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.

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INTRODUCTION TO WATER SUPPLY PLANS (WSP)

Who needs to complete a Water Supply Plan
Public water suppliers serving more than 1,000 people, and large private water suppliers in designated Groundwater Management Areas, and all water suppliers in the Twin Cities metropolitan area, is 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. Water suppliers need to know what they are going to do in a crisis, before the time comes. A lot of emergencies can be avoided or mitigated if long term sustainability measures are implemented.

Communities outside the seven-county Metropolitan Area need to complete Parts I-III. Communities in the seven-county metropolitan area need parts I-IV. Information in the Twin Cities Metropolitan Area Master Water Supply Plan can support completion of this Part 4 of the local water supply plan.

Benefits of completing a WSP
Completing a WSP using this template, fulfills a water supplier’s statutory obligations under 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 will:

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

WSP Approval

Department of Natural Resources (DNR)
Statewide, all WSPs must be submitted to the DNR every ten years for approval:

Contact name/Email: ________________________________
Mailing Address: ________________________________
Due Date: ________________________________

Metropolitan Council
In the metropolitan area, WSP must also be submitted to Metropolitan Council for review:

Contact name/Email: N/A
Mailing Address: ________________________________
Due Date: December 31, 2018

WSP Adoption
All DNR plan approvals are contingent on the formal adoption of the plan by the city council or utility board.

Date when city certificate of adoption was sent to DNR: September 16, 2015

WSP Completion
Prepare the WSP by completing this template, which is divided into four parts. The first three parts apply statewide:

I. Water Supply System Description and Evaluation
II. Emergency Preparedness Procedures
III. Water Conservation Plan

The fourth part relates to the comprehensive plan requirements that apply only to water suppliers within the seven-county Metropolitan Council area:

IV. Items for Metropolitan Area Water Suppliers

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

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

<table>
<thead>
<tr>
<th>Requested Information</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNR Water Appropriation Permit Number(s)</td>
<td></td>
</tr>
<tr>
<td>Ownership</td>
<td>□ Public or □ Private</td>
</tr>
<tr>
<td>Metropolitan Council Area</td>
<td>□ Yes or □ No (and county name)</td>
</tr>
<tr>
<td>Street Address</td>
<td></td>
</tr>
<tr>
<td>City, State, Zip</td>
<td></td>
</tr>
<tr>
<td>Contact Person Name</td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td></td>
</tr>
<tr>
<td>Phone Number</td>
<td></td>
</tr>
<tr>
<td>MDH Supplier Classification</td>
<td>Municipal, Non-municipal transient, non-municipal non-transient, etc.</td>
</tr>
</tbody>
</table>
PART I. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

The first step in any water supply analysis is to assess the current status of demand and supplies. Information summarized in Part I can be used to develop Emergency Preparedness Procedures (Part II) and the Water Conservation Plan (Part III). 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:

Percent unaccounted does not include percent unmetered. Total water sold does not include unmetered use. Additional data found in Appendix 11. Per capita water usage is relatively low. Unaccounted includes loss from main breaks. The method of estimating and recording losses from breaks will be improved going forward so these onetime events do not skew data.
## Table 2. Historic water demand (see definitions below)

<table>
<thead>
<tr>
<th>Year</th>
<th>Pop Served (MG)</th>
<th>Total Connections</th>
<th>Residential Water Sold (MG)</th>
<th>Water Demand (MG)</th>
<th>Wholesale Deliveries (MG)</th>
<th>Total Water Sold (MG)</th>
<th>Average Daily Demand (MGD)</th>
<th>Water Quantity Division (MGD)</th>
<th>Water Quality Division (MGD)</th>
<th>Distribution Efficiency</th>
<th>Date of Meter Demand</th>
<th>Source of Data</th>
<th>Residential Per Capita Demand (gpcd)</th>
<th>Total Demanded (gpcd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>2,921</td>
<td>3,255</td>
<td>49.4</td>
<td>40.5</td>
<td>None</td>
<td>89.9</td>
<td>124.2</td>
<td>26.9%</td>
<td>0.35</td>
<td>0.79</td>
<td>07/16/2005</td>
<td>63</td>
<td>68</td>
<td>81</td>
</tr>
<tr>
<td>2006</td>
<td>2,921</td>
<td>3,255</td>
<td>61.9</td>
<td>20.6</td>
<td>None</td>
<td>92.5</td>
<td>114.1</td>
<td>38.9%</td>
<td>0.32</td>
<td>0.59</td>
<td>06/03/2006</td>
<td>83</td>
<td>75</td>
<td>81</td>
</tr>
<tr>
<td>2007</td>
<td>2,921</td>
<td>3,255</td>
<td>57.4</td>
<td>28.4</td>
<td>None</td>
<td>85.8</td>
<td>109.8</td>
<td>21.0%</td>
<td>0.23</td>
<td>0.50</td>
<td>07/16/2007</td>
<td>73</td>
<td>79</td>
<td>81</td>
</tr>
<tr>
<td>2008</td>
<td>2,921</td>
<td>3,255</td>
<td>56.7</td>
<td>25.0</td>
<td>None</td>
<td>85.7</td>
<td>105.0</td>
<td>23.0%</td>
<td>0.23</td>
<td>0.52</td>
<td>06/23/2008</td>
<td>63</td>
<td>75</td>
<td>74</td>
</tr>
<tr>
<td>2009</td>
<td>2,921</td>
<td>3,255</td>
<td>58.4</td>
<td>28.4</td>
<td>None</td>
<td>81.8</td>
<td>108.7</td>
<td>24.1%</td>
<td>0.22</td>
<td>0.56</td>
<td>06/10/2009</td>
<td>48</td>
<td>70</td>
<td>81</td>
</tr>
<tr>
<td>2010</td>
<td>2,921</td>
<td>3,255</td>
<td>53.2</td>
<td>30.5</td>
<td>None</td>
<td>82.6</td>
<td>104.0</td>
<td>19.0%</td>
<td>0.23</td>
<td>0.50</td>
<td>09/10/2010</td>
<td>51</td>
<td>80</td>
<td>81</td>
</tr>
<tr>
<td>2011</td>
<td>2,921</td>
<td>3,255</td>
<td>51.5</td>
<td>32.6</td>
<td>None</td>
<td>85.1</td>
<td>110.0</td>
<td>25.6%</td>
<td>0.23</td>
<td>0.57</td>
<td>07/10/2011</td>
<td>50</td>
<td>82</td>
<td>78</td>
</tr>
<tr>
<td>2012</td>
<td>2,921</td>
<td>3,255</td>
<td>55.5</td>
<td>33.7</td>
<td>None</td>
<td>84.2</td>
<td>107.0</td>
<td>31.7%</td>
<td>0.26</td>
<td>1.10</td>
<td>07/14/2012</td>
<td>54</td>
<td>85</td>
<td>81</td>
</tr>
<tr>
<td>2013</td>
<td>2,921</td>
<td>3,255</td>
<td>57.2</td>
<td>33.6</td>
<td>None</td>
<td>81.1</td>
<td>95.1</td>
<td>55.0%</td>
<td>0.23</td>
<td>0.50</td>
<td>09/13/2013</td>
<td>46</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td>2014</td>
<td>2,921</td>
<td>3,255</td>
<td>55.0</td>
<td>32.2</td>
<td>None</td>
<td>77.9</td>
<td>93.7</td>
<td>10.3%</td>
<td>0.21</td>
<td>0.61</td>
<td>04/11/2014</td>
<td>43</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>2015</td>
<td>2,921</td>
<td>3,255</td>
<td>52.2</td>
<td>33.0</td>
<td>None</td>
<td>86.0</td>
<td>106.5</td>
<td>18.4%</td>
<td>0.34</td>
<td>0.68</td>
<td>2015</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

MG = Million Gallons  
MGD = Million Gallons per Day  
GPCD = Gallons per Capita per Day

### Population Served
Use current census data to report the number of people living in the community, regardless if they have a private well.

### Total Connections
- Number of people served by the public water supply - all water system customers – this includes wholesale customers, extended boundary of service or others.

### Residential Water Sold (MG)
- Water used for normal household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Must include all water sold to housing development associations, mobile home parks, private residents, apartment buildings etc.

### C/I/I Water Sold
- Commercial, Industrial, Institutional – Commercial—Water used by motels, hotels, restaurants, office buildings, commercial facilities, both civilian and military.  
- Industrial—Water used for thermoelectric power (electric utility generation) and other industrial uses such as steel, chemical and allied products, food processing, paper and allied products, mining, and petroleum refining.  
- Institutional—Includes hospitals, nursing homes, schools, day care centers, and other facilities that use water for essential domestic requirements. This section includes public facilities and public metered uses. Consider maintaining separate institutional water use records for emergency planning and allocation purposes.

### Water Used for non-essential
- Lawn sprinkling, golf course and park irrigation, and other nonessential uses

### Wholesale Deliveries
- Industrial use and/or Bulk water sales to other public water suppliers.

### Total Water Sold
- Residential + Industrial + wholesale + other water sold

### Total Water Pumped
- The cumulative water withdrawn from all sources

### Percent Unmetered/unaccounted for (non-revenue)
- Unaccounted for water is the volume of water withdrawn from all sources minus the volume sold and city water use. City water use may include water used for city parks, flushing hydrants, landscaping, swimming pools, firefighting and training, and other municipal services.

