Local Water Supply Plan Template
Third Generation for 2016-2018

Formerly called Water Emergency & Water Conservation Plan

Cover photo by Molly Shodeen

For more information on this Water Supply Plan Template, please contact the DNR Division of Ecological and Water Resources at (651) 259-5034 or (651) 259-5100.

This information is available in an alternative format upon request.

Table of Contents

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 DNRs 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
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
8. Plans should be submitted electronically – no paper documents are required. https://webapps11.dnr.state.mn.us/mpars/public/authentication/login
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

Requested Information	Description
DNR Water Appropriation Permit Number(s)	**1976-5086**
Ownership	☒ Public or ☐ Private
Metropolitan Council Area	☐ Yes or ☒ No (and county name)
Street Address	**315 West 4th Street**
City, State, Zip	**Red Wing, MN 55066**
Contact Person Name	Robert Stark, P.E.
Title	Deputy Director Public Works - Utilities
Phone Number	(651) 385-5112
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:

Commercial and Industrial is a single customer category. The other customer categories are residential and institutional.

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)	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	15930	5698	310.4	165.4			475.8	507.4	6.2%	1.39	3.4		53.39	87.26	
2006	15799	5638	313.4	252.3			565.7	566.6	<1%	1.55	3.7	7/31	54.35	98.11	
2007	15685	5721	343.8	310.5			651.3	669.23	2.7%	1.83	3.5		60.05	116.67	
2008	15703	5524	324.0	250.8			574.8	611.12	5.9%	1.67	2.9	9/2	56.59	106.35	
2009	15687	4991	317.2	209.8			527.0	578.9	9.0%	1.59	2.9	7/14	55.4	82.23	
2010	15682	6158	295.2	215.7			510.9	533.7	4.3%	1.46	2.5	10/15	51.47	93.1	
2011	15937	6250	294.5	230.5			525.0	543.2	3.4%	1.49	3.1	6/18	50.63	93.49	
2012	16006	6277	310.1	234.0			544.1	561.4	3.1%	1.53	3.3	7/17	53.08	95.59	
2013	16141	6330	295.8	214.3			510.1	527.4	3.3%	1.44	3.0		50.21	89.21	
2014	16441	6318	283.3	183.4			466.7	586.0	20.4%	1.61	2.9	7/30	47.21	97.93	
2015	16445	6262	275.6	186.3			461.9	565.2	18.3%	1.55	3.0	3/10	45.91	94.25	
2016	16524	6307	243.3	173.9			417.2	510.3	18.3%	1.40	2.5	7/3	40.22	68.98	
Avg. 2010-2016	16080	5950	302.8	218.3			528.8	568.2	6.84%	1.54	3.1	8.2.	51.54	93.59	95.83

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

See Glossary for definitions

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	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 FOOD SERVICE SPECIALITIES	INDUSTRIAL/COMMERCIAL	1,785,000	0.39%	YES
2CROTHHALL LAUNDRY SERVICES	INDUSTRIAL/COMMERCIAL	1,498,200	0.32%	UNKNOWN
3 ADM	INDUSTRIAL/COMMERCIAL	1,094,200	0.24%	UNKNOWN
4 MAYO CLINIC HEALTH SYSTEMS	INDUSTRIAL/COMMERCIAL	948,600	0.21%	UNKNOWN
5 PEPIN WOODS LLC	RESIDENTIAL (MANUFACTURERED HOME PARK)	888,600	0.19%	YES
6 GOODHUE CO GOV. CENTER	INDUSTRIAL/COMMERCIAL	830,000	0.18%	UNKNOWN
7 CITY OF RED WING – ATHLETIC FIELD	INDUSTRIAL/COMMERCIAL	635,700	0.14%	NO
8 NORWOOD PROMOTIONAL PRODUCTS	INDUSTRIAL/COMMERCIAL	630,500	0.14%	UNKNOWN
9 RW SHOE COMPANY	INDUSTRIAL/COMMERCIAL	578,000	0.13%	UNKNOWN
10 MAIN STREET CAR WASH	INDUSTRIAL/COMMERCIAL	576,900	0.12%	NO

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?
Twin Bluff Water Treatment Plant – Raw water from wells 7-1, 7-	2006	6,480,000 gallons per day	Greensand filtration for radium, iron and manganese removal	Aeration; KMnO4 addition; Greensand filtration; Chlorination	9.756 MG	Sanitary sewer	Yes. Reclaiming backwash water I the winter is not possible due to

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?
2 and 7-3			followed by chlorine disinfection	with ammonia addition; Fluoridation			freezing in the reclaim tank.
Charlson Crest Water Treatment Plant – Raw water from wells 8-1 and 8-2.	2005	4,320,000 gallons per day	Greensand filtration for radium, iron and manganese removal followed by chlorine disinfection	Aeration; KMnO4 addition; Greensand filtration; Chlorination with ammonia addition; Fluoridation	0.202 MG	Sanitary sewer	Yes. Approx. 97.5% of the backwash is recycled.
Total	NA	10,800,000 gallons per day	NA	NA	9.967 MG	NA	NA

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)
Sorin's Bluff Ground Storage Reservoir	Ground Storage – Low pressure zone	1927	Concrete	1,000,000 gallons
Hiawatha Hills Ground Storage Reservoir	Ground Storage – Low Pressure Zone	1973	Welded Steel	1,800,000 gallons
Sand Hill Standpipe	Standpipe – Intermediate Pressure Zone	1957	Welded Steel	300,000 gallons
Pine Ridge Ground Storage	Ground Storage – Intermediate Pressure Zone	1983	Welded Steel	500,000 gallons
Pioneer Road Standpipe	Standpipe – High Pressure Zone	1973	Welded Steel	700,000 gallons
River Bluff Reservoir	Pedestal – River Bluffs Intermediate Pressure Zone	2001	Welded Steel	300,000 gallons
Charlson Crest Reservoir	Pedestal – Western Intermediate Pressure Zone	2001	Welded Steel	300,000 gallons
Twin Bluff Clear Well	Clearwell for Twin Bluff Plant	1976	In-ground Concrete	1,000,000 gallons
Total	N.A.	N.A.	N.A.	10,800,000 gallons

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):

Current treatment capacity is adequate for the demand projected over the next 10 years. The total storage capacity is approximately 3 times the projected maximum daily demand.

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 7-1	216020	1975	1500 gpm	630	Normal operations	No
Groundwater	Well 7-2	151565	1983	1500 gpm	665	Normal operations	Yes
Groundwater	Well 7-3	686251	2005	1500 gpm	639	Normal operations	Yes
Groundwater	Well 8-1	686252	2005	1500 gpm	665	Normal operations	Yes
Groundwater	Well 8-2	686258	2006	1500 gpm	662	Normal operations	Yes

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.

None. Red Wing's water supply and treatment infrastructure is divided into two independent systems. Each of the two water plants has dedicated wells and is furnished with an emergency power supply. Either system can provide water to the entire City and has the capacity to meet current and future demands.

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 population served by the Red Wing Water utility as increased marginally (3.2% total) over the past 10 years. The per-capita residential water use has decreased significantly of that same time frame. Some of the downward trend can be attributed to recent wetter summers and reduced lawn irrigation; however the trend was been downward through most of the 10-year period. A portion of the downward trend may be due to the utilities public information efforts, and the relatively high water use rates have also likely contributed.

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	16,600	16,102	95 gpcd	1,529,690	3,059,380
2017	16,750	16,248	95 gpcd	1,543,560	3,087,120
2018	16,850	16,345	95 gpcd	1,552,775	3,105,550
2019	17,100	16,587	95 gpcd	1,575,765	3,151,530
2020	17,200	16,684	95 gpcd	1,584,980	3,169,960
2021	17,250	16,733	95 gpcd	1,589,635	3,179,270
2022	17,400	16,878	95 gpcd	1,603,410	3,206,820
2023	17,500	16,975	95 gpcd	1,612,625	3,225,250
2024	17,600	17,072	95 gpcd	1,621,840	3,243,680
2025	17,715	17,184	95 gpcd	1,632,480	3,264,960
2030	18,167	17,622	95 gpcd	1,674,090	3,348,180
2040	18,707	18,146	95 gpcd	1,723,870	3,447,740

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:

Population projections were based on State Demographer projections for Goodhue County. Population growth projections were estimated by proportioning the estimates for the County. The peak day flow was estimated using a 2.0 peaking factor. Per capita use and peaking factors are already relatively low, and a further reduction is likely, but was not assumed in these estimates.

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

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
216020	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☐ routine MDH sampling ☒ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☐ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
151565	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☒ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☐ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
686251	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☒ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☐ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☐ steel tape ☐ stream gauge
686252	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☒ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☐ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
686258	☒ production well ☐ observation well	☒ routine MDH sampling	☐ continuous ☐ hourly	☐ SCADA ☐ grab sampling

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
	☐ source water intake ☐ source water reservoir	☒ routine water utility sampling ☐ other	☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ steel tape ☐ 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

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
216020 (Well 7-1)	Mount Simon	Range: 5-32 feet Average: 18.5 feet	☐ Falling ☒ Stable ☐ Rising	See Appendix 2 for actual readings
151565 (Well 7-2)	Mount Simon	Range: 10 – 30 feet Average: 19.3 feet	☐ Falling ☒ Stable ☐ Rising	See Appendix 2 for actual readings
686251 (Well 7-3)	Mount Simon	Range: 15-26 feet Average: 17.9 feet	☐ Falling ☒ Stable ☐ Rising	See Appendix 2 for actual readings
686252 (Well 8-1)	Mount Simon	Range: 5-16 feet Average: 11.9 feet	☐ Falling ☒ Stable ☐ Rising	See Appendix 2 for actual readings
686258 (Well 8-2)	Mount Simon	Range: 3-24 feet Average: 13.7 feet	☐ Falling ☒ Stable ☐ Rising	See Appendix 2 for actual readings

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

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold*	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
All five of Red Wing's water supply wells are isolated from the surface by an overlying layer of non-permeable material and are deemed to be non-vulnerable to surface contamination. This non-permeable layer also isolates surface waters from impacts from the operation of the wells. Withdrawal of water from the aquifer in a sustainable manner would not be expected to have an influence on surface water bodies, including rivers and streams, fens, lakes or wetlands, or the plant and animals associated with them.						
☐ River or stream		☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ___		☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	
☐ Calcareous fen		☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing		☐ Revise permit ☐ Change groundwater pumping ☐ Increase	

