal of the WSP is to help water suppliers: 1) implement long term water sustainability and conservation measures; and 2) develop critical emergency preparedness measures. Your community needs to know what measures will be implemented in case of a water crisis. A lot of emergencies can be avoided or mitigated if long term sustainability measures are implemented.

### **Groundwater Management Areas (GWMA)**

The DNR has designated three areas of the state as Groundwater Management Areas (GWMAs) to focus groundwater management efforts in specific geographies where there is an added risk of overuse or water quality degradation. A plan directing the DNR's actions within each GWMA has been prepared. Although there are no specific additional requirements with respect to the water supply planning for communities within designated GWMAs, communities should be aware of the issues and actions planned if they are within the boundary of one of the GWMAs. The three GWMAs are the North and East Metro GWMA (Twin Cities Metro), the Bonanza Valley GWMA and the Straight River GWMA (near Park Rapids). Additional information and maps are included in the DNR webpage at <http://www.dnr.state.mn.us/gwmp/areas.html>

### **Benefits of completing a WSP**

Completing a WSP using this template, fulfills a water supplier's statutory obligations under M.S. [M.S.103G.291](#) to complete a water supply plan. For water suppliers in the metropolitan area, the WSP will help local governmental units to fulfill their requirements under M.S. 473.859 to complete a local comprehensive plan. Additional benefits of completing WSP template:

- The standardized format allows for quicker and easier review and approval.
- Help water suppliers prepare for droughts and water emergencies.
- Create eligibility for funding requests to the Minnesota Department of Health (MDH) for the Drinking Water Revolving Fund.
- Allow water suppliers to submit requests for new wells or expanded capacity of existing wells.
- Simplify the development of county comprehensive water plans and watershed plans.

- Fulfill the contingency plan provisions required in the MDH wellhead protection and surface water protection plans.
- Fulfill the demand reduction requirements of Minnesota Statutes, section 103G.291 subd 3 and 4.
- Upon implementation, contribute to maintaining aquifer levels, reducing potential well interference and water use conflicts, and reducing the need to drill new wells or expand system capacity.
- Enable DNR to compile and analyze water use and conservation data to help guide decisions.
- Conserve Minnesota's water resources

If your community needs assistance completing the Water Supply Plan, assistance is available from your area hydrologist or groundwater specialist, the MN Rural Waters Association circuit rider program, or in the metropolitan area from Metropolitan Council staff. Many private consultants are also available.

## **WSP Approval Process**

### **10 Basic Steps for completing a 10-Year Water Supply Plan**

1. Download the DNR/Metropolitan Council Water Supply Plan Template  
[www.mndnr.gov/watersupplyplans](http://www.mndnr.gov/watersupplyplans)
2. Save the document with a file name with this naming convention:  
WSP\_cityname\_permitnumber\_date.doc.
3. The template is a form that should be completed electronically.
4. Compile the required water use data (Part 1) and emergency procedures information (Part 2)
5. The Water Conservation section (Part 3) may need discussion with the water department, council, or planning commission, if your community does not already have an active water conservation program.
6. Communities in the seven-county Twin Cities metropolitan area should complete all the information discussed in Part 4. The Metropolitan Council has additional guidance information on their webpage <http://www.metrocouncil.org/Handbook/Plan-Elements/Water-Resources/Water-Supply.aspx>. All out-state water suppliers do *not* need to complete the content addressed in Part 4.
7. Use the Plan instructions and Checklist document to insure all data is complete and attachments are included. This will allow for a quicker approval process.  
[www.mndnr.gov/watersupplyplans](http://www.mndnr.gov/watersupplyplans)
8. Plans should be submitted electronically – no paper documents are required.  
<https://webapps11.dnr.state.mn.us/mpars/public/authentication/login>

*City of Ramsey Local Water Supply Plan*

9. DNR hydrologist will review plans (in cooperation with Metropolitan Council in Metro area) and approve the plan or make recommendations.
10. Once approved, communities should complete a Certification of Adoption form, and send a copy to the DNR.

Complete Table 1 with information about the public water supply system covered by this WSP.

**Table 1. General information regarding this WSP**

<b>Requested Information</b>	<b>Description</b>
DNR Water Appropriation Permit Number(s)	<b>1985-6005</b>
Ownership	<input checked="" type="checkbox"/> Public or <input type="checkbox"/> Private
Metropolitan Council Area	<input checked="" type="checkbox"/> Yes or <input type="checkbox"/> No (and county name)
Street Address	<b>7550 Sunwood Drive, NW</b>
City, State, Zip	<b>Ramsey, MN 55303</b>
Contact Person Name	<b>John Nelson</b>
Title	<b>Utilities Supervisor</b>
Phone Number	763 286-0296
MDH Supplier Classification	Municipal

## **PART 1. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION**

The first step in any water supply analysis is to assess the current status of demand and availability. Information summarized in Part 1 can be used to develop Emergency Preparedness Procedures (Part 2) and the Water Conservation Plan (Part 3). This data is also needed to track progress for water efficiency measures.

### **A. Analysis of Water Demand**

Complete Table 2 showing the past 10 years of water demand data.

- Some of this information may be in your Wellhead Protection Plan.
- If you do not have this information, do your best, call your engineer for assistance or if necessary leave blank.

If your customer categories are different than the ones listed in Table 2, please describe the differences below:

Wholesale deliveries are not part of Ramsey Water Demand
--

**Table 2. Historic water demand (see definitions in the glossary after Part 4 of this template)**

Year	Pop. Served	Total Connections	Residential Water Delivered (MG)	C/I/I Water Delivered (MG)	Water used for Non-essential	Wholesale Deliveries (MG)	Total Water Delivered (MG)	Total Water Pumped (MG)	Water Supplier Services	Percent Unmetered/Unaccounted	Average Daily Demand (MGD)	Max. Daily Demand (MGD)	Date of Max. Demand	Residential Per Capita Demand (GPCD)	Total per capita Demand (GPCD)
2005	8,717	3307	327	200	20	N/A	542	576	N/A	8.50%	1.58	5.2	Jul-15	103	170
2006	9,263	3544	392	249	21	N/A	661	686	N/A	6.62%	1.88	5.6	Jul-10	116	196
2007	9,702	3720	424	244	35	N/A	704	705	N/A	5.23%	1.93	5.2	Jul-30	120	199
2008	10,101	3776	370	255	35	N/A	625	627	N/A	0.30%	1.72	5.2	Jul-06	100	170
2009	10,540	3820	397	226	30	N/A	623	640	N/A	2.70%	1.75	4.6	Jun-04	103	162
2010	11,669	3879	375	217	28	N/A	620	628	N/A	5.70%	1.72	4.1	Jul-06	88	146
2011	11,807	3901	353	205	20	N/A	577	590	N/A	5.42%	1.62	4.6	Jul-10	82	134
2012	11,987	3957	418	233	28	N/A	680	690	N/A	5.65%	1.89	5.5	Jul-25	96	155
2013	12,838	4050	386	213	18	N/A	617	620	N/A	3.34%	1.70	5.0	Aug-26	82	132
2014	13,535	4110	343	224	20	N/A	552	588	N/A	3.52%	1.61	4.6	Jul-23	69	112
2015	13,774	4186	360	231	22	N/A	613	661	N/A	10.63%	1.81	4.5	Aug-05	72	122
Avg. 2010-2015	12,602	4,014	373	221	23		610	629		5.71%	1.72	4.7		81	131

**MG** – Million Gallons      **MGD** – Million Gallons per Day      **GPCD** – Gallons per Capita per Day

See Glossary for definitions

**Table 3. Historic water demand (see definitions in the glossary after Part 4 of this template)**

Complete Table 3 by listing the top 10 water users by volume, from largest to smallest. For each user, include information about the category of use (residential, commercial, industrial, institutional, or wholesale), the amount of water used in gallons per year, the percent of total water delivered, and the status of water conservation measures.

**Table 3. Large volume users**

Customer Rank	Name	Use Category (Residential, Industrial, Commercial, Institutional, Wholesale)	Amount Used (Gallons per Year)	Percent of Total Annual Water Delivered	Implementing Water Conservation Measures? (Yes/No/Unknown)
1	City, Buildings and Park Irrigation	IRRIGATION	26,163,000	5.39	YES
2	Vision Ease Lens, Inc.	INDUSTRIAL	23,634,000	4.87	YES
3	Alpine Acres	IRRIGATION	12,518,000	2.58	UNKNOWN
4	Oak Terrace Park Properties	RESIDENTIAL	7,669,000	1.58	UNKNOWN
5	Cove at Mississippi	IRRIGATION	6,494,000	1.34	UNKNOWN
6	Holiday Companies #395 Ramsey Blvd	COMMERCIAL	5,076,000	1.05	UNKNOWN
7	Life Fitness	INDUSTRIAL	4,696,000	0.97	YES
8	Holiday Station Stores #323 TH 47	COMMERCIAL	4,351,000	0.90	UNKNOWN
9	Comfort Suites	COMMERCIAL	4,170,000	0.86	YES
10	Sauter & Sons, Inc.	INDUSTRIAL	4,109,000	0.85	UNKNOWN

**B. Treatment and Storage Capacity**

Complete Table 4 with a description of where water is treated, the year treatment facilities were constructed, water treatment capacity, the treatment methods (i.e. chemical addition, reverse osmosis, coagulation, sedimentation, etc.) and treatment types used (i.e. fluoridation, softening, chlorination, Fe/MN removal, coagulation, etc.). Also describe the annual amount and method of disposal of treatment residuals. Add rows to the table as needed.

**Table 4. Water treatment capacity and treatment processes**

Treatment Site ID (Plant Name or Well ID)	Year Constructed	Treatment Capacity (GPD)	Treatment Method	Treatment Type	Annual Amount of Residuals	Disposal Process for Residuals	Do You Reclaim Filter Backwash Water?
Pump House 1 Wells 1 & 2	1989	1,368,000	Chemical addition	Chlorination, fluoridation, Ortho Polyphosphate C5	N/A	N/A	N/A
Pump House 2 Well 3	1997	2,304,000	Chemical addition	Chlorination, fluoridation, Ortho Polyphosphate C5	N/A	N/A	N/A
Well 4 added to Pump house 2	1998	1,224,000	Chemical addition	Chlorination, fluoridation, Ortho Polyphosphate C5	N/A	N/A	N/A
Pump House 3 Well 5	2000	1,224,000	Chemical addition	Chlorination, fluoridation, Ortho Polyphosphate C5	N/A	N/A	N/A
Well 6 added to Pump House 3	2005	1,296,000					N/A
Pump House 4 Wells 7 & 8	2007	3,528,000	Chemical addition	Chlorination, fluoridation, Ortho Polyphosphate C5	N/A	N/A	N/A
<b>Total</b>	<b>NA</b>	<b>10,944,000</b>	<b>NA</b>	<b>NA</b>		<b>NA</b>	

Complete Table 5 with information about storage structures. Describe the type (i.e. elevated, ground, etc.), the storage capacity of each type of structure, the year each structure was constructed, and the primary material for each structure. Add rows to the table as needed.

**Table 5. Storage capacity, as of the end of the last calendar year**

Structure Name	Type of Storage Structure	Year Constructed	Primary Material	Storage Capacity (Gallons)
1	Elevated storage	1989	Steel	500,000
2	Elevated storage	2000	Steel	1,500,000
3	Elevated storage	2010	Steel	2,000,000
Total	NA	NA	NA	4,000,000

## Treatment and storage capacity versus demand

It is recommended that total storage equal or exceed the average daily demand.

Discuss the difference between current storage and treatment capacity versus the water supplier’s projected average water demand over the next 10 years (see Table 7 for projected water demand):

The current treatment capacity is 11 MGD and storage is 4 MGD. Average day demand is projected to increase from 1.81 MGD in 2015 to 2.38 MGD in 2025. The additional 0.57 MGD of demand is within the system’s storage and treatment capacity based on Ten States Standards recommendation 7.0.1 that total storage shall equal the average daily consumption.

### C. Water Sources

Complete Table 6 by listing all types of water sources that supply water to the system, including groundwater, surface water, interconnections with other water suppliers, or others. Provide the name of each source (aquifer name, river or lake name, name of interconnecting water supplier) and the Minnesota unique well number or intake ID, as appropriate. Report the year the source was installed or established and the current capacity. Provide information about the depth of all wells. Describe the status of the source (active, inactive, emergency only, retail/wholesale interconnection) and if the source facilities have a dedicated emergency power source. Add rows to the table as needed for each installation.

Include copies of well records and maintenance summary for each well that has occurred since your last approved plan in **Appendix 1**.

**Table 6. Water sources and status**

Resource Type (Groundwater, Surface water, Interconnection)	Resource Name	MN Unique Well # or Intake ID	Year Installed	Capacity (Gallons per Minute)	Well Depth (Feet)	Status of Normal and Emergency Operations (active, inactive, emergency only, retail/wholesale interconnection))	Does this Source have a Dedicated Emergency Power Source? (Yes or No)
Groundwater	Well #1	161441	1984	700	320	Active	No
Groundwater	Well #2	416183	1987	220	320	Active	No
Groundwater	Well #3	580303	1997	1450	345	Active	No
Groundwater	Well #4	580313	1998	850	321	Active	No
Groundwater	Well #5	593672	2000	850	316	Active	Yes
Groundwater	Well #6	706840	2005	900	390	Active	No
Groundwater	Well #7	743832	2007	850	332	Active	No
Groundwater	Well #8	743833	2007	1400	354	Active	No

### Limits on Emergency Interconnections

Discuss any limitations on the use of the water sources (e.g. not to be operated simultaneously, limitations due to blending, aquifer recovery issues etc.) and the use of interconnections,

including capacity limits or timing constraints (i.e. only 200 gallons per minute are available from the City of Prior Lake, and it is estimated to take 6 hours to establish the emergency connection). If there are no limitations, list none.

Well 2 is used to meet seasonal peak demands only. The City has two (2) interconnections with Anoka, one is hard piped and one uses hoses.

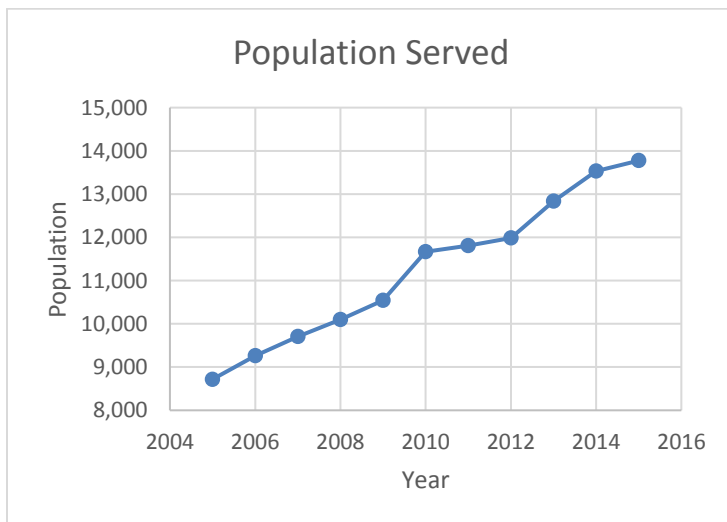
### D. Future Demand Projections – Key Metropolitan Council Benchmark

#### Water Use Trends

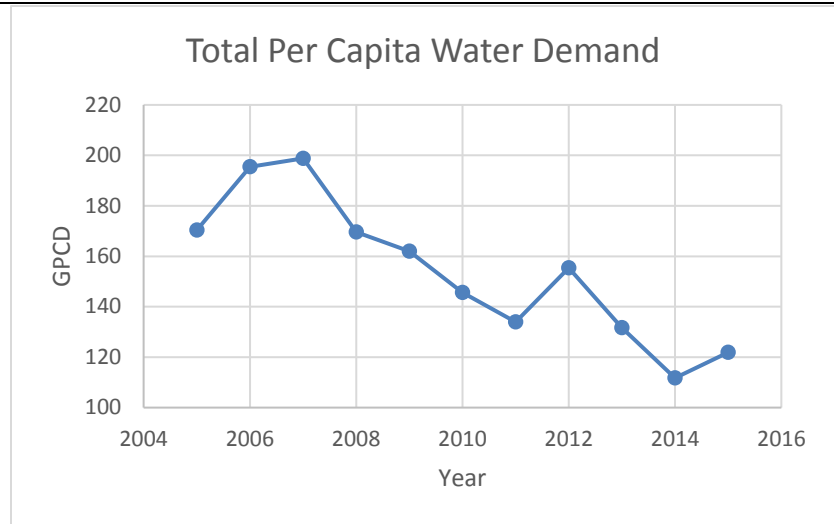
Use the data in Table 2 to describe trends in 1) population served; 2) total per capita water demand; 3) average daily demand; 4) maximum daily demand. Then explain the causes for upward or downward trends. For example, over the ten years has the average daily demand trended up or down? Why is this occurring?

The following trends are observed:

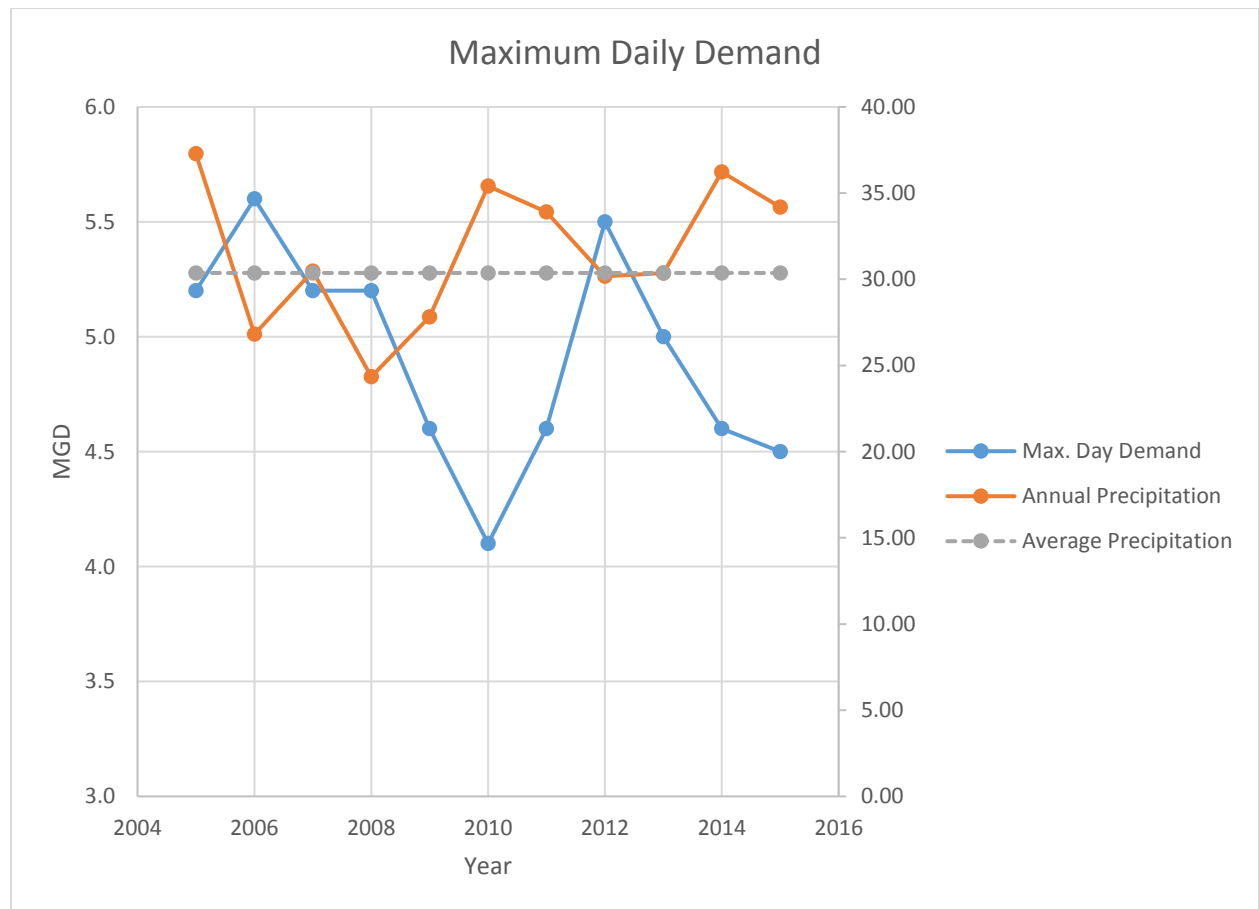
1. Population served increased to a peak in 2010, then dipped in 2011 and increased again. See graph below. The overall upward trend is caused by new connections added each year and construction that occurred in the past 10 years. There have been about 60 connections added per year on average over the last 5 years.