### Average Daily Demand
- This is the sum total water demand for the year and divided by 365

### Maximum Daily Demand
- Maximum 1-day demand, in millions of gallons per day

### Date of Max. Demand
- Date of highest demand

### Residential per capita demand
- Total residential sales in gallons divided by population served divided by 365 days

### Total Demand
- Total water withdrawals divided by population divided by 365 days
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

<table>
<thead>
<tr>
<th>Customer</th>
<th>Use Category (Residential, Industrial, Commercial, Institutional, Wholesale)</th>
<th>Amount Used (Gallons per Year)</th>
<th>Percent of Total Annual Water Delivered</th>
<th>Implementing Water Conservation Measures? (Yes/No/Unknown)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. WHOLE FOODS</td>
<td>COMMERCIAL</td>
<td>8,125,570</td>
<td>10.4 %</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td>2. SCHOOL DISTRICT</td>
<td>COMMERCIAL</td>
<td>7,910,070</td>
<td>10.1 %</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td>3. SHALOM CARE</td>
<td>COMMERCIAL</td>
<td>2,206,800</td>
<td>2.8 %</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td>4. GEDNEY PICKLES</td>
<td>COMMERCIAL</td>
<td>1,416,130</td>
<td>1.8 %</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td>5. HOMETOWN APPTS</td>
<td>COMMERCIAL</td>
<td>1,361,910</td>
<td>1.7 %</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td>6. WEST BEND HOMES</td>
<td>COMMERCIAL</td>
<td>931,400</td>
<td>1.2 %</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td>7. WHISPER OAKS APTS</td>
<td>COMMERCIAL</td>
<td>902,220</td>
<td>1.1 %</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td>8. FAIRFIELD INN</td>
<td>COMMERCIAL</td>
<td>773,900</td>
<td>1.0 %</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td>9. BRIDGE MGMT</td>
<td>COMMERCIAL</td>
<td>704,400</td>
<td>.9 %</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td>10. MIKE’S CARWASH</td>
<td>COMMERCIAL</td>
<td>698,980</td>
<td>.9 %</td>
<td>UNKNOWN</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Treatment Site ID (Plant Name or Well ID)</th>
<th>Year Constructed</th>
<th>Treatment Capacity (GPD)</th>
<th>Treatment Method</th>
<th>Treatment Type</th>
<th>Annual Amount of Residuals</th>
<th>Disposal Process for Residuals</th>
<th>Do You Reclaim Filter Backwash Water?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>NA</td>
<td>500,000</td>
<td>NA</td>
<td>Chlorination Fluorination</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>Type of Storage Structure</th>
<th>Year Constructed</th>
<th>Primary Material</th>
<th>Storage Capacity (Gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elevated storage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Ground storage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>600,000</td>
</tr>
</tbody>
</table>
Treatment and storage capacity versus 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):

The minimum recommended storage is equal to one day's peak demand, estimated 500,000 gals. The available storage of 600,000 gallons is greater. The Firm Supply of 500 GPM meets the normal daily demand.

C. Water Sources

Complete Table 6 by listing all sources that supply water to the system. Include groundwater, surface water; interconnections with other water suppliers, wastewater reuse and stormwater reuse sources. Add rows to the table as needed for each source.

Are the source facilities equipped with a dedicated emergency power sources? □ Yes  X No

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

Add additional rows for each installation.

Table 6. Water sources

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Resource Name</th>
<th>Does this source serve as an emergency interconnect? (Y or N)</th>
<th>Does this source have a dedicated emergency power source? (Y or N)</th>
<th>MN Unique Well # or Intake ID</th>
<th>Year Installed</th>
<th>Well Depth (feet)</th>
<th>Capacity (gallons per minute)</th>
<th>Description — (active, inactive, emergency only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater</td>
<td>Ironton/Galesville (#7)</td>
<td>No</td>
<td></td>
<td></td>
<td>2001</td>
<td>708</td>
<td>650</td>
<td>Active</td>
</tr>
<tr>
<td>Groundwater</td>
<td>Ironton/Galesville (#6)</td>
<td>No</td>
<td></td>
<td></td>
<td>1983</td>
<td>737</td>
<td>500</td>
<td>Active</td>
</tr>
<tr>
<td>Surface Water</td>
<td>River or lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wastewater</td>
<td>Treatment Plant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interconnection</td>
<td>City or water source</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emergency</td>
<td></td>
</tr>
<tr>
<td>Interconnection</td>
<td>City or water source</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Retail</td>
<td></td>
</tr>
</tbody>
</table>

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
D. Future Demand Projections

Water Use Trends

Using the data in Table 2 describe trends in 1) population served; 2) total per capita water demand; 3) average daily demand; 4) maximum daily demand; 5) average annual demand. Then explain the causes for upward or downward trends.

For example, over the ten years how much unaccounted water did you use? Is the trend up or down or flat?

1) The population served has a decreasing trend.
2) The total per capita water demand has a decreasing trend.
3) The average daily demand has a decreasing trend. A likely result of the decreasing population.
4) The maximum daily demand has an increasing trend. A likely result of more recent peak day occurrences caused by watermain breaks and hydrant flushing.
5) The average annual demand has a decreasing to flat trend. A possible result of the decreasing population.

Use this data to complete Table 7 with projected annual demand for the next ten years, consistent with trends evident in the historical data in Table 2 in conjunction with state demographer population projections, and/or other planning projections.

<table>
<thead>
<tr>
<th>Year</th>
<th>Projected Population Served</th>
<th>Projected Total Per Capita Water Demand (GPCD)</th>
<th>Projected Average Daily Demand (MGD)</th>
<th>Projected Maximum Daily Demand (MGD)</th>
<th>Projected Average Annual Demand (MGY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2,975</td>
<td>73</td>
<td>0.216</td>
<td>0.619</td>
<td>78.7</td>
</tr>
<tr>
<td>2017</td>
<td>2,987</td>
<td>73</td>
<td>0.217</td>
<td>0.622</td>
<td>79.0</td>
</tr>
<tr>
<td>2018</td>
<td>2,999</td>
<td>73</td>
<td>0.217</td>
<td>0.625</td>
<td>79.4</td>
</tr>
<tr>
<td>2019</td>
<td>3,011</td>
<td>73</td>
<td>0.218</td>
<td>0.627</td>
<td>79.7</td>
</tr>
<tr>
<td>2020</td>
<td>3,023</td>
<td>73</td>
<td>0.219</td>
<td>0.630</td>
<td>80.0</td>
</tr>
<tr>
<td>2021</td>
<td>3,034</td>
<td>73</td>
<td>0.220</td>
<td>0.632</td>
<td>80.3</td>
</tr>
<tr>
<td>2022</td>
<td>3,046</td>
<td>73</td>
<td>0.221</td>
<td>0.634</td>
<td>80.6</td>
</tr>
<tr>
<td>2023</td>
<td>3,057</td>
<td>73</td>
<td>0.222</td>
<td>0.637</td>
<td>80.9</td>
</tr>
<tr>
<td>2024</td>
<td>3,068</td>
<td>73</td>
<td>0.222</td>
<td>0.639</td>
<td>81.2</td>
</tr>
<tr>
<td>2025</td>
<td>3,079</td>
<td>73</td>
<td>0.223</td>
<td>0.641</td>
<td>81.5</td>
</tr>
</tbody>
</table>

GPCD — Gallons per Capita per Day    MGD — Million Gallons per Day    MGY — Million Gallons per Year

Projection Method

Describe the method used to project water demand, including assumptions for population and business growth:

Demand projections were made using the projected growth percentages for ______ County provided by the State Demographic Center, the 2010 census data, and the previous yearly demands. The same growth percentages used for the county population growth were used to project the City's population and to calculate the water usage for each year.
E. Resource Sustainability

Monitoring – Key DNR Benchmark
Complete Table 8 by inserting information about source water quality monitoring efforts. The list should include all production wells, observation wells, and source water intakes or reservoirs. Add rows to the table as needed.

<table>
<thead>
<tr>
<th>MN Unique Well # or Surface Water ID</th>
<th>Type of monitoring point</th>
<th>Monitoring program</th>
<th>Frequency of monitoring</th>
<th>Monitoring Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X production well,</td>
<td>X Routine MDH</td>
<td>☐ continuous,</td>
<td>☐ SCADA,</td>
</tr>
<tr>
<td></td>
<td>☐ observation well,</td>
<td>sampling,</td>
<td>☐ hourly,</td>
<td>X grab sampling</td>
</tr>
<tr>
<td></td>
<td>☐ source water intake,</td>
<td>☐ Routine water</td>
<td>☐ daily,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ source water reservoir</td>
<td>utility sampling,</td>
<td>☐ monthly,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ other</td>
<td>☐ quarterly,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>X annually</td>
<td></td>
</tr>
</tbody>
</table>

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. See guidance document reference above.

Complete Table 9 to summarize water level data, including seasonal and long-term trends for each well. 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.

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.

<table>
<thead>
<tr>
<th>Unique Well Number or Well ID</th>
<th>Aquifer Name</th>
<th>Seasonal Variation</th>
<th>Long-term Trend in water level data</th>
<th>Water level measured during well/pumping maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ironton/Galesville</td>
<td>No</td>
<td>X Falling</td>
<td>07/21/15: 365.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Stable</td>
<td>08/11/15: 371.75</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Rising</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Potential Water Supply Issues & Natural Resource Impacts – Key DNR & Met Council Benchmark

Fill out Table 10 by listing any natural resource features (e.g., calcareous fens, wetlands, trout streams, rivers or surface water basins) that are or could be impacted by water withdrawals from permitted wells. For each resource, also indicate if resource protection thresholds have been established and if mitigation measures or management plans have been developed. Add additional rows to the table as needed.

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 will your community do to mitigate the impacts? Your DNR area hydrologist is available to assist with this table.

