APPENDIX C:
WATER EMERGENCY AND CONSERVATION PLANS

DEPARTMENT OF NATURAL RESOURCES - DIVISION OF WATERS and METROPOLITAN COUNCIL
WATER EMERGENCY AND CONSERVATION PLANS

These guidelines are divided into four parts. The first three parts, Water Supply System Description and Evaluation, Emergency Response Procedures and Water Conservation Planning apply statewide. Part IV, relates to comprehensive plan requirements that apply only to communities in the Seven-County Twin Cities Metropolitan Area. If you have questions regarding water emergency and conservation plans, please call (651) 259-5703 or (651) 259-5647 or e-mail your question to wateruse@dnr.state.mn.us. Metro Communities can also direct questions to the Metropolitan Council at watersupply@metc.state.mn.us or (651) 602-1066.

DNR Water Appropriation Permit Number(s)	016076
Name of Water Supplier	City of Dayton
Address	16471 South Diamond Lake Rd, 55327
Contact Person	Rick Haas
Title	Public Works
Phone Number	(763) 427-3224
E-Mail Address	rhass@ci.dayton.mn.us

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 in Part I, can be used in the development of Emergency Response Procedures and Conservation Plans.

A. ANALYSIS OF WATER DEMAND.

Fill in Table 1 for the past 10 years water demand. If your customer categories are different than the ones listed in Table 1, please note the changes below.

TABLE 1 Historic Water Demand*

Year	Total Population	Population Served	Total Connections	Residential Water Sold (MG)	C/I/I Water Sold (MG)	Wholesale Deliveries (MG)	Total Water Sold (MG)	Total Water Pumped (MG)	Percent Unmetered/ Unaccounted	Average Demand (MGD)	Maximum Demand (MGD)	Residential gallons/ capita/day	Total gallons/ capita/day
**2001	4705	200	75		0	0		2.8***	0		0.056		
2002	4877	250	100		0	0		6.9	0	0.0189	0.063		75.6
2003	4911	275	110		0	0		7.9	0	0.021	0.073		78.7
2004	4963	292	117	5.91	.192	0	6.10	7.6	19.7	0.021	0.079	57.2	71.3
2005	4,990	310	124	5.92	.27	0	6.19	8.196	24.5	0.022	0.082	54.7	72.4

MG – Million Gallons **MGD** – Million Gallons per Day **C/I/I-** Commercial, Industrial, Institutional

* Data was not available for all categories listed, and was left blank for those considered inaccurate.
**2001 is the first year that the municipal water system was in use, and thus the first year that data is available.
***Data is from a partial year of municipal use.

Residential. Water used for normal household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens.

Institutional. Hospitals, nursing homes, day care centers, and other facilities that use water for essential domestic requirements. This includes public facilities and public metered uses. You may want to maintain separate institutional water use records for emergency planning and allocation purposes.

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.

Wholesale Deliveries. Bulk water sales to other public water suppliers.

Unaccounted. Unaccounted for water is the volume of water withdrawn from all sources minus the volume sold.

Residential Gallons per Capita per Day = total residential sales in gallons/population served/365 days

Total Gallons per Capita per Day = total water withdrawals/population served/365 days

NOTE: Non-essential water uses defined by Minnesota Statutes 103G.291, include lawn sprinkling, vehicle washing, golf course and park irrigation and other non-essential uses. Some of the above categories also include non-essential uses of water

Water Use Trends. Discuss factors that influence trends in water demand (i.e. growth, weather, industry, conservation). If appropriate, include a discussion of other factors that affect daily water use, such as use by non-resident commuter employees or large water consuming industry.
The rate of water consumption will vary from year to year, seasonally, and during different hours of the day. Several characteristic demand periods are recognized as being critical factors in the design and operation of a water system. The maximum demands upon the water system are encountered during short periods of time, usually on days of maximum consumption. These short period demands are referred to as hourly demands, and they seldom extend over a period of more than three or four hours, generally during hot summer evenings when lawn sprinkling load is the highest. Because the majority of demand on the system is from residential customers, seasonal fluctuations in water demand are influenced primarily by variations in lawn sprinkling. Growth in the number of service connections is anticipated, which will result in an overall trend toward increases in the annual water demand. Inter-annual climate variations also influence annual water usage. For example, the total volume of water pumped in 2004 was 0.32 MG less than the volume pumped in 2003. This difference can be attributed primarily to differences between the two years in climate and soil moisture during the growing season.

TABLE 2 Large Volume Users - List the top 10 largest users.

Customer	Gallons per year	% of total annual use
18130 Robinson	235,000	3.8
18380 Columbus Street	83,000	1.34
18240 Robinson	77,000	1.24
18190 Robinson Circle	76,000	1.22
18500 Bates Street	66,000	1.07
18520 Robinson Street	59,000	0.95
18620 Bates	53,000	0.9
16421 Division	52,000	0.8
18271 Johnson Street	51,000	0.8
18250 Dayton River Road	47,000	0.76

B. TREATMENT AND STORAGE CAPACITY.

TABLE 3(A) Water Treatment

Water Treatment Plant Capacity	432,000	Gallons per day
Describe the treatment process used (ie, softening, chlorination, fluoridation, Fe/Mn removal, reverse osmosis, coagulation, sedimentation, filtration, others). Also, describe the annual amount and method of disposal of treatment residuals, if any.		
Pressure in the water distribution system is provided by a hydro-pneumatic tank with a water capacity of nearly 2,000 gallons. The facility includes chemical feed equipment that provides chlorination and fluoridation. Polyphosphates are added to control iron and manganese.		