2. The total per capita water demand decreased from 170 GPCD in 2005 to 122 GPCD in 2015. Between 2005 and 2015, water use peaked at 196 GPCD and 199 GPCD in 2006 and 2007 respectively. The 5 year average from 2011 to 2015 was 131 GPCD. Several measures may have contributed to the overall decrease in total per capita water use, including replacing all residential meters in a 5 year period, implementation and enforcement of a new topsoil ordinance, changing the rate structure and increased enforcement of irrigation restrictions.



3. The average daily demand has fluctuated some between 2005 and 2015. Demand peaked in 2012, declined through 2014 then increased in 2015. The increased demand correlates with an uptick in housing construction in 2014 -2015.



4. The maximum daily demand decreased from 2006 to 2010, then increased until 2012 then decreased again to 2015. The decreasing trend is due to higher efficiency appliances, sprinkling bans and other conservation measures. The city had a flat fee residential rate structure in 2005. This was changed to a 7 tier sliding rate structure in 2006, with the rate increasing when each level. The City also has an escalating series of fines and penalties including water shutoff for those who consistently violate the odd-even sprinkling ban. The overall increase can be attributed to adding new customers as noted above. The spike in maximum daily demand in 2012 corresponds to two extremely dry months, August and September. These months saw less than one inch of precipitation in each month while the average is over 3.5 inches per month. The month of May saw 3 times the normal precipitation; however, eight (8) of the months were drier than normal. The year ended with close to normal precipitation.

Use the water use trend information discussed above to complete Table 7 with projected annual demand for the next ten years. Communities in the seven-county Twin Cities metropolitan area must also include projections for 2030 and 2040 as part of their local comprehensive planning.

Projected demand should be consistent with trends evident in the historical data in Table 2, as discussed above. Projected demand should also reflect state demographer population projections and/or other planning projections.

**Table 7. Projected annual water demand**

Year	Projected Total Population	Projected Population Served	Projected Total Per Capita Water Demand (GPCD)	Projected Average Daily Demand (MGD)	Projected Maximum Daily Demand (MGD)
2016	25,308	12,252	131	1.6050	4.6545
2017	25,581	12,524	131	1.6406	4.7579
2018	25,854	12,796	131	1.6763	4.8612
2019	26,127	13,068	131	1.7119	4.9645
2020	26,400	13,340	131	1.7475	5.0679
2021	26,830	14,150	131	1.8537	5.3756
2022	27,260	14,960	131	1.9598	5.6833
2023	27,690	15,770	131	2.0659	5.9910
2024	28,120	16,580	131	2.1720	6.2987
2025	28,550	17,390	131	2.2781	6.6065
2030	30,700	21,160	131	2.7720	8.0387
2040	34,700	23,920	131	3.1335	9.0872

GPCD – Gallons per Capita per Day

MGD – Million Gallons per Day

### Projection Method

Describe the method used to project water demand, including assumptions for population and business growth and how water conservation and efficiency programs affect projected water demand:

Populations were projected using linear interpolation of Metropolitan Council projections given in the 2015 System Statement for Ramsey.

The projected population served was estimated by multiplying the projected person per household by the projected residential connections. The projected residential connections were calculated by taking the average for the annual increase in residential connections from 2011 to 2015. (60 residential connections added per year) and added onto the 2015 actual residential connections and extrapolated out to 2040. The person/ household (PPH) was calculated to decrease from 3.1 in 2017 to 2.7 in 2040 by taking the projected total population and dividing it by the projected total households.

The average day demand was determined by multiplying the projected population served by 131 gallons per person per day (GPCD). The value 131 GPCD is the average GPCD for the last five years. The maximum daily demand was determined by multiplying the average day demand by 2.90, which is the max day peaking factor.

### E. Resource Sustainability

#### Monitoring – Key DNR Benchmark

Complete Table 8 by inserting information about source water quality and quantity monitoring efforts. List should include all production wells, observation wells, and source water intakes or reservoirs. Add rows to the table as needed. Find information on groundwater level monitoring program at: [http://www.dnr.state.mn.us/waters/groundwater\\_section/obwell/index.html](http://www.dnr.state.mn.us/waters/groundwater_section/obwell/index.html)

**Table 8. Information about source water quality and quantity monitoring**

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
161441	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input checked="" type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
416183	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input checked="" type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
580303	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input checked="" type="checkbox"/> monthly	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge

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MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
	<input type="checkbox"/> source water reservoir	<input type="checkbox"/> other	<input type="checkbox"/> quarterly <input type="checkbox"/> annually	
580313	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input checked="" type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
593672	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input checked="" type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
706814	<input type="checkbox"/> production well <input checked="" type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input checked="" type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
706815	<input type="checkbox"/> production well <input checked="" type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
706840	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input checked="" type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
731127	<input type="checkbox"/> production well <input checked="" type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
743832	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input checked="" type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
713833	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well	<input type="checkbox"/> routine MDH sampling	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
	<input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input checked="" type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input type="checkbox"/> stream gauge
759582	<input type="checkbox"/> production well <input checked="" type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge

### Water Level Data

A water level monitoring plan that includes monitoring locations and a schedule for water level readings must be submitted as **Appendix 2**. If one does not already exist, it needs to be prepared and submitted with the WSP. Ideally, all production and observation wells are monitored at least monthly.

Complete Table 9 to summarize water level data for each well being monitored. Provide the name of the aquifer and a brief description of how much water levels vary over the season (the difference between the highest and lowest water levels measured during the year) and the long-term trends for each well. If water levels are not measured and recorded on a routine basis, then provide the static water level when each well was constructed and the most recent water level measured during the same season the well was constructed. Also include all water level data taken during any well and pump maintenance. Add rows to the table as needed. Provide water level data graphs for each well in **Appendix 3** for the life of the well, or for as many years as water levels have been measured. See DNR website for Date Time Water Level [http://www.dnr.state.mn.us/waters/groundwater\\_section/obwell/waterleveldata.html](http://www.dnr.state.mn.us/waters/groundwater_section/obwell/waterleveldata.html)

**Table 9. Water level data**

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet)	Long-term Trend in water level data	Water level measured during well/pumping maintenance
161441	Tunnel City Group	25	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY: N/A MM/DD/YY: ____ MM/DD/YY: ____
416183	Tunnel City Group	0	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY: N/A MM/DD/YY: ____ MM/DD/YY: ____
580303	Tunnel City Group	10	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY: N/A MM/DD/YY: ____ MM/DD/YY: ____
580313	Tunnel City Group	40	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable	MM/DD/YY: N/A MM/DD/YY: ____

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet)	Long-term Trend in water level data	Water level measured during well/pumping maintenance
			<input type="checkbox"/> Rising	MM/DD/YY: ____
593672	Tunnel City Group	90	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY: N/A MM/DD/YY: ____ MM/DD/YY: ____
706840	Tunnel City Group	70	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY: N/A MM/DD/YY: ____ MM/DD/YY: ____
743832	Tunnel City Group	130	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY: N/A MM/DD/YY: ____ MM/DD/YY: ____
713833	Tunnel City Group	160	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY: N/A MM/DD/YY: ____ MM/DD/YY: ____

**Potential Water Supply Issues & Natural Resource Impacts – Key DNR & Metropolitan Council Benchmark**

Complete Table 10 by listing the types of natural resources that are or could be impacted by permitted water withdrawals. If known, provide the name of specific resources that may be impacted. Identify what the greatest risks to the resource are and how the risks are being assessed. Identify any resource protection thresholds – formal or informal – that have been established to identify when actions should be taken to mitigate impacts. Provide information about the potential mitigation actions that may be taken, if a resource protection threshold is crossed. Add additional rows to the table as needed. See glossary at the end of the template for definitions.

Some of this baseline data should have been in your earlier water supply plans or county comprehensive water plans. When filling out this table, think of what are the water supply risks, identify the resources, determine the threshold and then determine what your community will do to mitigate the impacts.

Your DNR area hydrologist is available to assist with this table.

For communities in the seven-county Twin Cities metropolitan area, the *Master Water Supply Plan Appendix 1 (Water Supply Profiles)*, provides information about potential water supply issues and natural resource impacts for your community.

**Table 10. Natural resource impacts**

City of Ramsey Local Water Supply Plan

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold*	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
<input type="checkbox"/> River or stream	N/A	<input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends and/or MCLs exceeded <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts <input type="checkbox"/> Other: _____	<input type="checkbox"/> GIS analysis <input type="checkbox"/> Modeling <input type="checkbox"/> Mapping <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> Other: _____		<input type="checkbox"/> Revise permit <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other	
<input type="checkbox"/> Calcareous fen	N/A	<input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends and/or MCLs exceeded <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts <input type="checkbox"/> Other: _____	<input type="checkbox"/> GIS analysis <input type="checkbox"/> Modeling <input type="checkbox"/> Mapping <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> Other: _____		<input type="checkbox"/> Revise permit <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other	
<input type="checkbox"/> Lake	N/A	<input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends and/or MCLs exceeded <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts	<input type="checkbox"/> GIS analysis <input type="checkbox"/> Modeling <input type="checkbox"/> Mapping <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> Other: _____		<input type="checkbox"/> Revise permit <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other	

City of Ramsey Local Water Supply Plan

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold*	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
		<input type="checkbox"/> Other: _____				
<input type="checkbox"/> Wetland	N/A	<input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends and/or MCLs exceeded <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts <input type="checkbox"/> Other: _____	<input type="checkbox"/> GIS analysis <input type="checkbox"/> Modeling <input type="checkbox"/> Mapping <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> Other: ____		<input type="checkbox"/> Revise permit <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other	
<input type="checkbox"/> Trout stream	N/A	<input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends and/or MCLs exceeded <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts <input type="checkbox"/> Other: _____	<input type="checkbox"/> GIS analysis <input type="checkbox"/> Modeling <input type="checkbox"/> Mapping <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> Other: ____		<input type="checkbox"/> Revise permit <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other	
<input checked="" type="checkbox"/> Aquifer	Tunnel City Group	<input checked="" type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends and/or MCLs exceeded <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat or other natural	<input type="checkbox"/> GIS analysis <input type="checkbox"/> Modeling <input type="checkbox"/> Mapping <input checked="" type="checkbox"/> Monitoring <input checked="" type="checkbox"/> Aquifer testing <input type="checkbox"/> Other: ____		<input type="checkbox"/> Revise permit <input type="checkbox"/> Change groundwater pumping <input checked="" type="checkbox"/> Increase conservation <input type="checkbox"/> Other	

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold*	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
		resource impacts <input type="checkbox"/> Other: _____				
<input type="checkbox"/> Endangered, threatened, or special concern species habitat, other natural resource impacts	N/A	<input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends and/or MCLs exceeded <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts <input type="checkbox"/> Other: _____	<input type="checkbox"/> GIS analysis <input type="checkbox"/> Modeling <input type="checkbox"/> Mapping <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> Other: _____		<input type="checkbox"/> Revise permit <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other	

\* Examples of thresholds: a lower limit on acceptable flow in a river or stream; water quality outside of an accepted range; a lower limit on acceptable aquifer level decline at one or more monitoring wells; withdrawals that exceed some percent of the total amount available from a source; or a lower limit on acceptable changes to a protected habitat.

**Wellhead Protection (WHP) and Surface Water Protection (SWP) Plans**

Complete Table 11 to provide status information about WHP and SWP plans.

The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health’s (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.

**Table 11. Status of Wellhead Protection and Surface Water Protection Plans**

Plan Type	Status	Date Adopted	Date for Update
WHP	<input type="checkbox"/> In Process <input checked="" type="checkbox"/> Completed <input type="checkbox"/> Not Applicable	August 11, 2009	August 2019
SWP	<input type="checkbox"/> In Process <input type="checkbox"/> Completed <input checked="" type="checkbox"/> Not Applicable		

**F. Capital Improvement Plan (CIP)**

Please note that any wells that received approval under a ten-year permit, but that were not built, are now expired and must submit a water appropriations permit.

**Adequacy of Water Supply System**

Complete Table 12 with information about the adequacy of wells and/or intakes, storage facilities, treatment facilities, and distribution systems to sustain current and projected demands. List planned capital improvements for any system components, in chronological order. Communities in the seven-county Twin Cities metropolitan area should also include information about plans through 2040.

The assessment can be the general status by category; it is not necessary to identify every single well, storage facility, treatment facility, lift station, and mile of pipe.

Please attach your latest Capital Improvement Plan as **Appendix 4**.

**Table 12. Adequacy of Water Supply System**

System Component	Planned action	Anticipated Construction Year	Notes
Wells/Intakes	<input type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input checked="" type="checkbox"/> Expansion/addition	2021 based on current demands and future projections	
Water Storage Facilities	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		
Water Treatment Facilities	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		
Distribution Systems (pipes, valves, etc.)	<input type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input checked="" type="checkbox"/> Expansion/addition	Based on development needs	

System Component	Planned action	Anticipated Construction Year	Notes
Pressure Zones	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		
Other:	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		

### Proposed Future Water Sources

Complete Table 13 to identify new water source installation planned over the next ten years. Add rows to the table as needed.

**Table 13. Proposed future installations/sources**

Source	Installation Location (approximate)	Resource Name	Proposed Pumping Capacity (gpm)	Planned Installation Year	Planned Partnerships
Groundwater	TBD	Tunnel City Group	1500	2020	
Surface Water	N/A				
Interconnection to another supplier	N/A				

### Water Source Alternatives - Key Metropolitan Council Benchmark

Do you anticipate the need for alternative water sources in the next 10 years? Yes  No   
 For metro communities, will you need alternative water sources by the year 2040? Yes   
 No

**If you answered yes for either question, then complete table 14. If no, insert NA.**

Complete Table 14 by checking the box next to alternative approaches that your community is considering, including approximate locations (if known), the estimated amount of future demand that could be met through the approach, the estimated timeframe to implement the approach, potential partnerships, and the major benefits and challenges of the approach. Add rows to the table as needed.

For communities in the seven-county Twin Cities metropolitan area, these alternatives should include approaches the community is considering to meet projected 2040 water demand.

**Table 14. Alternative water sources**

Alternative Source Considered	Source and/or Installation Location (approximate)	Estimated Amount of Future Demand (%)	Timeframe to Implement (YYYY)	Potential Partners	Benefits	Challenges
<input type="checkbox"/> Groundwater	N/A					
<input checked="" type="checkbox"/> Surface Water	Mississippi River	100	2030	Met Council, Regional Partners	Current source aquifer lateral extent and capacity is unknown. Surface water connection would provide known supply.	Cost of new Water treatment plant and intake
<input type="checkbox"/> Reclaimed stormwater	N/A					
<input type="checkbox"/> Reclaimed wastewater	N/A					
<input type="checkbox"/> Interconnection to another supplier	N/A					

## Part 2. Emergency Preparedness Procedures

The emergency preparedness procedures outlined in this plan are intended to comply with the contingency plan provisions required by MDH in the WHP and SWP. Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failings, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all-hazard emergency operations plan. Municipalities that already have written procedures dealing with water emergencies should review the following information and update existing procedures to address these water supply protection measures.

### A. Federal Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act, (Public Law 107-188, Title IV- Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan.

**Do you have a federal emergency response plan?** Yes  No

**If yes, what was the date it was certified?** May 8, 2008

Complete Table 15 by inserting the noted information regarding your completed Federal Emergency Response Plan.

**Table 15. Emergency Preparedness Plan contact information**

Emergency Response Plan Role	Contact Person	Contact Number	Phone	Contact Email
Emergency Response Lead	MATT KOHNER	763 433-9859		<a href="mailto:MKOHLNER@CI.RAMSEY.MN.US">MKOHLNER@CI.RAMSEY.MN.US</a>
Alternate Emergency Response Lead	JOHN NELSON	763 286-0296		<a href="mailto:JNELSON@CI.RAMSEY.MN.US">JNELSON@CI.RAMSEY.MN.US</a>

### B. Operational Contingency Plan

All utilities should have a written operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance.

**Do you have a written operational contingency plan?** Yes  No

At a minimum, a water supplier should prepare and maintain an emergency contact list of contractors and suppliers.

### C. Emergency Response Procedures

Water suppliers must meet the requirements of MN Rules 4720.5280 . Accordingly, the Minnesota Department of Natural Resources (DNR) requires public water suppliers serving more than 1,000 people to submit Emergency and Conservation Plans. Water emergency and

conservation plans that have been approved by the DNR, under provisions of Minnesota Statute 186 and Minnesota Rules, part 6115.0770, will be considered equivalent to an approved WHP contingency plan.

### **Emergency Telephone List**

Prepare and attach a list of emergency contacts, including the MN Duty Officer (1-800-422-0798), as **Appendix 5**. A template is available at [www.mndnr.gov/watersupplyplans](http://www.mndnr.gov/watersupplyplans)

The list should include key utility and community personnel, contacts in adjacent water suppliers, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list and date it. Thereafter, update on a regular basis (once a year is recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the Emergency Manager for that community. Responsibilities and services for each contact should be defined.

### **Current Water Sources and Service Area**

Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation and maintenance records should be maintained in secured central and back-up locations so that the records are accessible for emergency purposes. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. It is critical that public water supplier representatives and emergency response personnel communicate about the response procedures and be able to easily obtain this kind of information both in electronic and hard copy formats (in case of a power outage).

**Do records and maps exist?** Yes  No

**Can staff access records and maps from a central secured location in the event of an emergency?**

Yes  No

**Does the appropriate staff know where the materials are located?**

Yes  No

### **Procedure for Augmenting Water Supplies**

Complete Tables 16 – 17 by listing all available sources of water that can be used to augment or replace existing sources in an emergency. Add rows to the tables as needed.

In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community.

Municipalities are encouraged to execute cooperative agreements for potential emergency

water services and copies should be included in **Appendix 6**. Outstate Communities may consider using nearby high capacity wells (industry, golf course) as emergency water sources. WSP should include information on any physical or chemical problems that may limit interconnections to other sources of water. Approvals from the MDH are required for interconnections or the reuse of water.

**Table 16. Interconnections with other water supply systems to supply water in an emergency**

Other Water Supply System Owner	Capacity (GPM & MGD)	Note Any Limitations On Use	List of services, equipment, supplies available to respond
CITY OF ANOKA	2000 GPM 2,880,000 GPD	EMERGENCY USE ONLY	MUTUAL AID AGREEMENT MNWARN

GPM – Gallons per minute MGD – million gallons per day

**Table 17. Utilizing surface water as an alternative source**

Surface Water Source Name	Capacity (GPM)	Capacity (MGD)	Treatment Needs	Note Any Limitations On Use
N/A				

If not covered above, describe additional emergency measures for providing water (obtaining bottled water, or steps to obtain National Guard services, etc.)