Table 10. Natural resource impacts

<table>
<thead>
<tr>
<th>Resource</th>
<th>Resource Name</th>
<th>Risk</th>
<th>Risk Determined through:</th>
<th>Resource Protection Threshold</th>
<th>Mitigation Measure or Management Plan</th>
<th>How are Changes to Thresholds Monitored?</th>
</tr>
</thead>
<tbody>
<tr>
<td>River or stream</td>
<td>☐</td>
<td>☐ Flow decline</td>
<td>☐ GIS analysis</td>
<td>☐ Low flow declines &gt; 10-20%</td>
<td>☐ Revise permit</td>
<td>☐ Change groundwater pumping</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Degrading water quality trends</td>
<td>☐ Modeling</td>
<td>☐ Water quality outside acceptable range</td>
<td>☐ Change groundwater pumping</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ known contaminant plumes</td>
<td>☐ Monitoring</td>
<td>☐ Other</td>
<td>☐ Increase conservation</td>
<td>☐ Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ known MCL exceedances</td>
<td>☐ Aquifer testing</td>
<td></td>
<td>☐ Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Surface water features (water level</td>
<td>☐ Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>decline, well interference, habitat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>degradation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcareous</td>
<td>☐</td>
<td>☐ Flow decline</td>
<td>☐ GIS analysis</td>
<td>☐ Pumping impacts</td>
<td>☐ Revise permit</td>
<td>☐ Change groundwater pumping</td>
</tr>
<tr>
<td>fen</td>
<td></td>
<td>☐ Degrading water quality trends</td>
<td>☐ Modeling</td>
<td>☐ Water quality outside acceptable range</td>
<td>☐ Change groundwater pumping</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ known contaminant plumes</td>
<td>☐ Monitoring</td>
<td>☐ Other</td>
<td>☐ Increase conservation</td>
<td>☐ Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ known MCL</td>
<td>☐ Aquifer testing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exceedances</td>
<td>Other</td>
<td>GIS Analysis</td>
<td>Water Withdrawals &gt; ½ acre-foot</td>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>-------</td>
<td>--------------</td>
<td>---------------------------------</td>
<td>-------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts on surface water features (water level decline, well interference, habitat degradation)</td>
<td></td>
<td>Model</td>
<td>Water quality outside acceptable range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts on surface water features (water level decline, well interference, habitat degradation)</td>
<td></td>
<td>Mapping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impacts on</td>
<td></td>
<td>Monitoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>Aquifer testing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Flow decline
- Degrading water quality trends
- Known contaminant plumes
- Known MCL exceedances
- Impacts on surface water features (water level decline, well interference, habitat degradation)
- Other

<table>
<thead>
<tr>
<th>Native plant community</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>High or outstanding biodiversity</td>
<td></td>
</tr>
<tr>
<td>Water withdrawals &gt; ½ acre-foot</td>
<td></td>
</tr>
<tr>
<td>Water quality outside acceptable range</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

- Revise permit
- Change groundwater pumping
- Increase conservation
- Other

- Flow decline
- Degrading water quality trends
- Known contaminant
- Known MCL exceedances
- Impacts on surface water features (water level decline, well interference, habitat degradation)
- Other

- Local

- Low flow declines > 10%
- Water quality outside

- Revise permit
- Change groundwater pumping
- Increase conservation
- Other
<table>
<thead>
<tr>
<th>Plumes</th>
<th>Acceptable range</th>
<th>Conservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ known MCL exceedances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Impacts on surface water features (water level decline, well interference, habitat degradation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aquifer</th>
<th>Ironton/Galesville</th>
<th>Declining trend in water level</th>
</tr>
</thead>
<tbody>
<tr>
<td>☒</td>
<td>☐ Well interference</td>
<td></td>
</tr>
<tr>
<td>☐ Aquifer Water level decline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Degrading water quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Uncertainty of aquifer productivity or extent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Endangered, threatened, or special concern species habitat, other Natural resource impacts

---

**Wellhead Protection (WHP) and Source 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 Source Water Protection Plans**

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Status</th>
<th>Date Adopted</th>
<th>Date for Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHP</td>
<td>☒ In Process</td>
<td>February 16, 2007</td>
<td>On hold</td>
</tr>
<tr>
<td>☐ Completed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Not Applicable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| SWP       | ☐ In Process |
| ☐ Completed |
| ☒ Not Applicable |

---

17
F. Capital Improvement Plan (CIP)

Please note that any wells that received approval under a ten-year permit, but that were not built, are no longer considered approved by the DNR.

Adequacy of Water Supply System

Complete Table 12 and 13 with information about the adequacy of installations, treatment facilities, and distribution systems to sustain current and projected demands through the next ten years. 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.

Table 12. Adequacy of Water Supply System

<table>
<thead>
<tr>
<th>System Component</th>
<th>Adequate?</th>
<th>Expected Lifespan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wells</td>
<td>X</td>
<td>40 years</td>
</tr>
<tr>
<td>Water Storage Facilities</td>
<td>X</td>
<td>30 years</td>
</tr>
<tr>
<td>Water Treatment Facilities</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Distribution Systems (pipes, lifts, etc.)</td>
<td>0</td>
<td>40 years</td>
</tr>
</tbody>
</table>

List planned capital improvements for any system components, in chronological order for the years 2016 – 2025:

The City of ... does not have any immediate capital improvements planned. The City is aware of the slowly declining water levels within the Ironton/Galesville Aquifer, utilized by both of the City’s production wells. The City may someday have to access water from the deeper Mount Simon Aquifer. Based on the current rate at which the water level is falling and the usage by the City, the need for an alternative aquifer is long into the future.

Table 13. Planned Capital Improvements

<table>
<thead>
<tr>
<th>System Component</th>
<th>Planned Action</th>
<th>Planned Construction Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wells</td>
<td>□ Repair</td>
<td></td>
</tr>
<tr>
<td>Water storage facilities</td>
<td>□ Repair</td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Installation Location</td>
<td>Resource Name</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Aquifer</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Surface Water</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Interconnection to another supplier</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

**Water Source Alternatives**

Complete Table 15 to describe alternative water sources that were considered, along with any opportunities for joint efforts with neighboring water suppliers. Add rows to the table as needed.

**Table 15. Alternative water sources**

<table>
<thead>
<tr>
<th>Alternative Source Considered</th>
<th>Installation Location</th>
<th>Possible Partners</th>
<th>Conservation Measures Considered</th>
<th>Benefits</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Preventative Maintenance
Complete Table 16 to identify preventive maintenance activities completed during the past ten years. Describe how this information may inform the need for future system maintenance. Add rows to the table as needed.

Table 16. Summary of Maintenance for Past 10 Years

<table>
<thead>
<tr>
<th>Section of System</th>
<th>Types of Maintenance Activities</th>
<th>Most Common Reason for Maintenance Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution System</td>
<td>2013—approximately 1,100 feet of watermain was replaced</td>
<td>Age</td>
</tr>
<tr>
<td>Production Wells</td>
<td>Checked daily for any abnormal pumping hours</td>
<td>Preventative Maintenance</td>
</tr>
<tr>
<td>Water Utility Maps</td>
<td>Updated in 2007 to identify all water mains and sizes. Updating planned for 2015.</td>
<td>Ensures accurate, up to date information of water system</td>
</tr>
<tr>
<td>Meter Replacement</td>
<td>2012-13—Replacement of the system meters</td>
<td>Age</td>
</tr>
<tr>
<td>Well Sealing</td>
<td>2011—Abandonment and sealing of Wells #4 &amp; #5</td>
<td></td>
</tr>
<tr>
<td>Water Storage Tower Repair</td>
<td>2011—Riser pipe repair; cleaning of tank, repair &amp; recoating of welds, inspection, and disinfection</td>
<td>Material failure and regular equipment maintenance</td>
</tr>
</tbody>
</table>

Part II. 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 failures, 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.

Community water suppliers that have completed the Federal Emergency Response Plan and submitted the required certification to the U.S. Environmental Protection Agency have satisfied Part II, Sections B, and C of these guidelines and need only complete sections A, D and E with information about the emergency response plan and source water protection plan.
Do you have a federal emergency response plan? ☒ Yes ☐ No

If yes, what was the date it was certified? **May 1999**

Complete Table 17 by inserting the noted information regarding your completed Federal Emergency Response Plan.

<table>
<thead>
<tr>
<th>Emergency Response Plan Role</th>
<th>Contact Person</th>
<th>Contact Phone Number</th>
<th>Contact Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Response Lead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternate Emergency Response Lead</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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

_________ operational contingency plan is not written but the practices are well defined and understood by the water utility staff. The City intends to summarize key practices in a written document within 3 years.

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 ALTERNATE WATER SUPPLY; CONTINGENCY STRATEGY and 4720.5280 ALTERNATE WATER SUPPLY; CONTINGENCY STRATEGY. 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 4.

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 secure 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? X Yes □ No

Can staff access records and maps from a central secured location in the event of an emergency?
X Yes □ No

Does the appropriate staff know where the materials are located?
X Yes □ No

Procedure for Augmenting Water Supplies
Complete Tables 18 – 21 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 5. 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 18. Interconnections with or delivery from other water supply systems to supply water in an emergency

<table>
<thead>
<tr>
<th>Water Supply System Owner</th>
<th>Public or Private Supplier</th>
<th>Capacity (GPM)</th>
<th>Capacity (MGD)</th>
<th>Note Any Limitations On Use</th>
<th>List of services, equipment, supplies available for emergency response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business 1</td>
<td>PRIVATE</td>
<td>100 GPM</td>
<td></td>
<td>Small GPM pump inserted by owner for their own private washing needs. They are hooked up to the city water supply as well, but there is no interconnection.</td>
<td>Requires temporary connection or tanker trucks for access</td>
</tr>
<tr>
<td>Business 2</td>
<td>PRIVATE</td>
<td>100 GPM</td>
<td></td>
<td>Used to fill tankers</td>
<td>Requires tanker trucks for access</td>
</tr>
</tbody>
</table>

22
<table>
<thead>
<tr>
<th>Business</th>
<th>PRIVATE</th>
<th>25 GPM</th>
<th>Used to fill tankers</th>
<th>Requires tanker trucks for access</th>
</tr>
</thead>
</table>

GPM – Gallons per minute  
MGD – million gallons per day

Table 19. Interconnections with other public water supply systems to supply water in an emergency

<table>
<thead>
<tr>
<th>Water System</th>
<th>Supply Capacity (GPM &amp; MGD)</th>
<th>Note Any Limitations On Use</th>
<th>List of services, equipment, supplies available &amp; needed to respond</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GPM – Gallons per minute  
MGD – million gallons per day

Table 20. Utilizing Surface Water as an Alternative Source

<table>
<thead>
<tr>
<th>Surface Water Source Name</th>
<th>Capacity (GPM)</th>
<th>Capacity (MGD)</th>
<th>Treatment Needs</th>
<th>Note Any Limitations On Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

None

Allocation and Demand Reduction Procedures

Complete table 21 –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.

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 21. Water use priorities

<table>
<thead>
<tr>
<th>Customer Category</th>
<th>Allocation Priority</th>
<th>Average Daily Demand (GDP)</th>
<th>Short-Term Emergency Demand Reduction Potential (GPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>1</td>
<td>122,450</td>
<td>30,000</td>
</tr>
<tr>
<td>Institutional</td>
<td>N/A</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Commercial</td>
<td>2</td>
<td>39,394</td>
<td>6,400</td>
</tr>
<tr>
<td>Industrial</td>
<td>3</td>
<td>41,359</td>
<td>42,700</td>
</tr>
<tr>
<td>Irrigation</td>
<td>N/A</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wholesale</td>
<td>N/A</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Non-Essential</td>
<td>4</td>
<td>10,208</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL:</td>
<td>NA</td>
<td>213,411</td>
<td>79,100</td>
</tr>
</tbody>
</table>

GPD – Gallons per Day

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 III on water conservation to help you determine strategies.