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

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold*	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
		endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ Other: ___		☐ Other	
☒ Aquifer	Mount Simon	☒ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☒ Monitoring ☐ Aquifer testing ☐ Other: ___	Declining water level in the aquifer that does not recover	☐ Revise permit ☒ Change groundwater pumping ☒ Increase conservation ☐ Other	Pumping and static water levels in the aquifer are currently monitored monthly. Pressure transducers are being installed in the wells that will be connected to SCADA.
☐ Endangered, threatened, or special concern species habitat, other natural resource impacts		☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ___		☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ 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	☐ In Process ☒ Completed ☐ Not Applicable	June 2017	June 2027
SWP	☐ In Process ☐ Completed ☒ 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	☒ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition	Water Supply Capacity is adequate for foreseeable future	Well pumps are pulled, inspected and renovated on a regular basis. Wells are periodically televised
Water Storage Facilities	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	Water storage capacity is adequate for foreseeable future.	Reservoirs are reconditioned on a periodic basis. Four steel reservoirs have been completely reconditioned in last 6 years
Water Treatment Facilities	☒ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition	Treatment capacity is adequate for foreseeable future.	The treatment plants were constructed in 2005/2006 and are in very good

System Component	Planned action	Anticipated Construction Year	Notes
			condition. Building maintenance is addressed on a regular basis.
Distribution Systems (pipes, valves, etc.)	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	Ongoing – Included in annual street reconstruction program	Annual street reconstruction program includes water main and water service replacement.
Pressure Zones	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	Ongoing	
Other: SCADA	☐ No action planned - adequate ☒ Repair/replacement ☒ Expansion/addition	Ongoing	

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	None				
Surface Water	None				
Interconnection to another supplier	None				

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
☐ Groundwater	N.A.					
☐ Surface Water	N.A.					
☐ Reclaimed stormwater	N.A.					
☐ Reclaimed wastewater	N.A.					
☐ 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? 2004

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 Phone Number	Contact Email
Emergency Response Lead	BOB STARK	(651) 385-5112	BOB.STARK@CI.RED-WING.MN.US
Alternate Emergency Response Lead	COREY AADALEN	(651)380-3417	COREY.AADALEN@CI.RED-WING.MN.US

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

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
N.A.			

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.)

There are no adjacent cities that could supply emergency water through an interconnection. Surface water would be available from the Mississippi River, however the level of water treatment necessary to make that a safe supply cannot be provided by our water treatment plants. River water is available for fire protection if the need is near the river.

Red Wing's water supply and treatment infrastructure is split into two independent well fields, each with a dedicated treatment plant. All the wells and both plants are provided with emergency power and each plant and well field combination can meet the needs of the City. If a contamination or equipment failure would impact one well field or treatment plant, the other is fully capable of meeting the needs of the City.

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 (GDP)	Short-Term Emergency Demand Reduction Potential (GPD)
Residential	1	667,000	290,000
Institutional	1	599,700	260,000
Commercial	1	*	
Industrial	1	*	
Irrigation	3	400,000	400,000
Wholesale	3	MINIMAL	MINIMAL
Non-Essential	6	50,000	35,000
TOTAL	NA	NA	
*COMMERCIAL AND INDUSTRIAL ARE COMBINED INTO A SINGLE CATEGORY.			

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 action00s (Select all that may apply and describe)

Emergency Triggers	Short-term Actions	Long-term Actions
☒ Contamination ☒ Loss of production ☒ Infrastructure failure ☒ Executive order by Governor ☐ Other: _____	☐ Supply augmentation through ____ ☒ 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. ☒ Water allocation through____ ☒ Meet with large water users to discuss their contingency plan.	☐ Supply augmentation through ____ ☒ 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. ☒ Water allocation through____ ☒ 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
☒ Short-term demand reduction declared (< 1 year)	☒ Website ☒ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☒ Other: City Council Updates Door hangers knocking could be used for localized areas.	☒ Daily ☒ Weekly ☒ Monthly ☐ Annually	Red Wing Republican Eagle Red Wing Manufacturer's Group KCUE Radio HBC Local Access Television Down Town Mainstreet Red Wing Chamber of Commerce
☒ Long-term Ongoing demand reduction declared	☒ Website ☒ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☒ Other: City Council Updates	☒ Daily ☒ Weekly ☒ Monthly ☐ Annually	Red Wing Republican Eagle Red Wing Manufacturer's Group KCUE Radio HBC Local Access Television Down Town Mainstreet

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
			Red Wing Chamber of Commerce
☒ Governor's critical water deficiency declared	☒ Website ☐ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☒ Other: City Council Updates	☒ Daily ☒ Weekly ☒ Monthly ☐ Annually	Red Wing Republican Eagle Red Wing Manufacturer's Group KCUE Radio HBC Local Access Television Down Town Mainstreet Red Wing Chamber of Commerce

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.

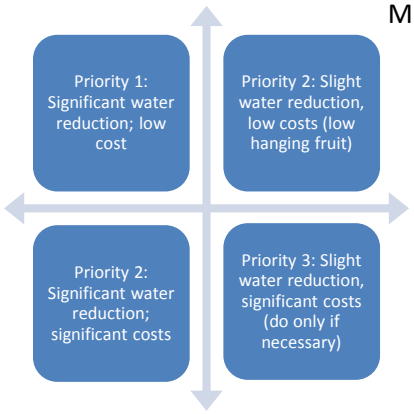
Irrespective of whether a critical water deficiency control is in place, does the public water supply utility, city manager, mayor, or emergency manager have standing authority to implement water restrictions? Yes ☐ No ☒

If yes, cite the regulatory authority reference: _____.

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

Currently, the City Council would adopt any measures to restrict or control water use. Council's direction would be administered through the Council Administrator. An Ordinance following the League of Minnesota/Minnesota Rural Water Association guidelines is being drafted and should be enacted before the end of 2017.

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.

Water conservation efforts enacted to date consist of public information and awareness, education and individual and utility pressure management. Our water rates are uniform in nature (currently $3.40/100 cubic feet) and are fairly high. This discourages discretionary use. This is demonstrated by per capita water use (<50 gpc/d) and peak to average day ratios (<2:1).

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	☐ Yes ☒ No
Water supply system improvements (e.g. leak repairs, valve replacements, etc.)	☒ Yes ☐ No
Educational efforts	☒ Yes ☐ No
New water conservation ordinances	☐ Yes ☒ No
Rebate or retrofitting Program (e.g. for toilet, faucets, appliances, showerheads, dish washers, washing machines, irrigation systems, rain barrels, water softeners, etc.	☐ Yes ☒ No
Enforcement	☐ Yes ☒ No
Describe other	☐ Yes ☐ No

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

The residential per-capita usage has steadily decreased during the period 2006 to 2015. The average of the years 2006 to 2008 is 57 gpc/d. The average for the last three years of this period is 48 gpc/d. While some of the decrease is due to reduced irrigation needs resulting from favorable summer rainfall events, the trend was downward throughout the ten year time frame. Water used by commercial and industrial customers also decreased steadily through the time frame. The total usage from the 2006-2008 time-frame to the 2013-2014 time-frame decreased approximately 22%.

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 Not Applicable- Surface water is not used as a water supply, nor is it impacted by use of water by the utility customers.	☐ Low stream flow conditions ☐ Reports of declining wetland and lake levels ☐ Other: _____	☐ Increase promotion of conservation measures ☐ Other: _____
Short-term demand reduction (less than 1 year	☐ Extremely high seasonal water demand (more than double winter demand) ☒ Loss of treatment capacity ☒ Lack of water in storage ☒ State drought plan ☒ Well interference ☒ Aquifer water levels dropping to abnormally low elevations _____	☒ 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. ☐ Supply augmentation through ____ ☒ Water allocation through____ ☒ Meet with large water users to discuss user's contingency plan.
Long-term demand reduction (>1 year)	☐ Per capita demand increasing ☐ Total demand increase (higher population or more industry) Water level in well(s) below elevation of continuing to drop ☒ Water level in wells dropping toward minimum level that can sustain normal pumping, including the drawdown.	☒ 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. ☒ 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. ☒ Meet with large water users to discuss user's contingency plan. ☐ Enhanced monitoring and reporting: audits, meters, billing, etc.
Governor's "Critical Water Deficiency Order" declared	☒ The Governor's issuance of a "Critical Water Deficiency Order" would constitute a trigger in and of itself.	☒ Actions taken in response to the issuance of a "Critical Water Deficiency Order" would be tailored to address the basis for the order.

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 ☒

The long term average unaccounted for water is less than 10%, however the amount has decreased significantly. We are currently monitoring this on a month to month basis and are trying to determine the reason for the increase. A water leak survey was completed in 2017 and again this fall. One significant leak was found in 2016, however the unaccounted for water is still much higher that prior to 2015. This work is ongoing.

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

We currently complete a comprehensive, system wide leak detection survey every other year. The most recent survey was just completed and we will be meeting with the leak detection contractor in the next week or so to view the survey results.

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 . 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? Currently in process. Plan to update annually thereafter.

Frequency of water audits: ☐ **yearly** ☒ **other (specify frequency) Starting first audit. Anticipate annual update.**
Leak detection and survey: ☐ **every year** ☒ **every other year** ☐ **periodic as needed**
Year last leak detection survey completed: October 2017

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

The unaccounted for water has tended to be very low, however it has increased dramatically the last couple of years. We are currently monitoring this on a monthly basis and trying to find the reason. Actions to date have focused on finding significant leaks in the distribution system, but have not been able to identify leaks that could account for the large recent increase. We are also evaluating the accuracy of our meters and the SCADA monitoring system to verify that the increase is in fact real.

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

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	5600	*	**	****	0-15 yr**(**
Irrigation meters	Approx. 30	*	**		0-10 / 10
Institutional	124	*	**	****	0-10 / 10
Commercial	491	*	**	****	0-10 / 10
Industrial	12	*	**	****	0-10 / 10
Public facilities	***	*	**	****	
*All water services in the City are metered **All water meters are equipped with automated readers, and are read on a monthly basis. *** Included with institutional accounts ****Meters are tested or replaced when measured use changes from historical trends					
TOTALS	6257	*	**	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.

N.A. All water services are metered.