--

**Allocation and Demand Reduction Procedures**

Complete Table 18 by adding information about how decisions will be made to allocate water and reduce demand during an emergency. Provide information for each customer category, including its priority ranking, average day demand, and demand reduction potential for each customer category. Modify the customer categories as needed, and add additional lines if necessary.

Water use categories should be prioritized in a way that is consistent with Minnesota Statutes 103G.261 (#1 is highest priority) as follows:

1. Water use for human needs such as cooking, cleaning, drinking, washing and waste disposal; use for on-farm livestock watering; and use for power production that meets contingency requirements.
2. Water use involving consumption of less than 10,000 gallons per day (usually from private wells or surface water intakes)
3. Water use for agricultural irrigation and processing of agricultural products involving consumption of more than 10,000 gallons per day (usually from private high-capacity wells or surface water intakes)
4. Water use for power production above the use provided for in the contingency plan.

5. All other water use involving consumption of more than 10,000 gallons per day.
6. Nonessential uses – car washes, golf courses, etc.

Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Lower priority uses will need to address water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. Water use for lawn sprinkling, vehicle washing, golf courses, and recreation are legislatively considered non-essential.

**Table 18. Water use priorities**

Customer Category	Allocation Priority	Average Daily Demand (GPD)	Short-Term Emergency Demand Reduction Potential (GPD)
Residential	1	1,542,000	1,370,000
Institutional	2	14,600	10,000
Commercial	3	163,400	15,000
Industrial	4		
Irrigation	5		
Wholesale	N/A		
Non-Essential	6		
TOTAL		1,720,000	1,395,000

**GPD** – Gallons per Day

***Tip: Calculating Emergency Demand Reduction Potential***

The emergency demand reduction potential for all uses will typically equal the difference between maximum use (summer demand) and base use (winter demand). In extreme emergency situations, lower priority water uses must be restricted or eliminated to protect priority domestic water requirements. Emergency demand reduction potential should be based on average day demands for customer categories within each priority class. Use the tables in Part 3 on water conservation to help you determine strategies.

Complete Table 19 by selecting the triggers and actions during water supply disruption conditions.

**Table 19. Emergency demand reduction conditions, triggers and actions (Select all that may apply and describe)**

Emergency Triggers	Short-term Actions	Long-term Actions
<input type="checkbox"/> Contamination <input checked="" type="checkbox"/> Loss of production <input checked="" type="checkbox"/> Infrastructure failure <input checked="" type="checkbox"/> Executive order by Governor <input type="checkbox"/> Other: _____  	<input type="checkbox"/> Supply augmentation through _____ <input checked="" type="checkbox"/> Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. <input checked="" type="checkbox"/> Water allocation through chart above <input checked="" type="checkbox"/> Meet with large water users to discuss their contingency plan.	<input type="checkbox"/> Supply augmentation through _____ <input type="checkbox"/> Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. <input type="checkbox"/> Water allocation through _____ <input type="checkbox"/> Meet with large water users to discuss their contingency plan.

**Notification Procedures**

Complete Table 20 by selecting trigger for informing customers regarding conservation requests, water use restrictions, and suspensions; notification frequencies; and partners that may assist in the notification process. Add rows to the table as needed.

**Table 20. Plan to inform customers regarding conservation requests, water use restrictions, and suspensions**

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
<input checked="" type="checkbox"/> Short-term demand reduction declared (< 1 year)	<input checked="" type="checkbox"/> Website <input checked="" type="checkbox"/> Email list serve <input checked="" type="checkbox"/> Social media (e.g. Twitter, Facebook) <input checked="" type="checkbox"/> Direct customer mailing, <input checked="" type="checkbox"/> Press release (TV, radio, newspaper), <input checked="" type="checkbox"/> Meeting with large water users (> 10% of total city use) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Daily <input checked="" type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	
<input checked="" type="checkbox"/> Long-term Ongoing demand reduction declared	<input checked="" type="checkbox"/> Website <input checked="" type="checkbox"/> Email list serve <input checked="" type="checkbox"/> Social media (e.g. Twitter, Facebook) <input checked="" type="checkbox"/> Direct customer mailing, <input checked="" type="checkbox"/> Press release (TV, radio, newspaper), <input checked="" type="checkbox"/> Meeting with large water users (> 10% of total city use) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Daily <input checked="" type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
<input checked="" type="checkbox"/> Governor’s critical water deficiency declared	<input checked="" type="checkbox"/> Website <input checked="" type="checkbox"/> Email list serve <input checked="" type="checkbox"/> Social media (e.g. Twitter, Facebook) <input checked="" type="checkbox"/> Direct customer mailing, <input checked="" type="checkbox"/> Press release (TV, radio, newspaper), <input type="checkbox"/> Meeting with large water users (> 10% of total city use) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Daily <input checked="" type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	

**Enforcement**

Prior to a water emergency, municipal water suppliers must adopt regulations that restrict water use and outline the enforcement response plan. The enforcement response plan must outline how conditions will be monitored to know when enforcement actions are triggered, what enforcement tools will be used, who will be responsible for enforcement, and what timelines for corrective actions will be expected.

Affected operations, communications, and enforcement staff must then be trained to rapidly implement those provisions during emergency conditions.

**Important Note:**  
 Disregard of critical water deficiency orders, even though total appropriation remains less than permitted, is adequate grounds for immediate modification of a public water supply authority’s water use permit (2013 MN Statutes 103G.291)

**Does the city have a critical water deficiency restriction/official control in place that includes provisions to restrict water use and enforce the restrictions? (This restriction may be an ordinance, rule, regulation, policy under a council directive, or other official control)** Yes   
 No

If yes, attach the official control document to this WSP as **Appendix 7**.

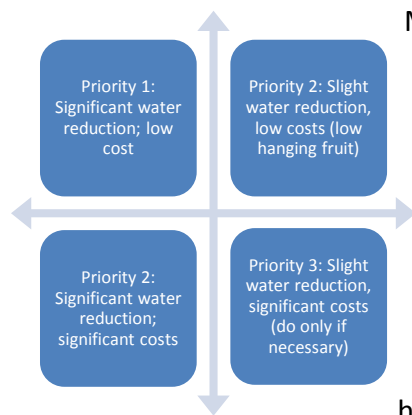
If no, the municipality must adopt such an official control within 6 months of submitting this WSP and submit it to the DNR as an amendment to this WSP.

**Irrespective of whether a critical water deficiency control is in place, does the public water supply utility, city manager, mayor, or emergency manager have standing authority to implement water restrictions?** Yes  No

If yes, cite the regulatory authority reference: City Code 58-118 .

If no, who has authority to implement water use restrictions in an emergency?

## PART 3. WATER CONSERVATION PLAN



Minnesotans have historically benefited from the state's abundant water supplies, reducing the need for conservation. There are however, limits to the available supplies of water and increasing threats to the quality of our drinking water. Causes of water supply limitation may include: population increases, economic trends, uneven statewide availability of groundwater, climatic changes, and degraded water quality. Examples of threats to drinking water quality include: the presence of contaminant plumes from past land use activities, exceedances of water quality standards from natural and human sources, contaminants of emerging concern, and

increasing pollutant trends from nonpoint sources.

There are many incentives for conserving water; conservation:

- reduces the potential for pumping-induced transfer of contaminants into the deeper aquifers, which can add treatment costs
- reduces the need for capital projects to expand system capacity
- reduces the likelihood of water use conflicts, like well interference, aquatic habitat loss, and declining lake levels
- conserves energy, because less energy is needed to extract, treat and distribute water (and less energy production also conserves water since water is use to produce energy)
- maintains water supplies that can then be available during times of drought

It is therefore imperative that water suppliers implement water conservation plans. The first step in water conservation is identifying opportunities for behavioral or engineering changes that could be made to reduce water use by conducting a thorough analysis of:

- Water use by customer
- Extraction, treatment, distribution and irrigation system efficiencies
- Industrial processing system efficiencies
- Regulatory and barriers to conservation
- Cultural barriers to conservation
- Water reuse opportunities

Once accurate data is compiled, water suppliers can set achievable goals for reducing water use. A successful water conservation plan follows a logical sequence of events. The plan should address both conservation on the supply side (leak detection and repairs, metering), as well as on the demand side (reductions in usage). Implementation should be conducted in phases, starting with the most obvious and lowest-cost options. In some cases one of the early steps will be reviewing regulatory constraints to water conservation, such as lawn irrigation requirements. Outside funding and grants may be available for implementation of projects. Engage water system operators and maintenance staff and customers in brainstorming opportunities to reduce water use. Ask the question: "How can I help save water?"

**Progress since 2006**

**Is this your community's first Water Supply Plan?** Yes  No

If yes, describe conservation practices that you are already implementing, such as: pricing, system improvements, education, regulation, appliance retrofitting, enforcement, etc.

--

If no, complete Table 21 to summarize conservation actions taken since the adoption of the 2006 water supply plan.

**Table 21. Implementation of previous ten-year Conservation Plan**

2006 Plan Commitments	Action Taken?
Change water rates structure to provide conservation pricing	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water supply system improvements (e.g. leak repairs, valve replacements, etc.)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Educational efforts	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
New water conservation ordinances	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Rebate or retrofitting Program (e.g. for toilet, faucets, appliances, showerheads, dish washers, washing machines, irrigation systems, rain barrels, water softeners, etc.)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Enforcement	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Describe other: Replaced all residential meters with Neptune Smart meters within last 10 years	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**What are the results you have seen from the actions in Table 21 and how were results measured?**

Overall per capita demand dropped while adding new customers during this time period.
---

**A. Triggers for Allocation and Demand Reduction Actions**

Complete table 22 by checking each trigger below, as appropriate, and the actions to be taken at various levels or stages of severity. Add in additional rows to the table as needed.

**Table 22. Short and long-term demand reduction conditions, triggers and actions**

Objective	Triggers	Actions
Protect surface water flows	<input type="checkbox"/> Low stream flow conditions <input type="checkbox"/> Reports of declining wetland and lake levels	<input type="checkbox"/> Increase promotion of conservation measures <input type="checkbox"/> Other: _____

Objective	Triggers	Actions
	<input type="checkbox"/> Other: _____	
Short-term demand reduction (less than 1 year)	<input checked="" type="checkbox"/> Extremely high seasonal water demand (more than double winter demand) <input checked="" type="checkbox"/> Loss of treatment capacity <input checked="" type="checkbox"/> Lack of water in storage <input checked="" type="checkbox"/> State drought plan <input type="checkbox"/> Well interference <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Adopt (if not already) and enforce the critical water deficiency ordinance to restrict or prohibit lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. <input type="checkbox"/> Supply augmentation through _____ <input checked="" type="checkbox"/> Water allocation through _____ <input checked="" type="checkbox"/> Meet with large water users to discuss user's contingency plan.
Long-term demand reduction (>1 year)	<input checked="" type="checkbox"/> Per capita demand increasing <input checked="" type="checkbox"/> Total demand increase (higher population or more industry) Water level in well(s) below elevation of _____ <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Develop a critical water deficiency ordinance that is or can be quickly adopted to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. <input type="checkbox"/> Enact a water waste ordinance that targets overwatering (causing water to flow off the landscape into streets, parking lots, or similar), watering impervious surfaces (streets, driveways or other hardscape areas), and negligence of known leaks, breaks, or malfunctions. <input checked="" type="checkbox"/> Meet with large water users to discuss user's contingency plan. <input type="checkbox"/> Enhanced monitoring and reporting: audits, meters, billing, etc.
Governor's "Critical Water Deficiency Order" declared	<input checked="" type="checkbox"/> "Critical Water Deficiency Order" issued	<input checked="" type="checkbox"/> Strictly enforce Odd/ Even Sprinkling Ban <input checked="" type="checkbox"/> Reduce or eliminate irrigation at public buildings and parks

**B. Conservation Objectives and Strategies – Key benchmark for DNR**

This section establishes water conservation objectives and strategies for eight major areas of water use.

**Objective 1: Reduce Unaccounted (Non-Revenue) Water loss to Less than 10%**

The Minnesota Rural Waters Association, the Metropolitan Council and the Department of Natural Resources recommend that all water uses be metered. Metering can help identify high use locations and times, along with leaks within buildings that have multiple meters.

It is difficult to quantify specific unmetered water use such as that associated with firefighting and system flushing or system leaks. Typically, water suppliers subtract metered water use from total water pumped to calculate unaccounted or non-revenue water loss.

**Is your five-year average (2005-2014) unaccounted Water Use in Table 2 higher than 10%?**

Yes  No

**What is your leak detection monitoring schedule? (e.g. monitor 1/3rd of the city lines per year)**

We get quarterly leak reports from our meter reading software. We follow up with a letter to the identified properties.

**Water Audits** - are intended to identify, quantify and verify water and revenue losses. The volume of unaccounted-for water should be evaluated each billing cycle. The American Water Works Association (AWWA) recommends that ten percent or less of pumped water is unaccounted-for water. Water audit procedures are available from the AWWA and MN Rural Water Association [www.mrwa.com](http://www.mrwa.com) . Drinking Water Revolving Loan Funds are available for purchase of new meters when new plants are built.

**What is the date of your most recent water audit? 2016 DNR Water Appropriation Permit**

Frequency of water audits:  yearly       other (specify frequency) \_\_\_\_\_

Leak detection and survey:  every year    every other year    periodic as needed

Year last leak detection survey completed: \_\_\_\_\_

If Table 2 shows annual water losses over 10% or an increasing trend over time, describe what actions will be taken to reach the <10% loss objective and within what timeframe

**Metering** -AWWA recommends that every water supplier install meters to account for all water taken into its system, along with all water distributed from its system at each customer’s point of service. An effective metering program relies upon periodic performance testing, repair, maintenance or replacement of all meters. AWWA also recommends that water suppliers conduct regular water audits to ensure accountability. Some cities install separate meters for interior and exterior water use, but some research suggests that this may not result in water conservation.

Complete Table 23 by adding the requested information regarding the number, types, testing and maintenance of customer meters.

**Table 23. Information about customer meters**

Customer Category	Number of Customers	Number of Metered Connections	Number of Automated Meter Readers	Meter testing intervals (years)	Average age/meter replacement schedule (years)
Residential	4105	4105	4105		8/10
Irrigation meters	145	145	145		/
Institutional	5	5	5		/
Commercial	255	255	255		/
Industrial					/
Public facilities	15	15	15		/

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Customer Category	Number of Customers	Number of Metered Connections	Number of Automated Meter Readers	Meter testing intervals (years)	Average age/meter replacement schedule (years)
Other					___ / ___
TOTALS	4525	4525	4525	NA	NA

For unmetered systems, describe any plans to install meters or replace current meters with advanced technology meters. Provide an estimate of the cost to implement the plan and the projected water savings from implementing the plan.

All of our meters have advanced technology.

**Table 24. Water source meters**

	Number of Meters	Meter testing schedule (years)	Number of Automated Meter Readers	Average age/meter replacement schedule (years)
Water source (wells/intakes)	8	10	0	0 / 10
Treatment plant	N/A			___ / ___

**Objective 2: Achieve Less than 75 Residential Gallons per Capita Demand (GPCD)**

The 2002 average residential per capita demand in the Twin Cities Metropolitan area was 75 gallons per capita per day.

**Is your average 2010-2015 residential per capita water demand in Table 2 more than 75? Yes**

No

**What was your 2010 – 2015 five-year average residential per capita water demand? 87 g/person/day**

Describe the water use trend over that timeframe:

Residential Per Capita Water use has declined during this period while the number of users has increased each year. There were two high years in the beginning of this 5 year period which affect the average. The last two years were 69 and 729 gpcd, respectively.

Complete Table 25 by checking which strategies you will use to continue reducing residential per capita demand and project a likely timeframe for completing each checked strategy (Select all that apply and add rows for additional strategies):

**Table 25. Strategies and timeframe to reduce residential per capita demand**

Strategy to reduce residential per capita demand	Timeframe for completing work
<input checked="" type="checkbox"/> Revise city ordinances/codes to encourage or require water efficient landscaping.	2019

Strategy to reduce residential per capita demand	Timeframe for completing work
<input type="checkbox"/> Revise city ordinance/codes to permit water reuse options, especially for non-potable purposes like irrigation, groundwater recharge, and industrial use. Check with plumbing authority to see if internal buildings reuse is permitted	
<input checked="" type="checkbox"/> Revise ordinances to limit irrigation. Describe the restricted irrigation plan:	Odd/ Even no Watering between 10 AM and 8 PM has been in code for several years
<input type="checkbox"/> Revise outdoor irrigation installations codes to require high efficiency systems (e.g. those with soil moisture sensors or programmable watering areas) in new installations or system replacements.	
<input checked="" type="checkbox"/> Make water system infrastructure improvements	Leak detection reports are generated, letters are sent to each customer. Follow up letters are sent. Toilet dye kits are available for residents.
<input checked="" type="checkbox"/> Offer free or reduced cost water use audits) for residential customers.	No
<input checked="" type="checkbox"/> Implement a notification system to inform customers when water availability conditions change.	We use the website, signs and the city newsletter.
<input type="checkbox"/> Provide rebates or incentives for installing water efficient appliances and/or fixtures indoors (e.g., low flow toilets, high efficiency dish washers and washing machines, showerhead and faucet aerators, water softeners, etc.)	
<input type="checkbox"/> Provide rebates or incentives to reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	
<input type="checkbox"/> Identify supplemental Water Resources	
<input checked="" type="checkbox"/> Conduct audience-appropriate water conservation education and outreach.	Water conservation tips for residents are posted on the website.
<input type="checkbox"/> Describe other plans	

**Objective 3: Achieve at least a 1.5% per year water reduction for Institutional, Industrial, Commercial, and Agricultural GPCD over the next 10 years or a 15% reduction in ten years.**

Complete Table 26 by checking which strategies you will used to continue reducing non-residential customer use demand and project a likely timeframe for completing each checked strategy (add rows for additional strategies).

Where possible, substitute recycled water used in one process for reuse in another. (For example, spent rinse water can often be reused in a cooling tower.) Keep in mind the true cost of water is the amount on the water bill PLUS the expenses to heat, cool, treat, pump, and dispose of/discharge the water. Don't just calculate the initial investment. Many conservation retrofits that appear to be prohibitively expensive are actually very cost-effective when amortized over the life of the equipment. Often reducing water use also saves electrical and other utility costs. Note: as of 2015, water reuse, and is not allowed by the state plumbing code, M.R. 4715 (a variance is needed). However several state agencies are addressing this issue.