The average daily demand categories listed in Table 21 are the average annual daily demand from 2014. The short-term emergency demand reduction potential categories are reductions in the peak demand, which occurred in August 2014.

Complete Table 22 by selecting the triggers and actions during water supply disruption conditions.

Table 22. Emergency demand reduction conditions, triggers and actions

<table>
<thead>
<tr>
<th>Objective</th>
<th>Triggers</th>
<th>Short-term Actions</th>
<th>Long-term Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Contamination</td>
<td>□ Supply augmentation through ___</td>
<td>X Supply augmentation through emergency sources</td>
</tr>
<tr>
<td></td>
<td>X Loss of production</td>
<td>X Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation &amp; other nonessential uses.</td>
<td>X Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation &amp; other nonessential uses.</td>
</tr>
<tr>
<td></td>
<td>X Infrastructure failure</td>
<td>□ Water allocation through ___</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Executive order by Governor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Other:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Notification Procedures
Complete Table 23 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 23. Plan to Inform Customers Regarding Conservation Requests, Water Use Restrictions, and Suspensions

<table>
<thead>
<tr>
<th>Method</th>
<th>Notification Trigger(s)</th>
<th>Update Frequency</th>
<th>Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website</td>
<td>☐ Ongoing&lt;br&gt;☐ Long-term demand reduction declared&lt;br&gt;☐ Short-term demand reduction declared (&lt; 1 year)&lt;br&gt;☐ Governor’s Critical water deficiency declared</td>
<td>☐ Daily&lt;br&gt;☐ Weekly&lt;br&gt;☐ Monthly&lt;br&gt;☐ Annually</td>
<td></td>
</tr>
<tr>
<td>E-mail or Text or other new tool</td>
<td>☐ Ongoing&lt;br&gt;☐ Long-term demand reduction declared&lt;br&gt;☐ Short-term demand reduction declared (&lt; 1 year)&lt;br&gt;☐ Governor’s Critical water deficiency declared</td>
<td>☐ Daily&lt;br&gt;☐ Weekly&lt;br&gt;☐ Monthly&lt;br&gt;☐ Annually</td>
<td></td>
</tr>
<tr>
<td>Mailing</td>
<td>☐ Ongoing&lt;br&gt;☒ Long-term demand reduction declared&lt;br&gt;☒ Short-term demand reduction declared (&lt; 1 year)&lt;br&gt;☒ Governor’s Critical water deficiency declared</td>
<td>☐ Daily&lt;br&gt;☐ Weekly&lt;br&gt;☐ Monthly&lt;br&gt;☒ Annually</td>
<td>Reminders would be included at the bottom of quarterly utility bills.</td>
</tr>
<tr>
<td>Radio</td>
<td>☐ Ongoing&lt;br&gt;☒ Long-term demand reduction declared&lt;br&gt;☒ Short-term demand reduction declared (&lt; 1 year)&lt;br&gt;☒ Governor’s Critical water deficiency declared</td>
<td>☐ Daily&lt;br&gt;☐ Weekly&lt;br&gt;☐ Monthly&lt;br&gt;☒ Annually&lt;br&gt;☐ As needed</td>
<td></td>
</tr>
<tr>
<td>TV</td>
<td>☐ Ongoing&lt;br&gt;☒ Long-term demand reduction declared&lt;br&gt;☒ Short-term demand reduction declared (&lt; 1 year)&lt;br&gt;☒ Governor’s Critical water deficiency declared</td>
<td>☐ Daily&lt;br&gt;☐ Weekly&lt;br&gt;☐ Monthly&lt;br&gt;☒ Annually&lt;br&gt;☐ As needed</td>
<td></td>
</tr>
<tr>
<td>Meeting with large water users (&gt; 10% of total city use)</td>
<td>☐ Ongoing&lt;br&gt;☒ Long-term demand reduction declared</td>
<td>☐ Daily&lt;br&gt;☐ Weekly&lt;br&gt;☐ Monthly&lt;br&gt;☐ Annually</td>
<td></td>
</tr>
<tr>
<td>□ Short-term demand reduction declared (&lt; 1 year)</td>
<td>X Governor’s Critical water deficiency declared</td>
<td>X As needed</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>□ Ongoing</td>
<td>□ Daily</td>
<td></td>
</tr>
<tr>
<td>□ Long-term demand reduction declared</td>
<td>□ Weekly</td>
<td>□ Weekly</td>
<td></td>
</tr>
<tr>
<td>□ Short-term demand reduction declared (&lt; 1 year)</td>
<td>□ Monthly</td>
<td>□ Monthly</td>
<td></td>
</tr>
<tr>
<td>□ Governor’s Critical water deficiency declared</td>
<td>□ Annually</td>
<td>□ Annually</td>
<td></td>
</tr>
</tbody>
</table>

**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 ordinance in place that includes provisions to restrict water use and enforce the restrictions? □ Yes X No

The City of ... is currently researching examples of critical water deficiency ordinances and plans to implement an ordinance within the next 36 months.

If yes, attach the ordinance to this WSP as Appendix 6.

If no, the municipality must adopt such an ordinance within 7 months of submitting this WSP and submit it to the DNR as an amendment to this WSP.

Irrespective of whether a critical water deficiency ordinance is in place, does the public water supply utility, city manager, mayor, or emergency manager have standing authority to implement water restrictions? X Yes □ No If yes, cite the regulatory authority reference: Utility Manager.

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

N/A
PART III. 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: climatic changes, population increases, economic trends, uneven statewide availability of groundwater, 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
- Others?

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
- Water reuse opportunities
- Regulatory and barriers to conservation
- Cultural barriers to conservation

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 reuse. 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 X No
If yes, describe conservation practices that you are already implementing, such as: pricing, system improvements, education, regulation, appliance retrofitting, enforcement, etc.

Actions since 2009 Water Supply Plan: replaced all water meters, updated and revised water rates using fixed rate based on meter size plus uniform volumetric rate, replaced old water mains in connection with street resurfacing, and repaired several leaks that surfaced.

If no, complete Table 24 to summarize conservation actions taken since the adoption of the 2006 water supply plan.

Table 24. Implementation of previous ten-year Conservation Plan

<table>
<thead>
<tr>
<th>2006 Plan Commitments</th>
<th>Action Taken?</th>
</tr>
</thead>
<tbody>
<tr>
<td>X Change Water Rates Structure</td>
<td>X Yes</td>
</tr>
<tr>
<td>Fixed charge based on meter size plus volumetric charge with uniform rate schedule.</td>
<td>□ No</td>
</tr>
<tr>
<td>X Water Supply System Improvements</td>
<td>X Yes</td>
</tr>
<tr>
<td>X Educational Efforts</td>
<td>X Yes</td>
</tr>
<tr>
<td>□ New water conservation Ordinances</td>
<td>□ Yes</td>
</tr>
<tr>
<td>□ Yes</td>
<td></td>
</tr>
<tr>
<td>□ No</td>
<td></td>
</tr>
<tr>
<td>□ Retrofitting Program – for toilet, faucets, appliances, etc.</td>
<td>□ Yes</td>
</tr>
<tr>
<td>□ No</td>
<td></td>
</tr>
<tr>
<td>□ Enhanced water conservation enforcement</td>
<td>□ Yes</td>
</tr>
<tr>
<td>□ No</td>
<td></td>
</tr>
<tr>
<td>□ Other</td>
<td>□ Yes</td>
</tr>
<tr>
<td>□ No</td>
<td></td>
</tr>
</tbody>
</table>

What are the results you have seen from the actions in Table 25?

Decreasing trend in total annual water pumped, residential demand, and percent of water unaccounted for between 2005 and 2014.

A. Triggers for Allocation and Demand Reduction Actions
Complete table 25 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 25. Short and long-term demand reduction conditions, triggers and actions

<table>
<thead>
<tr>
<th>Objective</th>
<th>Triggers</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term demand reduction (less than 1 year) and/or Protect Surface Water Flows</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X Extremely high seasonal water demand (more than double winter demand)</td>
<td>X Adopt (if not already) and enforce the critical water deficiency ordinance to restrict or prohibit lawn watering, vehicle washing, golf course and park irrigation &amp; other nonessential uses.</td>
</tr>
<tr>
<td></td>
<td>□ Loss of treatment capacity</td>
<td>□ Supply augmentation through ____</td>
</tr>
<tr>
<td></td>
<td>□ Lack of water in storage</td>
<td>□ Water allocation through ____</td>
</tr>
<tr>
<td></td>
<td>□ Low surface water flows and State drought plan</td>
<td>□ Meet with large water users to discuss user’s contingency plan.</td>
</tr>
<tr>
<td></td>
<td>□ Well interference</td>
<td>□ Other: ___________________</td>
</tr>
<tr>
<td></td>
<td>□ Other:</td>
<td></td>
</tr>
<tr>
<td>Long-term demand reduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Per capita demand increasing</td>
<td>□ Develop a critical water deficiency ordinance that is or can be quickly adopted to penalize lawn watering, vehicle washing, golf course and park irrigation &amp; other nonessential uses.</td>
</tr>
<tr>
<td></td>
<td>□ Total demand increase (higher population or more industry) Water level in well(s) below elevation of ____</td>
<td>□ 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Meet with large water users to discuss user’s contingency plan.</td>
</tr>
<tr>
<td></td>
<td>□ Other:</td>
<td>□ Enhanced monitoring and reporting; audits, meters, billing, etc.</td>
</tr>
</tbody>
</table>

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 ten-year average (2005-2014) unaccounted Water Use in Table 2 higher than 10%? X Yes □ No

What is the date of your most recent water audit? 2015
**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. Drinking Water Revolving Loan Funds are available for purchase of new meters when new plants are built.

Frequency of water audits: □ yearly  
□ other (specify frequency)  ☑ Continuous

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

Year last leak detection survey completed: None

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

Since 2005, unaccounted for water has decreased by approximately 10%, from 26.9% in 2005 to 16.2% in 2014. The unaccounted for water is expected to be less than 10% when the water loss during main breaks is better estimated.