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)	5	*	5 – All are monitored by SCADA system	12/*
Treatment plant	3 finished water meters	*	3 – All are monitored by SCADA system	12 / *
*The water utility is planning to procure a test meter and will monitor/repair/replace existing meters as needed.				

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? 51.54 g/person/day.

Describe the water use trend over that timeframe:

Residential per capita water use has been decreasing throughout the entire 10-year period. The current per capita usage averaged approximately 40 gpc/d. The decrease since 2005 exceeds 24%. Part of the decrease may be due

to the water conservation efforts undertaken by the utility, and a portion is likely due to the increase in water rates that has occurred over that same timeframe. Water availability and usage charges have increased over 60% over that 10 year period. The increases were necessary to service bonds used to construct the two new water treatment plants and wells, and to perform major renovations on four of our storage reservoirs.

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 de mand

Strategy to reduce residential per capita demand	Timeframe for completing work
☐ Revise city ordinances/codes to encourage or require water efficient landscaping.	
☐ 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	
☒ Revise ordinances to limit irrigation. Describe the restricted irrigation plan:	This could be implemented if necessary; however lawn irrigation is not widespread in Red Wing. Many of the lots are smaller and most are not irrigated.
☐ 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.	
☒ Make water system infrastructure improvements	This is ongoing. Improvements include system-wide pressure regulation, leak detection, reduced hydrant flushing
☐ Offer free or reduced cost water use audits) for residential customers.	
☒ Implement a notification system to inform customers when water availability conditions change.	Water bill inserts are routinely used to promote water conservation efforts.
☐ 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.)	
☐ 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.)	
☐ Identify supplemental Water Resources	
☒ Conduct audience-appropriate water conservation education and outreach.	
☒ Describe other plans	Promote regulation of pressure of individual services.

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
☐ Conduct a facility water use audit for both indoor and outdoor use, including system components	
☒ Install enhanced meters capable of automated readings to detect spikes in consumption	This will be offered to large water users as an option beginning in 2019.
☐ 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.)	
☐ Install water conservation fixtures and appliances or change processes to conserve water	
☐ Repair leaking system components (e.g., pipes, valves)	
☐ Investigate the reuse of reclaimed water (e.g., stormwater, wastewater effluent, process wastewater, etc.)	
☐ Reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	
☐ Train employees how to conserve water	
☐ Implement a notification system to inform non-residential customers when water availability conditions change.	
☐ 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 http://www.dli.mn.gov/PDF/docket/4714rule.pdf	
☒ Describe other plans: Water usage is monitored monthly and compared to historical trends. Customers are alerted if their usage changes form historical usage trends.	Ongoing
Commercial, industrial and institutional water use has decreased over the past ten year. This may be partially due to educational efforts related to water conservation, but is more likely the result of increasing water rates.	

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.

Residential per capita use has decreased an average of 2.3 gallons/year. This corresponds to about 4.5% per year. Obviously, this trend cannot continue over the long term, but it may realistic to assume a 1.5%/year reduction over a 10 year period. A 1.5%/year reduction over a 10 year period would result in a residential per capita demand of 40 gpc/day. Commercial/industrial per capita demand decreased at approximately 1.3 gpc/day, which corresponds to an annual average reduction of approximately 1%/year. A 1% reduction/year over 10 years would result in a per capita demand of 18 gpc/day. C/I/I changes in demand are influenced by factors other than conservation efforts. The economy and make up of industrial customers probably plays a larger role.

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: 2.0

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: __0___ gallons or _0___ 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: Water rates are typically changed annually. The last increase was January 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	☒ Monthly billing ☐ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates ☐ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☐ Service charge not based on water volume ☐ Other (describe)	☒ Uniform ☐ Odd/even day watering	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)
Commercial/ Industrial/ Institutional	☒ Monthly billing ☐ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates ☐ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☐ Service charge not based on water volume ☐ Other (describe)	☒ Uniform	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
☐ 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:

The City Council decided stay with the current water rate structure. The current rate structure is uniform (conservation neutral) however the water rates are fairly high (currently $3.40/ 100 cubic feet). This by itself discourages discretionary use. Lawn sprinkling is not widespread. This is reflected in both the per capita water use (approx. 40 gpc/d) and the peak to average day ratio (approx. 2.0)

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

☒	Participate in the GreenStep Cities Program, including implementation of at least one of the 20 "Best Practices" for water
☐	Prepare a master plan for smart growth (compact urban growth that avoids sprawl)
☒	Prepare a comprehensive open space plan (areas for parks, green spaces, natural areas)
☐	Adopt a water use restriction ordinance (lawn irrigation, car washing, pools, etc.)
☐	Adopt an outdoor lawn irrigation ordinance
☐	Adopt a private well ordinance (private wells in a city must comply with water restrictions)
☒	Implement a stormwater management program
☒	Adopt non-zoning wetlands ordinance (can further protect wetlands beyond state/federal laws- for vernal pools, buffer areas, restrictions on filling or alterations)
☐	Adopt a water offset program (primarily for new development or expansion)
☒	Implement a water conservation outreach program
☐	Hire a water conservation coordinator (part-time)
☐	Implement a rebate program for water efficient appliances, fixtures, or outdoor water management
☒	Continue to work to identify and eliminate unaccounted for water

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

The main way to measure success of the water conservation program is to continue to monitor per capita water use on a periodic basis. This should be done on a quarterly basis, as the conservation measures differ seasonally. For example, the largest reduction during the summer is to promote minimal or at least most effective lawn irrigation, while conservation efforts during the other seasons is more related to promoting water efficient plumbing fixtures and household practices.

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)?
☐ Rainfall sensors required on landscape irrigation systems	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Water efficient plumbing fixtures required	☐ New development ☐ Replacement ☐ Rebate Programs
☒ Critical/Emergency Water Deficiency ordinance	☒ Only during declared Emergencies
☐ Watering restriction requirements (time of day, allowable days, etc.)	☐ Odd/even ☐ 2 days/week ☐ Only during declared Emergencies
☐ Water waste prohibited (for example, having a fine for irrigators spraying on the street)	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Limitations on turf areas (requiring lots to have 10% - 25% of the space in natural areas)	☐ New development ☐ Shoreland/zoning ☐ Other
☐ Soil preparation requirement s (after construction, requiring topsoil to be applied to promote good root growth)	☐ New Development ☐ Construction Projects ☐ Other
☐ Tree ratios (requiring a certain number of trees per square foot of lawn)	☐ New development ☐ Shoreland/zoning ☐ Other
☐ Permit to fill swimming pool and/or requiring pools to be covered (to prevent evaporation)	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Ordinances that permit stormwater irrigation, reuse of water, or other alternative water use (Note: be sure to check current plumbing codes for updates)	☐ 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
☐ Low flush toilets, ☐ Toilet leak tablets, ☐ Low flow showerheads, ☐ Faucet aerators;	☐ Education about ☐ Free distribution of ☐ Rebate for ☐ Other	☒ Gas company ☒ Electric company ☐ Watershed organization
☐ Water conserving washing machines, ☐ Dish washers, ☐ Water softeners;	☐ Education about ☐ Free distribution of ☐ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☐ Watershed organization
☐ Rain gardens, ☐ Rain barrels, ☐ Native/drought tolerant landscaping, etc.	☐ Education about ☐ Free distribution of ☐ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☐ 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.):

None of the above water use targets have been implemented to date. Future activities will include promotion of several of these targets. Promotion will include utility bill inserts, and brochures that will be available at the public works and utility public areas.

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	Lawn watering guidelines; Individual pressure monitoring and control; Instructions on how to compare individual water use to average residential customers; Instructions on reading individual utility bills and determining water use; Explanation of water conservation goals; Description of water infrastructure	5-6	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Consumer Confidence Reports	Consumer confidence reports are available from the city's website, and a link is provided on utility bills. Copies are available during tours and other public events.	1 time/yr, but available through website	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Press releases to traditional local news outlets (e.g., newspapers, radio and TV)	Have held press releases promoting water plant tours and the recent Smithsonian Water/Ways exhibit that was in Red Wing. These have included press releases in the local newspaper as well as Public Service announcements on local access television.		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Social media distribution (e.g., emails, Facebook, Twitter)	The City uses Facebook and Twitter accounts to promote a wide variety of activities. These accounts have been used to promote the annual water plant tours and Smithsonian Water/Ways exhibit.		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Paid advertisements (e.g., billboards, print media, TV, radio, web sites, etc.)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Presentations to community groups	Water conservation promotion presentations have been presented to civic groups including the Kiwanis Club, Red Wing Manufacturers Association, Red Wing Sustainability Commission	3-4 times per year	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Staff training			☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Facility tours	Routinely provide tours to schools groups ranging from grade school through high school; Annually host an open house at the water plant that includes a tour and presentations. Displays on a variety of topics are located in the water plant conference room.	Numerous times per year	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Displays and exhibits	Information displays on a variety of topics are used. These include fluoridation rule changes, water conservation program, wellhead protection, quality control, facility identification and purpose.	Available in conference room at water plant	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Marketing rebate programs (e.g., indoor fixtures & appliances and outdoor practices)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community news letters	The water utility used utility bill inserts rather than community news letters to communicate with customers.		☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Direct mailings (water audit/retrofit kits, showerheads, brochures)			☐ Ongoing ☐ Seasonal

Education Methods	General summary of topics	#/Year	Frequency
			☐ Only during declared emergencies
Information kiosk at utility and public buildings	Informational displays are presented in the conference room at the water treatment plant. This room is occasionally used for public meetings.		☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Public service announcements	Public information announcements are occasionally presented on local access television		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Cable TV Programs			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Demonstration projects (landscaping or plumbing)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
K-12 education programs (Project Wet, Drinking Water Institute, presentations)	Several presentations per year made to schools. Includes grade school through high school		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community events (children's water festivals, environmental fairs)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community education classes	Have co-hosted a class on constructing and using rain barrows for landscape irrigation		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Water week promotions			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Website (include address:)	Currently working with the City's communication specialist on a water		☒ Ongoing ☐ Seasonal ☐ Only during

Education Methods	General summary of topics	#/Year	Frequency
	conservation web page that will be easily accessible form the City's website. The City's website is currently being redesigned, and the water conservation webpage will be included on the roll-out.		declared emergencies
Targeted efforts (large volume users, users with large increases)	All customers with significant changes in their water use are contacted after each monthly billing cycle.		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Notices of ordinances	Ordinances are available from the City's laserfiche server. These are linked from the City's website		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Emergency conservation notices	Have not been necessary to date.		☐ Ongoing ☐ Seasonal ☒ Only during declared emergencies
Other:			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies

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

Major new activity will be to improve the City's website as a medium to allow residents to gain information on water conservation and water use reduction. School programs, tours and public presentations will continue to be important.