TABLE 3(B) Storage Capacity - List all storage structures and capacities.

Total Storage Capacity		**Average Day Demand** (average of last 5 years)	
2,000	Gallons	18,000	Gallons per day
Type of Structure	Number of Structures	Gallons	
Elevated Storage			
Ground Storage			
Other: Hydro-pneumatic	1	2,000	

C. WATER SOURCES. List all groundwater, surface water and interconnections that supply water to the system. Add or delete lines to the tables as needed.

TABLE 4(A) Total Water Source Capacity for System (excluding emergency connections)

Total Capacity of Sources	300	Gallons per minute
Firm Capacity (largest pump out of service)	0	Gallons per minute

TABLE 4(B) Groundwater Sources - Copies of water well records and well maintenance information should be included with the public water supplier's copy of the plan in Attachment . If there are more wells than space provided or multiple well fields, please use the List of Wells template (see Resources) and include as Attachment .

Well # or name	**Unique Well Number**	**Year Installed**	**Well & Casing Depth (ft)**	**Well Diameter (in)**	**Capacity (GPM)**	**Geologic Unit**	**Status**
1	611054	2001	385 / 190	16	300	CFRNCIGL	Active

Status: Active use, Emergency, Standby, Seasonal, Peak use, etc. GPM – Gallons per Minute
Geologic Unit: Name of formation(s), which supplies water to the well

TABLE 4(C) Surface Water Sources

Intake ID	**Resource name**	**Capacity (GPM/MGD)**
	--N/A	

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 4(D) Wholesale or Retail Interconnections - List interconnections with neighboring suppliers that are used to supply water on a **regular basis** either wholesale or retail.

Water Supply System	**Capacity (GPM/MGD)**	**Wholesale or retail**
City of Maple Grove	2.8 MGD (average day)	Wholesale

GPM – Gallons per Minute MGD – Million Gallons per Day

* The City of Champlin currently serves about 80 homes in the Native's Crossing development in the City of Dayton. However, this area and Dayton's water system are not connected.

TABLE 4(E) Emergency Interconnections - List interconnections with neighboring suppliers or private sources that can be used to supply water on an emergency or occasional basis. Suppliers that serve less than 3,300 people can leave this section blank, but must provide this information in Section II C.

Water Supply System	Capacity (GPM/MGD)	Note any limitations on use
--N/A		

GPM – Gallons per Minute MGD – Million Gallons per Day

D. DEMAND PROJECTIONS.

TABLE 5 Ten Year Demand Projections

Year	Population Served	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Projected Demand (MGY)
2006	310	0.1	0.28	42
2007	310	0.2	0.48	77
2008	1,678	0.3	0.68	112
2009	2,398	0.4	0.88	147
2010	3,118	0.5	1.1	182
2011	3,838	0.6	1.42	226
2012	4,558	0.7	1.74	270
2013	5,278	0.86	2.06	314
2014	5,998	0.98	2.38	358
2015	6,718	1.1	2.7	402

MGD – Million Gallons per Day MGY – Million Gallons per Year

Projection Method. Describe how projections were made, (assumptions for per capita, per household, per acre or other methods used).

The served population was found by taking the existing (2005) served population of 310 and adding the number of expected connections per year (at an average of 2.4 people per household), and the number of expected building permits per year (also at an average of 2.4 people per household). The average day water demand was found by multiplying by the expected value of gallons per capita per day. This was assumed to be around 160 total gallons per capita per day. This is higher than existing due to the addition of non-residential land uses to the water system in future years, and also increased lawn watering for sod establishment associated with new developments. The total multiplier for the City is expected to decrease from its 2005 estimate of 4.1 to around 2.5.

Dayton's current revision to the Growth Management Policy eliminates the 300 units per year maximum. The expected served population and the water use projections should be revised accordingly if at any point the City wishes to permit more than 300 units in a given year.

E. RESOURCE SUSTAINABILITY

Sustainable water use: use of water to provide for the needs of society, now and in the future, without unacceptable social, economic, or environmental consequences.

Monitoring. Records of water levels should be maintained for all production wells and source water reservoirs/basins. Water level readings should be taken monthly for a production well or observation well that is representative of the wells completed in each water source formation. **If water levels are not currently measured each year, a monitoring plan that includes a schedule for water level readings must be submitted as Attachment .**

TABLE 6 Monitoring Wells - List all wells being measured.

Unique well number	Type of well (production, observation)	Frequency of Measurement (daily, monthly etc.)	Method of Measurement (steel tape, SCADA etc.)
611054	Production	--	

Water Level Data. Summarize water level data including seasonal and long-term trends for each ground and/or surface water source. If water levels are not measured and recorded on a routine basis then provide the static water level (SWL) when the well was constructed and a current water level measurement for each production well. Also include all water level data taken during well and pump maintenance.

Static Water Level when pump was installed (3/2001): 49 ft

There are no DNR or U. S. G. S. monitoring wells in the CFRN and/or CIGL formations within several miles of the City of Dayton.

Attachment : Provide monitoring data (graph or table) for as many years as possible.

Ground Water Level Monitoring – DNR Waters in conjunction with federal and local units of government maintain and measure approximately 750 observation wells around the state. Ground water level data are available online www.dnr.state.mn.us/waters. Information is also available by contacting the Ground Water Level Monitoring Manager, DNR Waters, 500 Lafayette Road, St. Paul, MN 55155-4032 or call (651) 259-5700.

