AGENDA
CITY COUNCIL - WELL HEAD PROTECTION PLAN- PUBLIC HEARING
MAPLE PLAIN CITY HALL
April 14, 2025
6:45 PM

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1. **WELCOME**
2. **CALL TO ORDER**
3. **ADOPT AGENDA**
4. **PUBLIC HEARING**
   - **A.** CITY OF MAPLE PLAIN WELLHEAD PROTECTION PLAN
5. **DISCUSSION**
6. **ADJOURNMENT**

This meeting will be recorded and then posted to the City website within 3 to 5 business days.
The City Council may meet as a group for dinner.

Executive Summary

City Council Public Hearing

AGENDA ITEM:	City of Maple Plain Wellhead Protection Plan
PREPARED BY:	Jacob Kolander, City Administrator
RECOMMENDED ACTION: Conduct Public Hearing and Council Discussion	

Please see City Engineer's Report attached and the Wellhead Protection Plan.

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MEMORANDUM

Date: April 9, 2025

To: Jacob Kolander, City Administrator
City of Maple Plain

From: Angie Smith, Environmental Planner
Matt Bauman, P.E.

Subject: Staff Report: Wellhead Protection Plan – Part 2 Update
Public Hearing, City of Maple Plain

Introduction

This agenda item is to record public and City Council comments on the draft *Wellhead Protection Plan (WHPP) Part 2*, aimed at protecting the city's drinking water resources. The draft document was submitted for Local Government Unit (LGU) stakeholders to review and provide comments between February 6 and April 6, 2025.

No LGU comments were received during this time; however, the Minnesota Department of Health (MDH) provided courtesy comments that will expedite the agency approval process.

Angie Smith will provide an informational overview for the City Council on the draft *WHPP Part 2* document and process.

WHPP Process

Minnesota Rules 4720 outlines the process and requirements for local communities to update and maintain their WHPP every 10 years. The MDH oversees and manages this process in close collaboration with its partner communities.

The City of Maple Plain received notice of the Part 2 requirements on February 6, 2024, with the Part 2 plan due by October 2025. The draft *WHPP Part 2* and its associated Appendices were presented to City Council for initial review at its January 27, 2025, meeting. During this review, the City Council expressed interest in and reviewed the *WHPP Part 2* goals, objectives, and action plan. The action plan represents the City's commitment to protecting land and water resources, managing potential drinking water contaminant sources, and proactively engaging with the WHPP stakeholders. Items identified in the action plan are potentially available for grant funding.

Following the 60-day LGU review period, the City Council hosts a Public Hearing for recording public and Council comments. Following receipt of all draft document comments, Bolton & Menk will update the *WHPP Part 2* and present the final document for City Council approval at its April 29th meeting. MDH will coordinate with other state agencies for the 90-day agency review period and subsequent approval. The tentative timeline in the table below outlines those steps and how the City will meet its October 2025 deadline.

The City Council can review the draft *WHPP Part 2* document and provide any comments, questions, or edits during the Public Hearing. Upon Council approval at the April 29th meeting, the document will be submitted for the 90-day agency review period. With the planned agency submittal on May 5, 2025, we anticipate MDH approval by August 5, 2025.

WHPP Schedule

The schedule below provides an overview of the *WHPP Part 2* update process. After the WHPP process is completed, the City is responsible for implementing its action plan and coordinating with MDH for regular updates.

Date	Action
1/27/25	**City Council Workshop – Review Draft *WHPP Part 2***
2/6/25	Submit Draft *WHPP Part 2* for 60-day LGU Review
2/6/25 – 4/6/25	60-day LGU Review Period
4/14/25	**City Council – Public Hearing on Draft *WHPP Part 2***
4/15/25 – 4/22/25	Finalize *WHPP Part 2* Updates
4/29/25	**City Council Approves *WHPP Part 2* for Agency Review**
5/5/25	Submit *WHPP Part 2* for 90-day Agency Review
8/5/25	MHD Approval Notice to City
8/11/25	Provide Notice to LGUs, re. Plan Approval
10/1/25	**Begin Implementation Plan**

Key Points

- The draft document was reviewed by LGUs and no comments were received.
- The Public Hearing will allow constituents and interested parties to provide comments on the draft document.
- MDH provided draft document comments as a courtesy and these updates will be made before the City Council approves the final *WHPP Part 2*.
- The final draft *WHPP Part 2* will be presented to the City Council for approval at their April 29th meeting.

Recommendation:

Staff recommends the City Council make a motion to have Bolton & Menk update the draft *WHPP Part 2* based on comments received in the MDH letter (see attached) and any provided during the Public Hearing, to be presented at the April 29th Council meeting.

Attachments:

1. Draft WHPP Part 2*
2. Appendices*
3. MDH Comment Letter

* Available to download from the following SharePoint Site: Maple Plain WHPP Part 2

City of Maple Plain
Wellhead Protection Plan
Part 2

October 2025 – October 2034

DEPARTMENT OF HEALTH

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Table of Contents

Figures

Tables

Appendices

Public Water Supply Profile

WELLHEAD PROTECTION MANAGER	
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	Maple Plain, MN 55359
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E-MAIL	jkolander@mapleplain.com

CONSULTANT	
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ADDRESS	2638 Shadow Lane Suite 200
	Chaska, MN 55318
TELEPHONE NUMBER	(612) 756-4315
E-MAIL	david.martini@bolton-menk.com

GENERAL INFORMATION	
PUBLIC WATER SUPPLY ID:	1270021
UNIQUE WELL NUMBERS:	Primary - Well #3 (Unique Number: 112238)
	Primary - Well #4 (Unique Number: 824078)
COUNTY:	Hennepin
POPULATION SERVED:	2,174
SERVICE CONNECTIONS:	736

Documentation List

STEP	DATE PERFORMED
Scoping Meeting 2 Held (4720.5340, subp. 1)	January 17, 2024
Scoping 2 Letter Received (4720.5340, subp. 2)	February 6, 2024
Remaining Portion of Plan Submitted to Local Units of Government (LGUs) (4720.5350)	February 3, 2025
Review Received from Local Units of Government (4720.5350, subp. 2)	April 4, 2025
Review Comments Considered (4720.5350, subp. 3)	April 7, 2025
Public Hearing Conducted (4720.5350, subp.4)	April 14, 2025
Remaining Portion WHP Plan Submitted (4720.5360, subp. 1)	May 1, 2025
Final WHP Plan Approval Received (4720.5360, subp. 4)	August 1, 2025

Members of the Wellhead Protection Team

Name	Representing
Jacob Kolander	City of Maple Plain – City Administrator
Kevin Larson	City of Maple Plain – Assistant City Administrator
Dylan Hoflock	City of Maple Plain – Public Works Manager
Mark Kaltsas	City of Maple Plain – City Planner
Abby Shea	Minnesota Department of Health – Planning
David Martini	Bolton & Menk, Inc.
Matt Bauman	Bolton & Menk, Inc.
Angie Smith	Bolton & Menk, Inc.

Abbreviations

BMP Best Management Practices
BWSR Board of Water and Soil Resources
CPR Conservation Reserve Program
DNR MN Department of Natural Resources
DWSMA Drinking Water Supply Management Area
EPA Environmental Protection Agency
GIS Geographic Information Systems
HWGP Hazardous Waste Generator Permit
IWMZ Inner Wellhead Management Zone
LGU Local Government Unit
LUST Leaking Underground Storage Tanks
LWMP Local Water Management Plan
MDA MN Department of Agriculture
MDH MN Department of Health
MGY Million Gallons Per Year
MN Minnesota
MNDOT MN Department of Transportation
MPCA MN Pollution Control Agency
MRWA MN Rural Water Association
NRCS Natural Resources Conservation Service
NWI National Wetland Inventory
OBWEL Observation Well
OHW Ordinary High-Water Level
PCSI Potential Contaminant Source Inventory
PWS Public Water Supply
RST Registered Storage Tank
SSTS Subsurface Sewage Treatment Systems
SWCD Soil and Water Conservation District
ST Storage Tank
STOR Ag Chemical Storage Permit
SWUDS State Water Use Permit
TMDL Total Maximum Daily Load
TOT Time of Travel
UST Underground Storage Tank
WHP Wellhead Protection
WHPA Wellhead Protection Area
WHPP Wellhead Protection Team

EXECUTIVE SUMMARY

The City of Maple Plain's Wellhead Protection Plan (WHPP) – Part 2 addresses the two municipal water supply wells' vulnerability and strategies to mitigate potential contaminants that could impact the public water supply. This WHPP was prepared in accordance with the applicable portions of the State of Minnesota Wellhead Protection Rules: Part 4720. The overall goal of Maple Plain's Wellhead Protection Plan is to improve water quality, increase public awareness, and advance data collection to protect the city's drinking water sources.