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
☐ None at this time		
☐ Comprehensive planning that guides development in vulnerable drinking water supply management areas		
☐ Zoning overlay		
☐ 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)

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

Appendix 1

Well Records and Maintenance Summaries

(See Part 1C)

Appendix 2

Water Level Monitoring Plan

(See Part 1E)

APPENDIX 2

WATER LEVEL MONITORING PLAN

Red Wing, Minnesota

General

Red Wing's water supply wells are located in two separate wellfields, each tributary to an independent water treatment plant. Both water treatment plants feed to a common water distribution system, and either plant can meet the current needs of the City. The east well field consists of three wells (7-1, 7-2 and 7-3) and the west well field consists of 2 wells (8-1, 8-2). The well fields are approximately 5 miles apart and do not have a noticeable hydraulic impact on each other. Each well is approximately 650 feet deep and draw water from the Mt. Simon Aquifer.

Current

The aquifer water level in the aquifer is monitored at each well under static and pumping condition on a monthly basis. This is intended to verify that the rate of water withdrawal from the aquifer does not exceed the rate at which it is replenished, and that the current utilization is sustainable for the long term. The water levels are plotted on a graph and examined to make sure there are no long term downward trends. Pumping levels are measured after the well has been pumped at the design rate (1500 gpm) for approximately an hour. These graphs are provided in Appendix 3.

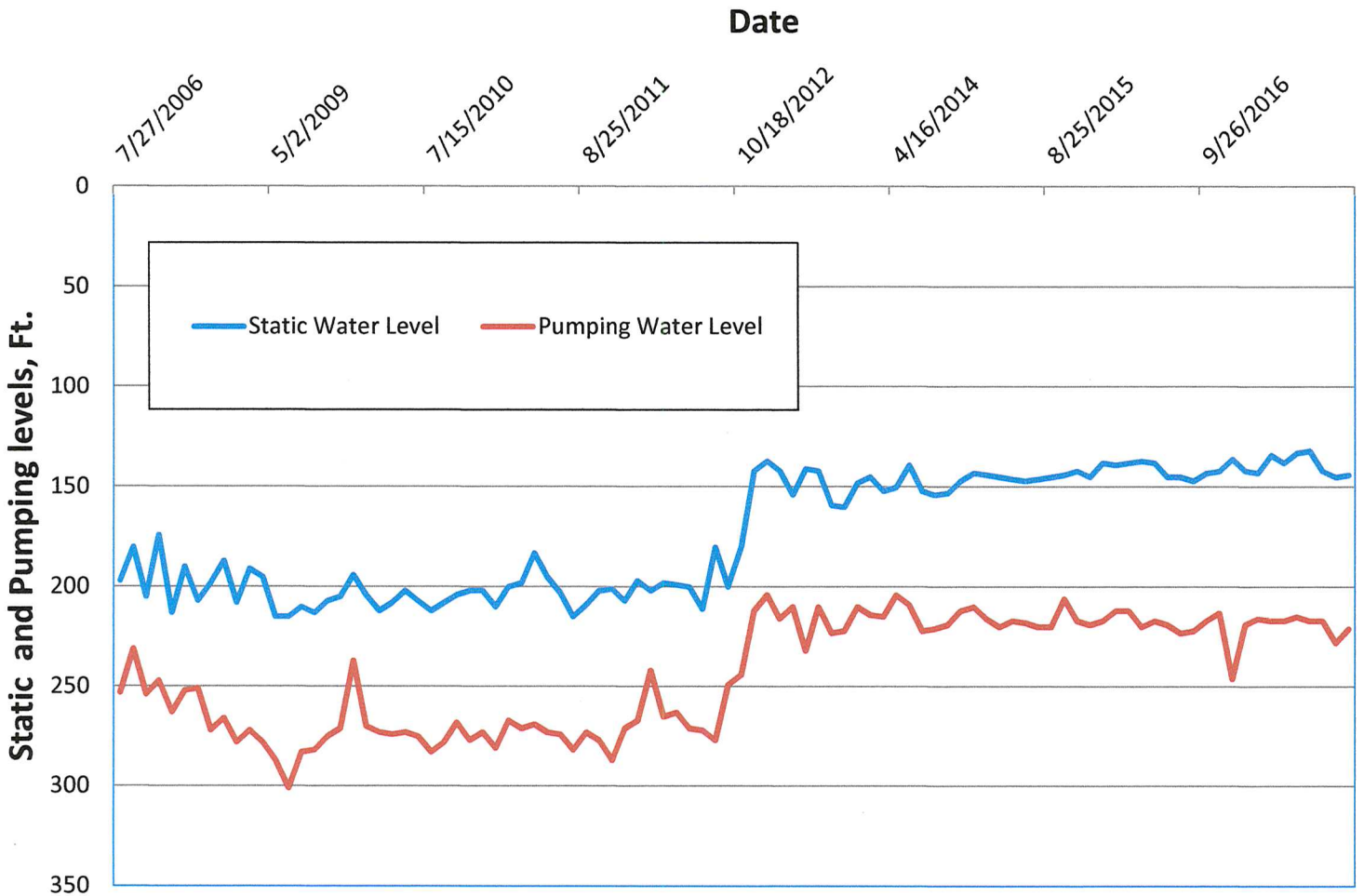
Proposed

The water utility is in the process of installing dedicated, electronic level sensors in each well that will be capable of continuous monitoring, and will be connected the utility SCADA system. This will allow water levels, drawdown and recovery rates to be monitored and correlated to a variety of operating conditions, including interaction of adjacent wells. Each well field can also be removed from service for a longer period of time, which will enable the long term aquifer characteristics to be monitored in the absence of water withdrawal. The current plan is to equip one well per year with these automated level sensors. The work should be completed in 3 years. The Water Utility would like to meet with DNR Groundwater Hydrologist to develop a monitoring program that will provide the information the DNR desires to evaluate long term impacts on the water supply aquifer using these level sensors.

Appendix 3

Water Level Graphs for Each Water Supply Well

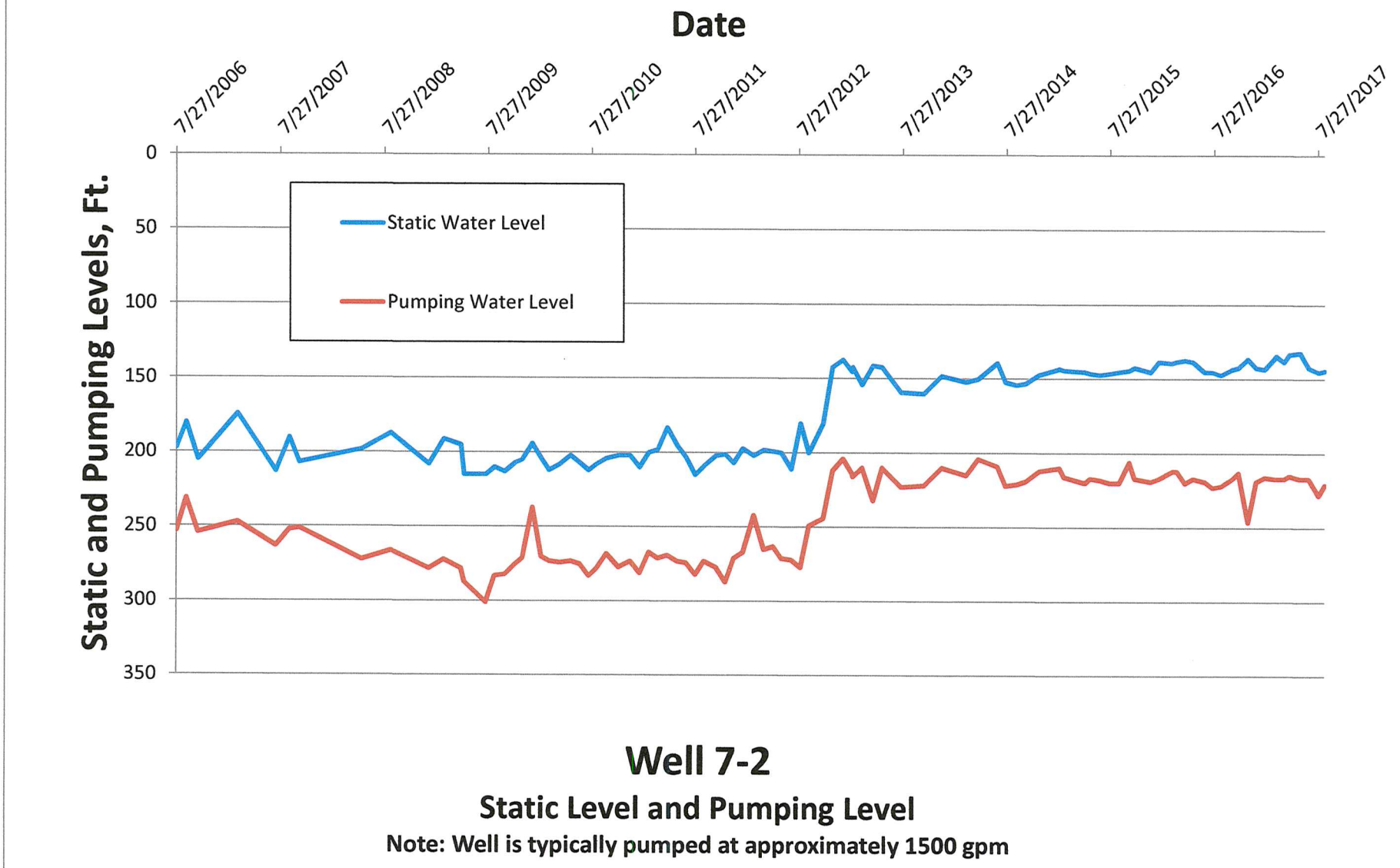
(See Part 1E)