Natural Resource Impacts. Indicate any natural resource features such as calcareous fens, wetlands, trout streams, rivers or surface water basins that are or could be influenced by water withdrawals from municipal production wells. Also indicate if resource protection thresholds have been established and if mitigation measures or management plans have been developed.

The aquifer from which the City of Dayton system draws its water is well confined and not directly connected with any surface water features. Water from the aquifer is discharged to the Mississippi River via leakage into the overlying Quaternary aquifer(s). Withdrawals from the aquifer are not anticipated to have a significant or detrimental impact on flows in the Mississippi River. No resource protection thresholds have been established.

Sustainability. Evaluate the adequacy of the resource to sustain current and projected demands. Describe any modeling conducted to determine impacts of projected demands on the resource.
The City undertook an aquifer availability study in 2005. The study indicated that the Franconia-Ironton-Galesville aquifer is present throughout most of the City in its entire thickness, with yields expected to range between 700-1200 gpm per well. In addition, buried drift aquifers and the Jordan aquifer may also be available in certain areas for municipal water supply wells. Based on the current predictions, the aquifer availability and the estimated sustainable yield appear to be high enough to meet the 2030 demands. Further study may be needed to determine the productivity and sustainability of the aquifers to meet the ultimate demands.

Source Water Protection 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.	
Date WHP Plan Adopted:	Part 1 approved by MDH in October 2005 Part 2 approved by MDH in February 2008
Date for Next WHP Update:	
SWP Plan:	☐ In Process ☒ Completed ☐ Not Applicable

F. CAPITAL IMPROVEMENT PLAN (CIP)

Adequacy of Water Supply System. Are water supply installations, treatment facilities and distribution systems adequate to sustain current and projected demands? ☐ Yes ☒ No If no, describe any potential capital improvements over the next ten years and state the reasons for the proposed changes (CIP Attachment 2).
The existing hydro-pneumatic system that serves the Historic Village development in NW Dayton is near capacity (based on recommendations from the Ten State Standards). In addition, the Historic Village system does not have a back-up well. Additional development in NW Dayton will require an additional well and elevated storage. A well and elevated storage tank is required and currently under construction, to provide water service to the existing homes in NE Dayton that are currently being served by residential wells. An emergency connection to Champlin, also under construction, will delay the need for a back-up well in NE Dayton. Water service to proposed development in SW Dayton is being provided by Maple Grove. A connection was completed in the summer of 2007. A second connection to Maple Grove will be provided and looped through Dayton as SW Dayton develops. Additional wells, storage and distribution pipes are added with development. The attached CIP assumes that development occurs in accordance with Dayton's Comprehensive Plan.

Proposed Water Sources. Does your current CIP include the addition of new wells or intakes?

☒ Yes ☐ No If yes, list the number of new installations and projected water demands from each for the next ten years. Plans for new production wells must include the geologic source formation, well location, and proposed pumping capacity.
Three new wells are planned to be constructed in the Franconia-Ironton-Galesville aquifer system in the northern part of the City by the year 2015 to meet the demand projections shown in Table 5. The expected well capacity is 850 gpm. Actual capacity may vary based on local aquifer characteristics.

Water Source Alternatives. If new water sources are being proposed, describe alternative sources that were considered and any possibilities of joint efforts with neighboring communities for development of supplies.
An interconnection with the City of Maple Grove water system to serve the southwestern portion of the City of Dayton was constructed in 2007. The capacity of this interconnection is expected to be 2.8 MGD (average day). An emergency connection with the City of Champlin water system is also under construction.
Preventative Maintenance. Long-term preventative programs and measures will help reduce the risk of emergency situations. Identify sections of the system that are prone to failure due to age, materials or other problems. This information should be used to prioritize capital improvements, preventative maintenance, and to determine the types of materials (pipes, valves, couplings, etc.) to have in stock to reduce repair time.
The existing system was constructed in 2001, and no parts of the system are expected to be prone to failure due to age, materials or other problems.

PART II. EMERGENCY RESPONSE PROCECURES

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. If your community already has written procedures dealing with water emergencies we recommend that you use these guidelines to review and update existing procedures and water supply protection measures.

Federal Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (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 A, B, and C of these guidelines and need only provide the information below regarding the emergency response plan and source water protection plan and complete Sections D (Allocation and Demand Reduction Procedures), and E (Enforcement).**

Provide the following information regarding your completed Federal Emergency Response Plan:

Emergency Response Plan	Contact Person	Contact Number
Emergency Response Lead	Rick Hass	612-790-5540
Alternate Emergency Response Lead	Victor Martinez	612-750-1887
Emergency Response Plan Certification Date		

Operational Contingency Plan. An operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance is recommended for all utilities. Check here ☒ if the utility has an operational contingency plan. At a minimum a contact list for contractors and supplies should be included in a water emergency telephone list.

The Emergency Phone List and Operational Contingency Plan are not included in the agency review copy for privacy reasons.

Communities that have completed Federal Emergency Response Plans should skip to Section D.

EMERGENCY RESPONSE PROCEDURES

A. Emergency Telephone List. A telephone list of emergency contacts must be included as Attachment 1 to the plan (complete template or use your own list). The list should include key utility and community personnel, contacts in adjacent communities, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list on a regular basis (once each year recommended). 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. Responsibilities and services for each contact should be defined.

B. 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, water well and maintenance records should be maintained in a central secured location so that the records are accessible for emergency purposes and preventative maintenance. 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. Check here ☒ if these records and maps exist and staff can access the documents in the event of an emergency.