Part 1 of the plan includes the Wellhead Protection Area (WHPA) and the Drinking Water Supply Management Area (DWSMA) re-delineation, the water supply wells' vulnerability, and the vulnerability status of the aquifers in which the city's wells are located. The Part 1 WHPP was completed and approved by the Minnesota Department of Health (MDH).

The vulnerability of the city's source water aquifers is based on the geologic sensitivity ratings of the wells and the associated monitoring data. Based on this information, MDH has assigned a low vulnerability to the DWSMA. This suggests that the clay-rich sediments that overlay the city's aquifer prevent water and contaminants from moving quickly from the land surface into the groundwater aquifer. This travel time from surface to aquifer would take decades or longer.

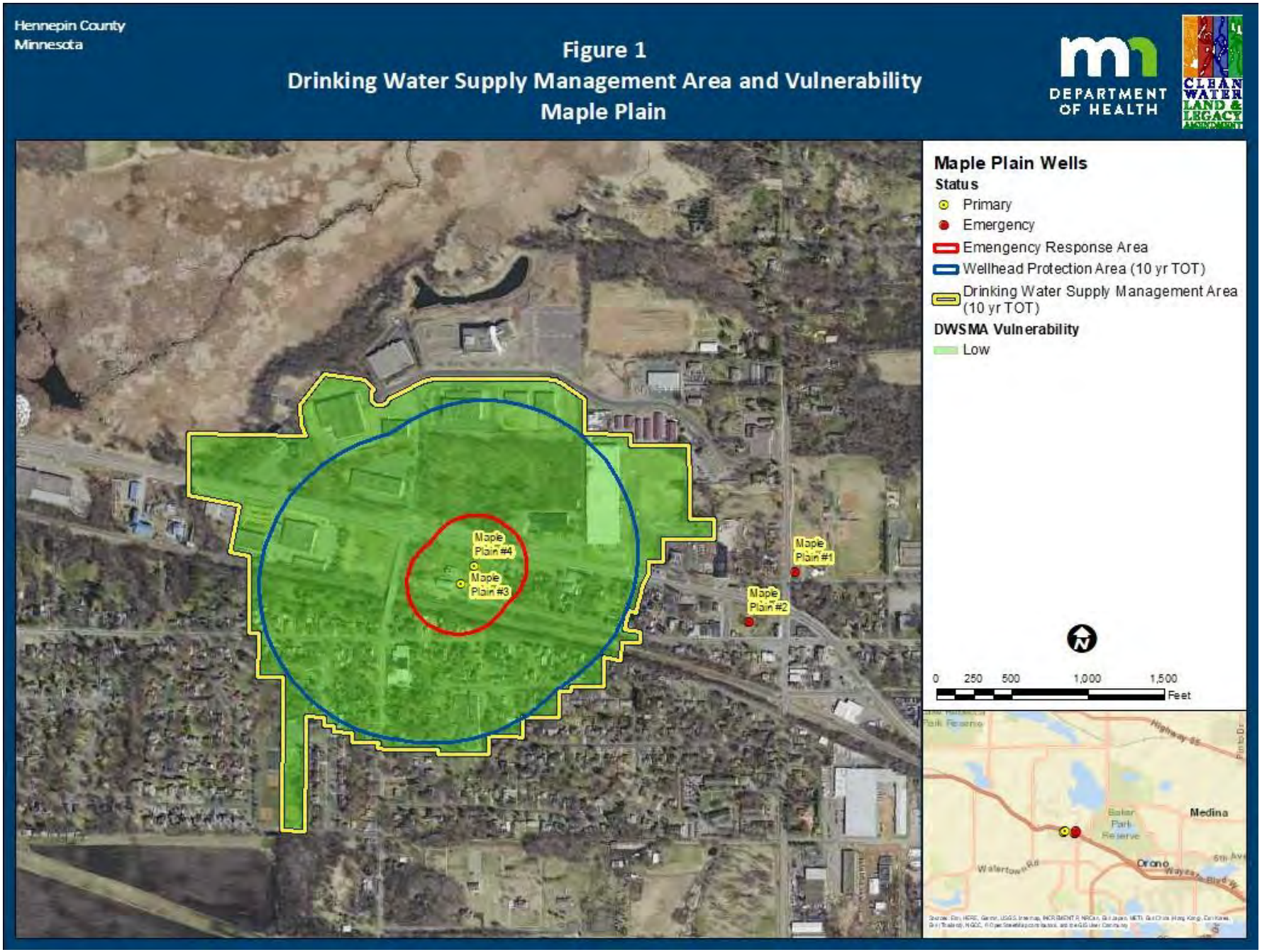
As a result of the low vulnerability status, the city's DWSMA is not highly susceptible to contaminant threats. The principal threats to the city's aquifer are unknown or unsealed wells that penetrate through the clay sediment layer. This includes wells 270 feet or greater in depth within the Maple Plain DWSMA. **Figure 1** shows the DWSMA area and its low vulnerability status. **Figure 2** identifies the Section-Township-Range, associated transportation corridors, and property parcels as they relate to the DWSMA.

This Part 2 WHPP addresses information from the MN Rules 4720 but does not require all sections due to the DWSMA's low vulnerability. The following information is included in this Part 2 WHPP:

- Data elements and assessments;
- Delineation and vulnerability;
- Potential contaminant sources;
- Impacts of changes on the public water supply well;
- Issues, problems, and opportunities, including potential contaminant sources;
- Wellhead protection goals, objectives, and action plans;
- Program evaluation; and
- Alternative water supply/contingency strategy.

The Wellhead Protection Team intends to coordinate with MDH, Hennepin County, and other local and state agencies to best manage land and water resources within the DWSMA. Management strategies focus on actions the city and its partners can facilitate over the next 10 years. Through increased public awareness, the City of Maple Plain can mitigate any potential issues and the community can continue to enjoy the current quality of water it has come to expect.

Figure 1: Drinking Water Supply Management Area (DWSMA)