**Table 26. Strategies and timeframe to reduce institutional, commercial industrial, and agricultural and non-revenue use demand**

Strategy to reduce total business, industry, agricultural demand	Timeframe for completing work
<input type="checkbox"/> Conduct a facility water use audit for both indoor and outdoor use, including system components	
<input checked="" type="checkbox"/> Install enhanced meters capable of automated readings to detect spikes in consumption	Leak detection reports are generated, letters are sent to each customer. Follow up letters are sent.
<input type="checkbox"/> Compare facility water use to related industry benchmarks, if available (e.g., meat processing, dairy, fruit and vegetable, beverage, textiles, paper/pulp, metals, technology, petroleum refining etc.)	
<input type="checkbox"/> Install water conservation fixtures and appliances or change processes to conserve water	
<input checked="" type="checkbox"/> Repair leaking system components (e.g., pipes, valves)	Leaks are investigated and repaired.
<input type="checkbox"/> Investigate the reuse of reclaimed water (e.g., stormwater, wastewater effluent, process wastewater, etc.)	
<input checked="" type="checkbox"/> Reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	The City is open to installation of rain gardens on commercial projects
<input type="checkbox"/> Train employees how to conserve water	
<input checked="" type="checkbox"/> Implement a notification system to inform non-residential customers when water availability conditions change.	The odd/ even signs are posted in locations where residents and commercial customers see them.
<input type="checkbox"/> Rainwater catchment systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, industrial processes, water features, vehicle washing facilities, cooling tower makeup, and similar uses shall be approved by the commissioner. Proposed plumbing code 4714.1702.1 <a href="http://www.dli.mn.gov/PDF/docket/4714rule.pdf">http://www.dli.mn.gov/PDF/docket/4714rule.pdf</a>	
<input type="checkbox"/> Describe other plans:	

**Objective 4: Achieve a Decreasing Trend in Total Per Capita Demand**

Include as **Appendix 8** one graph showing total per capita water demand for each customer category (i.e., residential, institutional, commercial, industrial) from 2005-2014 and add the calculated/estimated linear trend for the next 10 years.

Describe the trend for each customer category; explain the reason(s) for the trends, and where trends are increasing.

Water demand has been decreasing over the last 10 years. Non-essential use is not declining as fast as Residential or C/I/I. Residential has shown the largest decrease which correlates to the rate structure change and requiring better topsoil for all new construction green areas.

**Objective 5: Reduce Peak Day Demand so that the Ratio of Average Maximum day to the Average Day is less than 2.6**

Is the ratio of average 2005-2014 maximum day demand to average 2005-2014 average day demand reported in Table 2 more than 2.6? Yes  No

Calculate a ten year average (2005 – 2014) of the ratio of maximum day demand to average day demand: 2.74

The position of the DNR has been that a peak day/average day ratio that is above 2.6 for in summer indicates that the water being used for irrigation by the residents in a community is too large and that efforts should be made to reduce the peak day use by the community.

It should be noted that by reducing the peak day use, communities can also reduce the amount of infrastructure that is required to meet the peak day use. This infrastructure includes new wells, new water towers which can be costly items.

**Objective 6: Implement a Conservation Water Rate Structure and/or a Uniform Rate Structure with a Water Conservation Program**

***Water Conservation Program***

Municipal water suppliers serving over 1,000 people are required to adopt demand reduction measures that include a conservation rate structure, or a uniform rate structure with a conservation program that achieves demand reduction. These measures must achieve demand reduction in ways that reduce water demand, water losses, peak water demands, and nonessential water uses. These measures must be approved before a community may request well construction approval from the Department of Health or before requesting an increase in water appropriations permit volume (*Minnesota Statutes*, section 103G.291, subd. 3 and 4). Rates should be adjusted on a regular basis to ensure that revenue of the system is adequate under reduced demand scenarios. If a municipal water supplier intends to use a Uniform Rate Structure, a community-wide Water Conservation Program that will achieve demand reduction must be provided.

***Current Water Rates***

Include a copy of the actual rate structure in **Appendix 9** or list current water rates including base/service fees and volume charges below.

Volume included in base rate or service charge: 15,000 gallons or \_\_\_ cubic feet \_\_\_ other

Frequency of billing:  Monthly  Bimonthly  Quarterly  Other:

Water Rate Evaluation Frequency:  every year  every \_\_\_ years  no schedule

Date of last rate change: 1/1/2017

**Table 27. Rate structures for each customer category (Select all that apply and add additional rows as needed)**

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
Residential	<input type="checkbox"/> Monthly billing <input checked="" type="checkbox"/> Increasing block rates (volume tiered rates) <input type="checkbox"/> Seasonal rates <input type="checkbox"/> Time of use rates <input checked="" type="checkbox"/> Water bills reported in gallons <input type="checkbox"/> Individualized goal rates <input checked="" type="checkbox"/> Excess use rates <input type="checkbox"/> Drought surcharge <input type="checkbox"/> Use water bill to provide comparisons <input type="checkbox"/> Service charge not based on water volume <input type="checkbox"/> Other (describe)	<input type="checkbox"/> Uniform <input type="checkbox"/> Odd/even day watering	<input type="checkbox"/> Service charge based on water volume <input type="checkbox"/> Declining block <input type="checkbox"/> Flat <input type="checkbox"/> Other (describe)
Commercial/ Industrial/ Institutional	<input checked="" type="checkbox"/> Monthly billing <input checked="" type="checkbox"/> Increasing block rates (volume tiered rates) <input type="checkbox"/> Seasonal rates <input type="checkbox"/> Time of use rates <input checked="" type="checkbox"/> Water bills reported in gallons <input type="checkbox"/> Individualized goal rates <input type="checkbox"/> Excess use rates <input type="checkbox"/> Drought surcharge <input type="checkbox"/> Use water bill to provide comparisons <input type="checkbox"/> Service charge not based on water volume <input type="checkbox"/> Other (describe)	<input type="checkbox"/> Uniform	<input type="checkbox"/> Service charge based on water volume <input type="checkbox"/> Declining block <input type="checkbox"/> Flat <input type="checkbox"/> Other (describe)
<input type="checkbox"/> Other			

**\* Rate Structures components that may promote water conservation:**

- **Monthly billing:** is encouraged to help people see their water usage so they can consider changing behavior.
- **Increasing block rates (also known as a tiered residential rate structure):** Typically, these have at least three tiers: should have at least three tiers.
  - The first tier is for the winter average water use.
  - The second tier is the year-round average use, which is lower than typical summer use. This rate should be set to cover the full cost of service.
  - The third tier should be above the average annual use and should be priced high enough to encourage conservation, as should any higher tiers. For this to be effective, the difference in block rates should be significant.
- **Seasonal rate:** higher rates in summer to reduce peak demands
- **Time of Use rates:** lower rates for off peak water use
- **Bill water use in gallons:** this allows customers to compare their use to average rates

- **Individualized goal rates:** typically used for industry, business or other large water users to promote water conservation if they keep within agreed upon goals. **Excess Use rates:** if water use goes above an agreed upon amount this higher rate is charged
- **Drought surcharge:** an extra fee is charged for guaranteed water use during drought
- **Use water bill to provide comparisons:** simple graphics comparing individual use over time or compare individual use to others.
- **Service charge or base fee that does not include a water volume** – a base charge or fee to cover universal city expenses that are not customer dependent and/or to provide minimal water at a lower rate (e.g., an amount less than the average residential per capita demand for the water supplier for the last 5 years)
- **Emergency rates** -A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

**\*\*Conservation Neutral\*\***

- **Uniform rate:** rate per unit used is the same regardless of the volume used
- **Odd/even day watering** –This approach reduces peak demand on a daily basis for system operation, but it does not reduce overall water use.

**\*\*\* Non-Conserving \*\*\***

- **Service charge or base fee with water volume:** an amount of water larger than the average residential per capita demand for the water supplier for the last 5 years
- **Declining block rate:** the rate per unit used decreases as water use increases.
- **Flat rate:** one fee regardless of how much water is used (usually unmetered).

Provide justification for any conservation neutral or non-conserving rate structures. If intending to adopt a conservation rate structure, include the timeframe to do so:

--

**Objective 7: Additional strategies to Reduce Water Use and Support Wellhead Protection Planning**

Development and redevelopment projects can provide additional water conservation opportunities, such as the actions listed below. If a Uniform Rate Structure is in place, the water supplier must provide a Water Conservation Program that includes at least two of the actions listed below. Check those actions that you intent to implement within the next 10 years.

**Table 28. Additional strategies to Reduce Water Use & Support Wellhead Protection**

<input type="checkbox"/>	Participate in the GreenStep Cities Program, including implementation of at least one of the 20 “Best Practices” for water
<input type="checkbox"/>	Prepare a master plan for smart growth (compact urban growth that avoids sprawl)
<input type="checkbox"/>	Prepare a comprehensive open space plan (areas for parks, green spaces, natural areas)
<input type="checkbox"/>	Adopt a water use restriction ordinance (lawn irrigation, car washing, pools, etc.)
<input type="checkbox"/>	Adopt an outdoor lawn irrigation ordinance
<input type="checkbox"/>	Adopt a private well ordinance (private wells in a city must comply with water restrictions)
<input type="checkbox"/>	Implement a stormwater management program

<input type="checkbox"/>	Adopt non-zoning wetlands ordinance (can further protect wetlands beyond state/federal laws-for vernal pools, buffer areas, restrictions on filling or alterations)
<input type="checkbox"/>	Adopt a water offset program (primarily for new development or expansion)
<input checked="" type="checkbox"/>	Implement a water conservation outreach program
<input type="checkbox"/>	Hire a water conservation coordinator (part-time)
<input type="checkbox"/>	Implement a rebate program for water efficient appliances, fixtures, or outdoor water management
<input checked="" type="checkbox"/>	Revise the commercial development ordinance to allow low water landscaping practices and eliminate the requirement for installation of an irrigation system.

**Objective 8: Tracking Success: How will you track or measure success through the next ten years?**

We will keep a record of new commercial developments that are constructed with low water or no water landscaping plans. We will record contacts and successes through the water conservation outreach program.

**Tip: The process to monitor demand reduction and/or a rate structure includes:**

- a) The DNR Hydrologist will call or visit the community the first 1-3 years after the water supply plan is completed.
- b) They will discuss what activities the community is doing to conserve water and if they feel their actions are successful. The Water Supply Plan, Part 3 tables and responses will guide the discussion. For example, they will discuss efforts to reduce unaccounted for water loss if that is a problem, or go through Tables 33, 34 and 35 to discuss new initiatives.
- c) The city representative and the hydrologist will discuss total per capita water use, residential per capita water use, and business/industry use. They will note trends.
- d) They will also discuss options for improvement and/or collect case studies of success stories to share with other communities. One option may be to change the rate structure, but there are many other paths to successful water conservation.
- e) If appropriate, they will cooperatively develop a simple work plan for the next few years, targeting a couple areas where the city might focus efforts.

**A. Regulation**

Complete Table 29 by selecting which regulations are used to reduce demand and improve water efficiencies. Add additional rows as needed.

Copies of adopted regulations or proposed restrictions or should be included in **Appendix 10** (a list with hyperlinks is acceptable).

**Table 29. Regulations for short-term reductions in demand and long-term improvements in water efficiencies**

Regulations Utilized	When is it applied (in effect)?
<input checked="" type="checkbox"/> Rainfall sensors required on landscape irrigation systems	<input checked="" type="checkbox"/> Ongoing

Regulations Utilized	When is it applied (in effect)?
Commercial, Parks and City Own Properties	<input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies
<input type="checkbox"/> Water efficient plumbing fixtures required	<input type="checkbox"/> New development <input type="checkbox"/> Replacement <input type="checkbox"/> Rebate Programs
<input checked="" type="checkbox"/> Critical/Emergency Water Deficiency ordinance	<input checked="" type="checkbox"/> Only during declared Emergencies
<input checked="" type="checkbox"/> Watering restriction requirements (time of day, allowable days, etc.) Odd/ Even Day, Time of day watering restrictions are enforced	<input checked="" type="checkbox"/> Odd/even <input type="checkbox"/> 2 days/week <input type="checkbox"/> Only during declared Emergencies
<input type="checkbox"/> Water waste prohibited (for example, having a fine for irrigators spraying on the street)	<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies
<input type="checkbox"/> Limitations on turf areas (requiring lots to have 10% - 25% of the space in natural areas)	<input type="checkbox"/> New development <input type="checkbox"/> Shoreland/zoning <input type="checkbox"/> Other
<input checked="" type="checkbox"/> Soil preparation requirements (after construction, requiring topsoil to be applied to promote good root growth) Approved topsoil is required under sod for all new construction projects.	<input checked="" type="checkbox"/> New Development <input type="checkbox"/> Construction Projects <input type="checkbox"/> Other
<input checked="" type="checkbox"/> Tree ratios (requiring a certain number of trees per square foot of lawn)	<input checked="" type="checkbox"/> New development <input type="checkbox"/> Shoreland/zoning <input type="checkbox"/> Other
<input type="checkbox"/> Permit to fill swimming pool and/or requiring pools to be covered (to prevent evaporation)	<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies
<input type="checkbox"/> Ordinances that permit stormwater irrigation, reuse of water, or other alternative water use (Note: be sure to check current plumbing codes for updates)	<input type="checkbox"/> Describe

## B. Retrofitting Programs

Education and incentive programs aimed at replacing inefficient plumbing fixtures and appliances can help reduce per capita water use, as well as energy costs. It is recommended that municipal water suppliers develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and appliances. Some water suppliers have developed partnerships with organizations having similar conservation goals, such as electric or gas suppliers, to develop cooperative rebate and retrofit programs.

A study by the AWWA Research Foundation (Residential End Uses of Water, 1999) found that the average indoor water use for a non-conserving home is 69.3 gallons per capita per day (gpcd). The average indoor water use in a conserving home is 45.2 gpcd and most of the decrease in water use is related to water efficient plumbing fixtures and appliances that can reduce water, sewer and energy costs. In Minnesota, certain electric and gas providers are required (Minnesota Statute 216B.241) to fund programs that will conserve energy resources and some utilities have distributed water efficient showerheads to customers to help reduce energy demands required to supply hot water.

**Retrofitting Programs**

Complete Table 30 by checking which water uses are targeted, the outreach methods used, the measures used to identify success, and any participating partners.

**Table 30. Retrofitting programs (Select all that apply)**

Water Use Targets	Outreach Methods	Partners
<input type="checkbox"/> Low flush toilets, <input checked="" type="checkbox"/> Toilet leak tablets, <input type="checkbox"/> Low flow showerheads, <input type="checkbox"/> Faucet aerators;	<input checked="" type="checkbox"/> Education about leak detection <input checked="" type="checkbox"/> Free distribution of toilet leak kits <input type="checkbox"/> Rebate for <input type="checkbox"/> Other	<input type="checkbox"/> Gas company <input type="checkbox"/> Electric company <input type="checkbox"/> Watershed organization
<input type="checkbox"/> Water conserving washing machines, <input type="checkbox"/> Dish washers, <input type="checkbox"/> Water softeners;	<input type="checkbox"/> Education about <input type="checkbox"/> Free distribution of <input type="checkbox"/> Rebate for <input type="checkbox"/> Other	<input type="checkbox"/> Gas company <input type="checkbox"/> Electric company <input type="checkbox"/> Watershed organization
<input checked="" type="checkbox"/> Rain gardens, <input checked="" type="checkbox"/> Rain barrels, <input checked="" type="checkbox"/> Native/drought tolerant landscaping, etc.	<input checked="" type="checkbox"/> Education about rain gardens, rain barrels <input type="checkbox"/> Free distribution of <input type="checkbox"/> Rebate for <input type="checkbox"/> Other	<input type="checkbox"/> Gas company <input type="checkbox"/> Electric company <input checked="" type="checkbox"/> Watershed organization

Briefly discuss measures of success from the above table (e.g. number of items distributed, dollar value of rebates, gallons of water conserved, etc.):

We will record and report on the number of rain gardens, rain barrels and native landscaping areas installed. We will continue to provide toilet leak tablets and information on detecting other leaks in homes and businesses.

**C. Education and Information Programs**

Customer education should take place in three different circumstances. First, customers should be provided information on how to conserve water and improve water use efficiencies. Second, information should be provided at appropriate times to address peak demands. Third, emergency notices and educational materials about how to reduce water use should be available for quick distribution during an emergency.

**Proposed Education Programs**

Complete Table 31 by selecting which methods are used to provide water conservation and information, including the frequency of program components. Select all that apply and add additional lines as needed.

**Table 31. Current and Proposed Education Programs**

Education Methods	General summary of topics	#/Year	Frequency
Billing inserts or tips printed on the actual bill	- Water conservation topics - Odd/ Even information - How much water does irrigation use	2	<input type="checkbox"/> Ongoing <input checked="" type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Consumer Confidence Reports		1	<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Press releases to traditional local news outlets (e.g., newspapers, radio and TV)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Social media distribution (e.g., emails, Facebook, Twitter)	- Water conservation topics - Odd/ Even information - How much water does irrigation use		<input checked="" type="checkbox"/> Ongoing <input checked="" type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Paid advertisements (e.g., billboards, print media, TV, radio, web sites, etc.)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Presentations to community groups			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Staff training			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Facility tours			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Displays and exhibits	Signs for Odd/ Even Ban		<input type="checkbox"/> Ongoing <input checked="" type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Marketing rebate programs (e.g., indoor fixtures & appliances and outdoor practices)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Community news letters	Odd/ even news letter articles		<input type="checkbox"/> Ongoing <input checked="" type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies

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Education Methods	General summary of topics	#/Year	Frequency
Direct mailings (water audit/retrofit kits, showerheads, brochures)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Information kiosk at utility and public buildings			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Public service announcements			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Cable TV Programs	Odd/ Even Ban		<input type="checkbox"/> Ongoing <input checked="" type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Demonstration projects (landscaping or plumbing)			<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
K-12 education programs (Project Wet, Drinking Water Institute, presentations)	Water Tower Tours for local elementary school		<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Community events (children’s water festivals, environmental fairs)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Community education classes			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Water week promotions	Well Testing kits provided		<input checked="" type="checkbox"/> Ongoing <input checked="" type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Website (include address: <a href="http://www.cityoframsey.com/utilities-water-system">www.cityoframsey.com/utilities-water-system</a> )			<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Targeted efforts (large volume users, users with large increases)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Notices of ordinances			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal

Education Methods	General summary of topics	#/Year	Frequency
			<input type="checkbox"/> Only during declared emergencies
Emergency conservation notices			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Other: City website	Page on Xeriscapes, Hardscape Page on Water Conservation Grant Opportunities Page on Irrigation Do's and Do Not's		<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies

Briefly discuss what future education and information activities your community is considering in the future:

The City meets with school age children once a year about water conservation, future water conservation practices, irrigation calculator, website and newsletter articles. We will continue this practice and expand the audience when the opportunity arises.

## Part 4. ITEMS FOR METROPOLITAN AREA COMMUNITIES

Minnesota Statute 473.859 requires WSPs to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process.



Much of the information in Parts 1-3 addresses water demand for the next 10 years. However, additional information is needed to address water demand through 2040, which will make the WSP consistent with the Metropolitan Land Use Planning Act, upon which the local comprehensive plans are based.

This Part 4 provides guidance to complete the WSP in a way that addresses plans for water supply through 2040.

### A. Water Demand Projections through 2040

Complete Table 7 in Part 1D by filling in information about long-term water demand projections through 2040. Total Community Population projections should be consistent with the community's system statement, which can be found on the Metropolitan Council's website and which was sent to the community in September 2015.

Projected Average Day, Maximum Day, and Annual Water Demands may either be calculated using the method outlined in *Appendix 2* of the *2015 Master Water Supply Plan* or by a method developed by the individual water supplier.

### B. Potential Water Supply Issues

Complete Table 10 in Part 1E by providing information about the potential water supply issues in your community, including those that might occur due to 2040 projected water use.

The *Master Water Supply Plan* provides information about potential issues for your community in *Appendix 1 (Water Supply Profiles)*. This resource may be useful in completing Table 10.

You may document results of local work done to evaluate impact of planned uses by attaching a feasibility assessment or providing a citation and link to where the plan is available electronically.