Well 7-1

Static Level and Pumping Level

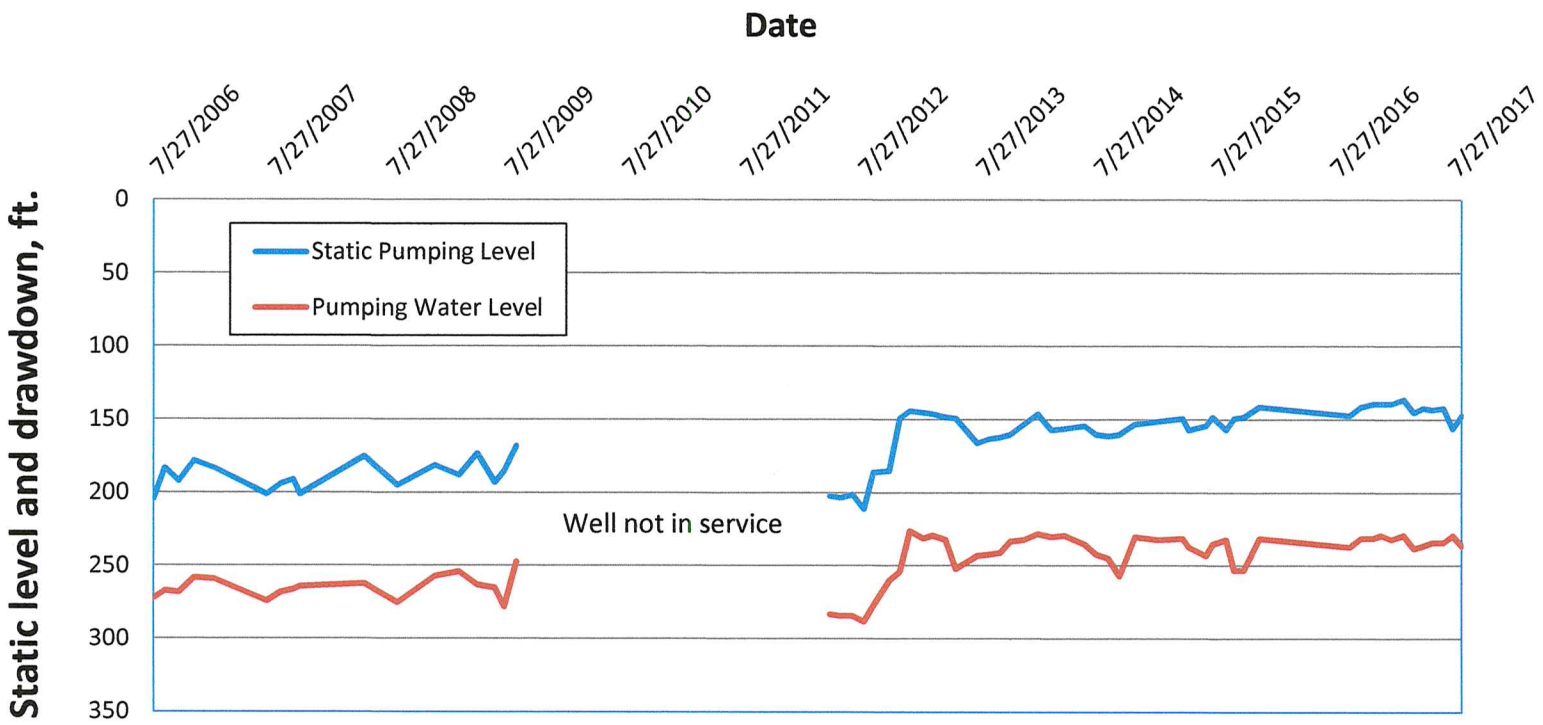
Note: Well is typically pumped at approximately 1500 gpm



Well 7-2

Static Level and Pumping Level

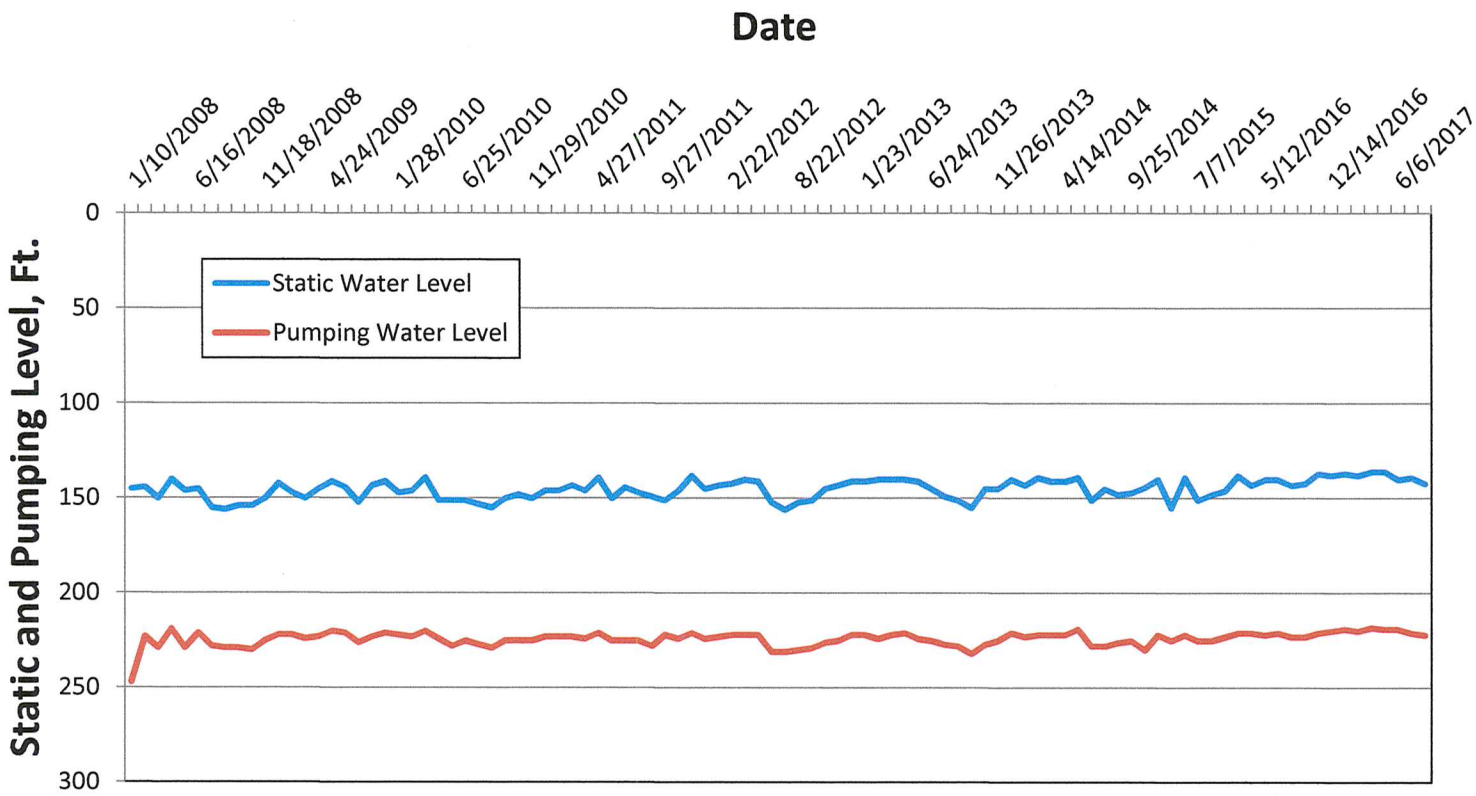
Note: Well is typically pumped at approximately 1500 gpm



Well 7-3

Static Level and Pumping Level

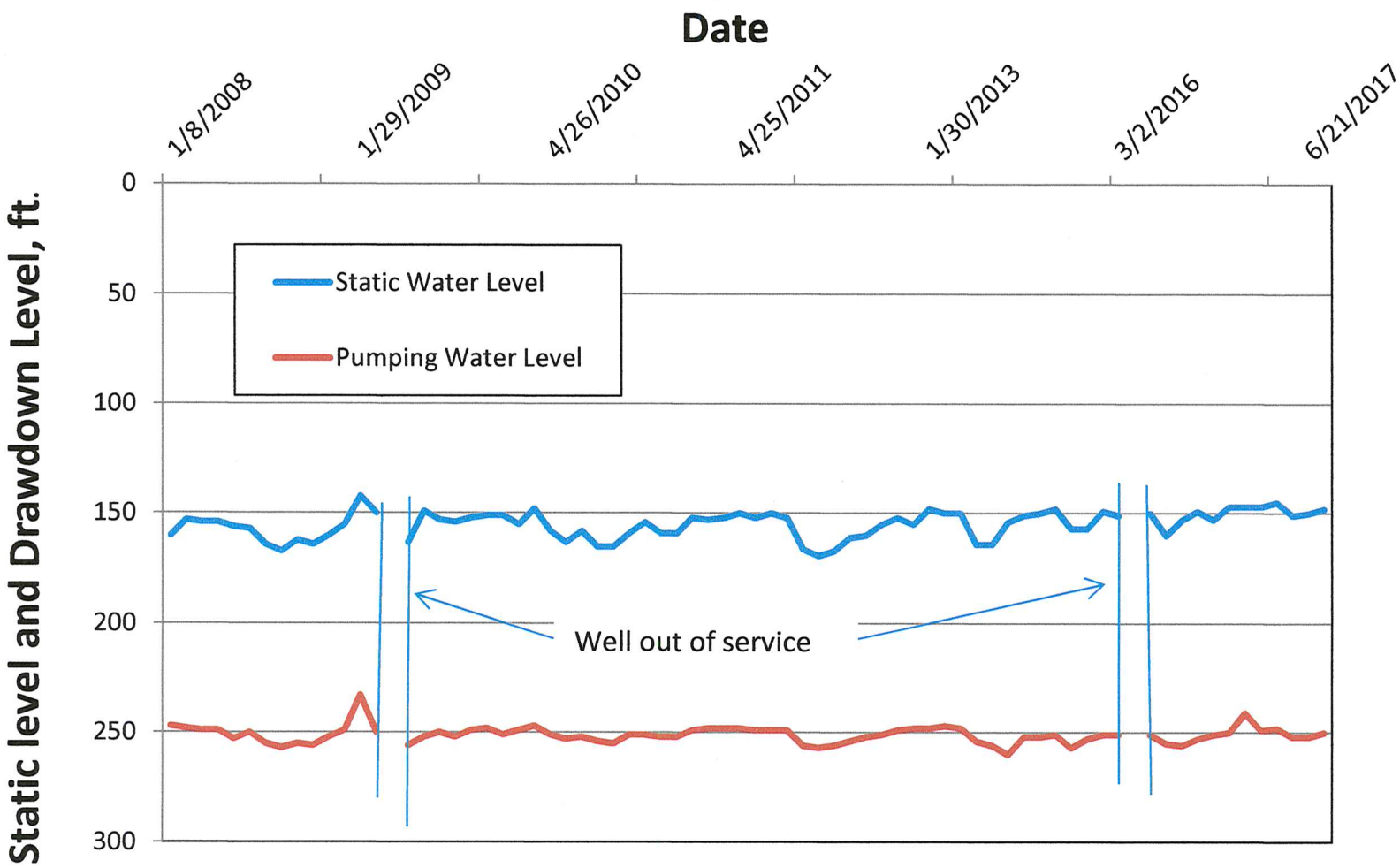
Note: Well is typically pumped at 1500 gpm