C. Procedure for Augmenting Water Supplies. List all available sources of water that can be used to augment or replace existing sources in an emergency. 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. Copies of cooperative agreements should be maintained with your copy of the plan and include in Attachment . Be sure to include information on any physical or chemical problems that may limit interconnections to other sources of water. Approvals from the MN Department of Health are required for interconnections and reuse of water.

TABLE 7 (A) Public Water Supply Systems – List interconnections with other public water supply systems that can supply water in an emergency.

Water Supply System	Capacity (GPM/MGD)	Note any limitations on use
--N/A		

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 7 (B) - Private Water Sources – List other sources of water available in an emergency.

Name	Capacity (GPM/MGD)	Note any limitations on use
Water Trucks from either Ramsey, Champlin, Maple Grove or Otsego		

GPM – Gallons per Minute MGD – Million Gallons per Day

D. Allocation and Demand Reduction Procedures. The plan must include procedures to address gradual decreases in water supply as well as emergencies and the sudden loss of water due to line breaks, power failures, sabotage, etc. During periods of limited water supplies public water suppliers are required to allocate water based on the priorities established in Minnesota Statutes 103G.261.

Water Use Priorities (Minnesota Statutes 103G.261)

First Priority. Domestic water supply, excluding industrial and commercial uses of municipal water supply, and use for power production that meets contingency requirements.

NOTE: Domestic use is defined (MN Rules 6115.0630, Subp. 9), as use for general household purposes for human needs such as cooking, cleaning, drinking, washing, and waste disposal, and uses for on-farm livestock watering excluding commercial livestock operations which use more than 10,000 gallons per day or one million gallons per year.

Second Priority. Water uses involving consumption of less than 10,000 gallons per day.

Third Priority. Agricultural irrigation and processing of agricultural products.

Fourth Priority. Power production in excess of the use provided for in the contingency plan under first priority.

Fifth Priority. Uses, other than agricultural irrigation, processing of agricultural products, and power production.

Sixth Priority. Non-essential uses. These uses are defined by Minnesota Statutes 103G.291 as lawn sprinkling, vehicle washing, golf course and park irrigation, and other non-essential uses.

List the statutory water use priorities along with any local priorities (hospitals, nursing homes, etc.) in Table 8. 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. Local allocation priorities 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. In Table 8, list the priority ranking, average day demand and demand reduction potential for each customer category (modify customer categories if necessary).

Table 8 Water Use Priorities

Customer Category	Allocation Priority	Average Day Demand (GPD)	Demand Reduction Potential (GPD)
Residential	1	16,300	0
Institutional	1	475	0
Commercial	2	265	265
Industrial	2	0	0
Irrigation	3	0	0
Non-essential	6	5,500	5,500 (38,000 Peak Day)
	TOTALS	22,540	5,765

GPD – Gallons per Day

Demand Reduction Potential. The demand reduction potential for residential use will typically be the base demand during the winter months when water use for non-essential uses such as lawn watering do not occur. The difference between summer and winter demands typically defines the demand reduction that can be achieved by eliminating non-essential uses. In extreme emergency situations lower priority water uses must be restricted or eliminated to protect first priority domestic water requirements. Short-term demand reduction potential should be based on average day demands for customer categories within each priority class.

Triggers for Allocation and Demand Reduction Actions. Triggering levels must be defined for implementing emergency responses, including supply augmentation, demand reduction, and water allocation. Examples of triggers include: water demand >100% of storage, water level in well(s) below a certain elevation, treatment capacity reduced 10% etc. Each trigger should have a quantifiable indicator and actions can have multiple stages such as mild, moderate and severe responses. Check each trigger below that is used for implementing emergency responses and for each trigger indicate the actions to be taken at various levels or stages of severity in Table 9.

- ☒ Water Demand
- ☐ Treatment Capacity
- ☐ Storage Capacity
- ☐ Groundwater Levels
- ☐ Surface Water Flows or Levels
- ☐ Pump, Booster Station or Well Out of Service
- ☒ Governor's Executive Order – Critical Water Deficiency (required by statute)
- ☐ Water Main Break
- ☐ Loss of Production
- ☐ Security Breach
- ☒ Contamination
- ☐ Other (list in Table 9)

Table 9 Demand Reduction Procedures

Condition	Trigger(s)	Actions
Stage 1 (Mild)	Demand 90% of well capacity	Odd/Even Sprinkling Ban
Stage 2 (Moderate)	Demand 98% of well capacity	Total Sprinkling Ban
Stage 3 (Severe)	Demand 100% of firm well capacity	Eliminate 6th priority allocation. Eliminate 5th to 2nd priority allocation if demand of 100% of firm capacity continues after elimination of 6th priority allocation.
Critical Water Deficiency (M.S. 103G.291)	Executive Order by Governor & as provided in above triggers	Stage 1: Restrict lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses Stage 2: Suspend lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses

Note: The potential for water availability problems during the onset of a drought are almost impossible to predict. Significant increases in demand should be balanced with preventative measures to conserve supplies in the event of prolonged drought conditions.

Notification Procedures. List methods that will be used to inform customers regarding conservation requests, water use restrictions, and suspensions. Customers should be aware of emergency procedures and responses that they may need to implement.

Notice may be given as deemed appropriate by the Mayor and City Council and may include newspaper articles, radio, and television.

E. Enforcement. Minnesota Statutes require public water supply authorities to adopt and enforce water conservation restrictions during periods of critical water shortages.