Wellhead Protection Plan
City of Maple Plain

Basemap
September 2024

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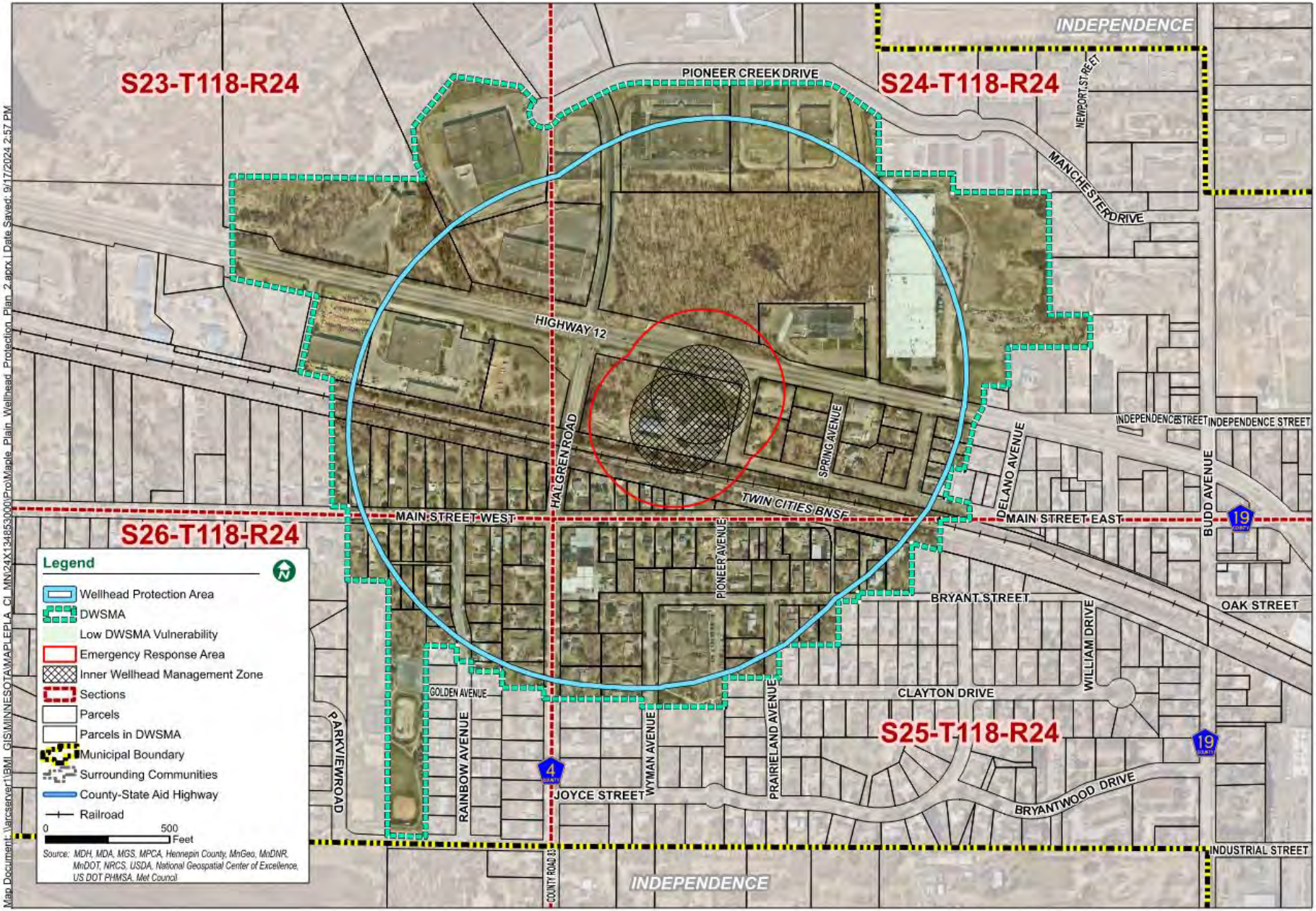
Figure 2: Section-Township-Range



CHAPTER 1: DATA ELEMENTS AND ASSESSMENT

Minnesota Rules 4720.5200, 4720.5210

The Part 1 WHPP was completed in October 2023 and addressed the data elements needed to support the WHPA, DWSMA delineation, and DWSMA vulnerability assessment. The Part 2 scoping decision meeting, held on January 17, 2024, discussed the data elements required to identify potential risks and develop effective management strategies to protect the public water supply relative to the DWSMA vulnerability. The results of each meeting were communicated to the city by MDH through a formal scoping decision notice and are presented in **Appendix B**. Not all the data elements listed in the WHP rule (MN Rules 4720) need to be addressed in the WHPP because of the DWSMA's low vulnerability.

A. Geologic Conditions

A geologic atlas of Hennepin County was updated in 2018[1]. Geologic data elements pertinent to the WHPA delineation and vulnerability status are included in Part 1 of this WHPP and were utilized in the DWSMA's delineation.

The City of Maple Plain has two primary wells screened in sandstone bedrock aquifers that are buried beneath a layer of clay-rich sediment. Well #3 (Unique No. 207090) and Well #4 (Unique No. 824078) are 534 feet and 392 feet deep, respectively. Well #3 draws water from the Mt. Simon aquifer and Well #4 draws water from the Wonewoc aquifer. The aquifer exhibits a low geologic sensitivity throughout the DWSMA and is isolated from any surface water recharge interaction.

Regionally, groundwater flow is to the south/southeast. The vulnerability of the aquifer that underlies the city's well fields was assessed based on geologic logs from area wells, soils maps, and chemical and isotope data. The groundwater flow fields and geologic cross-sections are further defined and discussed in the Part 1 WHPP.

Figures 3A through **3C** identify other geologic conditions of Depth to Groundwater (Figure 3A), Soil Erosion (Figure 3B), and Soil Infiltration (Figure 3C).

For more information related to geology, please refer to Part 1 WHPP (**Appendix A**).

B. Water Resources

Figure 4 shows the land area of the DWSMA located within the Pioneer-Sarah Creek subwatershed (HUC12: 070102050703), the southern part of which drains to the South Fork Crow River (HUC10: 0701020507). The wellhead protection area includes a 3.7-acre wetland (PFO1A: Freshwater Forested/Shrub Wetland), and residential, industrial, and mixed-use land areas. The inner wellhead management zone is located between Halgren Road and Spring Avenue to the west and east, respectively, and Highway 12 and the BNSF Railroad to the north and south, respectively.

The northwestern corner of the DWSMA is considered Zone AE flood area, which is also known as the 100-year flood area or those areas having a 1% chance of flooding on an annual basis.

The city of Maple Plain is located within Hennepin County. Watershed management organizations located within the metropolitan area are required to prepare a watershed management plan—which guides decisions for managing and restoring lakes, rivers, and

[1] MN Department of Natural Resources, County Geologic Atlas for Hennepin County: https://conservancy.umn.edu/items/f26b7092-1cd1-4a60-bf5e-8d3f72dc7b5c.

wetlands within the water management organization's boundaries—every 10 years, per Minnesota state statue 103B.231.

The Minnesota Pollution Control Agency (MPCA) is the primary state agency charged with pollution monitoring, control, and abatement. These documents were designed to assess the quality of the lakes and streams in the watershed through both biological and water chemistry monitoring. Once this data is analyzed, the adoption of best management practices (BMPs) such as an implementation of perennial vegetation buffers, can improve stormwater runoff and help mitigate nutrient loading to surface waters. BMPs combined with other water quality improvement projects could have profound benefits to water quality and biological communities within the Maple Plain DWSMA and across the larger watershed areas.

The South Fork Crow River Watershed Comprehensive Watershed Management Plan and other watershed resources can be found through the MPCA's website at https://www.pca.state.mn.us/watershed-information/south-fork-crow-river. Additionally, the Pioneer-Sarah Creek Watershed Management Commission (PCSWMC) is responsible for leading a watershed-wide approach to managing lakes, streams, and wetlands within the Commission's jurisdiction, which includes the Maple Plain DWSMA. The PSCWMC contains a wealth of surface-water quantity and quality resources, which can be accessed through their website at http://www.pioneersarahcreek.org/.