Well 8-1

Static Level and Pumping Level

Note: Well is typically pumped at approximately 1500 gpm



Well 8-2

Static Level and Pumping Level

Note: Well is typically pumped at approximately 1500 gpm

Appendix 4

Capital Improvement Plan

(See Part 1E)

Capital Improvement Detail Summary 2017 *thru* 2021

City of Red Wing, MN

Department Utilities - Water
Contact Public Works Director

Project # **UW 02-R01**
Project Name **Annual Water Main Replacement**

Type Maintenance
Useful Life 40 years
Category Water Construction
Priority 2 Mandated or Listed Essential
Status Active

Account # 601-49430-54240 **Points**
Orig Sched Start 2002

Total Project Cost: **$1,615,000**

Description

Intended for water main replacement costs that are not inlcuded in a street reconstruction project. Goal is to replace undersized or mains with reduced carrying capacity.

2018 - This was combined with the watermain extension/main cleaning category

Justification

Maintain fire flow and customer pressure capabilities

2018 - This was combined with the watermain extension/main cleaning category

Prior	Expenditures	2017	2018	2019	2020	2021	Total
1,455,000	Construction/Maintenance	160,000					160,000
Total	**Total**	**160,000**					**160,000**

Prior	Funding Sources	2017	2018	2019	2020	2021	Total
1,455,000	Water Fund	160,000					160,000
Total	**Total**	**160,000**					**160,000**

Budget Impact/Other

Capital Improvement Detail Summary

2017 *thru* 2021

City of Red Wing, MN

Project # UW 03-R01
Project Name Vehicle Replacement - Supply

Account # 601-49400-54170 **Points**
Orig Sched Start 2003

Department Utilities - Water
Contact Public Works Director
Type Equipment
Useful Life 15 years
Category Vehicles
Priority 3 Efficiency, labor saving, reso
Status Active
Total Project Cost: $355,000

Description

Truck replacement

Justification

Scheduled replacement
Fleet Vehicles:
256 - 2005 regular truck replace in 2020
219 - 2007 regular truck replace in 2022
214 - 2009 utility box with crane replace in 2024
221 - 2012 utility box replace in 2027

Prior	Expenditures	2017	2018	2019	2020	2021	Total	Future
110,000	Equip/Vehicles/Furnishings				40,000		40,000	205,000
Total	Total				**40,000**		**40,000**	**Total**

Prior	Funding Sources	2017	2018	2019	2020	2021	Total	Future
110,000	Water Fund				40,000		40,000	205,000
Total	Total				**40,000**		**40,000**	**Total**

Budget Impact/Other

Capital Improvement Detail Summary

2017 *thru* 2021

City of Red Wing, MN

Project # UW 05-R01

Project Name Vehicle Replacement - Distribution

Account # 601-49430-54170 **Points**

Orig Sched Start 2005

Department Utilities - Water

Contact Public Works Director

Type Equipment

Useful Life 15 years

Category Vehicles

Priority 3 Efficiency, labor saving, reso

Status Active

Total Project Cost: **$827,000**

Description

Pickup Trucks and Service Vehicles

Justification

Scheduled Replacement
Fleet Vehicles:
210 - 2005 replace 2020 utility box
220 - 2007 replace 2022 regular pickup box
212 - 2008 replace 2023 utility box
211 - 2009 replace 2024 utility box
204 - 2012 replace 2027 utility box
202 - 2014 replace 2029 utility box
203 - 2015 replace 2030 utility box

Prior	Expenditures	2017	2018	2019	2020	2021	Total	Future
337,000	Equip/Vehicles/Furnishings				60,000		60,000	430,000
Total	**Total**				**60,000**		**60,000**	**Total**

Prior	Funding Sources	2017	2018	2019	2020	2021	Total	Future
337,000	Water Fund				60,000		60,000	430,000
Total	**Total**				**60,000**		**60,000**	**Total**

Budget Impact/Other

Capital Improvement Detail Summary 2017 *thru* 2021

City of Red Wing, MN

Project # UW 07-R01

Project Name Reservoir Maintenance

Account # 601-49400-54240 **Points**

Orig Sched Start 2007

Department Utilities - Water

Contact Public Works Director

Type Maintenance

Useful Life 20 years

Category Water Construction

Priority 3 Efficiency, labor saving, reso

Status Active

Total Project Cost: **$2,680,000**

Description

2011 - Water Reservoir Renovations - Hiawatha Hills

2012 - Water Reservoir Renovations - Pine Ridge

2013 - Water Reservoir Renovations - Pioneer Road

2015 - Water Reservoir Renovations - Sand Hill Major Renovation

2016 - Sorins Bluff Ground Storage Reservoir Minor Renovations

2017 - Pioneer Road Ground storage Reservoir Minor Renovations
2017 - Warranty ROV inspection - Sand Hill Reservoir

2018 - ROV inspection on River Bluff and Charlson Crest

2021 - ROV inspection on Hiawatha Hills
2021 - River Bluff Reservoir - Major Renovation

2022 - ROV inspection on Pine Ridge

2023 - ROV Inspection on Pioneer Road
2023 - Charlson Crest - Major Renovation

2024 - ROV Inspection Sand Hill

Justification

2009 - The Hiawatha Hills reservoir was recently professionally inspected and found to be in need of substantial work. The interior and exterior coating systems are failing and need to be replaced if this tank is to remain a viable component of the City's water distribution system. The recommendations included sandblasting and recoating both interior and exterior. The exterior of the tank will have to be tarped during sandblasting due to the presence of lead paint.

2009 - The Pine Hills reservoir was recently professionally inspected and found to be in need of partial renovation within a 3-5 year time frame. The interior coating system is failing and needs to be replaced if this tank is to remain a viable component of the City's water distribution system. The recommendations included sandblasting and recoating interior and miscellaneous structural repairs.

2009 - The Twin Bluffs reservoir was recently professionally inspected and found to be in need of partial renovation within a 3-5 year time frame. The coating system on the ferrous metal components, including ladders, piping, valves and hatches is failing and needs to be replaced if this tank is to remain a viable component of the City's water distribution system. The recommendations included sandblasting and recoating these components.

2009 - The Sorins Bluff Ground Storage reservoir was recently professionally inspected and found to be in need of partial renovation within a 3-5 year time frame. The interior coating system is failing and needs to be replaced if this tank is to remain a viable component of the City's water distribution system. The recommendations included sandblasting and recoating interior and miscellaneous structural repairs.

2012 - The Pioneer Road standpipe was recently professionally inspected and found to be in need of a total reconditioning within a 3-5 year time frame. The interior and exterior coating systems are failing and needs to be replaced if this tank is to remain a viable component of the City's water distribution system. The recommendations included sandblasting and recoating both the interior and exterior of the tank, and other miscellaneous structural repairs.

2013 - River Bluffs, & Charlson Crest: These tanks are relatively new and do not have any known deficiencies. Future work should include routine inspections on a 5 year time frame beginning in 2013. Pioneer Road will be painted.

2014 - The Sandhill reservoir was recently professionally inspected. The evaluation recommended miscellaneous structural repairs both inside

and on the exterior of the tank. The existing coating was adequate was rated good to fair and no coating repairs were recommended at this time.

2016 - The reservoir evaluation report completed in 2007 identified minor repairs recommended for the Sorins Bluff Ground Storage Reservoir. This inlcudes the items that had not been addressed to date.

2017 - The reservoir evaluation report completed in 2007 identified mnor repairs recommended for the Pioneer Road Ground Storage Reservoir. This inlcudes the items that had not been addressed to date.

2018 - ROV inspection on River Bluff and Chalson Crest. The reservoirs were last inspected in 2007. This inspection will help identify when a complete or partial coating reconditioning is necessary.

2021 - ROV inspection on Hiawatha Hills Ground Storage Reservoir. And complete renovation of river Bluff Reservoir

2022 - ROV inspection on Pine ridge Reservoir

2023 - ROV inspection on Pioneer Road reservoir and major renovation on Chalrson Crest Reservoir

2024 - ROV inspection on Sand Hill Reservoir

2025 - ROV inspection - TBD
2026, 2027 - ROV inspection - TBD

Prior	Expenditures	2017	2018	2019	2020	2021	Total	Future
1,909,000	Construction/Maintenance	38,000	6,000			353,000	397,000	374,000
Total	**Total**	**38,000**	**6,000**			**353,000**	**397,000**	**Total**

Prior	Funding Sources	2017	2018	2019	2020	2021	Total	Future
1,909,000	Water Fund	38,000	6,000			353,000	397,000	374,000
Total	**Total**	**38,000**	**6,000**			**353,000**	**397,000**	**Total**

Budget Impact/Other

2009 - Hiawatha Hills: Assume follow-up inspections in 2015, 2020, 2025. Recoating in 2029. Inspection costs are estimated to be $3,000 each (2008 costs)

2009 - Pine Hills: Assume follow-up inspections in 2016, 2021, 2026. Recoating in 2030. Inspection costs are estimated to be $3,000 each (2008 costs). Assume that the exterior will require partial reconditioning around 2020 at a cost of $150,000.

2009 - Twin Bluffs: Assume follow-up inspections in 2017, 2022 and 2027. Inspection costs are estimated to be $3,000 each (2008 costs). Assume ferrous components will require recoating again in approximately 2028.