Public Water Supply Appropriation During Deficiency.
Minnesota Statutes 103G.291, Subdivision 1.

Declaration and conservation.
(a) If the governor determines and declares by executive order that there is a critical water deficiency, public water supply authorities appropriating water must adopt and enforce water conservation restrictions within their jurisdiction that are consistent with rules adopted by the commissioner.
(b) The restrictions must limit lawn sprinkling, vehicle washing, golf course and park irrigation, and other nonessential uses, and have appropriate penalties for failure to comply with the restrictions.

An ordinance that has been adopted or a draft ordinance that can be quickly adopted to comply with the critical water deficiency declaration must be included in the plan (include with other ordinances in Attachment 7 for Part III, Item 4). Enforcement responsibilities and penalties for non-compliance should be addressed in the critical water deficiency ordinance.
Sample regulations are available at www.dnr.state.mn.us/waters

Authority to Implement Water Emergency Responses. Emergency responses could be delayed if city council or utility board actions are required. Standing authority for utility or city managers to implement water restrictions can improve response times for dealing with emergencies. Who has authority to implement water use restrictions in an emergency?

☐ Utility Manager ☐ City Manager ☒ City Council or Utility Board
☒ Other (describe): Mayor

Emergency Preparedness If city or utility managers do not have standing authority to implement water emergency responses, please indicate any intentions to delegate that authority. Also indicate any other measures that are being considered to reduce delays for implementing emergency responses.
--N/A

PART III. WATER CONSERVATION PLAN

Water conservation programs are intended to reduce demand for water, improve the efficiency in use and reduce losses and waste of water. Long-term conservation measures that improve overall water use efficiencies can help reduce the need for short-term conservation measures. Water conservation is an important part of water resource management and can also help utility managers satisfy the ever-increasing demands being placed on water resources.

> Minnesota Statutes 103G.291, requires public water suppliers to implement demand reduction measures before seeking approvals to construct new wells or increases in authorized volumes of water. Minnesota Rules 6115.0770, require water users to employ the best available means and practices to promote the efficient use of water. Conservation programs can be cost effective when compared to the generally higher costs of developing new sources of supply or expanding water and/or wastewater treatment plant capacities.

A. Conservation Goals. The following section establishes goals for various measures of water demand. The programs necessary to achieve the goals will be described in the following section.

Unaccounted Water (calculate five year averages with data from Table 1)		
Average annual volume unaccounted water for the last 5 years	1,500,000	gallons
Average percent unaccounted water for the last 5 years	22.1	percent
AWWA recommends that unaccounted water not exceed 10%. Describe goals to reduce unaccounted water if the average of the last 5 years exceeds 10%.		
Unaccounted water in this city consists of hydrant flushing and ball field irrigation. The City does not currently meter or charge themselves for either of these. Although it is a large percentage of the total water pumped, it is a small amount of water that is not uncommon for a city of this size to provide for ball fields or flushing. The City will attempt to estimate this usage in the future.		

Residential Gallons Per Capita Demand (GPCD)		
Average residential GPCD use for the last 5 years (use data from Table 1)	55	GPCD
In 2002, average residential GPCD use in the Twin Cities Metropolitan Area was 75 GPCD. Describe goals to reduce residential demand if the average for the last 5 years exceeds 75 GPCD.		
All current and future water users are and will be metered. All large meters will be tested, repaired, or replaced based on AWWA recommendations. The billing department uses software for billing purposes and to identify unusual changes in use. The City has instituted a uniform rate system and bills its customers quarterly. A base rate is charged plus a set rate per 1000 gallons used per quarter. All new homes and retrofits of existing homes will have water efficient fixtures according to State and Federal plumbing Codes. The City water system has been designed to ensure that static and residual pressures in the water		

service area are maintained between 40 psi and 120 psi. Users with pressures above 80 psi will be required to install individual pressure reducing valves at the point of service, unless special needs dictate otherwise.

Total Per Capita Demand: From Table 1, is the trend in overall per capita demand over the past 10 years ☐ increasing or ☒ decreasing? If total GPCD is increasing, describe the goals to lower overall per capita demand or explain the reasons for the increase.
--N/A

Peak Demands (calculate average ratio for last five years using data from Table 1)	
Average maximum day to average day ratio	3.7
If peak demands exceed a ratio of 2.6, describe the goals for lowering peak demands.	
The demand ratio is due to the fact that this water system is small and consists mostly of residential use, which in general varies greatly throughout the year. Also, the use of irrigation during the summers greatly increases this ratio. With the odd/even sprinkling ban and other conservation measures, this ratio is expected to decrease.	

B. Water Conservation Programs. Describe all short-term conservation measures that are available for use in an emergency and long-term measures to improve water use efficiencies for each of the six conservation program elements listed below. Short-term demand reduction measures must be included in the emergency response procedures and must be in support of, and part of, a community all-hazard emergency operation plan.

1. **Metering.** The American Water Works Association (AWWA) recommends that every water utility meter all water taken into its system and all water distributed from its system at its customer's point of service. An effective metering program relies upon periodic performance testing, repair, repair and maintenance of all meters. AWWA also recommends that utilities conduct regular water audits to ensure accountability. Complete Table 10 (A) regarding the number and maintenance of customer meters.