Figure 3A: Geologic Conditions – Depth to Water Table

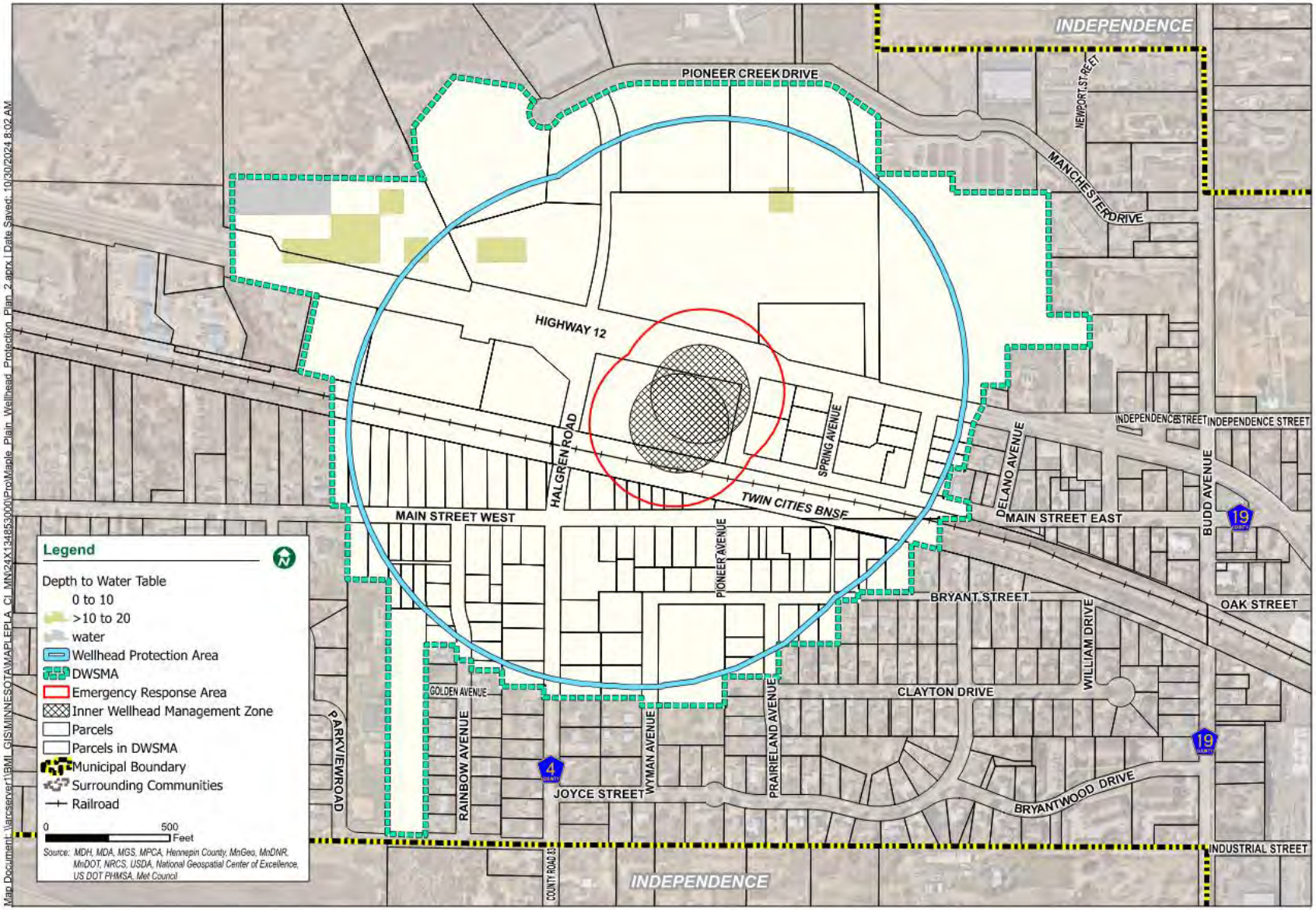


Figure 3B: Geologic Conditions – Soil Erosion

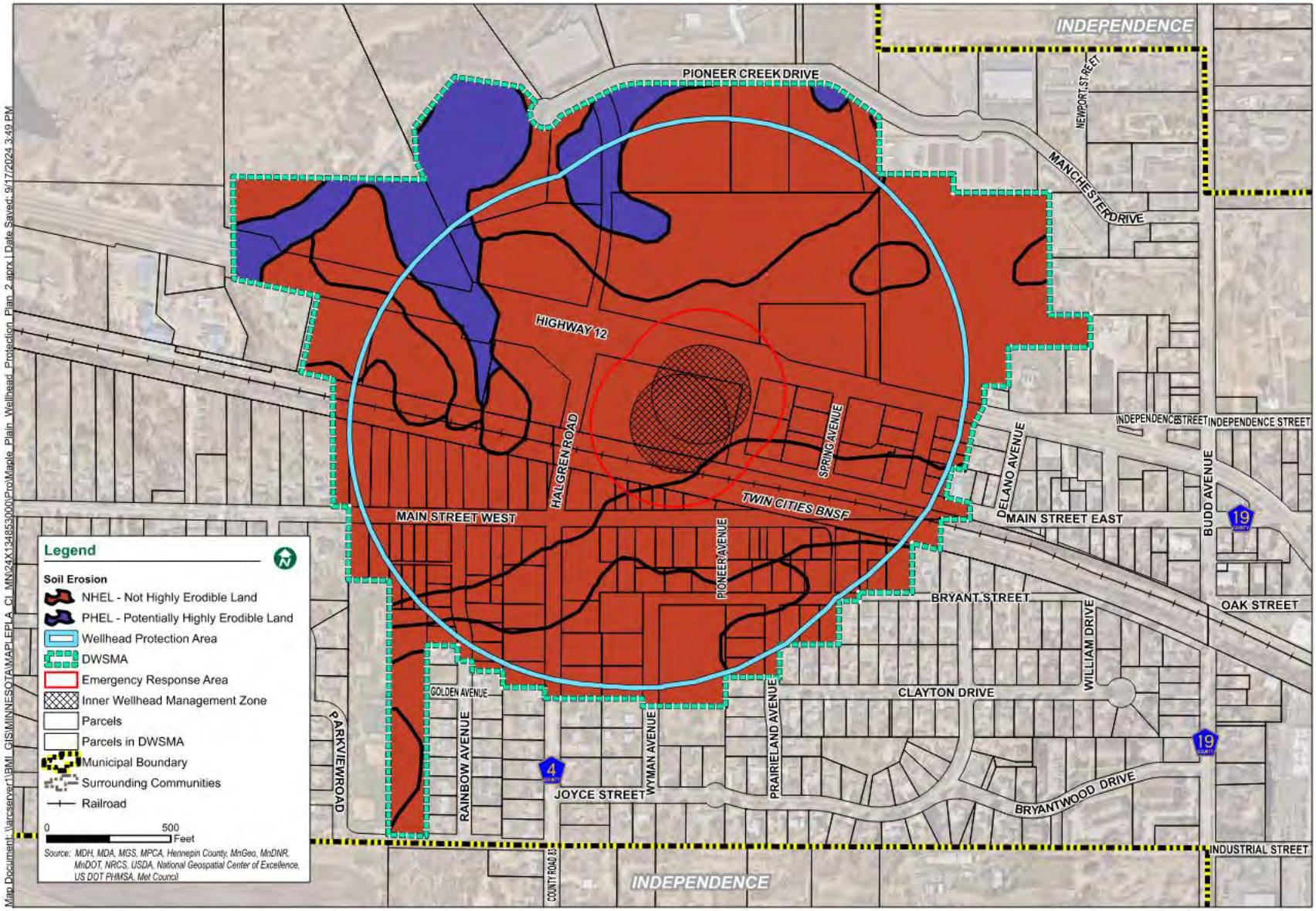


Figure 3C: Geologic Conditions – Soil Infiltration

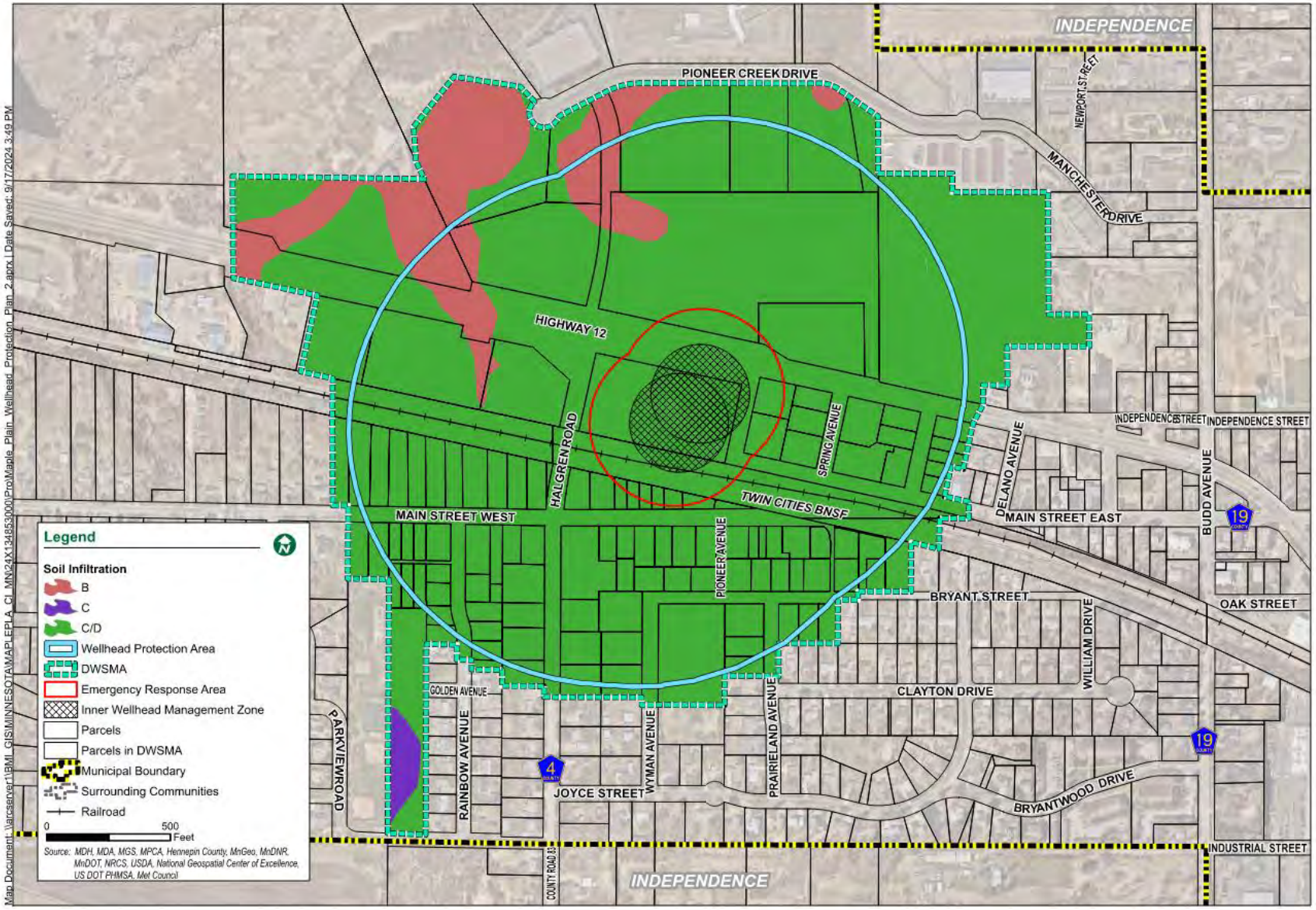
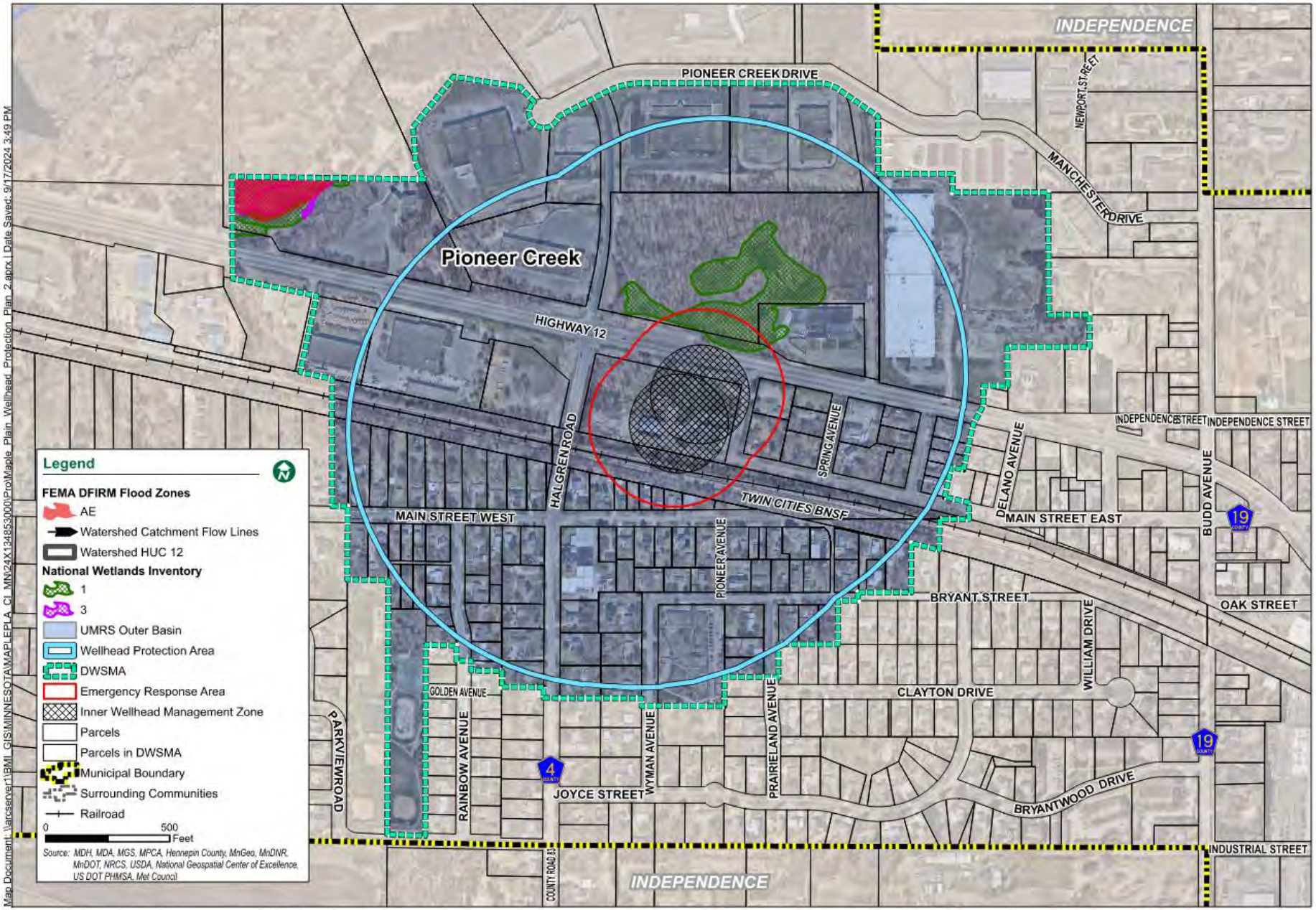


Figure 4: Water Resources



C. Land Use and Zoning

Table 1 depicts the land use within the DWSMA utilizing the USDA land cover data for 2022 and incorporating local knowledge of the area. Land use within the DWSMA is primarily comprised of developed land. The DWSMA also contains tree cover, woodland, and herbaceous land. The DWSMA is located within the Maple Plain city limits in Hennepin County. **Figure 5 and Figure 6** show the current Land Cover and Zoning, respectively, within the city's DWSMA.

Table 1: Existing Land Use in the Maple Plain DWSMA

Land Class Category (USDA, 2022)	DWSMA Acres	DWSMA Percent
Barren	0	0%
Crops	0	0%
Developed	116.08	83.1%
Grassland/Pasture	0	0%
Open Water	0	0%
Tree Cover	0	0%
Wetlands	0	0%
Right-of-Way	23.55	16.9%
Total	**139.63**	**100%**

Table 2 depicts zoning within the Maple Plain DWSMA, which consists of Maple Plain zoning districts. The DWSMA is primarily comprised of residential zoning districts, some mixed use, industrial, and railroad areas. There are no known land use conflicts with the existing zoning designations.

Table 2: Zoning in the Maple Plain DWSMA

Zoning District	DWSMA Acres	DWSMA Percent
Single Family Residential	24.34	17.4%
Single and 2-Family Residential	13.68	9.8%
Mixed Use	20.68	14.8%
Industrial	48.68	34.9%
Railroad	8.69	6.2%
Right-of-Way	23.55	16.9%
Total	**139.63**	**100%**

Figure 5 and **Table 3** depict planned future land use changes within the DWSMA. The city's future land use plans are discussed in the Maple Plain 2040 Comprehensive Plan. The future land use plan focuses on providing additional areas for residential and industrial growth. The

portion of the 2040 Comprehensive Plan that discusses future land use within the DWSMA is available online at: https://www.mapleplain.com/media/Comp%20Plan/2040%20Comprehensive%20Plan.pdf .