### C. Proposed Alternative Approaches to Meet Extended Water Demand Projections

Complete Table 12 in Part 1F with information about potential water supply infrastructure impacts (such as replacements, expansions or additions to wells/intakes, water storage and treatment capacity, distribution systems, and emergency interconnections) of extended plans for development and redevelopment, in 10-year increments through 2040. It may be useful to refer to information in the community's local Land Use Plan, if available.

Complete Table 14 in Part 1F by checking each approach your community is considering to meet future demand. For each approach your community is considering, provide information about the amount of future water demand to be met using that approach, the timeframe to

implement the approach, potential partners, and current understanding of the key benefits and challenges of the approach.

As challenges are being discussed, consider the need for: evaluation of geologic conditions (mapping, aquifer tests, modeling), identification of areas where domestic wells could be impacted, measurement and analysis of water levels & pumping rates, triggers & associated actions to protect water levels, etc.

**D. Value-Added Water Supply Planning Efforts (Optional)**

The following information is not required to be completed as part of the local water supply plan, but completing this can help strengthen source water protection throughout the region and help Metropolitan Council and partners in the region to better support local efforts.

**Source Water Protection Strategies**

**Does a Drinking Water Supply Management Area for a neighboring public water supplier overlap your community?** Yes  No

If you answered no, skip this section. If you answered yes, please complete Table 32 with information about new water demand or land use planning-related local controls that are being considered to provide additional protection in this area.

**Table 32. Local controls and schedule to protect Drinking Water Supply Management Areas**

Local Control	Schedule to Implement	Potential Partners
<input type="checkbox"/> None at this time		
<input type="checkbox"/> Comprehensive planning that guides development in vulnerable drinking water supply management areas		
<input type="checkbox"/> Zoning overlay		
<input type="checkbox"/> Other:		

**Technical assistance**

From your community’s perspective, what are the most important topics for the Metropolitan Council to address, guided by the region’s Metropolitan Area Water Supply Advisory Committee and Technical Advisory Committee, as part of its ongoing water supply planning role?

- Coordination of state, regional and local water supply planning roles
- Regional water use goals
- Water use reporting standards
- Regional and sub-regional partnership opportunities
- Identifying and prioritizing data gaps and input for regional and sub-regional analyses
- Others:

## GLOSSARY

**Agricultural/Irrigation Water Use** - Water used for crop and non-crop irrigation, livestock watering, chemigation, golf course irrigation, landscape and athletic field irrigation.

**Average Daily Demand** - The total water pumped during the year divided by 365 days.

**Calcareous Fen** - Calcareous fens are rare and distinctive wetlands dependent on a constant supply of cold groundwater. Because they are dependent on groundwater and are one of the rarest natural communities in the United States, they are a protected resource in MN. Approximately 200 have been located in Minnesota. They may not be filled, drained or otherwise degraded.

**Commercial/Institutional Water Use** - Water used by motels, hotels, restaurants, office buildings, commercial facilities and institutions (both civilian and military). Consider maintaining separate institutional water use records for emergency planning and allocation purposes. Water used by multi-family dwellings, apartment buildings, senior housing complexes, and mobile home parks should be reported as Residential Water Use.

**Commercial/Institutional/Industrial (C/I/I) Water Sold** - The sum of water delivered for commercial/institutional or industrial purposes.

**Conservation Rate Structure** - A rate structure that encourages conservation and may include increasing block rates, seasonal rates, time of use rates, individualized goal rates, or excess use rates. If a conservation rate is applied to multifamily dwellings, the rate structure must consider each residential unit as an individual user. A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

**Date of Maximum Daily Demand** - The date of the maximum (highest) water demand. Typically this is a day in July or August.

**Declining Rate Structure** - Under a declining block rate structure, a consumer pays less per additional unit of water as usage increases. This rate structure does not promote water conservation.

**Distribution System** - Water distribution systems consist of an interconnected series of pipes, valves, storage facilities (water tanks, water towers, reservoirs), water purification facilities, pumping stations, flushing hydrants, and components that convey drinking water and meeting fire protection needs for cities, homes, schools, hospitals, businesses, industries and other facilities.

**Flat Rate Structure** - Flat fee rates do not vary by customer characteristics or water usage. This rate structure does not promote water conservation.

**Industrial Water Use** - Water used for thermonuclear power (electric utility generation) and other industrial use such as steel, chemical and allied products, paper and allied products, mining, and petroleum refining.

**Low Flow Fixtures/Appliances** - Plumbing fixtures and appliances that significantly reduce the amount of water released per use are labeled “low flow”. These fixtures and appliances use just enough water to be effective, saving excess, clean drinking water that usually goes down the drain.

**Maximum Daily Demand** - The maximum (highest) amount of water used in one day.

**Metered Residential Connections** - The number of residential connections to the water system that have meters. For multifamily dwellings, report each residential unit as an individual user.

**Percent Unmetered/Unaccounted For** - Unaccounted for water use is the volume of water withdrawn from all sources minus the volume of water delivered. This value represents water “lost” by miscalculated water use due to inaccurate meters, water lost through leaks, or water that is used but unmetered or otherwise undocumented. Water used for public services such as hydrant flushing, ice skating rinks, and public swimming pools should be reported under the category “Water Supplier Services”.

**Population Served** - The number of people who are served by the community’s public water supply system. This includes the number of people in the community who are connected to the public water supply system, as well as people in neighboring communities who use water supplied by the community’s public water supply system. It should not include residents in the community who have private wells or get their water from neighboring water supply.

**Residential Connections** - The total number of residential connections to the water system. For multifamily dwellings, report each residential unit as an individual user.

**Residential Per Capita Demand** - The total residential water delivered during the year divided by the population served divided by 365 days.

**Residential Water Use** - Water used for normal household purposes such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Should include all water delivered to single family private residences, multi-family dwellings, apartment buildings, senior housing complexes, mobile home parks, etc.

**Smart Meter** - Smart meters can be used by municipalities or by individual homeowners. Smart metering generally indicates the presence of one or more of the following:

- Smart irrigation water meters are controllers that look at factors such as weather, soil, slope, etc. and adjust watering time up or down based on data. Smart controllers in a typical summer will reduce water use by 30%-50%. Just changing the spray nozzle to new efficient models can reduce water use by 40%.
- Smart Meters on customer premises that measure consumption during specific time periods and communicate it to the utility, often on a daily basis.
- A communication channel that permits the utility, at a minimum, to obtain meter reads on demand, to ascertain whether water has recently been flowing through the meter and onto the premises, and to issue commands to the meter to perform specific tasks such as disconnecting or restricting water flow.

**Total Connections** - The number of connections to the public water supply system.

**Total Per Capita Demand** - The total amount of water withdrawn from all water supply sources during the year divided by the population served divided by 365 days.

**Total Water Pumped** - The cumulative amount of water withdrawn from all water supply sources during the year.

**Total Water Delivered** - The sum of residential, commercial, industrial, institutional, water supplier services, wholesale and other water delivered.

**Ultimate (Full Build-Out)** - Time period representing the community's estimated total amount and location of potential development, or when the community is fully built out at the final planned density.

**Unaccounted (Non-revenue) Loss** - See definitions for "percent unmetered/unaccounted for loss".

**Uniform Rate Structure** - A uniform rate structure charges the same price-per-unit for water usage beyond the fixed customer charge, which covers some fixed costs. The rate sends a price signal to the customer because the water bill will vary by usage. Uniform rates by class charge the same price-per-unit for all customers within a customer class (e.g. residential or non-residential). This price structure is generally considered less effective in encouraging water conservation.

**Water Supplier Services** - Water used for public services such as hydrant flushing, ice skating rinks, public swimming pools, city park irrigation, back-flushing at water treatment facilities, and/or other uses.

**Water Used for Nonessential Purposes** - Water used for lawn irrigation, golf course and park irrigation, car washes, ornamental fountains, and other non-essential uses.

**Wholesale Deliveries** - The amount of water delivered in bulk to other public water suppliers.

## **Acronyms and Initialisms**

**AWWA** – American Water Works Association

**C/I/I** – Commercial/Institutional/Industrial

**CIP** – Capital Improvement Plan

**GIS** – Geographic Information System

**GPCD** – Gallons per capita per day

**GWMA** – Groundwater Management Area – North and East Metro, Straight River, Bonanza,

**MDH** – Minnesota Department of Health

**MGD** – Million gallons per day

**MG** – Million gallons

**MGL** – Maximum Contaminant Level

**MnTAP** – Minnesota Technical Assistance Program (University of Minnesota)

*City of Ramsey Local Water Supply Plan*

**MPARS** – MN/DNR Permitting and Reporting System (new electronic permitting system)

**MRWA** – Minnesota Rural Waters Association

**SWP** – Source Water Protection

**WHP** – Wellhead Protection

**APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER**

**Appendix 1: Well records and maintenance summaries – see Part 1C**

**Appendix 2: Water level monitoring plan – see Part 1E**

**Appendix 3: Water level graphs for each water supply well - see Part 1E**

**Appendix 4: Capital Improvement Plan - see Part 1E**

**Appendix 5: Emergency Telephone List – see Part 2C**

**Appendix 6: Cooperative Agreements for Emergency Services – see Part 2C**

**Appendix 7: Municipal Critical Water Deficiency Ordinance – see Part 2C**

**Appendix 8: Graph showing annual per capita water demand for each customer category during the last ten-years – see Part 3 Objective 4**

**Appendix 9: Water Rate Structure – see Part 3 Objective 6**

**Appendix 10: Adopted or proposed regulations to reduce demand or improve water efficiency – see Part 3 Objective 7**

**Appendix 11: Implementation Checklist – summary of all the actions that a community is doing, or proposes to do, including estimated implementation dates – see**

**[www.mndnr.gov/watersupplyplans](http://www.mndnr.gov/watersupplyplans)**

**Appendix 1: Well Records and Maintenance Summaries**

**Well Records and Maintenance Summaries**

Well No.	Construction	Maintenance	Type
1	1985		
2	1987		
3	1997		
4	1998	2013	Replace VFD
5	2000		
6	2005		
7	2007	2016	Replace check valve and drop pipe
8	2007		

**Appendix 2: Water Level Monitoring Plan – see Part 1E**

**Water Level Monitoring Plan for the City of Ramsey**

1. Purpose of the Water Level Monitoring Plan

The purpose of the Water Level Monitoring Plan is to document the water level for wells 1 – 8 to track the seasonal variation in water levels and the long-term trends for each well.

2. Data Collection Method

The water level is measured by recording the depth to water in feet from the top of the casing located at each well. The top of the casing is 2.5 feet above the ground surface for each well. The depth to water for each well is measured with a SCADA system.

3. Measurement Frequency and Timing

The depth to water for each well is recorded on the last day of the month. The time the measurement is taken for each well is shown in Table 1.

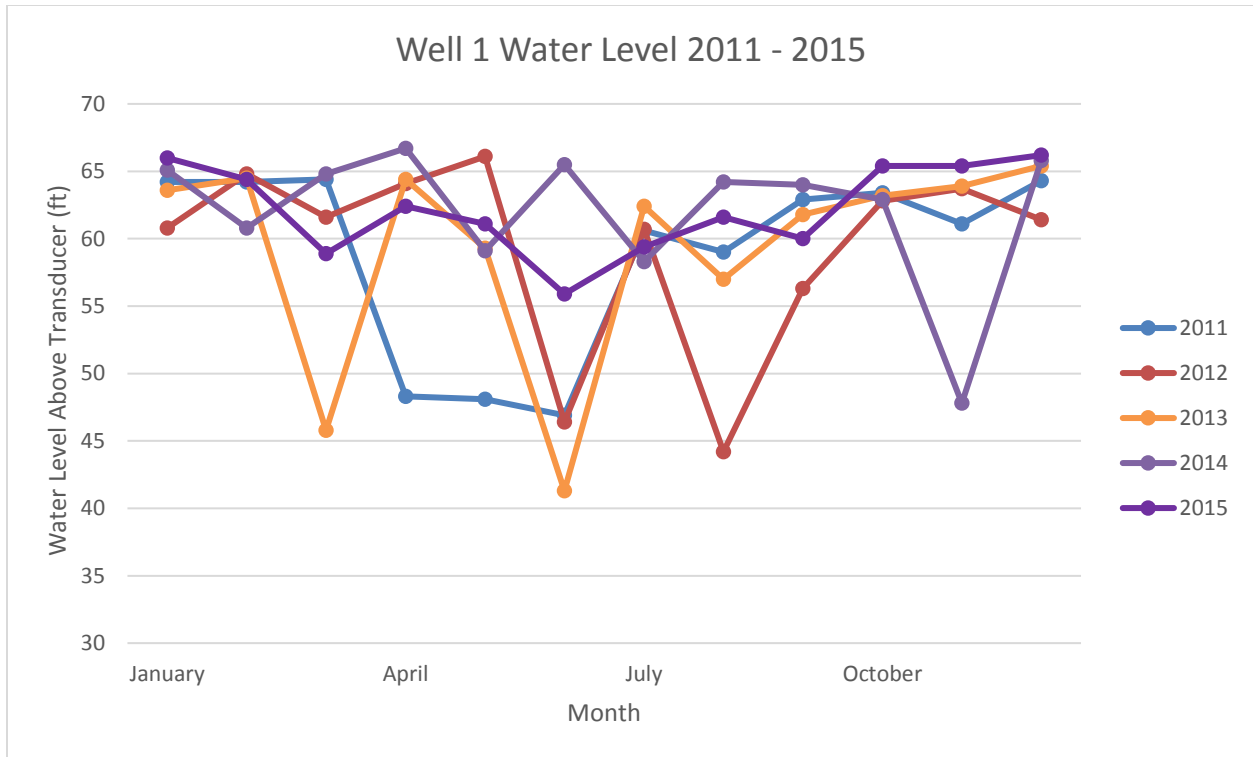
**Table 1 – Well Locations and Schedule for Water Level Readings**

Permittee Well Number:	MDH Unique Well Number:	Well Address:	DNR Permit Number:	Measurement Frequency	SCADA Measurement Timing
1	161441	T32-R25-SEC 25-DCCA	1985-6005	1x/month (Last Day of Month)	11:30 pm
2	416183	T32-R25-SEC 25-ABAB	1985-6005	1x/month (Last Day of Month)	11:30 pm
3	580303	T32-R25-SEC 28-AACD	1985-6005	1x/month (Last Day of Month)	11:30 pm
4	580313	T32-R25-SEC 28-ABCC	1985-6005	1x/month (Last Day of Month)	11:30 pm
5	593672	T32-R25-SEC 28-ACCC	1985-6005	1x/month (Last Day of Month)	11:30 pm
6	706840	T32-R25-SEC 28-BCDC	1985-6005	1x/month (Last Day of Month)	11:30 pm
7	743832	T32-R25-SEC 20-DDAA	1985-6005	1x/month (Last Day of Month)	11:30 pm

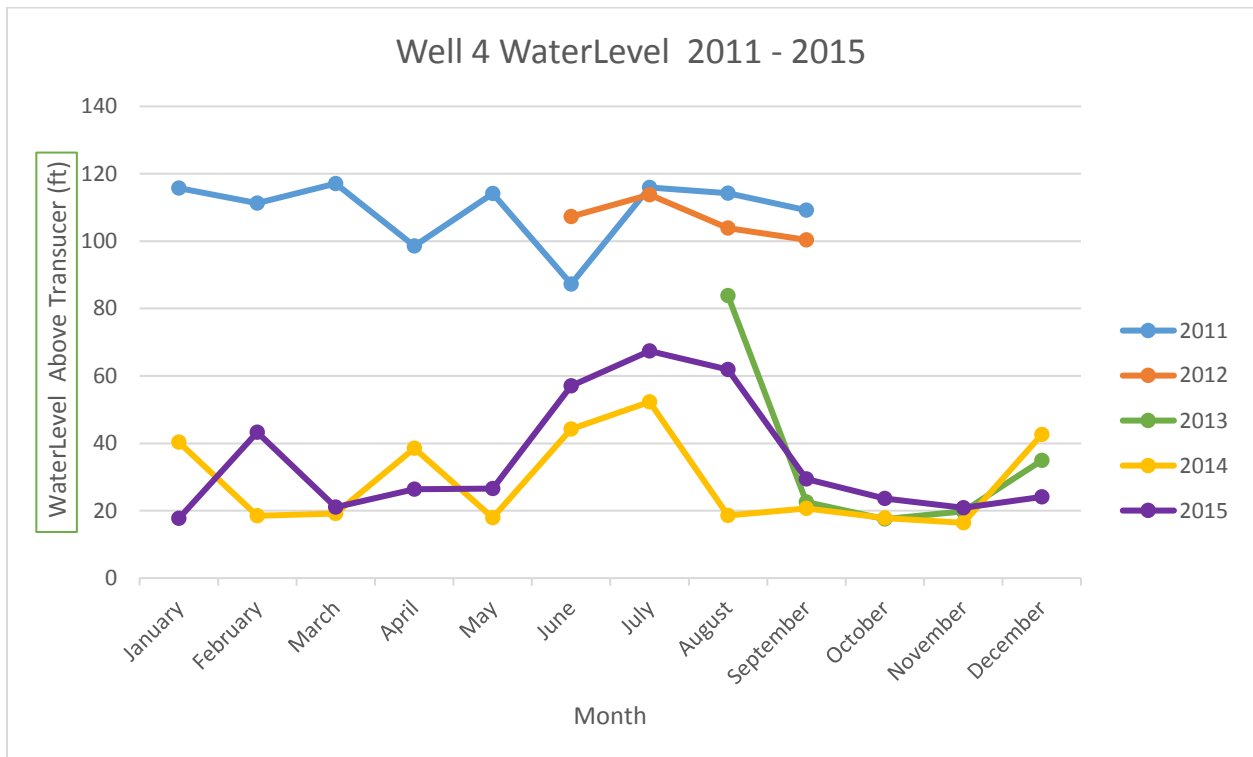
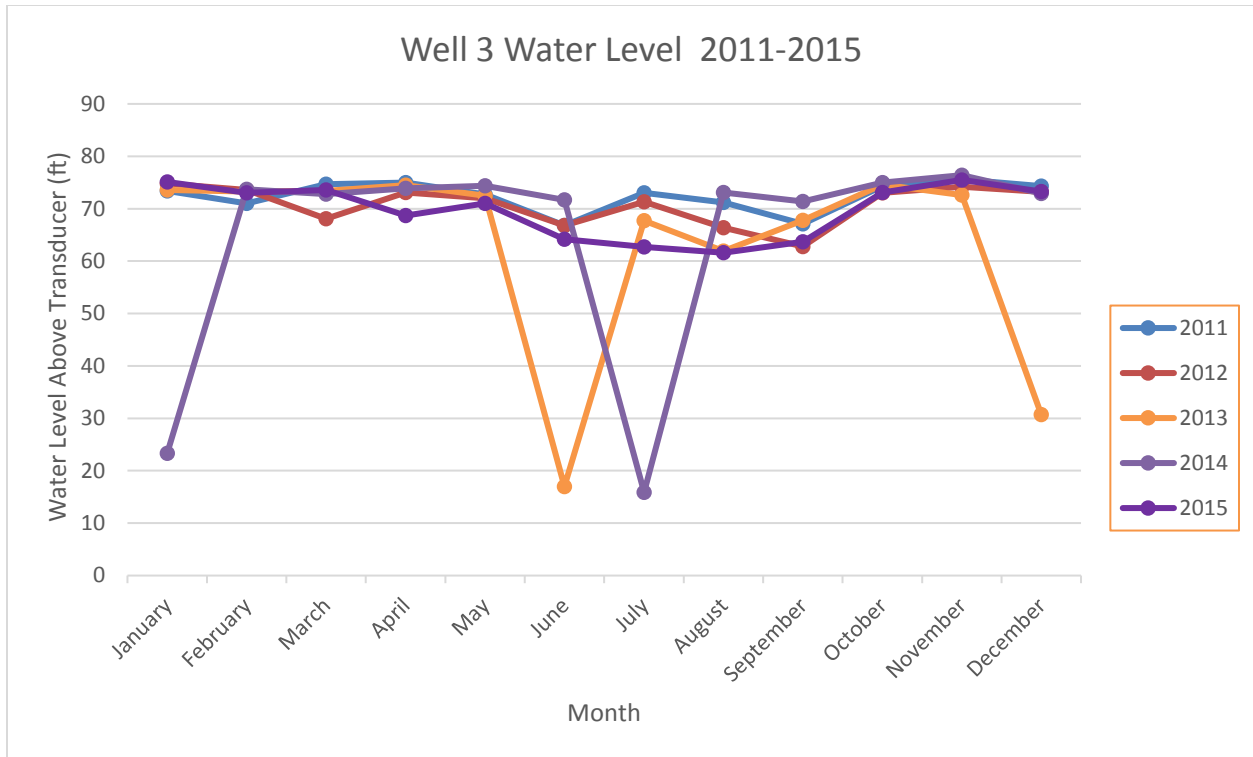
*City of Ramsey Local Water Supply Plan*