2009 - Sorins Bluff: Assume follow-up inspections in 2016, 2021, 2026. ecoating in 2030. Inspection costs are estimated to be $3,000 each (2008 costs). Assume that the exterior will require partial reconditioning around 2020 at a cost of $150,000.

2012 - Pioneer Road: Assume follow-up inspections in 2017, 2022, 2027. Recoating in 2032. Inspection costs are estimated to be $3,000 each (2008 costs).

2013 - Sandhill: Assume follow-up inspections in 2018, 2023, 2028. Inspection costs are estimated to be $3,000 each (2008 costs). Assume coating repairs will likely be necessary in 10-15 years.

2013 - River Bluffs & Charlson Crest: Assume follow-up inspections in 2018, 2023, 2028. Inspection costs are estimated to be $3,000 each (2008 costs).

2016 - The 2007 estimated cost was 67,500. Project cost estimated at $80,000 for 2016.

2017 - The 2007 estimate was $29,000. Prioject cost estimated at $35,000.

2108 - ROV inspections estimated at $3000 each.

2021 - ROV inspection estimated at $3000. River Bluff Tank renovation estimated at $350,000.

2023 - ROV inspection estimated at $3000. Charlson Crest Tank renovation estimated at $350,000.

2022 - ROV inspection estimated at $3000.

Capital Improvement Detail Summary 2017 *thru* 2021

City of Red Wing, MN

Project # UW 09-R01
Project Name Well Inspections

Account # 601-49400-54240 **Points**
Orig Sched Start 2009

Department Utilities - Water
Contact Public Works Director
Type Maintenance
Useful Life 8 years
Category Water Construction
Priority 2 Mandated or Listed Essential
Status Active
Total Project Cost: **$706,000**

Description

Water Well inspections

Justification

It is a good practice to perform a detailed inspection on water wells on a 7 - 10 year interval. The inspection entails pulling the well, physically inspecting and replacing any components of the pump, motor, column pipe and other components that show excessive wear or corrosion. This practice will reduce the potential for catastrophic failures, reduce ongoing repairs and keep the pump operating at peak efficiency. The City currently has 5 wells that should be incorporated into a inspection schedule. The following schedule was developed based the time that the wells have been in service since they were last examined. Wells 7-3, 8-2 and 8-3 were all examined and updated following motor replacements or rebuilds.
Well 7-3 - 2016, 2023
Well 7-2 - 2017, 2024
Well 7-1 - 2018, 2025
Well 8-1 - 2019, 2026
Well 8-2 - 2020, 2027

Prior	Expenditures	2017	2018	2019	2020	2021	Total	Future
206,000	Construction/Maintenance	50,000	50,000	50,000	50,000		200,000	300,000
Total	**Total**	**50,000**	**50,000**	**50,000**	**50,000**		**200,000**	**Total**

Prior	Funding Sources	2017	2018	2019	2020	2021	Total	Future
206,000	Water Fund	50,000	50,000	50,000	50,000		200,000	300,000
Total	**Total**	**50,000**	**50,000**	**50,000**	**50,000**		**200,000**	**Total**

Budget Impact/Other

Routine maintenace should minimize unanticipted, catistrophic failures which impact overall system reliability. Repairing failures is also more costly than PM.

Capital Improvement Detail Summary 2017 *thru* 2021

City of Red Wing, MN

Project # UW 11-R01

Project Name Water Main Extension/Main Cleaning/Replacement

Account # 601-49430-54240 **Points**

Orig Sched Start 2011

Department Utilities - Water

Contact

Type Improvement

Useful Life 40 years

Category Water Construction

Priority 2 Mandated or Listed Essential

Status Active

Total Project Cost: **$1,570,000**

Description

Includes minor sewer extensions not inlcuded with a large project, and replacement and cleaning of existing sewers. This wouyld inlcude projects to improve fire flows and pressures

Prior to 2018, there was another category called Annual water main replacement that was inlcuded in this item from 2018 on..

Justification

Strengthen distribution and improve fireflow and pressures.

Prior	Expenditures	2017	2018	2019	2020	2021	Total	Future
570,000	Construction/Maintenance	0	100,000	100,000	100,000	100,000	400,000	600,000
Total	**Total**	**0**	**100,000**	**100,000**	**100,000**	**100,000**	**400,000**	**Total**

Prior	Funding Sources	2017	2018	2019	2020	2021	Total	Future
570,000	Water Fund	0	100,000	100,000	100,000	100,000	400,000	600,000
Total	**Total**	**0**	**100,000**	**100,000**	**100,000**	**100,000**	**400,000**	**Total**

Budget Impact/Other

Capital Improvement Detail Summary

2017 *thru* 2021

City of Red Wing, MN

Project # UW 11-R02

Project Name Pot Hole, Valve Turner

Account # 601-49430-54200 **Points**

Orig Sched Start 2011

Department Utilities - Water

Contact Public Works Director

Type Equipment

Useful Life 11 years

Category Equipment: Other

Priority 3 Efficiency, labor saving, reso

Status Active

Total Project Cost: **$105,000**

Description

Small suction machine, trailer mounted

Justification

Used by all departments for locating utilities
Unit #213 - 2010 replace in 2021

Prior	Expenditures	2017	2018	2019	2020	2021	Total
40,000	Equip/Vehicles/Furnishings					65,000	65,000
Total	**Total**					**65,000**	**65,000**

Prior	Funding Sources	2017	2018	2019	2020	2021	Total
40,000	Water Fund					65,000	65,000
Total	**Total**					**65,000**	**65,000**

Budget Impact/Other

Capital Improvement Detail Summary

2017 *thru* 2021

City of Red Wing, MN

Department Utilities - Water
Contact Public Works Director

Project # UW 13-R01
Project Name SCADA

Type Technology
Useful Life 20 years
Category Equipment: Other

Account # 601-49400-54200
Points
Priority 3 Efficiency, labor saving, reso

Orig Sched Start 2013
Status Active

Total Project Cost: $290,000

Description

SCADA system upgrade and maintenance

Justification

The SCADA systemupgrade will be complete in 2016. A $10,000 annual expendature was assumed for additions, upgrades and maintenance.

Prior	Expenditures	2017	2018	2019	2020	2021	Total	Future
70,000	Equip/Vehicles/Furnishings	20,000	20,000	20,000	20,000	20,000	100,000	120,000
Total	**Total**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**100,000**	**Total**

Prior	Funding Sources	2017	2018	2019	2020	2021	Total	Future
70,000	Water Fund	20,000	20,000	20,000	20,000	20,000	100,000	120,000
Total	**Total**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**100,000**	**Total**

Budget Impact/Other

Capital Improvement Detail Summary 2017 *thru* 2021

City of Red Wing, MN

Project # UW 13-R02
Project Name Building Maintenance

Account # 601-49400-54140 **Points**
Orig Sched Start 2013

Department Utilities - Water
Contact Public Works Director
Type Maintenance
Useful Life 20 years
Category Building Improvement
Priority 2 Mandated or Listed Essential
Status Active
Total Project Cost: $1,817,435

Description

Building Maintenance identified through the VFA study

2016 - Major project will be the roof replacement on the Charlson Crest Water Plant.

2017 - Demolition of the Station 3 pumphouse and reservoir.

2018 - Demolition and reconstruction of the 10th street booster station

2019 - onward. - Place holder based on costs identified in VFA study.

2018-2025 - Individual projects are not identified. The amount shown is a place holder based on estimated costs in the the VFA study

Justification

2016 - It has been determinend that the roof on the Charlson Crest WTP nneds to be completely removed and replaced. There is also masonry tuckpointing nd reflashing required.

2017 - Pump station no 3 and the adjacent reservoir is no longer needed and represents an unecessary operational expense as well as a liability. The well will be sealed in 2015, and the remainder of the faciity can be demolished.

2018 - The 10th St. booster station requied a great deal of work including HVAC, roofing and insulation. A much small structure and more atractive building could meet the needs of the pumping faciltiy.

2019 - onward - the VFA study identified needs at most fo the water buildings. Specific projects have not been identified, however a $100,000 placeholder was used for planning purposes. Individual projects will be described as they are developed.

Prior	Expenditures	2017	2018	2019	2020	2021	Total	Future
617,435	Construction/Maintenance	200,000	200,000	100,000	100,000	100,000	700,000	500,000
Total	Total	**200,000**	**200,000**	**100,000**	**100,000**	**100,000**	**700,000**	**Total**

Prior	Funding Sources	2017	2018	2019	2020	2021	Total	Future
617,435	Water Fund	200,000	200,000	100,000	100,000	100,000	700,000	500,000
Total	Total	**200,000**	**200,000**	**100,000**	**100,000**	**100,000**	**700,000**	**Total**

Budget Impact/Other

Appendix 5

Emergency Telephone List

(See Part 2C)

Attachment 2
City of Red Wing
Water Supply, Treatment Storage and Distribution
Emergency Telephone List

Emergency Response Team	Name	Work Telephone	Alternate Telephone
Emergency Response Lead	Robert Stark	(651) 385-5112	(651) 380-9010
Alternate Emergency Response Lead	Rick Moskwa	(651) 385-3653	(651) 764-3320
Water Operator	Corey Aadalen	(651) 385-5160	(651) 380-3417
Alternate Water Operator	Ed Krawiecki	(651) 385-5161	(651) 764-0257
Public Communications	Laura Blair	(651) 385-3699	(651) 764-4031

State and Local Emergency Response Contacts	Name	Work Telephone	Alternate Telephone
State Incident Duty Officer	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
County Emergency Director	Diane Richter-Biwer	(651) 267-2639	
National Guard	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
Mayor/Board Chair	Shawn Dowse	(651) 388-5935	
Fire Chief	Shannon Draper	(651) 385-3695	911
Sheriff	Scott McNurlin	(651) 385-3155	911
Police Chief	Roger Pohlman	(651) 267-2610	911
Ambulance	Red Wing Fire Department	(651) 385-3621	911
Hospital	Mayo Clinic Health Systems – Red Wing	(651) 267-5000	
Doctor or Medical Facility	Mayo Clinic Health Systems – Red Wing	(651) 267-5000	