Future land use within the DWSMA is not anticipated to change significantly and there will be limited impacts to the drinking water supply to meet both commercial and residential demands.

Table 3: Future Land Use in the Maple Plain DWSMA

Future Land Use	DWSMA Acres	DWSMA Percent
Downtown Mixed Use	7.58	5.4%
General Mixed Use	15.31	11.0%
Industrial	37.53	26.9%
Low Density Residential	34.19	24.4%
Low Density Residential (Nursing Home)	2.90	2.1%
Park / Institutional	21.92	15.7%
Rail ROW	8.79	6.3%
ROW	11.42	8.2%
Total	**139.63**	**100%**

Figure 5: Land Cover

Wellhead Protection Plan
City of Maple Plain

2023 USDA Land Cover
September 2024

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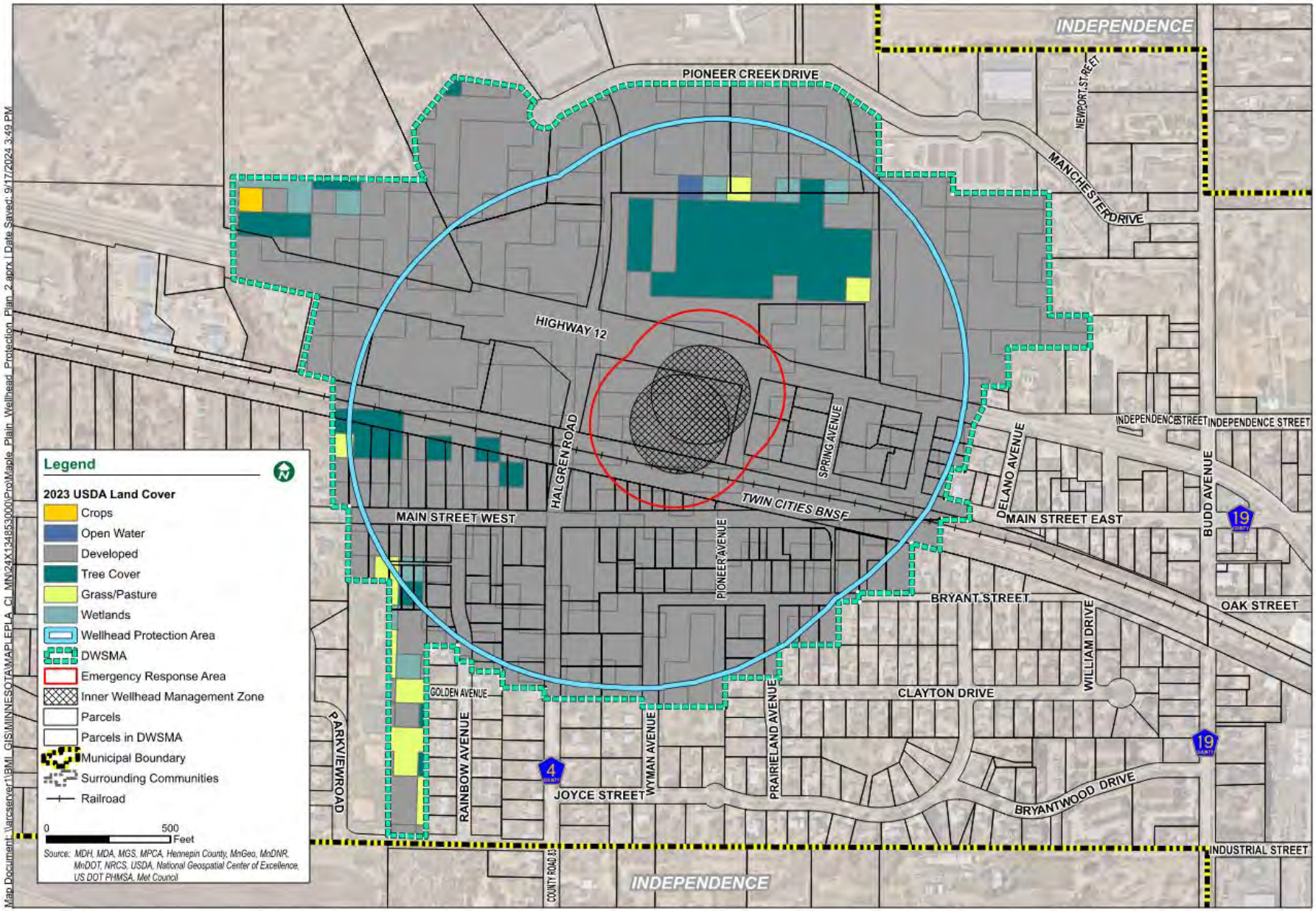

Wellhead Protection Plan
City of Maple Plain

Figure 6: Zoning

Zoning Map
September 2024

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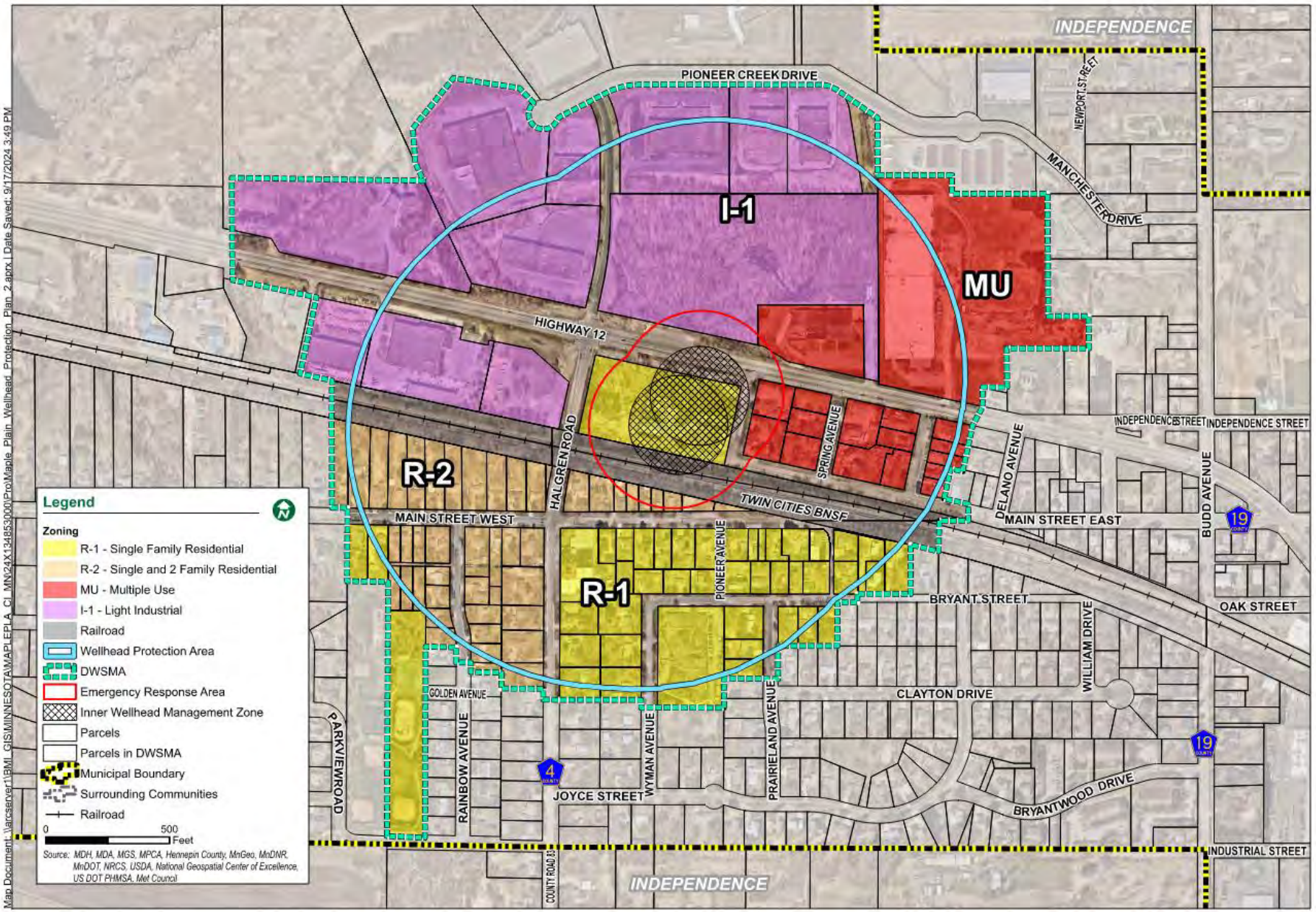