	731127	T32-R25-SEC 21-CCCC	1985-6005	Continuous	30 Min
8	743833	T32-R28-SEC 28-BABD	1985-6005	1x/month (Last Day of Month)	11:30 pm

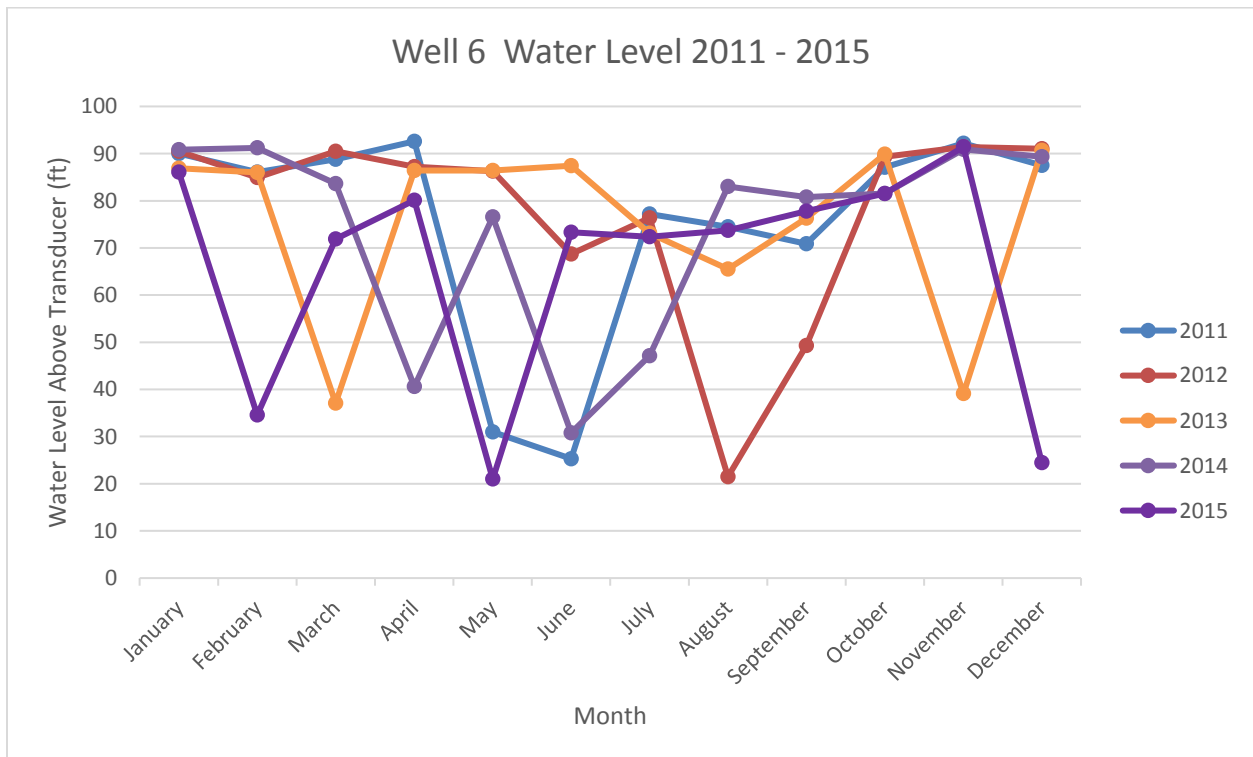
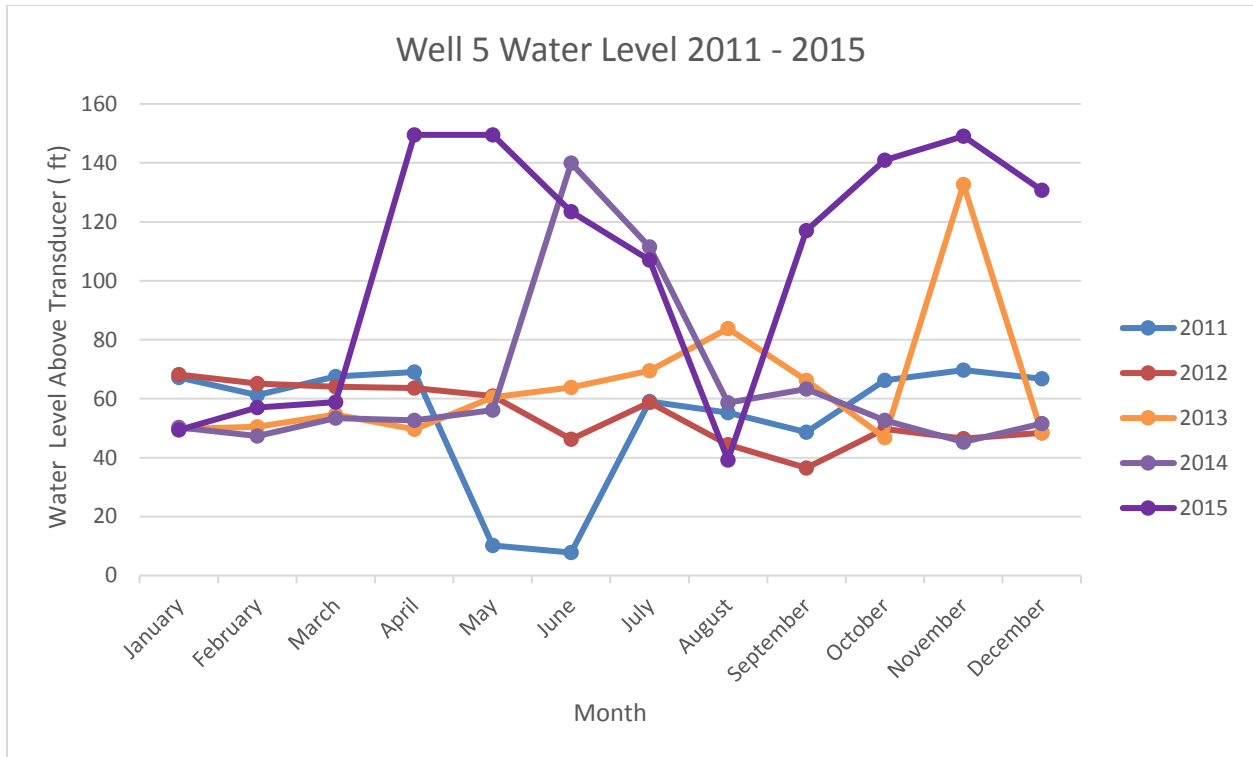
**Appendix 3: Water Level Graphs for Each Water Supply Well**

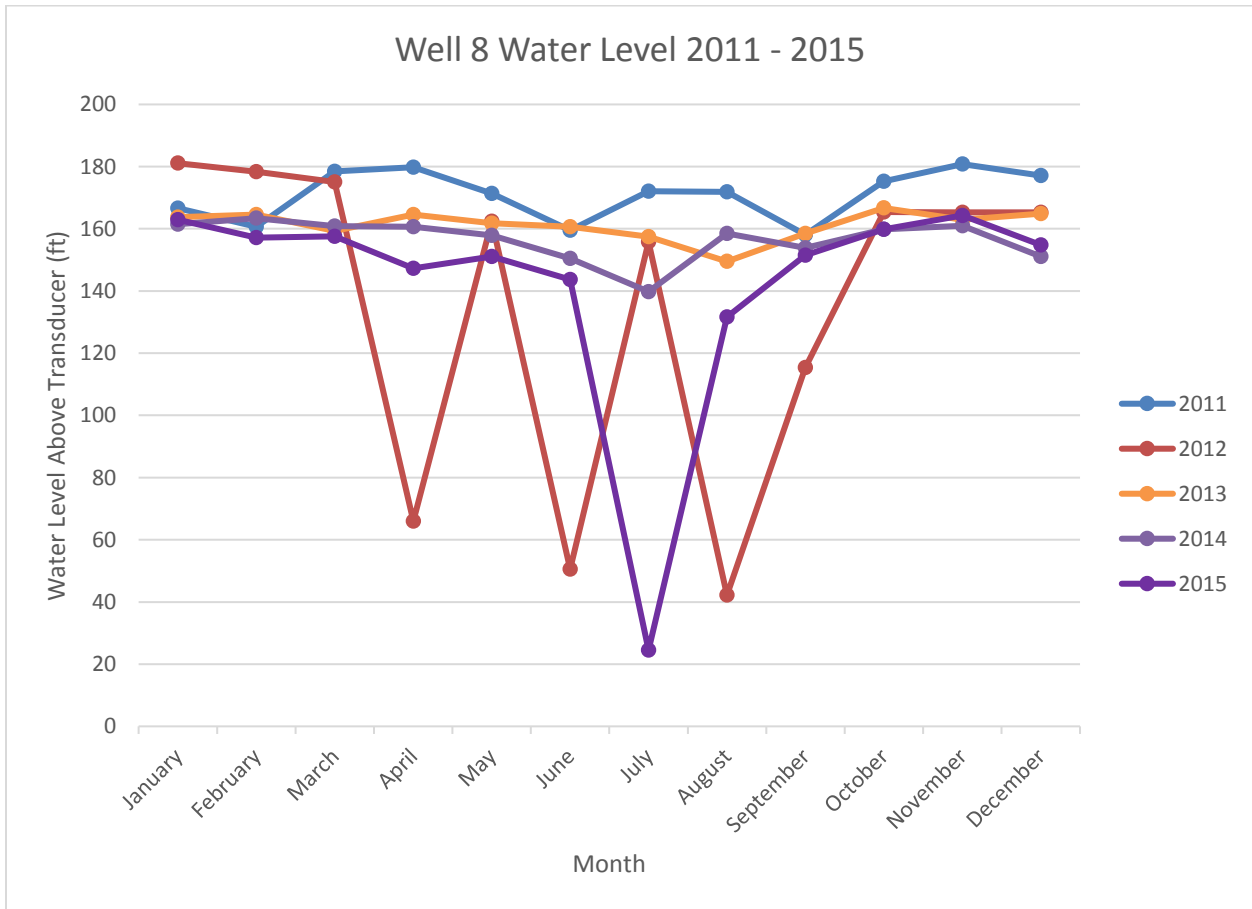
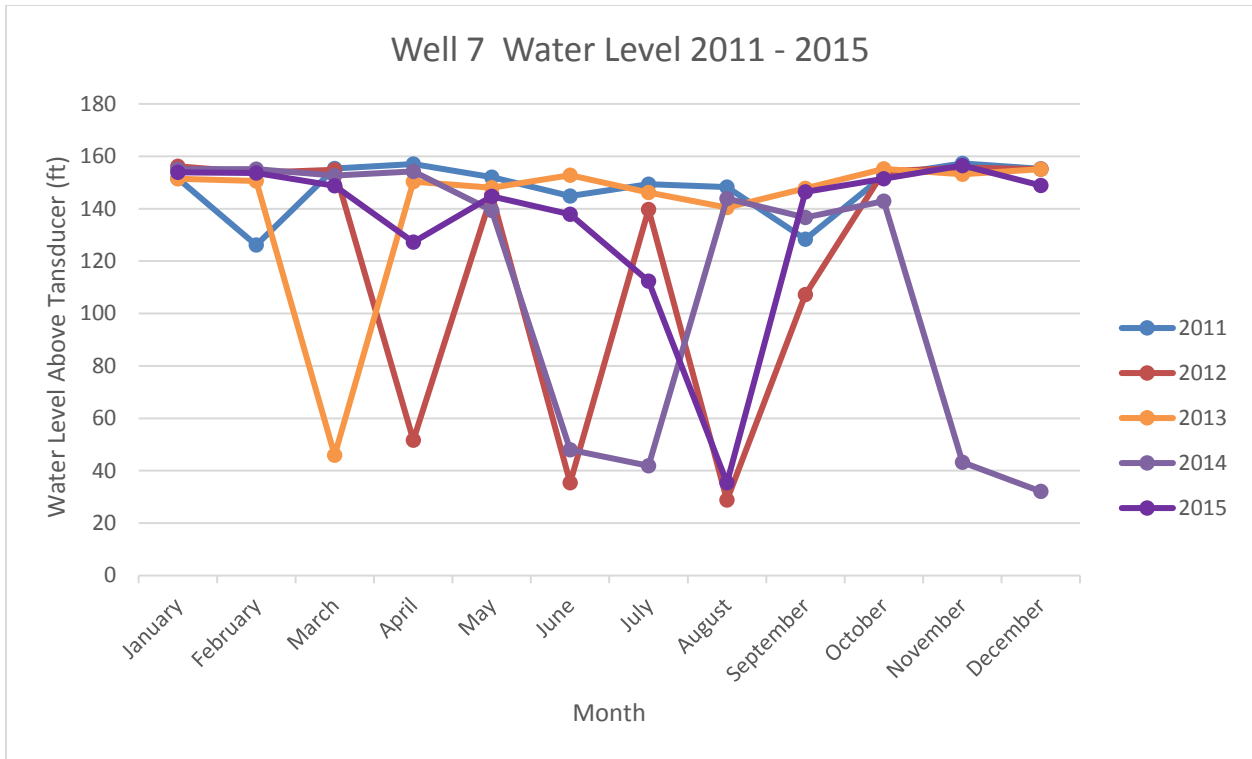


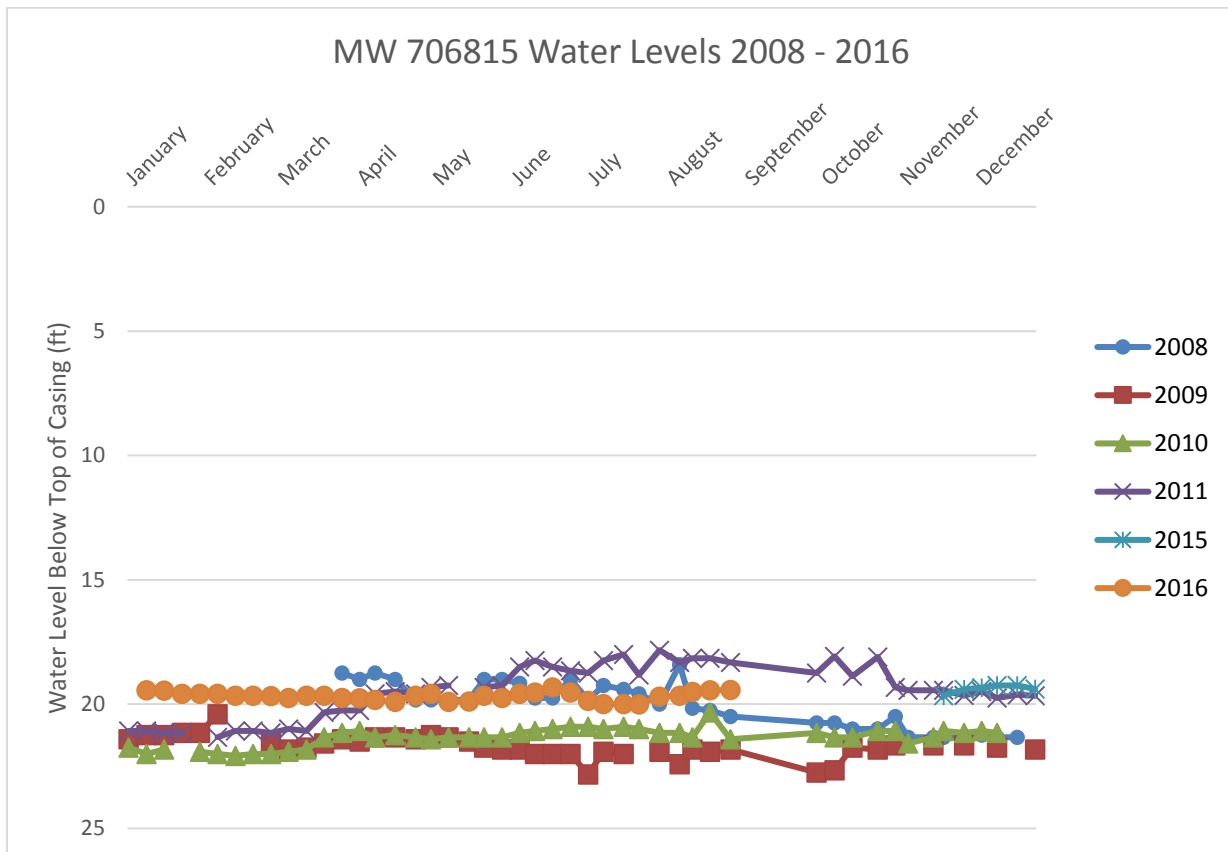
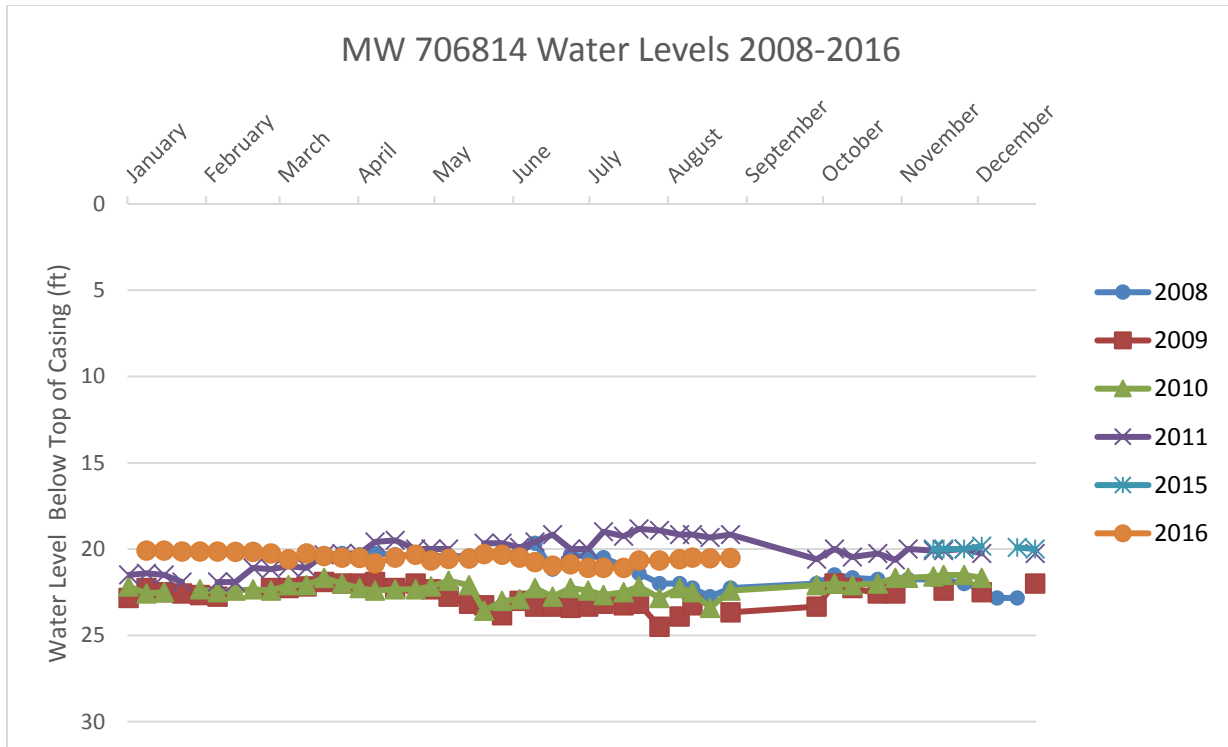
Well 2 is only used for extreme demand periods. It was not used in this period.