**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, and maintenance 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 26 by adding the requested information regarding the number, types, testing and maintenance of customer meters.

**Table 26. Customer Meters**

<table>
<thead>
<tr>
<th></th>
<th>Number of Customers</th>
<th>Number of Metered Connections</th>
<th>Number of Automated Meter Readers</th>
<th>Meter testing schedule (years)</th>
<th>Average age/meter replacement schedule (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td></td>
<td>1,107</td>
<td>All</td>
<td>Meters are tested when flagged by software</td>
<td>3 years / 20 years</td>
</tr>
<tr>
<td>Smart meters – sprinkler system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>167</td>
<td>5</td>
<td>20</td>
<td>3 years / 20 years</td>
<td></td>
</tr>
<tr>
<td>Industrial</td>
<td>5</td>
<td>3 years / 20 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Facilities</td>
<td>20</td>
<td>3 years / 20 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td>1,299</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>
**Unmetered Systems**

Describe plans, if any, 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.

The majority of the meters in where replaced as recently as 2012-13, including software updates.

Table 27. Water source meters

<table>
<thead>
<tr>
<th>Water Source (wells/intakes)</th>
<th>Number of Meters</th>
<th>Meter testing schedule (years)</th>
<th>Automated Meter Readers installed</th>
<th>Average age/meter replacement schedule (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Plant</td>
<td>N/A</td>
<td></td>
<td>No</td>
<td>3 years /25 years</td>
</tr>
</tbody>
</table>

**Strategies for Reducing Unaccounted Water Loss**

Identify strategies you will use to reduce unaccounted water to less than 10% and include the timeframe for completing work:

Table 28. Strategies and timeframe to reduce unaccounted water

<table>
<thead>
<tr>
<th>Strategy to reduce unaccounted water</th>
<th>Timeframe for completing work</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Conduct a thorough water audit</td>
<td></td>
</tr>
<tr>
<td>X Leak detection and repair</td>
<td>As leaks surface and in conjunction with street repair projects.</td>
</tr>
<tr>
<td>□ Meter installation</td>
<td></td>
</tr>
<tr>
<td>X Others</td>
<td>Improve accounted for estimates.</td>
</tr>
</tbody>
</table>

**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 X No

What was your 2005 – 2014 ten-year average residential per capita water demand? **50 g/person/day.**

The residential per capita water demand has continued to decrease between 2005 and 2014, with a maximum demand of only 57 gals/person/day in 2006 to a recent low of 43 gals/person/day in 2014. The residential usage in is very low compared to others leaving little room for reduction.

Describe the water use trend over that timeframe:
Complete Table 29 by checking which strategies you will use to continue reducing residential per capita demand and project a likely timeframe for completing each checked strategy (add rows for additional strategies):

**Table 29. Strategies and timeframe to reduce residential per capita demand**

<table>
<thead>
<tr>
<th>Strategy to reduce residential per capita demand</th>
<th>Timeframe for completing work</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Revise city ordinances/codes to encourage water efficient landscaping.</td>
<td></td>
</tr>
<tr>
<td>□ Revise city ordinance/codes to allow/permit water reuse options, especially for non-potable purposes like irrigation, groundwater recharge, and industrial use. Check with authority of plumbing board to see if reuse in internal to buildings is a conflict</td>
<td></td>
</tr>
<tr>
<td>□ Revise ordinances to limit sprinkling to no more than 2 days/ a week.</td>
<td></td>
</tr>
<tr>
<td>□ Revise outdoor sprinkler installations codes to require high efficiency systems with soil moisture sensors in new installs or system replacements.</td>
<td></td>
</tr>
<tr>
<td>X Water system and infrastructure improvements</td>
<td>Continue to replace distribution system in conjunction with street repair projects and as problems surface.</td>
</tr>
<tr>
<td>□ Free or reduced cost audits (home internal and/or external) for residents.</td>
<td></td>
</tr>
<tr>
<td>□ Well or water level notification program to let residents know changes in water level conditions</td>
<td></td>
</tr>
<tr>
<td>□ Water efficient appliance and/or fixtures rebate program</td>
<td></td>
</tr>
<tr>
<td>□ Rebate program for turf replacement</td>
<td></td>
</tr>
<tr>
<td>□ Supplemental Water Resources Identified</td>
<td></td>
</tr>
<tr>
<td>□ Irrigation controller rebate program (smart meters)</td>
<td></td>
</tr>
<tr>
<td>□ Water efficient toilet replacement program</td>
<td></td>
</tr>
<tr>
<td>□ Low flow faucet aerator distribution program and installation – home energy squad type program like NEC-St. Paul Program</td>
<td></td>
</tr>
<tr>
<td>□ Low flow showerhead aerator distribution and installation program</td>
<td></td>
</tr>
<tr>
<td>□ Rain barrel distribution and installation program</td>
<td></td>
</tr>
<tr>
<td>□ Replace non-native grass with Minnesota native landscape and/or rain gardens</td>
<td></td>
</tr>
<tr>
<td>□ Water conservation education and outreach that targets school children and adults.</td>
<td></td>
</tr>
<tr>
<td>□ Incentives to encourage stormwater reuse for irrigation</td>
<td></td>
</tr>
<tr>
<td>□ Recycling municipal or gray water is not currently supported by plumbing codes and requires a variance</td>
<td></td>
</tr>
<tr>
<td>□ Others</td>
<td></td>
</tr>
</tbody>
</table>

**Objective 3: Achieve at least a 1.5% per year water reduction for Industrial, Commercial, Agricultural GPCD over the next 10 years or a 15% reduction in ten years.**
Complete Table 30 by checking which strategies you will use 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 30. Strategies and timeframe to reduce business, industrial, and agricultural and non-revenue use demand

<table>
<thead>
<tr>
<th>Strategy to reduce total business, industry, agricultural demand</th>
<th>Timeframe for completing work</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Industrial and/or commercial facility water use audits and outdoor irrigation system audits</td>
<td></td>
</tr>
<tr>
<td>☐ Metering enhancement – ideally automated meter reading to detect spikes in consumption</td>
<td></td>
</tr>
<tr>
<td>☒ Compare local business water use to industry benchmarks if available (meat processing, dairy, fruit and vegetable, beverage, textiles, paper/pulp, metals, technology, petroleum refining etc.)</td>
<td>2016. The 2 largest water users, 1.) wash the interior of tanker trucks and 2.) clean and package organic vegetables.</td>
</tr>
<tr>
<td>☐ Business loan/grant program for water conservation initiatives</td>
<td></td>
</tr>
<tr>
<td>☒ Leak reduction and repair program</td>
<td>On going</td>
</tr>
<tr>
<td>☐ Reusing secondary effluent/treated reclaimed water</td>
<td></td>
</tr>
<tr>
<td>☐ Water efficient appliance rebate program</td>
<td></td>
</tr>
<tr>
<td>☐ Water Rate structure changes to encourage conservation and/or a drought surcharge – temporary pricing measures</td>
<td></td>
</tr>
<tr>
<td>☐ Irrigation system audit and/or rebate program (smart meters) and/or drip irrigation systems</td>
<td></td>
</tr>
<tr>
<td>☐ Dual flush (water efficient) toilet replacement program</td>
<td></td>
</tr>
<tr>
<td>☐ Faucet aerator distribution program</td>
<td></td>
</tr>
<tr>
<td>☐ Replace non-native grass with Minnesota native landscape and/or rain gardens</td>
<td></td>
</tr>
<tr>
<td>☒ Water conservation education and outreach</td>
<td>On going</td>
</tr>
<tr>
<td>☐ Well or water level notification program to let business know changes in water level conditions</td>
<td></td>
</tr>
<tr>
<td>☐ Stormwater reuse for irrigation</td>
<td></td>
</tr>
<tr>
<td>☐ Recycling water or gray water use - May need variance from plumbing code</td>
<td></td>
</tr>
<tr>
<td>☐ [Rainwater catchment systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, industrial processes, water features, vehicle washing facilities, cooling tower makeup, and similar uses shall be approved by the commissioner. Proposed plumbing code 4714.1702.1 <a href="http://www.dli.mn.gov/PDF/docket/4714rule.pdf">http://www.dli.mn.gov/PDF/docket/4714rule.pdf</a>]</td>
<td></td>
</tr>
</tbody>
</table>

33
Objective 4: Achieve a Decreasing Trend In Total Per Capita Demand

Include as Appendix 7 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.

As shown in Appendix 7, the majority of the demands are expected to decrease over the next 10 years with the exception of industrial demand. These demands have decreasing trends that follow the data provided in Table 1 with reductions in both residential and total water demand. The commercial water demand is not expected to continue to decrease as the graph depicts, but to stabilize as it has over the last several years. The industrial demand predicts a constant to somewhat increasing linear trend, a likely result of the steady use by (system) prominent industries: Whole Foods & School District. Residential demand is already very low.

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: it was 2.48. Recent peak day demands were the result of hydrant flushing in 2012 and a broken pipe in the old jail sprinkler system in 2014. None of the peak days were associated with irrigation usage.