Wellhead Protection Plan
City of Maple Plain

Figure 7: Future Land Use

Met Council Future Land Use
September 2024

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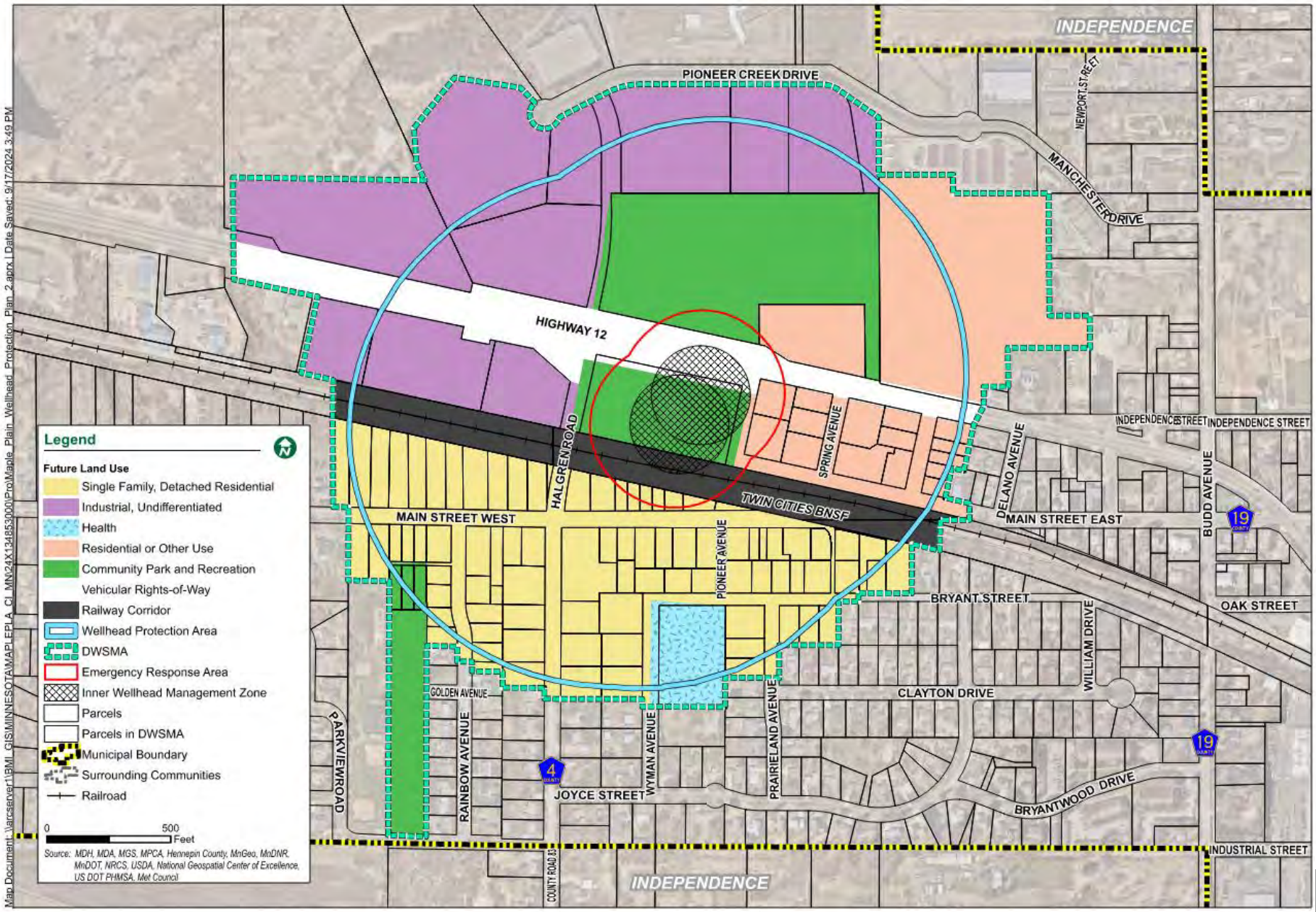


D. Groundwater Quantity

Historical annual pumping amounts for each of the wells located within the DWSMA are shown in **Table 4.** Total permitted water appropriations equate to 135 million gallons per year (MGY). The city does not currently anticipate exceeding its permitted allocation over the next 10 years.

Table 4: Annual Well Pumping Amounts (gallons per year)

Year	Well #1*	Well #2*	Well #3	Well #4	Annual Total
2019	119,000	0	25,243,500	26,585,000	**51,947,500**
2020	0	0	35,100,000	21,712,000	**56,812,000**
2021	0	NA	32,453,000	35,111,000	**67,564,000**
2022	0	NA	35,224,000	35,583,000	**70,807,000**
2023	0	NA	32,789,000	33,314,000	**66,103,000**
Avg Per Year	23,800	NA	32,161,900	30,461,000	**62,646,700**

*Wells #1 and #2 are the city's Emergency Wells and usage varies annually. Well #2 was capped in 2021.

In addition to the wells used by the public water supplier, **Table 5** shows two other high-capacity wells included in the delineation to account for their pumping impacts on the capture areas for the public water supply wells. There are no significant impacts or interference concerns to the city's public water supply from these high-capacity wells.

Any newly proposed high-capacity wells will be evaluated by the Minnesota Department of Natural Resources (MNDNR), the city, and MDH to determine impact to the public water supply. If a new well is needed by the city, staff will work with the MDH to determine placement, pumping capacity, and mitigation measures for any potential impacts.

Table 5: Other Permitted High-Capacity Wells

Unique Number	Well Name	DNR Permit Number	Aquifer	Use	5-Year Annual Average Volume (MGY)	Average Daily Use (m^3/d)
448765	Independence #2	1976-6030	Quaternary Buried Artesian Aquifer	Municipal/Public Water Supply	9,748,900	9.87
100219	Independence #1	1976-6030	Quaternary Buried Artesian Aquifer	Municipal/Public Water Supply	966,620	0.97

There are no known environmental boreholes in the DWSMA.

Additional groundwater quantity information can be found in Part 1 of this plan.

E. Groundwater Quality

Available chemical and isotopic information from Well #3 and #4 were analyzed for tritium, nitrate, chloride, and bromide. This information is presented in **Table 6.**

Table 6: Isotope and Water Quality Results

Well Name (Unique Number)	Tritium	Nitrate (mg/L)	Chloride (mg/L)	Bromide (mg/L)	Chloride/ Bromide Ratio
Well #3 (112238)	< 0.8 (05/03/2021)	< 0.05 (05/03/2021)	8.63 (05/03/2021)	0.0491 (05/03/2021)	176 (05/03/2021)
Well #4 (824078)	< 0.8 (05/03/2021)	< 0.05 (05/03/2021)	1.15 (05/03/2021)	0.0177 (05/03/2021)	65 (05/03/2021)

As discussed in Part 1 WHPP, the vulnerability of the city's aquifers throughout the DWSMA is based on the geologic sensitivity ratings of wells and their monitoring data. Based on this information, MDH has assigned a low vulnerability to the DWSMA. This suggests that the clay-rich sediments that overlie the city's aquifers prevent water and contaminants from moving quickly from the land surface into the city's aquifers and implies a time of travel of decades or longer. The principal threats to these aquifers are unsealed abandoned wells that penetrate through this clay layer. These wells may be 270 feet or greater in depth in the Maple Plain area.