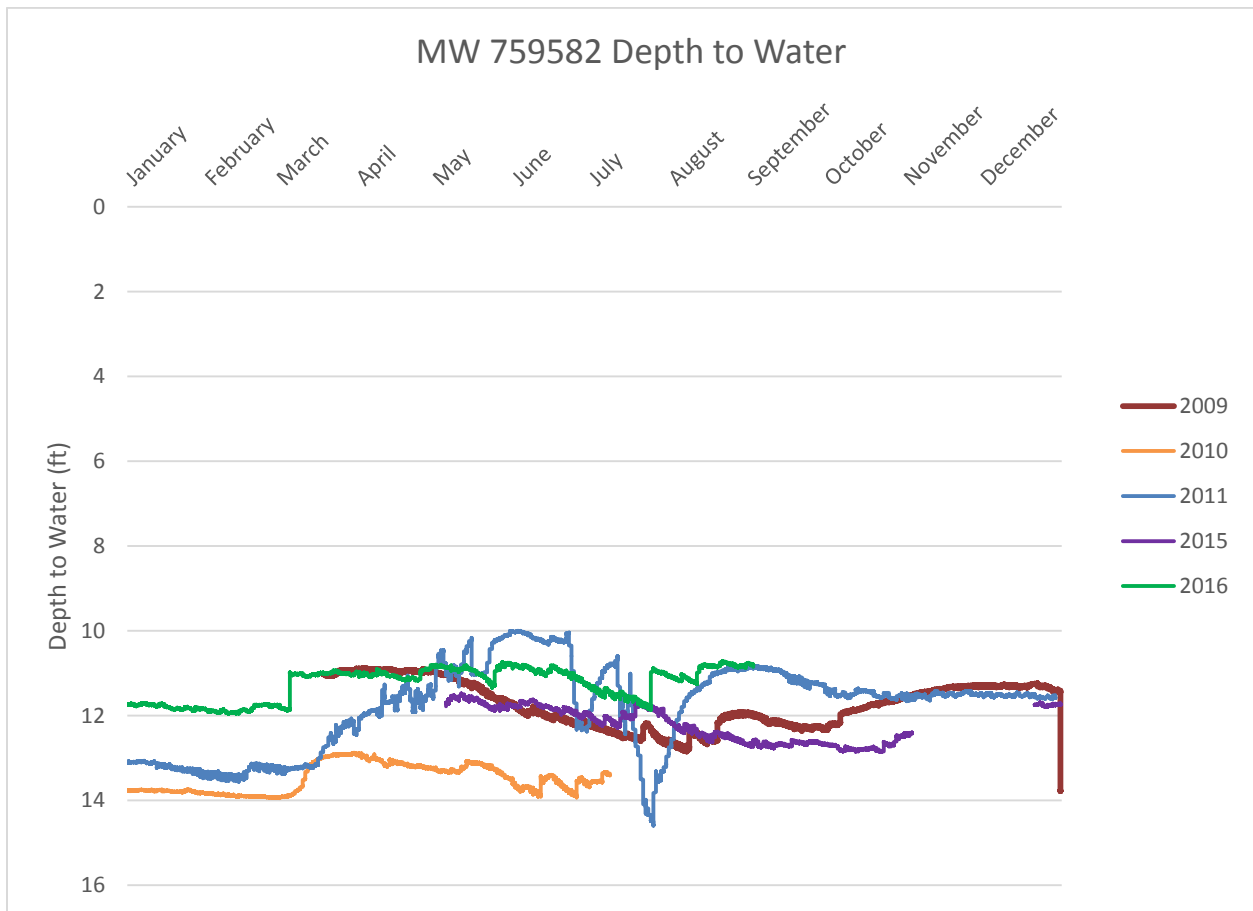
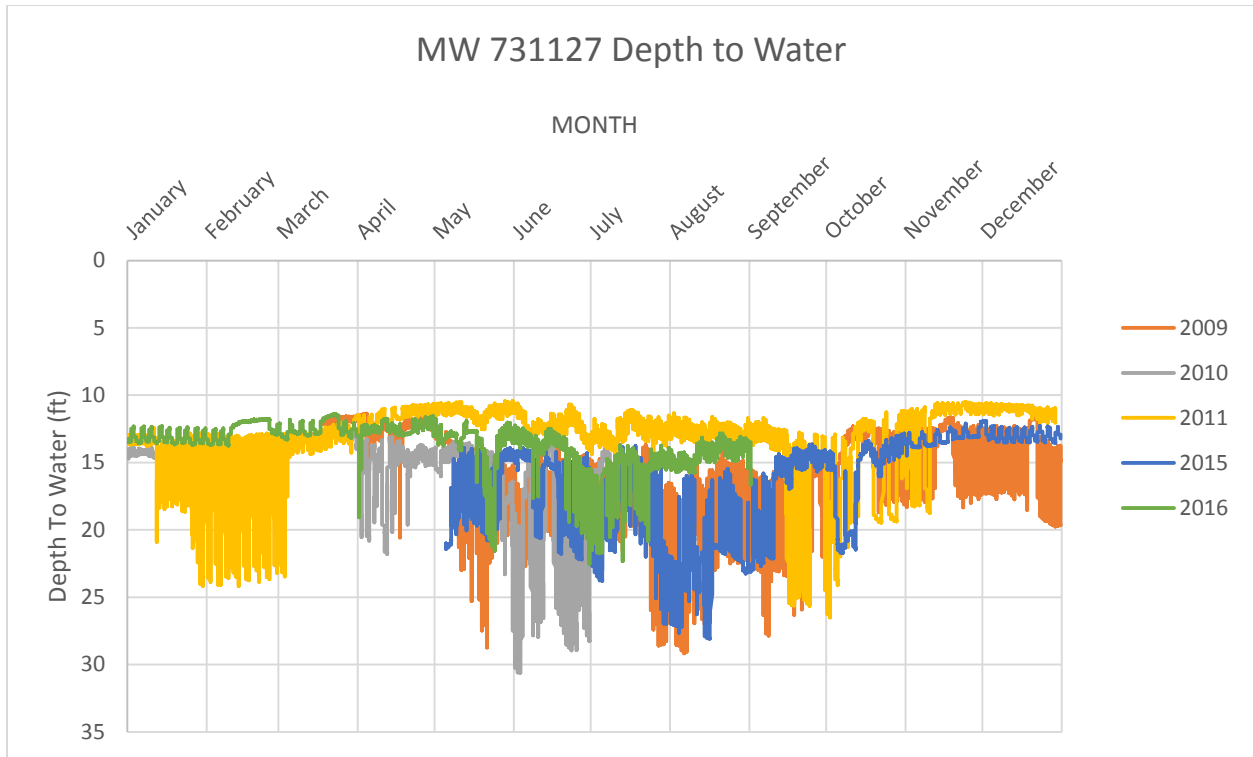


The Well 4 transducer was malfunctioning in late 2011 and early 2012 so there is no data for this period.









**Appendix 4: Capital Improvement Plan**

City of Ramsey Local Water Supply Plan

Project #	04-WTR-005	Department	Water Utility								
Project Name	Complete Pump House 3	Contact	Unassigned								
		Type	Improvement								
		Useful Life	50 Years								
		Category	Water Utility Improvement								
		Priority	3-Existing Obligation (Med)								
		Status	Active								
		Total Cost	\$60,000								
<b>Description</b>											
Install brick exterior to match building style of The COR buildings, landscape to match streetscape.											
<b>Justification</b>											
The intent is to have the building and grounds match The COR and adjacent developments.											
Expenditures	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Improvements Other than Building Cost		60,000									60,000
<b>Total</b>		<b>60,000</b>									<b>60,000</b>
Funding Sources	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Water Utility Fund		60,000									60,000
<b>Total</b>		<b>60,000</b>									<b>60,000</b>

Department Water Utility  
 Contact Unassigned  
 Type Improvement  
 Useful Life 60 Years  
 Category Water Utility Improvement  
 Priority 3-Existing Obligation (Med)  
 Status Active

Project # 04-WTR-009  
 Project Name The COR Bunker Lake Blvd (Armstrong - Ramsey Blvd)

Total Cost \$340,000

**Description**  
 Upgrades Bunker Lake Blvd between Armstrong and Ramsey Blvds, necessitated by the COR Development. Watermain segments along this portion of roadway will be lowered and extended as necessary.  
 Total Cost for Bunker Lake Blvd = \$4,520,000  
 Street Improvements: \$3,650,000  
 Storm Water Improvements: \$530,000  
 Water Utility Improvements: \$340,000  
 Total Cost for Regional Roadway improvements = \$14,607,860 (Per JPA)

**Justification**  
 The construction of the COR will add additional traffic to Bunker Lake Blvd. This project will upgrade Bunker Lake Blvd between Ramsey Blvd and Armstrong Blvd to better handle the traffic.  
 See projects Core Armstrong, Core Hwy 10 and Core Ramsey Blvd and Storm Sewer south of Bunker Lake Blvd.

Expenditures	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Improvements Other than Building Cost				340,000							340,000
<b>Total</b>				<b>340,000</b>							<b>340,000</b>
<b>Funding Sources</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>Total</b>
Water Utility Fund				340,000							340,000
<b>Total</b>				<b>340,000</b>							<b>340,000</b>

Project #	04-WTR-018	Department	Water Utility								
Project Name	Watermain Looping: (Ramsey Blvd to Traprock St.)	Contact	Unassigned								
		Type	Improvement								
		Useful Life	60 Years								
		Category	Water Utility Improvement								
		Priority	2-New Addition (High)								
		Status	Active								
		Total Cost	\$129,250								
<b>Description</b>											
This project includes the looping of a 12" watermain from Ramsey Blvd to Traprock Street with the extension of Riverdale Drive along the south side of Highway 10.											
Watermain Extension (04-WTR-018)	\$ 129,250										
Stormwater (16-STM-003)	\$ 118,120										
Street Improvement (12-STR-007)	\$ 911,905										
Right-of-Way	\$ 200,000										
*Street Lighting (16-STLT-001)	\$ 275,000 (related project not included in costs)										
<b>Total Project Cost</b>	<b>\$ 1,359,275 (not including street lights)</b>										
<b>Justification</b>											
Development south of Highway 10 is anticipated as a result of The COR, including through the Mississippi West County Park. The project will provide dependable water pressure and supply to this developing area.											
The city was awarded a MNDOT cooperative agreement funds grant to extend Riverdale Drive from Traprock Street to Ramsey Blvd in 2016/2017. Installation of water with street construction will eliminate the need to dig up the street in the future.											
Expenditures	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Improvements											129,250
Building Cost	129,250										
<b>Total</b>	<b>129,250</b>										<b>129,250</b>
Funding Sources	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Water Utility Fund	129,250										129,250
<b>Total</b>	<b>129,250</b>										<b>129,250</b>

Project #	08-WTR-003	Department	Water Utility									
Project Name	River Pines Lift Station Water Connection	Contact										
		Type	Improvement									
		Useful Life	50 Years									
		Category	Water Utility Improvement									
		Priority	5-Opportunity/Unfunded/Placeholder									
		Status	Active									
		Total Cost	\$20,000									
Description	This project involves extending the watermain in conjunction with extending gravity sewer to the River Pines Lift Station.											
	Total costs including street & water utility = \$120,000.											
Justification	This project adds a water loop at the same time a lift station is eliminated.											
Expenditures	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total	
Improvements Other than Building Cost				20,000							20,000	20,000
Total				20,000							20,000	20,000
Funding Sources	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total	
Water Utility Fund				20,000							20,000	20,000
Total				20,000							20,000	20,000

City of Ramsey Local Water Supply Plan

Department Water Utility  
 Contact  
 Type Improvement  
 Useful Life 50 Years  
 Category Water Utility Improvement  
 Priority 5-Opportunity/Unfunded/Placeholder  
 Status Active

Project # 11-WTR-003  
 Project Name Fire Station #1 Extension of Water

Total Cost \$55,000

**Description**  
 Extend municipal water from parking lot into Fire Station #1 building.  
 Related Project 12-SEW-002 \$60,000  
 Total Project Cost \$115,000

**Justification**  
 Treated water is currently at the west end of parking lot on the property. This extension would allow for the installation of a sprinkler system within the building while also improving water quality inside of the building. The current well would be used for irrigation on the site.  
 Trunk charges are waived for public buildings.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Expenditures											
Improvements Other than Building Cost				55,000							55,000
<b>Total</b>				<b>55,000</b>							<b>55,000</b>
Funding Sources											
Water Utility Fund				55,000							55,000
<b>Total</b>				<b>55,000</b>							<b>55,000</b>

Project #	12-WTR-001										Department	Water Utility
Project Name	Watermain Sunfish Lk Blvd										Contact	
											Type	Improvement
											Useful Life	50 Years
											Category	Water Utility Improvement
											Priority	4-New Addition (Med)
											Status	Active
											Total Cost	\$450,000
<b>Description</b> Extend watermain along Sunfish Lake Boulevard from Sunwood Drive to Fox Knoll approx. 4,000 feet.												
<b>Justification</b> This project will complete another watermain loop connection, providing increased fire flows, increased pressure and enhanced system reliability.												
Coordinate with development east of Sunfish Lake Blvd.												
Expenditures	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total	
Improvements Other than Building Cost				450,000							450,000	
<b>Total</b>				<b>450,000</b>							<b>450,000</b>	
Funding Sources	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total	
Water Utility Fund				450,000							450,000	
<b>Total</b>				<b>450,000</b>							<b>450,000</b>	

City of Ramsey Local Water Supply Plan

Department Water Utility  
 Contact Unassigned  
 Type Improvement  
 Useful Life 15  
 Category Water Utility Improvement  
 Priority 1-Existing Obligation (High)  
 Status Active

Project # 14-WTR-001  
 Project Name Refurbish Water Tower #2

Description Interior and exterior coatings at water tower #2. Total Cost \$1,300,000

Justification Ongoing maintenance of interior and exterior coatings on 1.5mg water tower to include inspections. Project will be scheduled after full inspection of tower.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Expenditures											
Improvements Other than Building Cost	1,300,000										1,300,000
<b>Total</b>	<b>1,300,000</b>										<b>1,300,000</b>
Funding Sources											
Water Utility Fund	1,300,000										1,300,000
<b>Total</b>	<b>1,300,000</b>										<b>1,300,000</b>

City of Ramsey Local Water Supply Plan

Project #	14-WTR-002										Department	Water Utility
Project Name	Refurbish Water Tower #1										Contact	Unassigned
											Type	Improvement
											Useful Life	15
											Category	Water Utility Improvement
											Priority	3-Existing Obligation (Med)
											Status	Active
											Total Cost	\$700,000
<p><b>Description</b></p> <p>Interior and exterior coatings at water tower #1.</p>												
<p><b>Justification</b></p> <p>Ongoing maintenance of interior and exterior coatings on 0.5mg water tower to include inspections. Project will be scheduled after full inspection of tower.</p>												
Expenditures	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total	
Improvements Other than Building Cost		700,000									700,000	
<b>Total</b>		<b>700,000</b>									<b>700,000</b>	
Funding Sources	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total	
Water Utility Fund		700,000									700,000	
<b>Total</b>		<b>700,000</b>									<b>700,000</b>	

Department Water Utility

Contact

Type Improvement

Useful Life

Category Water Utility Improvement

Priority 1-Existing Obligation (High)

Status Active

Project # 16-WTR-001  
 Project Name Emergency Power Supply for Well #3

Total Cost \$115,000

**Description**  
 Purchase and install a back up generator for Pumphouse #2, 7301 Bunker Lake Blvd. The generator is 150 KW 480 Volt, 3 phase 60 hz 1800 rpm.

**Justification**  
 Currently the City has a backup generator on one well that has the ability to produce 850 gallons per minute (gpm). Our average consumption rate is 1,120 gpm. In the event of a power failure our well cannot keep pace with demand. Well #3 can produce 1,600 gpm so with both wells running we will be able to produce 2,450 gpm, thus able to keep up with demand during a long power outage.  
 This project includes running a natural gas service to the well house to supply fuel for the generator. The project will also include SCADA upgrades for the site.

Expenditures	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Improvements Other than Building Cost	115,000										115,000
<b>Total</b>	<b>115,000</b>										<b>115,000</b>
Funding Sources	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Water Utility Fund	115,000										115,000
<b>Total</b>	<b>115,000</b>										<b>115,000</b>

Department Water Utility  
 Contact  
 Type Improvement  
 Useful Life 50 Years  
 Category Water Utility Improvement  
 Priority 5-Opportunity/Unfunded/Placeholder  
 Status Active

Project # 16-WTR-002  
 Project Name Construct Well and Pumphouse #9

Description  
 Construct new municipal groundwater supply well with supporting pumphouse and chemical feed system to remove pollutants, including iron and manganese and to add chlorine and fluoride.  
 Total Cost \$1,775,000

Justification  
 A study will be conducted in 2020 to determine a desirable site - \$75,000 est.  
 This project will provide a ninth municipal groundwater well with pumphouse and chemical feed system to treat the groundwater before supplying for public consumption. This project was added in lieu of the previously proposed surface water supply treatment facility which was removed due to excessively large project costs and a general lack of regional support for funding the proposed surfacewater treatment facility. As the City of Ramsey continues to grow, additional wells or a surface water supply facility will be needed.