Complete Table 31 by checking which strategies you will use to reduce peak day demand and project a likely timeframe for completing each checked strategy (add rows for additional strategies):

<table>
<thead>
<tr>
<th>Strategy to reduce peak day demand</th>
<th>Timeframe for completing work</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Irrigation system audit</td>
<td></td>
</tr>
<tr>
<td>☐ Irrigation system controller rebate program</td>
<td></td>
</tr>
<tr>
<td>☐ Stormwater reuse for irrigation</td>
<td></td>
</tr>
<tr>
<td>☐ Minnesota native landscape, replacing non-native grass</td>
<td></td>
</tr>
<tr>
<td>☐ Water conservation education</td>
<td></td>
</tr>
<tr>
<td>☐ Odd/Even watering</td>
<td></td>
</tr>
<tr>
<td>☐ Others</td>
<td></td>
</tr>
</tbody>
</table>

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 8 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 none other

Frequency of billing: □ Monthly □ Bimonthly X Quarterly □ Other: __________________________

Water Rate Evaluation Frequency: X every year □ every ___ years □ no schedule

Date of last rate change: January 1, 2011

Table 32. Rate structures for each customer category (add additional rows as needed)

<table>
<thead>
<tr>
<th>Customer Category</th>
<th>Conservation Billing Strategies in Use *</th>
<th>Conservation Neutral Billing Strategies in Use **</th>
<th>Non-Conserving Billing Strategies in Use ***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>☐ Monthly Billing ☐ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of Use rates X Water bills reported in gallons ☐ Individualized goal rates ☐ Excess Use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons X Service charge not based on water volume ☐ Other (describe)</td>
<td>X Uniform ☐ Odd/Even day watering</td>
<td>☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)</td>
</tr>
<tr>
<td>Commercial/Industrial/Institutional</td>
<td>☐ Monthly Billing ☐ Increasing block rates ☐ Seasonal rates ☐ Time of Use rates X Bill water use in gallons ☐ Individualized goal rates ☐ Excess Use rates ☐ Drought surcharge</td>
<td>X Uniform</td>
<td>☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)</td>
</tr>
</tbody>
</table>
**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)

**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:

N/A
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 intend to implement within the next 10 years.

Table 33. Additional strategies to Reduce Water Use & Support Wellhead Protection

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participate in the GreenStep Cities Program, including implementation of at least one of the 20 “Best Practices” for water</td>
</tr>
<tr>
<td></td>
<td>Prepare a Master Plan for Smart Growth (compact urban growth that avoids sprawl)</td>
</tr>
<tr>
<td></td>
<td>Prepare a Comprehensive Open Space Plan (areas for parks, green spaces, natural areas)</td>
</tr>
<tr>
<td>X</td>
<td>Adopt a Water Use Restriction Ordinance (lawn irrigation, car washing, pools, etc.)</td>
</tr>
<tr>
<td></td>
<td>Adopt an Outdoor Lawn Irrigation Ordinance</td>
</tr>
<tr>
<td>X</td>
<td>Adopt a Private well Ordinance (private wells in a city must comply with water restrictions)</td>
</tr>
<tr>
<td></td>
<td>Implement a Stormwater Management Program</td>
</tr>
<tr>
<td></td>
<td>Adopt Non-Zoning Wetlands Ordinance (can further protect wetlands beyond state/federal laws—for vernal pools, buffer areas, restrictions on filling or alterations)</td>
</tr>
<tr>
<td></td>
<td>Adopt a Water Offset Program (primarily for new development or expansion)</td>
</tr>
<tr>
<td></td>
<td>Implement a Water Conservation Outreach Program</td>
</tr>
<tr>
<td></td>
<td>Hire a Water Conservation Coordinator (part-time)</td>
</tr>
<tr>
<td>X</td>
<td>Implement a Rebate program for water efficient appliances, fixtures, or outdoor water management, evaluate water softener replacement incentives</td>
</tr>
<tr>
<td>X</td>
<td>Other: Replace Watermains</td>
</tr>
</tbody>
</table>

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

What is the process to monitor demand reduction and/or a rate structure?

a) The DNR District Hydrologist or Groundwater Appropriation Hydrologist will call or visit the community the first year or so 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 III 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.

37
A. Regulation

Complete Table 34 by selecting which regulations are used to reduce demand and improve water efficiencies.

Copies of adopted regulations or proposed restrictions or should be included in Appendix 9 (A list with hyperlinks is acceptable).

<table>
<thead>
<tr>
<th>Regulations Utilized</th>
<th>When is it applied (in effect)?</th>
</tr>
</thead>
</table>
| ☐ State-required rainfall sensors on landscape irrigation systems | ☐ Year Round  
☐ Seasonal  
☐ Only Emergencies |
| ☐ Federally-required water efficient plumbing fixtures | ☐ Year Round  
☐ Seasonal  
☐ Only Emergencies |
| ☒ Critical/Emergency Water Deficiency ordinance | ☒ Only Emergencies |
| ☒ Time of day watering restriction | ☐ Year Round  
☐ Seasonal  
☒ Only Emergencies |
| ☒ Odd/even day watering restriction | ☐ Year Round  
☐ Seasonal  
☒ Only Emergencies |
| ☐ Water waste prohibited (for example, having a fine for irrigators spraying on the street) | ☐ Year Round  
☐ Seasonal  
☐ Only Emergencies |
| ☐ Limitations on turf areas (requiring lots to have 10% - 25% of the space in natural areas) | ☐ Ongoing  
☐ Seasonal  
☐ Only during declared Emergencies |
| ☐ Soil preparation (after construction, requiring topsoil to be applied to promote good root growth) | ☐ Ongoing  
☐ Seasonal  
☐ Only during declared Emergencies |
| ☐ Tree ratios (requiring a certain number of trees per square foot of lawn) | ☐ Ongoing  
☐ Seasonal  
☐ Only during declared Emergencies |
| ☐ Prohibition on irrigation of medians | ☐ Ongoing  
☐ Seasonal  
☐ Only during declared Emergencies |
| ☐ 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) | ☐ Ongoing  
☐ Seasonal  
☐ Only during declared Emergencies |
| ☐ Other (Note that retrofit programs are in the next section) | ☐ Ongoing  
☐ Seasonal  
☐ Only during declared Emergencies |

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

**Table 35. Retrofitting programs**

<table>
<thead>
<tr>
<th>Water Use Targets</th>
<th>Outreach Methods</th>
<th>Measures of Success</th>
<th>Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ low flush toilets,</td>
<td>☐ Education about</td>
<td>☐ # of impressions</td>
<td>☐ Gas company</td>
</tr>
<tr>
<td>☐ toilet leak tablets,</td>
<td>☐ free distribution of</td>
<td>☐ # distributed</td>
<td>☐ Electric company</td>
</tr>
<tr>
<td>☐ low flow showerheads,</td>
<td>☐ rebate for</td>
<td>☐ # of customers</td>
<td>☐ Watershed organization</td>
</tr>
<tr>
<td>☐ faucet aerators;</td>
<td>☐ other</td>
<td>with changed habits</td>
<td></td>
</tr>
<tr>
<td>☐ water conserving washing machines,</td>
<td>☒ Education about</td>
<td>☐ $ value of rebates</td>
<td></td>
</tr>
<tr>
<td>☐ dish washers,</td>
<td>☐ free distribution of</td>
<td>☐ Gallons conserved</td>
<td></td>
</tr>
<tr>
<td>☒ water softeners;</td>
<td>☐ rebate for</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ rain gardens,</td>
<td>☐ Education about</td>
<td>☐ # of impressions</td>
<td>☐ Gas company</td>
</tr>
<tr>
<td>☐ rain barrels,</td>
<td>☐ free distribution of</td>
<td>☐ # distributed</td>
<td>☐ Electric company</td>
</tr>
<tr>
<td>☐ Native/drought tolerant landscaping, etc.</td>
<td>☐ rebate for</td>
<td>☐ # of customers</td>
<td>☐ Watershed organization</td>
</tr>
<tr>
<td></td>
<td>☐ other</td>
<td>with changed habits</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ $ value of rebates</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☐ Gallons conserved</td>
<td></td>
</tr>
</tbody>
</table>
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 36 by selecting which methods are used to provide water conservation and information, including the frequency of program components. Add additional lines as needed.

<table>
<thead>
<tr>
<th>Education Methods</th>
<th>General summary of topics</th>
<th>#/Year</th>
<th>Frequency</th>
</tr>
</thead>
</table>
| Billing inserts or tips printed on the actual bill | | 1/year | Ongoing  
[ ] Seasonal  
[ ] Only during declared Emergencies |
| Consumer Confidence Reports | | 1/year | Ongoing  
[ ] Seasonal  
[ ] Only during declared Emergencies |
| Press releases to traditional local news outlets (e.g., newspapers, radio and TV) | | 1/year | Ongoing  
[ ] Seasonal  
[ ] Only during declared Emergencies |
| Social media distribution (e.g., emails, Facebook, Twitter) | |  | Ongoing  
[ ] Seasonal  
[ ] Only during declared Emergencies |
| Paid advertisements (e.g., billboards, print media, TV, radio, web sites, etc.) | |  | Ongoing  
[ ] Seasonal  
[ ] Only during declared Emergencies |
| Presentations to community groups | | | Ongoing  
[ ] Seasonal  
[ ] Only during declared Emergencies |
| Staff training | Continuing Education | | Ongoing  
[ ] Seasonal  
[ ] Only during declared Emergencies |
| Facility tours | | | Ongoing  
[ ] Seasonal  
[ ] Only during declared Emergencies |
| Displays and exhibits | | | 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 | | | Ongoing  
[ ] Seasonal |
<table>
<thead>
<tr>
<th>Activity Description</th>
<th>Frequency Options</th>
</tr>
</thead>
</table>
| Direct mailings (water audit/retrofit kits, showerheads, brochures)                  | □ Only during declared Emergencies  
□ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
| Information kiosk at utility and public buildings                                   | □ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
| Public Service Announcements                                                        | □ 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)      | □ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
| Community Events (children's water festivals, environmental fairs)                  | □ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
| Community education classes                                                         | □ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
| Water Week promotions                                                               | □ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
| Website (include address: )                                                         | □ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
| Targeted efforts (large volume users, users with large increases)                   | □ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
| Notices of ordinances                                                               | □ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
| Emergency conservation notices                                                      | □ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
| Other:                                                                             | □ Ongoing  
□ Seasonal  
□ Only during declared Emergencies |
Appendices to be submitted by the water supplier

Appendix 1: Well records and maintenance summaries

Appendix 2: Water level monitoring plan

Appendix 3: Water level graphs for each water supply well

Appendix 4: Emergency Telephone List

Appendix 5: Cooperative Agreements for Emergency Services

Appendix 6: Municipal Critical Water Deficiency Ordinance

Appendix 7: Graph showing annual per capita water demand for each customer category during the last ten-years

Appendix 8: Water Rate Structure

Appendix 9: Adopted or proposed regulations to reduce demand or improve water efficiency

Appendix 10: Implementation Checklist – summary of all the actions that a community is doing, or proposes to do, including estimated implementation dates.