TABLE 10 (A) Customer Meters

	Number of Connections	Number of Metered Connections	Meter testing schedule (years)	Average age/meter replacement schedule (years)
Residential	121	121		4 / 25
Institutional	1	1		4 / 25
Commercial	2	2		4 / 25
Industrial				4 / 25
Public Facilities				4 / 25
Other				4 / 25
TOTALS	124	124		

Unmetered Systems. Provide an estimate of the cost to install meters and the projected water savings from metering water use. Also indicate any plans to install meters.
--N/A

TABLE 10 (B) Water Source Meters

	Number of Meters	Meter testing schedule (years)	Average age/meter replacement schedule (years)
Water Source (wells/intakes)	1 – Well 1- Proposed Maple Grove Connection	Need to repair/replace meter evaluated every year based on water audit	5 / 25
Treatment Plant	--N/A		

2. **Unaccounted Water.** 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 AWWA recommends a goal of ten percent or less for unaccounted-for water. Water audit procedures are available from the AWWA and MN Rural Water Association.

Frequency of water audits: ☐ each billing cycle ☒ yearly ☐ other:

Leak detection and survey: ☐every year ☐ every years ☒ periodic as needed
Year last leak detection survey completed: N/A – new system

Reducing Unaccounted Water. List potential sources and efforts being taken to reduce unaccounted water. If unaccounted water exceeds 10% of total withdrawals, include the timeframe for completing work to reduce unaccounted water to 10% or less.
The majority of the unaccounted for water is due to hydrant flushing, and city irrigation. The city will attempt to estimate this usage.

3. **Conservation Water Rates.** Plans must include the current rate structure for all customers and provide information on any proposed rate changes. Discuss the basis for current price levels and rates, including cost of service data, and the impact current rates have on conservation.

Billing Frequency: ☐ Monthly ☐ Bimonthly ☒ Quarterly
☐ Other (describe):

Volume included in base rate or service charge: 0 gallons

Conservation Rate Structures

☐ Increasing block rate: rate per unit increases as water use increases

☐ Seasonal rate: higher rates in summer to reduce peak demands
☒ Service charge or base fee that does not include a water volume

Conservation Neutral Rate Structure
☒ Uniform rate: rate per unit is the same regardless of volume

Non-conserving Rate Structures
☐ Service charge or base fee that includes a large volume of water
☐ Declining block rate: rate per unit decreases as water use increases
☐ Flat rate: one fee regardless of how much water is used (unmetered)

Other (describe):

Water Rates Evaluated: ☐ every year ☐ every years ☒ no schedule
Date of last rate change: 5/25/04

Declining block (the more water used, the cheaper the rate) and flat (one fee for an unlimited volume of water) rates should be phased out and replaced with conservation rates. Incorporating a seasonal rate structure and the benefits of a monthly billing cycle should also be considered along with the development of an emergency rate structure that could be quickly implemented to encourage conservation in an emergency.

Current Water Rates. Include a copy of the actual rate structure in Attachment or list current water rates including base/service fees and volume charges below.
$25.00 base fee per quarter $0.28/1000 gal $1.59 per quarter State Testing Charge

Non-conserving Rate Structures. Provide justification for the rate structure and its impact on reducing demands or indicate intentions including the timeframe for adopting a conservation rate structure.
--N/A

4. **Regulation.** Plans should include regulations for short-term reductions in demand and long-term improvements in water efficiencies. Sample regulations are available from DNR Waters. Copies of adopted regulations or proposed restrictions should be included in Attachment of the plan. Indicate any of the items below that are required by local regulations and also indicate if the requirement is applied each year or just in emergencies.

☐ Time of Day: no watering between am/pm and am/pm
(reduces evaporation) ☐ year around ☐ seasonal ☐ emergency only
☒ Odd/Even: (helps reduce peak demand) ☐ year around ☐ seasonal ☒ emergency only

☐ Water waste prohibited (no runoff from irrigation systems)
Describe ordinance:
☐ Limitations on turf areas for landscaping (reduces high water use turf areas)
Describe ordinance:
☒ Soil preparation (such as 4"-6" of organic soil on new turf areas with sandy soil)
Describe ordinance: 4" topsoil
☒ Tree ratios (plant one tree for every square feet to reduce turf evapotranspiration)
Describe ordinance: minimum of 2 trees (minimum 2" diameter) on each lot, in the front yard
☐ Prohibit irrigation of medians or areas less than 8 feet wide
Describe ordinance:
☐ Permit required to fill swimming pool ☐ every year ☐ emergency only
☐ Other (describe):

State and Federal Regulations (mandated)

☐ Rainfall sensors on landscape irrigation systems. Minnesota Statute 103G.298 requires "All automatically operated landscape irrigation systems shall have furnished and installed technology that inhibits or interrupts operation of the landscape irrigation system during periods of sufficient moisture. The technology must be adjustable either by the end user or the professional practitioner of landscape irrigation services."
☒ Water Efficient Plumbing Fixtures. The 1992 Federal Energy Policy Act established manufacturing standards for water efficient plumbing fixtures, including toilets, urinals, faucets, and aerators.

Enforcement. Are ordinances enforced? ☒ Yes ☐ No If yes, indicate how ordinances are enforced along with any penalties for non-compliance.
The City of Dayton has adopted the Minnesota State Building Code by reference (Chapter 900, Part 901). The City contracts with Metro West Inspections for all building inspections, including plan reviews, plan checks, fee determination, site inspections, building inspections, and any other follow-up inspections.

5. **Education and Information Programs.** Customers should be provided information on how to improve water use efficiencies a minimum of two times per year. Information should be provided at appropriate times to address peak demands. Emergency notices and educational materials on how to reduce water use should be available for quick distribution during an emergency. If any of the methods listed in the table below are used to provide water conservation tips, indicate the number of times that information is provided each year and attach a list of education efforts used for the last three years.