Expenditures	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Improvements Other than Building Cost				75,000			1,700,000				1,775,000
<b>Total</b>				<b>75,000</b>			<b>1,700,000</b>				<b>1,775,000</b>
Funding Sources	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Water Utility Fund				75,000			1,700,000				1,775,000
<b>Total</b>				<b>75,000</b>			<b>1,700,000</b>				<b>1,775,000</b>

**Appendix 5: Emergency Telephone List**

**Ramsey Emergency Telephone List**

<b>Emergency Response Team</b>	<b>Name</b>	<b>Work Telephone</b>	<b>Alternate Telephone</b>
Emergency Response Lead	Matt Kohner	763 433-9859	
Alternate Emergency Response Lead	Jeff Katers	763 433-9882	
Water Operator	John Nelson	763 286-0296	
Public Works Superintendent	Grant Riemer	763 286-0282	
City Engineer	Bruce Westby	763 433-9825	
City Administrator/ Public Communications	Kurt Ulrich	763 433-9845	

<b>State and Local Emergency Response Contacts</b>	<b>Name</b>	<b>Work Telephone</b>	<b>Alternate Telephone</b>
State Incident Duty Officer	Minnesota Duty Officer	651 649-5451 Metro	800 422-0798 Out State
County Emergency Director	Terry Stoltzman	763 421-4760	
National Guard	Minnesota Duty Officer	651 649-5451 Metro	800 422-0798 Out State
Mayor	Sarah Strommen		
Fire Chief	Matt Kohner	763 433-9859	
Sherriff	Anoka County Sheriff	763 427-1212	
Central Communications	Anoka County Sheriff	763 427-1212	
Ambulance	Allina	763 576-9593	
Hospital	Mercy Medical Center	763 236-7144	
Doctor or Medical Facility	Allina Clinic Ramsey	763 236-0000	

<b>State and Local Agencies</b>	<b>Name</b>	<b>Work Telephone</b>	<b>Alternate Telephone</b>
MDH District Engineer			
MDH	Drinking Water Protection	651 201-4700	
State Testing Laboratory	Minnesota Duty Officer	651 649-5451 Metro	800 422-0798 Out State
MPCA	St. Paul Regional Office	651 296-6300	800 657-3864
DNR Area Hydrologist	Kate Drewry	651 259-5753	
Anoka County Environmental Services	Bart Biernat	763 422-6985	
MNWARN	Minnesota Duty Officer	651 649-5451 Metro	800 422-0798 Out State

City of Ramsey Local Water Supply Plan

<b>Utilities</b>	<b>Name</b>	<b>Work Telephone</b>	<b>Alternate Telephone</b>
Electric Company	Connexus Energy	763 323-2660	763 323-2600
Gas Company	CenterPoint Energy	612 372-5050	612 372-4727
Telephone Company	Century Link	763 712-5020	763 712-5002
Utility Locations	Gopher State One Call	800 252-1166	651 454-0002
County Highway Department	Anoka County	763 862-4201	
State Highway Department	MNDOT	651 296-3000	911

<b>Mutual Aid Agreements</b>	<b>Name</b>	<b>Work Telephone</b>	<b>Alternate Telephone</b>
Neighboring Water System	City of Anoka	763 576-2980	763 576-2860
Emergency Water Connection	City of Anoka	763 573-2980	
Materials	HD Supply	952 937-9666	

<b>Technical/ Contracted Services/ Supplies</b>	<b>Name</b>	<b>Work Telephone</b>	<b>Alternate Telephone</b>
MRWA Technical Services	MN Rural Water Association	800 367-6792	
Well Driller/ Repair	E. H. Renner	763 427-6100	
Electrician	3 Way Electric	612 865-3262	
Water Main Repair	Dave Perkins Contracting	763 427-0109	612 363-6459
Chemical Feed	Hawkins Chemical	612 331-9100	
Meter Repair	City of Ramsey	763 433-9861	
SCADA System	Total Control	763 286-7365	
Valves, Pipes and Fittings	Ferguson Water Works	763 560-5200	
Laboratory	Twin Cities Water Clinic	953 935-3556	

<b>Communications</b>	<b>Name</b>	<b>Work Telephone</b>	<b>Alternate Telephone</b>
Newspaper	Star Tribune	612 673-4000	
	Pioneer Press	651 222-1111	
School Superintendent	David Law	763 506-1001	
Property and Casualty Insurance	League of MN Cities	651 281-1200	

<b>Critical Water Users</b>	<b>Name</b>	<b>Work Telephone</b>	<b>Alternate Telephone</b>
Long Term Care Center	Stoney River Assisted Living	612 615-9936	

**Appendix 6: Cooperative Agreements for Emergency Services**

JOINT POWERS AGREEMENT BETWEEN THE  
CITY OF ANOKA AND THE CITY OF RAMSEY  
FOR THE SUPPLY OF MUNICIPAL WATER SERVICE  
TO PORTIONS OF THE CITY OF RAMSEY

THIS AGREEMENT is entered into between the City of Anoka, Minnesota, a Charter City under the laws of the State of Minnesota ("Anoka"), and the City of Ramsey, Minnesota, a Charter City under the laws of the State of Minnesota ("Ramsey"), on the 14<sup>th</sup> day of August, 1996.

WHEREAS, both Anoka and Ramsey own and operate municipal water systems for the purpose of providing municipal water service to their citizens, and

WHEREAS, Anoka's and Ramsey's corporate boundaries are adjacent and their respective water systems are in close proximity at the West boundary of Anoka and the East boundary of Ramsey; and

WHEREAS, Anoka has reserve municipal water system capacity beyond that which is currently needed to supply its peak day demand, and Ramsey has an expanding customer base which has exhausted Ramsey's municipal water system capacity, and

WHEREAS, it would be in the best interests of both cities to cooperate in providing municipal water service to portions of Ramsey and providing Ramsey with a secondary emergency water source, by utilizing Anoka's excess capacity, and

WHEREAS, such cooperation will provide revenue to Anoka and postpone the need for Ramsey to spend substantial amounts to expand its water system capacity.

NOW, THEREFORE, Anoka and Ramsey, pursuant to the authority contained in Minnesota Statutes, Section 471.59, commonly known as the "Joint Powers Act," in order to accomplish the foregoing purposes, agree as follows:

1. CONSTRUCTION OF INTERCONNECTIONS. Anoka and Ramsey shall and have constructed two interconnections between the Anoka municipal water system and the Ramsey municipal water system, as follows:

(a) Highway 10 Connection - a permanent connection located at the Anoka/Ramsey boundary on the North side of Highway 10 which consists of water main, a manhole, a back flow preventer, water meter, and valves and fittings. The purpose of this connection is to provide a supplemental source to Ramsey and an emergency water supply to Ramsey in the event of a water main break or interruption of Ramsey's water supply.

(b) County Road #116/Thurston Avenue Connection - a connection at the Southeast corner of the intersection of County Road #116 and Thurston Avenue. This connection is temporary in nature and has been accomplished by the connection of fittings and a hose line between two fire hydrants. Water drawn at this location will be for emergency use only. The connection contains a backflow preventer and meter.

2. OWNERSHIP OF HIGHWAY 10 CONNECTION EQUIPMENT. Anoka shall own all equipment East of the metering manhole and within the corporate limits of Anoka, and shall own and maintain the meter within the metering manhole and have access to the meter. Ramsey shall own and maintain the metering manhole and all equipment West of the manhole and within the corporate limits of Ramsey. All water flow through this connection shall be from Anoka to Ramsey and the one-way flow is insured by a double check backflow preventer owned and maintained by Ramsey. All equipment has been

purchased and installed by Ramsey, and Anoka has credited Ramsey for that portion of the equipment owned by Anoka. The construction, equipment, engineering, and other costs are described in Exhibit A attached hereto, as is the portion of the cost charged to Anoka and the credit given by Anoka. Ramsey has furnished Anoka a set of reproducible "as built" drawings of the connection.

3. SALE OF WATER. Anoka shall sell, at Ramsey's option, at least one million gallons of water per day through both connections described above, provided however:

(a) Anoka may, without notice to Ramsey, reduce or eliminate the amount of water sold to Ramsey in the event of a catastrophic event or emergency circumstance which causes an extraordinary demand for water within Anoka. The existence of any such catastrophic event or emergency circumstance shall be determined in the sole discretion and judgment of Anoka.

(b) Commencing upon and after January 1, 2000, Anoka may, upon nine months' written notice, reduce or eliminate the amount of water sold to Ramsey

4. WATER CONSERVATION. Ramsey agrees, with regard to its customers drawing water from Anoka, to implement water conservation and water restriction regulations similar to those imposed by Anoka on its water customers.

5. COMPENSATION.

(a) Ramsey shall pay Anoka for water supplied pursuant to this agreement according to the following schedule:

That standard industrial rate charged by Anoka to its industrial customers from time to time (currently 85 cents per 1,000 gallons) plus an additional monthly charge, based on the high usage day of each month, in the following amounts:

\$150.00 if the high usage day of the month is less than 250,001 gallons.

City of Ramsey Local Water Supply Plan

IN WITNESS WHEREOF, the undersigned Cities, by action of their governing bodies, have caused this agreement to be executed in accordance with the authority of Minnesota Statutes, Section 471.59.

CITY OF RAMSEY

By: [Signature]  
Mayor Date

Attest: [Signature] 8/14/96  
City Clerk Date

Approved as to form:

[Signature]  
City Attorney

CITY OF ANOKA

By: Peter M. Baby 8-19-96  
Mayor Date

Attest: Mark Nagel 8/16/96  
City Clerk Date

Approved as to form:

[Signature]  
City Attorney

**Appendix 7: Municipal Critical Water Deficiency Ordinance**

## DRAFT

### 10-1-13: DEFICIENCY OF WATER:

- A. General Requirements: The city shall not be liable for any deficiency or failure in the supply of water to consumers, whether occasioned by shutting the water off for the purpose of making repairs or connections or from any other cause whatsoever. In case of fire, or alarm of fire, or in making repairs or construction of new works, water may be shut off at such time and kept off as long as necessary. In addition, the City Council or City Administrator shall have the right to impose reasonable restrictions on the use of the city water system in emergency situations. (Amended Ord. 55, 5-5-1981; amd. 2003 Code)
- B. Irrigation And Sprinkling Restrictions: The following irrigation and sprinkling restrictions shall apply to those persons on the municipal water system:
1. Cross Connections Prohibited: No person shall construct, cause to be constructed or operate any device which provides a cross connection between the municipal water supply and a private well or the sewer system.
  2. Waste Of Water Prohibited:
    - a. Customers shall maintain taps, faucets, valves and other water facilities so that water waste is eliminated from seeps, dripping faucets, etc.
    - b. No person shall waste water deliberately by allowing irrigation or sprinkling water to run off onto the street or into the drains.
  3. Permission To Use Hydrant: No person shall open, close or tamper with any fire hydrant except under the authorization of the Public Utilities Department personnel.
  4. Odd-Even Day Sprinkling: Sprinkling will be curtailed from May 1 through August 31. Even numbered houses can sprinkle on even numbered calendar days. Odd numbered houses can sprinkle on odd numbered calendar days.
  5. Prohibited Hours: There will be no watering in the city (on the city water system), odd or even, between the hours of twelve o'clock (12:00) noon and six o'clock (6:00) P.M.
  6. Warning; Penalty: There will be only one written warning for violators of the sprinkling restrictions. Any subsequent violations carry a penalty as set forth by city ordinance.
  7. Exemptions:

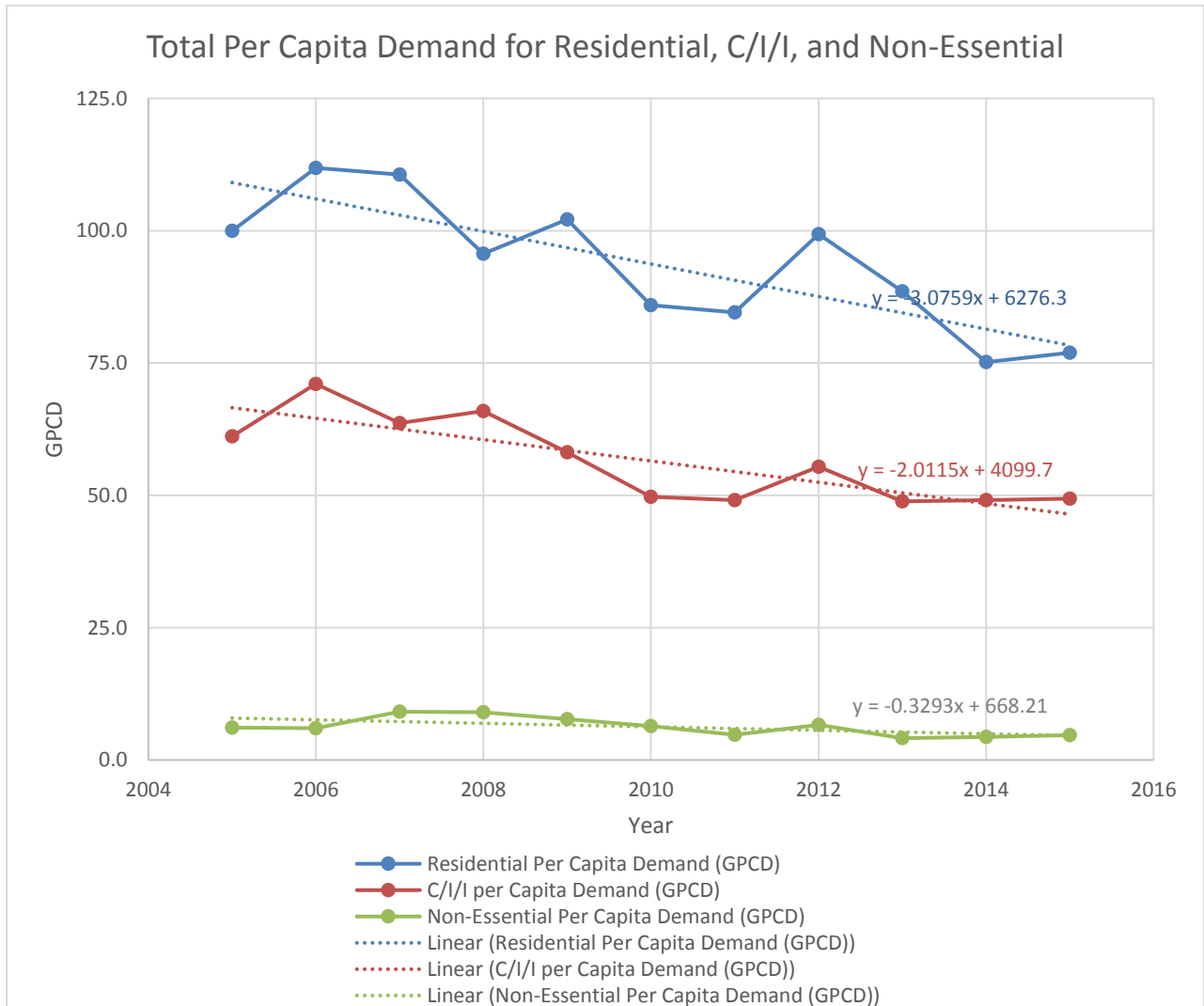
- a. Newly sodded or seeded yards will be exempt from the odd-even restriction for a period of two (2) weeks only. Overseeding or spot patching of existing established yards can be watered every day with a hand controlled hose. No watering will be allowed between twelve o'clock (12:00) noon and six o'clock (6:00) P.M.
- b. Other exemptions are: car washing, filling of children's swimming pools, children playing in a hose operated sprinkler or water toy.

8. Additional Restrictions:

- a. Additional curtailment of water usage in dry weather will be by order of the City Administrator. When restricted, no person shall discharge water for the purposes of watering lawns, shrubs, trees, washing cars or structures. All unnecessary uses of water are prohibited for the duration of the imposed restriction. If such restriction endangers the life of a new lawn, shrubs or trees, the Water Department shall be notified. If justified, limited permission may be granted to deviate from restrictions.
- b. If more drastic restrictions are necessary, orders may issued by the City Administrator to take necessary action to protect the water system so that ample water may be available for health, sanitation and fire protection. (Amended Ord. 55, 5-5-1981; amd. 2003 Code)

### Appendix 8: Graph Showing Annual Per Capita Water Demand for Each Customer Category During the Last 10 Years

**Figure 1 – Annual Per Capita Water Demand for Each Customer Category During the Last Ten Years**



**Appendix 9: Water Rate Structure**

**Water Rate Structure for the City of Ramsey Effective 1/1/2016**

Source: <http://cityoframsey.com/utility-billing>

Water Rates			2016
Minimum usage fee/qtr	Per 2012 Comprehensive Water System Study		37.80
Quarterly Rate Structure			
	Conservation Rates		\$37.80 Minimum
			\$2.61 per 1,000 for 15,001-25,000
			\$2.69 per 1,000 for 25,001-40,000
			\$2.86 per 1,000 for 40,001-60,000
			\$3.08 per 1,000 for 60,001-99,000
			\$3.40 per 1,000 for 99,001-201,000
			\$4.07 per 1,000 for 201,001 and above
Odd/Even Sprinkling Violations:			
	Effective day after Memorial Day thru Day after Labor Day		
	No Sprinkling between 10 am-8:00 pm		
First Violation			Written Warning & Registered Letter
Second Violation			50.00
Third Violation			100.00
Fourth Violation			Water Service turned off
Meter Replacement Admin Fee for Non-Compliance			\$75/qtr.

**Appendix 10: Adopted or Proposed Regulations to Reduce Demand or Improve Water Efficiency**

City of Ramsey Local Water Supply Plan

Adopted or Proposed Regulations to Reduce Demand or Improve Water Efficiency

Note: Ramsey is not proposing and new regulations to reduce demand. Listed in the table below are current regulations that are already in place.

Regulations Utilized	Website Link
<input checked="" type="checkbox"/> Rainfall sensors required on landscape irrigation systems	"Rain Sensors are required: Section 117-588, 589 <a href="http://www.municode.com/library/mn/ramsey/codes/">www.municode.com/library/mn/ramsey/codes/</a> )
<input type="checkbox"/> Critical/ Emergency Water Deficiency ordinance	Ordinance will be developed within 6 months of plan approval by DNR.
<input checked="" type="checkbox"/> Watering restriction requirements (time of day, allowable days, etc.)	Rules for Lawn Irrigation Odd and Even Number Houses  Time Restrictions 10:00 am – 8:00 pm Chapter 58 of City Code found at: <a href="http://www.municode.com/library/mn/ramsey/codes/">www.municode.com/library/mn/ramsey/codes/</a> )
<input checked="" type="checkbox"/> Water waste prohibited	Chapter 58 of City Code found at: <a href="http://www.municode.com/library/mn/ramsey/codes/">www.municode.com/library/mn/ramsey/codes/</a> )
<input checked="" type="checkbox"/> Soil preparation requirements (after construction, requiring topsoil to be applied to promote good root growth)	A minimum of 4" of approved topsoil is required under lawn areas of all newly constructed buildings.  Section 117-348 of City Code found at: <a href="http://www.municode.com/library/mn/ramsey/codes/">www.municode.com/library/mn/ramsey/codes/</a> )
<input checked="" type="checkbox"/> Tree ratios (requiring a certain number of trees per square foot of lawn)	Two trees are required per single family lot, additional trees are required for multi-family dwellings and commercial/ industrial lots. Section 117-111,112,113,114,115,116,117,118,119 <a href="http://www.municode.com/library/mn/ramsey/codes/">www.municode.com/library/mn/ramsey/codes/</a> )
All air conditioning systems connected directly or indirectly with public water system must be equipped with water conserving and regulating devices.	

**Appendix 11: Implementation Checklist – Summary All the Actions That A Community Is Doing or Proposes To Do, Including Estimated Implementation Dates**

**Implementation Checklist – Summary of all the Actions That a Community Is Doing or Proposes To Do, Including Estimated Implementation Dates**

Ramsey is a developing city with an increasing number of irrigation systems. The City plans to focus on reducing irrigation to decrease the total per capita water demand. Listed below is a table summarizing the actions Ramsey is proposing to complete within the next five years to reduce irrigation usage.

<b>Proposed Action</b>	<b>Implementation Date</b>
Promote videos on how to operate and program irrigation systems. This will be done through Anoka County. The videos will be promoted through individual contact, QCTV, Newsletter, social media and “Know the Flow” website.	2021
Rain Sensor Promotion – Ramsey and Anoka County will promote installation of rain sensors. Ramsey has applied to participate in a study of irrigation water use for 2017.	2021