Appendix 11: Data

Appendix 12: Water System Map
Appendix 1
Attachment F

City of _________ Well #7

City of _________ Well #7 was put on line in 2001 and has not been pulled up since that date. The well is checked every day as a daily routine and has not shown any indications from our pumping records that there is any problems.
## Appendix 1

### Well and Boring Record

**Minnesota Department of Health**

**Well and Boring Record**

**Minnesota Statutes Chapter 103**

<table>
<thead>
<tr>
<th>Well Name</th>
<th>Township Range Dr Section Subsections Elevation</th>
<th>Elevation Method</th>
<th>Well Depth</th>
<th>Depth Completed</th>
<th>Date Well Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1197 ft.</td>
<td>7.5 minute topographic map (+/- 5 feet)</td>
<td>737 ft.</td>
<td>737 ft.</td>
<td>09/06/1993</td>
</tr>
</tbody>
</table>

**Drilling Fluid**

- Use Community Supply
- PWS ID: Source 503
- Well Hydrofractured? Yes / No
- From Ft. to Ft.

<table>
<thead>
<tr>
<th>Casing Type</th>
<th>Weight</th>
<th>Hole Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel (black or low carbon), Joint Welded, Drive Shoe? Yes / No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Above/Below 0 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 in. to 35 ft.</td>
<td>94.62 lbs/ft.</td>
<td>24 in. to 620 ft.</td>
</tr>
<tr>
<td>18 in. to 620 ft.</td>
<td>70.59 lbs/ft.</td>
<td>18 in. to 737 ft.</td>
</tr>
</tbody>
</table>

**Open Hole** from 620 ft. to 737 ft.

**Screen NO** Make Type

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Slot/Gauze</th>
<th>Length</th>
<th>Set Between</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Static Water Level**

- 395 ft. from Land surface
- Date Measured: 06/06/1983

**Pumping Level** (below Land surface)

- 437 ft. after 24 hrs. pumping 500 gpm.

**Well Head Completion**

- Filtration adapter manufacturer
- Model
- Casing Protection: Yes / No
- 12 ft. above grade
- At-grade (Environmental Wells and Boring Only)

**Remarks**

GAMMA LOGGED 5-10-1983, M.G.S. NO. 1860.

**Located by**

- Minnesota Department of Health (Digitizing Table)
- Unique Number Verification: Information from owner
- Input Date: 11/06/2004

**Grouting Information**

- Well Grouted? Yes / No
- Grout Material: Neat Cement from 0 to 620 ft. 85 yards.

**Nearest Known Source of Contamination**

- _feet _direction _type
- Well drilled/installed upon completion? Yes / No
- Pump: Not Installed
- Date installed: 
- Manufacturer's name
- Model number
- HP: _Volts
- Length of drop pipes ft. Capacity: _gpm
- Type: _Material

**Abandoned Wells**

- Does property have any not in use and not sealed well(s)? Yes / No
- Variance: Was a variance granted from the MDH for this well? Yes / No

**Well Contractor Certification**

- Segarsen Caswell 22058
- License Business Name:
- Lic. Or Reg. No.:
- Name of Driller:

**County Well Index Online Report**

Printed 2/16/2012

HE-01295-07
Appendix 1

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103J

Well Name:
Township Range Dir Section Subsections Elevation 1171 ft.
102 6 W 13 800000 Elevation Method 7.5 minute topographic map (+/-5 feet)

Well Address

Geological Material Color Hardness From To
CLAY BROWN SOFT 0 40
DECOMPOSED ROCK BROWN MEDIUM 40 71
LIMEROCK BROWN MED-HRD 71 275
SAND ROCK WHITE SOFT 275 372
SHALE GRAY HARD 372 415
SHALE STICKY GRAY SOFT 415 590
SANDSTONE GRAY SOFT 590 708

Well Depth Depth Completed Date Well Completed
708 ft. 708 ft. 11/19/2001

Drilling Method: Cable Tool
Drilling Fluid: Water
Well Hydrofractured? Yes No

Use Community Supply PWS ID: Source SD4

Casing Type: Steel (black or low carbon) Jetted Welded Drive Shoe?

No: Above/Below ft.

Casing Diameter Weight Hole Diameter
30 in. to 71 ft. 118.5 lbs/ft. 29 in. to 122 ft.
24 in. to 122 ft. 94.9 lbs/ft. 23 in. to 540 ft.
18 in. to 590 ft. 70.59 lbs/ft. 17 in. to 708 ft.

Open Hole from 590 ft. to 708 ft.

Screen NO Make Type

Diameter Slot/Gauze Length Set Between

Statute Water Level
367.2 ft. from land surface Date Measured 06/29/2001

PUMPING LEVEL (below land surface)
468.17 ft. after 3 hrs pumping 600 g.p.m.

Well Head Completion
Pressure adapter manufacturer Model
Casing Protection 12 ft. above grade

AI-grade (Environmental Wells and Boring ONLY)

Grouting Information Well Grouted?

Grout Material: Neat Cement from 0 to 590 ft. 605 bags
Grout Material: Neat Cement from 0 to 122 ft. 200 bags

Nearest Known Source of Contamination
76 feet N, direction type

Well disinfected upon completion? Yes No

Pump Not Installed Date Installed 11/29/2001
Manufacturer’s name: JINIE Model number: 10MC HP 150 Volts 180
Length of drop Pipe: 500 ft. Capacity: 500 g.p.m. Type: Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? Yes No

Variances Was a variance granted from the MCH for this well? Yes No

Well Contractor Certification

Regroleum Caswell 27954
License Business Name Lic. Or Reg. No. Name of Driller

Printed 2/16/2012
HE-01205-07

Minnesota Unique Well No.
County Quad
Quad ID

MINNESOTA STATUTES 103J

REMARKS
M.G.S. No. 4050.

Located by: Minnesota Department of Health
Unique Number Verification: Information from owner
System: UTM - NatDS, Zone16, Meters
X: 620052 Y: 485758

Method: Digitization (Screen) - Map (1:12,000)
Input Date: 09/27/2004

Cuttings: Yes
First Bedrock: Prairie du Chien Group
Aquifer: Ironon-Galesville
Last Strat: Ironon-Galesville Depth to Bedrock: 40 ft.

County Well Index Online Report

01/14/2002
09/12/2007

Yes

No

Yes

No
### Appendix 1

**MINNESOTA DEPARTMENT OF HEALTH**

**WELL AND BORING SEALING RECORD**

**MINNESOTA STATUTES, CHAPTER 103I**

**WELL OR BORING LOCATION**

**County Name**

**Township No.**

**Range No.**

**Section No.**

**Fraction (t, r, s, n)**

**Date Sealed**

**Date Well or Boring Constructed**

**LOCATION:**

- **Latitude:** degrees minutes seconds
- **Longitude:** degrees minutes seconds

**Numerical Street Address or Fire Number and City of Well or Boring Location**

**Sketch map of well or boring location, showing property lines, roads, and buildings.**

**PROPERTY OWNERS NAME/COMPANY NAME**

**CITY OF**

**WELL OWNERS NAME/COMPANY NAME**

**CITY OF**

**PROPERTY OWNER'S MAILING ADDRESS**

- **Address**

**WELL OWNER'S MAILING ADDRESS**

- **Address**

**GEOLOGICAL MATERIAL**

- **Color**
- **Hardness or Formation**
- **From**
- **To**

**GROUTING MATERIAL(S)**

- **(One bag of cement = 84 lbs., one bag of bentonite = 50 lbs.)**

**OTHER WELLS AND BORINGS**

**REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING**

**LICENSED OR REGISTERED CONTRACTOR CERTIFICATION**

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

**BERGERSON CASWELL INC**

**Licensee Business Name**

**License or Registration No.**

**Certified Representative Signature**

**Certified Rep. No.**

**Date**

**EUGENE DVORAK**

**Name of Person Sealing Well or Boring**

**CITY WELL #4**

**IMPORTANT - FILE WITH PROPERTY PAPERS - WELL OWNER COPY**

**H 299329**

**HE 0434-12**

**ICF 140-0423**
Appendix 1

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes, Chapter 103I

<table>
<thead>
<tr>
<th>Township Name</th>
<th>Township No.</th>
<th>Range No.</th>
<th>Section No.</th>
<th>Fraction Fm. - W</th>
<th>Date Sealed</th>
<th>Date Well or Boring Constructed</th>
</tr>
</thead>
<tbody>
<tr>
<td>102N 6W 13</td>
<td>5W NE NE</td>
<td>9-21-11</td>
<td>1960</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **GPS LOCATION:**
  - Latitude: 40.7 degrees
  - Longitude: -93.5 degrees

- **Sketch map of well or boring location, showing property lines, roads, and buildings.**

- **AQUIFERS:**
  - Single Aquifer
  - Multiaquifer

- **WELL BORING:**
  - Water Supply Well
  - Ment. Well
  - Grn. Bore Hole
  - Other: 173

- **CASING TYPE:**
  - Steel
  - Plastic
  - Tile
  - Other

- **WELLHEAD COMPLETION:**
  - Exterior: 200 ft
  - Below: 15 ft
  - No above land surface

- **CASING(S):**
  - Diameter: 4 in.
  - Depth: From 301 to SURFACE
  - Screen Open Hole: From 301 to 407 ft

- **SCREEN OPEN HOLE:**
  - Screen Length: From to ft
  - Open Hole Length: From 301 to 407 ft

- **OBSTRUCTIONS:**
  - Rod/Screw Pipe
  - Check Valve(s)
  - Debris

- **Type of Obstruction (Describe):**
  - Sandstone

- **METHOD USED TO SEAL ANNUAL SPACE BETWEEN CASINGS, OR CASING AND BORE HOLE:**
  - No Annual Spacing
  - Annual Spacing Grouded with Trench Pipe
  - Casing Perforation/Removal

- **PUMP:**
  - Type: TGR, Inc.
  - Size: 48 x 36 in.

- **GROUTING MATERIAL:**
  - (One bag of cement = 84 lbs., one bag of water = 50 lbs.)
  - Grain: 405
  - Pea: 305

- **Remarks, Source of Data, Difficulties in Sealing:**
  - MOC Gamma logged well before sealing

- **License Business Name:**
  - Bergerson Caswell, Inc.