Current Education Programs	**Times/Year**
Billing inserts or tips printed on the actual bill	
Consumer Confidence Reports	1
Local news papers	

Community news letters	
Direct mailings (water audit/retrofit kits, showerheads, brochures)	
Information at utility and public buildings	
Public Service Announcements	
Cable TV Programs	
Demonstration projects (landscaping or plumbing)	
K-12 Education programs (Project Wet, Drinking Water Institute)	
School presentations	
Events (children's water festivals, environmental fairs)	
Community education	
Water Week promotions	
Information provided to groups that tour the water treatment plant	
Website (include address:)	
Targeted efforts (large volume users, users with large increases)	
Notices of ordinances (include tips with notices)	
Emergency conservation notices (recommended)	
Other:	

List education efforts for the last three years in Attachment N/A of the plan. Be sure to indicate whether educational efforts are on-going and which efforts were initiated as an emergency or drought management effort.

Proposed Education Programs. Describe any additional efforts planned to provide conservation information to customers a minimum of twice per year (required if there are no current efforts).
Only a small portion of the City is currently served by distribution system. As this changes with the proposed development, the City will consider adding information about conservation on their website and local newspaper, and utilize billing inserts.

A packet of conservation tips and information can be obtained by contacting DNR Waters or the Minnesota Rural Water Association (MRWA). The American Water Works Association (AWWA) www.awwa.org or www.waterwiser.org also has excellent materials on water conservation that are available in a number of formats. You can contact the MRWA 800/367-6792, the AWWA bookstore 800/926-7337 or DNR Waters 651/259-5703 for information regarding educational materials and formats that are available.

6. **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 communities develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and that the benefits of retrofitting be included in public education programs. You may also want to contact local electric or gas suppliers to see if they are interested in developing a showerhead distribution program for customers in your service area.

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. Describe any education or incentive programs to encourage the retrofitting of inefficient plumbing fixtures (toilets, showerheads, faucets, and aerators) or appliances (washing machines).
--N/A

Plan Approval. Water Emergency and Conservation Plans must be approved by the Department of Natural Resources (DNR) every ten years. Please submit plans for approval to the following address:

DNR Waters
Water Permit Programs Supervisor
500 Lafayette Road
St. Paul, MN 55155-4032

or Submit electronically to
wateruse@dnr.state.mn.us.

Adoption of Plan. All DNR plan approvals are contingent on the formal adoption of the plan by the city council or utility board. Please submit a certificate of adoption (example available) or other action adopting the plan.

Metropolitan Area communities are also required to submit these plans to the Metropolitan Council. Please see PART IV. ITEMS FOR METROPOLITAN AREA PUBLIC SUPPLIERS.

METROPOLITAN COUNCIL

PART IV. ITEMS FOR METROPOLITAN AREA PUBLIC SUPPLIERS

Minnesota Statute 473.859 requires water supply plans to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process. Much of the required information is contained in Parts I-III of these guidelines. However, the following additional information is necessary to make the water supply plans consistent with the Metropolitan Land Use Planning Act upon which local comprehensive plans are based. Communities should use the information collected in the development of their plans to evaluate whether or not their water supplies are being developed consistent with the Council's Water Resources Management Policy Plan.

Policies. Provide a statement(s) on the principles that will dictate operation of the water supply utility: for example, "It is the policy of the city to provide good quality water at an affordable rate, while assuring this use does not have a long-term negative resource impact."

The policy of the Dayton water supply system is to provide the consumers with safe, high quality, and affordable drinking water. The system will provide this vital service while assuring the long-term protection of our supply from contamination and excessive depletion.

Impact on the Local Comprehensive Plan. Identify the impact that the adoption of this water supply plan has on the rest of the local comprehensive plan, including implications for future growth of the community, economic impact on the community and changes to the comprehensive plan that might result.

The Water Supply Plan was prepared based on the Land Use Plan for the City contained in the Comprehensive Plan and the household and population forecasts based on the land use plan. The staging of the Capital Improvement Plan (CIP) is in accordance with the Comprehensive Plan and the existing Comprehensive Sanitary Sewer Plan. Future growth of the community will be dependent on successfully carrying out the water system improvements included in the CIP.

Demand Projections

Year	Total Community Population	Population Served	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Projected Demand (MGY)
2010	8,434	3,118	0.5	1.1	182
2020	26,213	10,318	1.7	4.3	620
2030	35,140	17,518	2.9	7.3	1,058

Population projections should be consistent with those in the Metropolitan Council's *2030 Regional Development Framework* or the Communities 2008 Comprehensive Plan update**.** If population served differs from total population, explain in detail why the difference (ie, service to other communities, not complete service within community etc.).

Population projections are based on Metropolitan Council projections in the adopted Regional Development Framework. The population served is currently less than and will continue to be less than the total population because most of the community is not currently served. Service will

be extended to some but not all areas not currently served by private wells. Development will be discouraged in areas not served by utilities.

The City of Dayton recently adopted a resolution and an ordinance regarding the adoption of a Growth Management Policy which limits the number of building permits the City of Dayton will issue each year to 2010. Although the Growth Management Policy does not extend beyond 2010, for the purposed of demand projections, it was assumed that an average of 300 building permits per year will be issued between 2010 and 2030.