State and Local Agencies	Name	Work Telephone	Alternate Telephone
MDH District Engineer	Paul Halverson	(507) 206-2724	
MDH	Drinking Water Protection	(651) 201-4700	
State Testing Laboratory	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
MPCA	Environmental Emergencies	(800) 422-0798	
DNR Area Hydrologist	Bill Huber	(507) 345-5601	
County Water Planner	Beau Kennedy	(651) 923-5286	

Utilities	Name	Work Telephone	Alternate Telephone
Electric Company	Xcel Energy	(800) 895-1999	
Gas Company	Xcel Energy	(800) 895-2999	
Telephone Company	Hiawatha Broadband Company	(651) 327-2000	
Gopher State One Call	Utility Locations	800-252-1166	651-454-0002
Highway Department	MN DOT - Rochester	(507) 286-7500	

Technical/Contracted Services/Supplies	Name	Work Telephone	Alternate Telephone
MRWA Technical Services	MN Rural Water Association	800-367-6792	
Well Driller/Repair	Traut Companies	(320) 251-5090	(800) 728-5091
Pump Repair	Traut Companies	(320) 251-5090	(800) 728-5091
Electrician	City of Red Wing- Buildings and Grounds	(651) 385-3690	(651) 385-3655
Plumber	City of Red Wing- Buildings and Grounds	(651) 385-3690	(651) 385-3655
Backhoe	MJS of Red Wing	(651) 267-0382	
Chemical Feed	DPC Industries	(877) 437-1333	
Generator	Red Wing Fleet Maintenance	(651) 385-5106	(651) 380-8061

Valves	Minnesota Pipe & Equipment	(651) 463-6090	(507) 285-5389
Pipe & Fittings	Minnesota Pipe & Equipment	(651) 463-6090	(507) 285-5389
Water Storage	KLM Engineering	(651) 773-5111	
Laboratory	City Laboratory	(651) 385 5141	(651) 764-3242

Communications	Name	Work Telephone	Alternate Telephone
News Paper	Republican Eagle	(651) 301-7800	
Radio Station	KWNG	(651) 388-7151	
School Superintendent	Karsten Anderson	(651) 385-4500	
Property & Casualty Insurance	Jeff Cunningham	(651) 388-7128	

Critical Water Users	Name	Work Telephone	Alternate Telephone
Hospital Critical Use:	Mayo Clinic Health Systems – Red Wing	(651) 267-5000	
Nursing Home Critical Use:	Mayo Clinic Health Systems – Red Wing	(651) 267-5000	

Appendix 6

Cooperative Agreements for Emergency Services

(See Part 2C)

Appendix 7

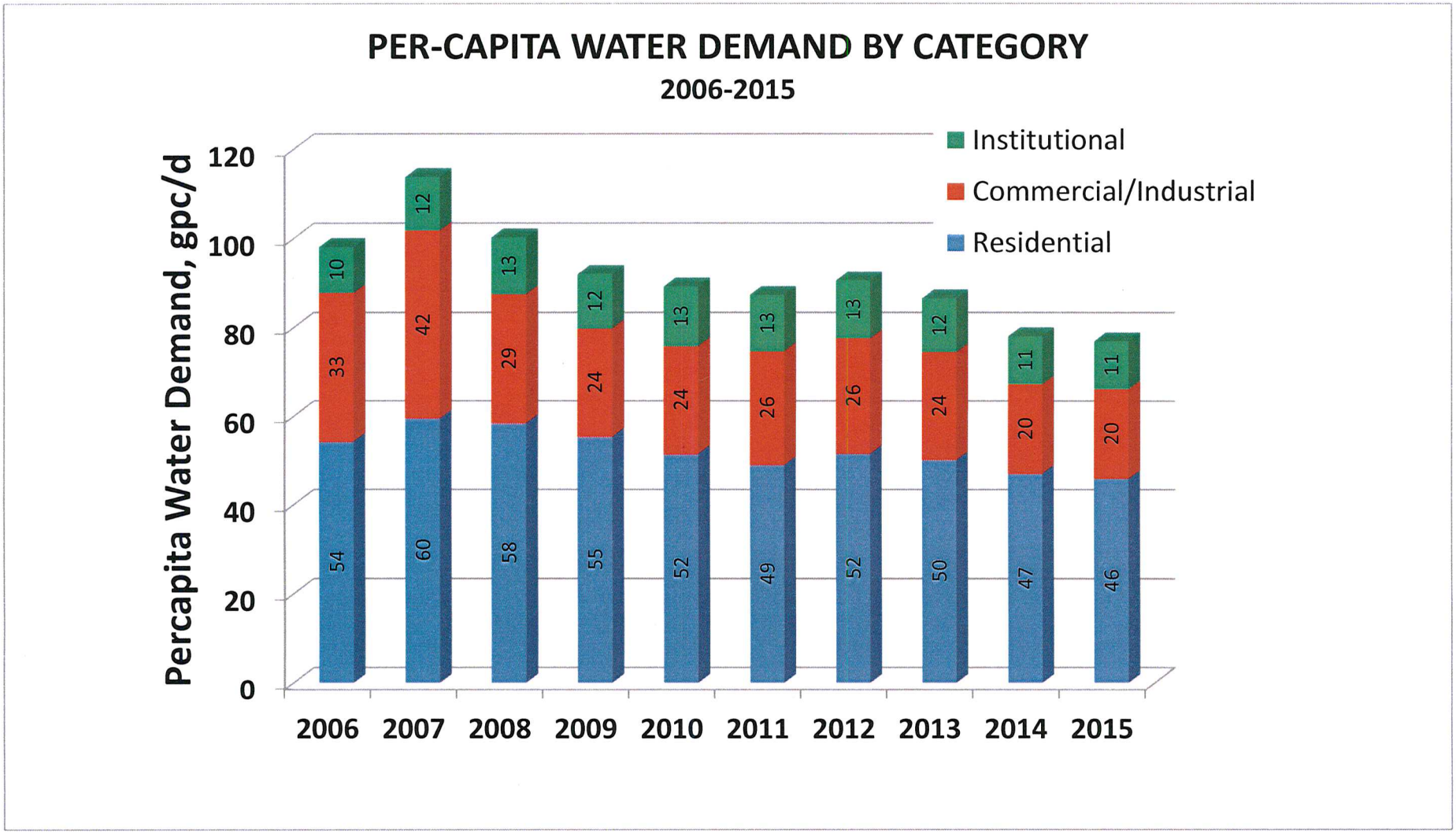
Municipal Critical Deficiency Ordinance

(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)


PER-CAPITA WATER DEMAND BY CATEGORY
2006-2015
Percapita Water Demand, gpc/d
120
100
80
60
40
20
0
Institutional
Commercial/Industrial
Residential
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
54
33
10
60
42
12
58
29
13
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11
46
20
11

Appendix 9

Water Rate Structure

(See Part 3 – Objective 6)

WATER RATES

Fees - Annually - Unless Specified Differently

A. Water Rates

The consumers of city water shall pay to the City of Red Wing for water used or metered: $ 3.40 per 100 cu. ft.

B. Availability Charges

In addition to the above water rates, a monthly service charge will be made to every metered service where public water is available, whether water is used or not, based on the size of the water meter.

For a 5/8-inch meter:	$12.70 per month
For a 3/4-inch meter:	$12.70 per month
For a 1-inch meter:	$16.42 per month
For a 1-1/2-inch meter:	$30.35 per month
For a 2-inch meter:	$47.43 per month
For a 3-inch meter:	$91.19 per month
For a 4-inch meter:	$143.67 per month
For a 6-inch meter:	$287.28 per month

All charges for water and sewer must be paid by the due date printed on the Utility Services Bill. In the event charges are not paid by such due date, the city will assess a finance charge to the account and issue a Late Notice.	6% APR finance charge with minimum of $5 per month.
In the event charges are not paid by the date printed on the Late Notice the city at its discretion may assess a monthly late fee on such unpaid balance.	$40 late fee
In addition, in the event charges are not paid by the date printed on the Late Notice the city at its discretion may assess a utility shut-off and a utility restoration fee for administration and labor fee costs associated with the shut-off and restoration of utility service procedures.	$60 shut-off fee $60 restoration fee
The city at its discretion may order the water shut off and services terminated or the restoration of such services. If the services are terminated or restored after normal business hours, callback charges will be assessed.	$125.00 termination callback charge $125.00 restoration callback charge
An "account setup fee" will be charged on new accounts to defray the cost of setting up new accounts, meter installation, and verifying meter readings.	$60.00 account setup fee
A charge will be made for operating any curb stop for plumbing repair .	$75.00 curb stop charge

C. Bulk Water and Other Miscellaneous Use Rates and Fees

Administrative Charge	$21.00 per load
Standard Charge	$21.00 per 1000 gallons
	$21.00 minimum charge
Hydrant Meter Charge	$10.00 per day $75.00 setup fee Plus water usage

D. Service Line and Street Rebuilding Charge

1. The city shall charge all applicants for water service line installations and connections done or made in the public streets or on public property as follows:
    - On all service line connections jointly made with the sewer service and the water line laid in the same trench as the sewer pipe:

      Charge Actual Costs

2. On street reconstruction where all sewer and water service must be replaced due to age and condition, special costs will be charged as follows:

    - Sanitary sewer service and water service replacement during reconstruction (based on 100% of project costs):

6" PVC sanitary sewer service*:	$1,800.00
1" copper water service*:	$1,800.00
** Fee reduced to $1,620.00 each if sewer and water services are constructed through same project (10% savings).*	
8" or larger sanitary sewer service	Charge actual costs
1-1/2" or larger water service	Charge actual costs

It is mandatory for all sanitary sewer services within the public rights-of-way or easements that are in excess of 40 years old to be replaced within the area of street reconstruction.

All water services within the rights-of-way or easements that are constructed of galvanized pipe, cast iron pipe with lead joints, or other nonstandard materials (lead gooseneck, waste & drain c/s, undersized pipe, etc.) shall require mandatory replacement within areas of street or utility reconstruction.

3. Annual Private Hydrant Inspection and Maintenance Charge $90.00 per hydrant

Appendix 10

Adopted or Proposed Regulations to Reduce Demand or Improved Water Efficiency

(See Part 3 Objective 7)

Appendix 11

Implementation checklist – Summary of all the Actions that a Community is Doing, including Estimated Implementation Dates

(See www.mndnr.gov/watersupplyplans)