- **Certified Representative Signature:**
  - Eugene Dvorak

- **License or Registration No.:**
  - 146-0423

- **Other Wells and Boreholes:**
  - Other unsealed and unused well or boring on property: Yes 50 ft

- **Licensed or Registered Contractor Certification:**
  - This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.
Appendix 2
City of
Monitoring Plan

The City of submits water level measurements to the DNR on an annual basis. The water level of the two production wells (Well #6 and Well #7) are measured on a monthly basis. The following map shows the monitoring locations.
Appendix 2
Monitoring Plan

City of
2015
Water Conservation Plan

Overview

Legend
☐ Corporate Limits
☐ Political Township
Static Water Levels
Well #7
Appendix 4
City of
Emergency Telephone List

Water/Wastewater Supervisor
Water/Wastewater Operator
Minnesota Department of Health
    Rochester Office
    Minnesota Rural Water Association
    Department of Natural Resources (DNR)
    Minnesota Duty Officer
    County Engineer
    City Engineer,
    County Sheriff,
    Chief of Police,
    Fire Chief,
    County Emergency Management Director
City Electrician,
Well Pullers
Thein Well
    Bergerson Caswell
    Contractors—Plumbing
    Schulze Plumbing
    Esch Builders, Myles Esch
    Contractors—Electricians
    Hoskins Electric
    Brad’s Electric
    Generators—Large
    Bonanza Grain
Trucks
    Haulers
Cliff Viessman, Inc.
Appendix 5

City of C
Procedures for Augmenting Water Supplies

1. No interconnect to cities or private wells adjacent to the City of but there are two (2) private well sources in the city limits and one (1) outside the city limits they may be used as drinking water sources by filling tankers from them.

2. No surface supplies.

3. Alternative Sources:
   a. The city would have to contract with Haulers or Cliff Viessman Inc. to deliver drinking water in milk tankers from three (3) private wells or from neighboring cities in County. In case of a major catastrophe the Emergency Management Director would be contacted for assistance.

4. No written agreements only verbal are in place at this time for water supplies.
Appendix 8
City of
Water Utility Rates

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Meters</th>
<th>Monthly Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot;-3/4&quot;</td>
<td>Meter or less</td>
<td>$10.14/Month</td>
</tr>
<tr>
<td>1&quot;</td>
<td>Meters</td>
<td>$19.27/Month</td>
</tr>
<tr>
<td>1 ¼&quot;</td>
<td>Meters</td>
<td>$28.52/Month</td>
</tr>
<tr>
<td>1 ½&quot;</td>
<td>Meters</td>
<td>$37.75/Month</td>
</tr>
<tr>
<td>2&quot;</td>
<td>Meters</td>
<td>$66.33/Month</td>
</tr>
<tr>
<td>3&quot;</td>
<td>Meters</td>
<td>$147.77/Month</td>
</tr>
<tr>
<td>4&quot;</td>
<td>Meters</td>
<td>$229.28/Month</td>
</tr>
</tbody>
</table>

Usage Rate
Minimum Monthly Charge is the Base Charge

Reviewed: February 2014
RESOLUTION ESTABLISHING LAWN WATERING RESTRICTIONS

WHEREAS, the City Municipal Water Supply may reach critical levels due to summer peak usage, and

WHEREAS, a possibility of water shortage is made more critical by hot, dry springs weather conditions, and

WHEREAS, lack of adequate water pressure could cause serious fire protection problems, and

WHEREAS, it has been determined that a watering ban must be implemented in order to assure the safety and well being of citizens of the city.

NOW, THEREFORE, BE IT RESOLVED that the Mayor and Council of the City of [City Name] hereby establish restrictions for all residents, commercial, and industry that use municipal water as follows:

1. Residents with an odd house number shall water lawns or wash cars when necessary only on odd-numbered calendar days, and those with even-numbered addresses shall water lawns or wash cars only on even-numbered days.

2. On those days, properties shall not water between the hours of 10:00 a.m. and 6:00 p.m..

3. An exception shall be granted for recently established lawns. Those lawns may be watered daily for up to one month after installation, but only during the hours listed above.

4. Municipal water customers who have been notified of the said restrictions, and who violate the watering ban, shall be fined $25 on the first day and $50 each additional day.

5. The violation ticket will be issued immediately.

Adopted by the Mayor and the City Council for the City of [City Name], on this day of [Date], 2007.

Attest: ____________________________

City Mayor

City Administrator

Motion by ____________________________

Second by ____________________________
### Implementation Checklist

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billing Inserts</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Consumer Confidence Reports</td>
<td>Annual</td>
</tr>
<tr>
<td>Press Releases</td>
<td>As needed</td>
</tr>
<tr>
<td>Water Conservation education &amp; outreach</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Compare local business water use to industry benchmarks if available</td>
<td>2016</td>
</tr>
<tr>
<td>Water system &amp; infrastructure improvements</td>
<td>As problems surface and in conjunction with street repair projects</td>
</tr>
<tr>
<td>Leak detection &amp; repair</td>
<td>As problems surface and in conjunction with street repair projects</td>
</tr>
<tr>
<td>Improve accounted for estimates</td>
<td>Yearly</td>
</tr>
</tbody>
</table>
# WATER DEMAND

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population (MNSOC)</td>
<td>2,839</td>
<td>2,839</td>
<td>2,839</td>
<td>2,839</td>
<td>2,851</td>
<td>2,868</td>
<td>2,965</td>
<td>2,965</td>
<td>2,965</td>
<td>2,965</td>
<td>2,965</td>
</tr>
<tr>
<td>Population Served</td>
<td>2,823</td>
<td>2,823</td>
<td>2,823</td>
<td>2,823</td>
<td>2,835</td>
<td>2,852</td>
<td>2,951</td>
<td>2,951</td>
<td>2,951</td>
<td>2,951</td>
<td>2,951</td>
</tr>
<tr>
<td>Total Water Meters</td>
<td>1,299</td>
<td>1,305</td>
<td>1,317</td>
<td>1,268</td>
<td>1,268</td>
<td>1,275</td>
<td>1,289</td>
<td>1,289</td>
<td>1,255</td>
<td>1,255</td>
<td></td>
</tr>
</tbody>
</table>

### Water Sold

- **Residential**
  - 44,694,244
  - 47,531,266
  - 56,537,920
  - 51,524,355
  - 53,115,073
  - 53,362,447
  - 56,702,476
  - 57,396,811
  - 61,877,388
  - 49,385,994

- **Commercial**
  - 14,378,920
  - 15,307,910
  - 16,552,912
  - 15,156,208
  - 16,799,970
  - 28,394,528
  - 28,958,200
  - 28,370,134
  - 30,591,085
  - 40,497,960

- **Industrial**
  - 15,095,970
  - 13,236,740
  - 17,034,573
  - 14,797,822
  - 13,721,480
  - -
  - -
  - -
  - -
  - -

- **Public**
  - 3,725,940
  - 5,049,470
  - 6,105,184
  - 3,621,095
  - -
  - -
  - -
  - -
  - -
  - -

### Total Annual Water Sold

- 77,895,074
- 81,125,326
- 96,230,589
- 85,099,480
- 83,636,523
- 81,756,975
- 85,660,676
- 85,766,945
- 92,468,473
- 89,884,954

### Unmetered Use

- 612,780
- 611,114
- 1,506,244
- 847,355
- 579,849
- 695,259
- 699,535
- 612,070
- 615,210
- 862,234

### Total Accounted

- 78,507,854
- 81,736,440
- 97,736,833
- 85,946,935
- 84,216,372
- 82,452,234
- 86,360,211
- 86,279,015
- 93,083,083
- 90,747,188

### Water Pumped

- **Well #6**
  - 43,528,000
  - 44,882,000
  - 48,008,000
  - 49,290,000
  - 49,436,000
  - 50,874,000
  - 49,997,000
  - 44,925,000
  - 46,206,000
  - 53,133,000

- **Well #7**
  - 50,208,000
  - 51,241,000
  - 59,005,000
  - 53,725,000
  - 54,521,000
  - 57,812,000
  - 55,003,000
  - 64,409,000
  - 67,939,000
  - 71,056,000

### Total Annual Water Pumped

- 93,736,000
- 96,123,000
- 107,013,000
- 103,015,000
- 103,957,000
- 108,686,000
- 105,000,000
- 109,334,000
- 114,145,000
- 124,189,000

### % Unaccounted

- 16.2%
- 15.0%
- 8.7%
- 16.6%
- 19.0%
- 24.1%
- 17.8%
- 21.0%
- 18.5%
- 26.9%

### Annual Average Demand (GPD)

- 213,411.16
- 222,251
- 263,545
- 233,149
- 229,141.16
- 223,992
- 234,687
- 234,978
- 253,338
- 246,260

### Peak Month

- August
- September
- August
- August
- September
- September
- July
- July
- August

### Peak Month Demand

- 9,697,000
- 10,079,000
- 10,563,000
- 11,523,000
- 10,637,000
- 11,655,000
- 11,972,000
- 12,146,000
- 12,517,000
- 13,496,000

### Peak Day

- 4/11/2014
- 9/13/2013
- 7/14/2012
- 7/2/2011
- 6/30/2010
- 9/10/2009
- 8/23/2008
- 7/26/2007
- 6/29/2006
- 7/16/2005

### Peak Day Demand

- 613,000
- 501,000
- 1,201,000
- 565,200
- 997,200
- 558,000
- 515,400
- 502,200
- 587,400
- 745,800

### 2nd Peak Day

- 7/23/2014
- 9/19/2012
- 8/11/2010

### 2nd Peak Day Demand

- 393,000
- 467,000
- 433,000

### Ratio Max Day to Ave Day

- 1.8
- 2.3
- 1.8
- 2.4
- 4.4
- 2.5
- 2.2
- 2.1
- 2.3
- 3.0

### Residential Annual Average

- 122,450
- 130,222
- 154,898
- 141,163
- 145,521
- 146,198
- 155,349
- 157,252
- 169,527
- 135,307

### Residential GPCPD

- 43
- 46
- 55
- 50
- 51
- 49
- 50
- 53
- 53
- 57
- 46

### Total GPCPD

- 75
- 78
- 93
- 82
- 80
- 76
- 79
- 79
- 85
- 83

### Total REU

- 4,948
- 4,846
- 4,832
- 4,709
- 4,516
- 4,543
- 4,479
- 4,431
- 4,431
- 5,396