Dayton's current revision to the Growth Management Policy eliminates the 300 units per year maximum. The expected served population and the water use projections should be revised accordingly if at any point the City wishes to permit more than 300 units in a given year.

PLAN SUBMITTAL AND REVIEW OF THE PLAN

The plan will be reviewed by the Council according to the sequence outlined in Minnesota Statutes 473.175. **Prior to submittal to the Council, the plan must be submitted to adjacent governmental units for a 60-day review period.** Following submittal, the Council determines if the plan is complete for review within 15 days. If incomplete, the Council will notify the community and request the necessary information. When complete the Council will complete its review within 60 days or a mutually agreed upon extension. The community officially adopts the plan after the Council provides its comments.

Plans can be submitted electronically to the Council; however, the review process will not begin until the Council receives a paper copy of the materials. Electronic submissions can be via a CD, 3 ½" floppy disk or to the email address below. Metropolitan communities should submit their plans to:

Reviews Coordinator
Metropolitan Council
230 E 5th Street,
St. Paul, MN 55101

electronically to:
watersupply@metc.state.mn.us

Attachment 1

Emergency Telephone List

Emergency Response Team	Name	Work Telephone	Alternate Telephone
Emergency Response Lead	Rick Hass	612-790-5540	763-427-3224
Alternate Emergency Response Lead	Victor Martinez	612-750-1887	
Water Operator	Rick Hass	612-790-5540	
Alternate Water Operator	Victor Martinez	612-750-1887	
Public Communications			

State and Local Emergency Response Contacts	Name	Work Telephone	Alternate Telephone
State Incident Duty Officer	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
County Emergency Director			
National Guard	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
Mayor/Board Chair	Doug Anderson	612-840-2758	
Fire Chief	Jim Nordmeyer	763-421-3122	
Sheriff			
Police Chief	Richard Pietrzak	612-481-1961	
Ambulance			
Hospital			
Doctor or Medical Facility			

State and Local Agencies	Name	Work Telephone	Alternate Telephone
MDH District Engineer			
MDH	Drinking Water Protection	651-201-4700	
State Testing Laboratory	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
MPCA			
DNR Area Hydrologist			
County Water Planner			

Utilities	Name	Work Telephone	Alternate Telephone
Electric Company	Elk River Utilities	763-441-2020	
Gas Company	Minnegasco	612-372-5050	
Telephone Company	Sprint	1-800-788-3500	
Gopher State One Call	Utility Locations	800-252-1166	651-454-0002
Highway Department			

Mutual Aid Agreements	Name	Work Telephone	Alternate Telephone
Neighboring Water System			
Emergency Water Connection			
Materials			

Technical/Contracted Services/Supplies	Name	Work Telephone	Alternate Telephone
MRWA Technical Services	MN Rural Water Association	800-367-6792	
Well Driller/Repair			
Pump Repair			
Electrician			
Plumber			
Backhoe			
Chemical Feed			

Meter Repair			
Generator			
Valves			
Pipe & Fittings			
Water Storage			
Laboratory			
Engineering firm			

Communications	Name	Work Telephone	Alternate Telephone
News Paper	Champlin Dayton Press	763-425-3323	
Radio Station			
School Superintendent			
Property & Casualty Insurance			

Critical Water Users	Name	Work Telephone	Alternate Telephone
Hospital Critical Use:			
Nursing Home Critical Use:			
Public Shelter Critical Use:			

Attachment 2

Capital Improvement Plan

	Improvement
2006	1 Connection Maple Grove
	Meter Manhole Instrumentation
	12″ Main SW Dayton
	16″ Main SW Dayton
	18″ Main SW Dayton
	24″ Main SW Dayton
2007	Well and Pump House No. 2 NE Dayton
	0.5 MG Storage NE Dayton
	12″ Main NE Dayton
	16″ Main NE Dayton
2008	12″ Main SW Dayton
	20″ Main SW Dayton
	Well and Pump House No. 3 NW Dayton
2009 - 2010	12″ Main SW Dayton
	16″ Main SW Dayton
	12″ Main NE Dayton
	12″ Main NW Dayton
	14″ Main NW Dayton
	Meter Manhole Instrumentation
	1.0 MG Storage NW Dayton
2010 – 2015	Well and Pump House No. 4 NE Dayton
	12″ Main NW Dayton
	12″ Main NE Dayton
	12″ Main SW Dayton
	18″ Main SW Dayton
	20″ Main SW Dayton
	1.5 MG Storage SW Dayton
2015 – 2020	12″ Main NW Dayton
	12″ Main SW Dayton
	16″ Main SW Dayton
	Well and Pump House No. 5 NW Dayton
	TOTAL

February 1, 2007

DNR Waters
Water Permit Programs Supervisor
500 Lafayette Road
St. Paul, MN 55155-4032

Re: Emergency & Conservation Plan
Dayton, Minnesota
Bonestroo File 174-05121-1

To Whom It May Concern:

Transmitted herewith is the Emergency and Conservation Plan on behalf of the City of Dayton. This plan will be included as part of the City of Dayton's 2008 Comprehensive Plan Update.

If you have any questions please contact Rick Hass (763) 427-4589 at the City of Dayton, or myself at 651-604-4838.

Respectfully submitted,

BONESTROO, ROSENE, ANDERLIK & ASSOCIATES, INC.

Mark Hanson, P.E.

Cc: Rick Hass, Sandy Borders, Samantha Orduno – City of Dayton
Reviews Coordinator
Metropolitan Council
390 N Robert St.
St. Paul, MN 55101