At present, none of the contaminants for which the Safe Drinking Water Act has established health-based standards has been found above maximum allowable levels in the city's water supply, nor are any present at one-half of those levels. Maple Plain currently treats for radium which is above the safe drinking water standard in the source aquifer.

For more information related to groundwater quality, please refer to Part 1 of this plan

CHAPTER 2: DELINEATION AND VULNERABILITY ASSESSMENTS

Minnesota Rules 4720.5205, 4720.5210

A detailed description of the Part 1 Plan, which includes the process used for 1) delineating the WHPA and the DWSMA, and 2) preparing the vulnerability assessments of the city water supply wells and DWSMA is presented in **Appendix A**. This work was certified by Anneka Munsell, PE, MDH.

A. WHPA and DWSMA Delineation

Figure 1 shows the boundary of the WHPA and the DWSMA. In accordance with the Minnesota WHP Minnesota Rule (MR), parts 4720.5100 to 4720.5590, the WHPA was delineated using computer simulations of groundwater movement to generate the underground capture zones for city Well #3 (Unique No. 112238) and Well #4 (Unique No. 824078). The WHPA delineates the ten-year time-of-travel for groundwater toward the city wells.

The DWSMA is approximately 139.63 acres in total, and the entirety of the DWSMA is located within Hennepin County. The DWSMA boundary was designated using the following criteria (identifiable landmarks that reflect the scientifically calculated wellhead protection area boundaries as closely as possible (Minnesota Rules, part 4720.5100, subpart 13)).:

- Center lines of highways, streets, or roads rights-of-way
- Public Land Survey System coordinates
- Parcel boundaries, properties, and/or fence lines

B. Well Vulnerability Assessment

As part of Part 1 of this plan, a vulnerability analysis was completed by reviewing geologic sensitivity and available chemistry data. The primary source of potential uncertainty is the amount of low-permeable material (clay, till, shale) above the Wonewoc and Mt. Simon aquifers. However, based on a review of city well construction and historical water quality data from Well #3 and Well #4, the wells are considered not vulnerable. Well construction meets current State Well Code specifications (Minnesota Rules, part 4725).

The geologic conditions at the well sites include a cover of clay-rich geologic materials over the aquifer that is sufficient to retard or prevent the vertical movement of contaminants. None of the human-caused contaminants regulated under the federal Safe Drinking Water Act have been detected at levels indicating that the wells themselves serve to draw contaminants into the aquifer because of pumping.

Water samples were collected from wells #3 and #4 (112238 and 824078) on 05/03/2021 and were analyzed for tritium, nitrate, chloride, and bromide (Table 2). No significant amount of tritium or nitrate was detected in the sample, confirming the non-vulnerable nature of the well (Alexander and Alexander, 1989). In addition, the chloride and bromide results confirm that the well has not been impacted by land-use activities (Mullaney et. al, 2009).

C. DWSMA Vulnerability Assessment

Review of site-specific data from the Minnesota Well Index and the Hennepin County Hydrogeologic Atlases indicate that the thicknesses of low permeability clay-rich material relatively thick and consistent across the DWSMA. These low conductivity materials, when approximately 10-feet thick or greater, provide protection against the potential vertical migration of contaminants. As a result of the varied thicknesses, the geologic sensitivity is

very low across the DWSMA.

Once the geologic sensitivity was determined for wells near the DWSMA, and for the area within the DWSMA, the vulnerability ratings could be determined. Isotopic and water chemistry data from wells located within the DWSMA indicate that the aquifer contains water that has no detectable levels of tritium or human-caused contamination. Review of the geologic logs contained in the CWI database and geological maps and reports indicate that the aquifer exhibits a low geologic sensitivity throughout the DWSMA and is isolated from the direct vertical recharge of surface water.

Radium, which is a naturally occurring contaminant, has been detected in the water from public water supply Well #3 (Unique Number 112238, 7.3 pCi/L). Maple Plain treats the source water for radium to safe drinking water standards. The presence of a naturally occurring contaminant does not indicate that there is a direct pathway between the aquifer and potential contamination sources that occur at or near the land surface. Therefore, the DWSMA has a vulnerability ranking of low, or slow time-of-travel for potential contaminants at grade to migrate downward to the Wonewoc and Mt. Simon aquifers.

Additional information related to well and DWSMA vulnerability assessments is included in Part 1 of this plan (**Appendix A**).

D. Potential Contaminant Source Inventory

The potential contaminant source inventory (PCSI) that exists within the DWSMA was derived from the information collected to satisfy the data element requirements. The impact assigned to each data element as part of the assessment process was used to assess the types of potential contamination sources that may present a risk to the city's drinking water supply. The low vulnerability assessment for the DWSMA indicates that only unknown wells and wells greater than 270-feet deep need to be considered. Other types of boreholes, excavations that may reach the aquifer, and certain types of EPA Class V Wells also require consideration.

1. Contaminants of Concern

At present, none of the contaminants for which the Safe Drinking Water Act has established health-based standards has been found above maximum allowable levels in the city's water supply, nor are any present at one-half of those levels.

Radium has been detected in Well #3, however, radium is a naturally occurring contaminant that the city treats to a level that meets the safe drinking water standards. The presence of this naturally occurring contaminant does not indicate that there is a direct pathway between the aquifer and potential contamination sources that occur at or near the land surface.

2. Inventory Results and Risk Assessment

A description of the locations of potential contamination sources is presented in **Appendix C**. The MDH "County Well Index" (CWI), along with city employee knowledge, was utilized to locate wells. The city employees have a good working knowledge of the properties and their uses within the DWSMA. There are no known Class V wells within the DWSMA area. Base maps, land use, land cover, and zoning were used to identify other areas of concern and help delineate potential contaminant source locations.

Only two (2) potential contaminant sources were identified in this Part 2 WHPP and

annotated in **Table 8**.

- Public water supply Well #3 (Unique Number 112238)
- Public water supply Well #4 (Unique Number 824078).

The PCSI, along with parcels located within the DWSMA, can be found in **Appendix C**. Parcel data was obtained through the county's GIS records. Unused, unsealed municipal or other wells identified in the Old Municipal Well Report will need to be reviewed during the implementation of this plan (**Appendix H**). Unknown wells will be investigated, and an attempt will be made by the city to mitigate these with assistance from MDH and Hennepin County.

A summary of results for the inner wellhead management zone (IWMZ) survey is listed in **Table 7.** The IWMZ includes the area within 200 feet of a public water supply well and the survey evaluates potential contaminant sources adjacent to the city wells. Measures to mitigate PCSI adjacent to the public water supply wells will be addressed in the implementation plan (**Table 14** and **Appendix H**)

Class V injection wells are typically shallow disposal systems that are used to place a variety of fluids below the land surface. Examples of Class V injection wells include motor vehicle waste disposal wells, large-capacity cesspools, stormwater drainage wells, aquifer remediation wells and large-capacity septic systems. Class V wells are a concern because, in some situations, they may pose a risk to underground sources of drinking water. There are no known Class V wells located within the DWSMA. Management of Class V injection wells will be addressed in the strategies of this plan.

The priority assigned to each type of potential contamination source addresses 1) the number inventoried, 2) its proximity to a city well, 3) the capability of local geologic conditions to absorb a contaminant, 4) the effectiveness of existing regulatory controls, 5) the time required for the city of Maple Plain to obtain cooperation from governmental agencies that regulate it, and 6) the administrative, legal, technical, and financial resources needed. A high (H) risk potential implies that the potential source type has the greatest likelihood to negatively impact the city's water supply and should receive the highest priority for management. A low (L) risk potential implies that a lower priority for implementing management measures is assigned.

Table 7: Potential Contamination Sources and Assigned Risk for the IWMZ

Potential Source Type	Well #1 207090	Well #3 112238	Well #4 824078	Level of Risk
FD1 – Floor drain, grate, or trough connected to buried sewer	N	Y (87)	N	
GSP – Gas pipe	Y (103, 86)	Y (62)	Y (200)	L
PR2 – Portable (privy) or toilet	Y (85)	N	N	L
PT4 – Petroleum tank or container not buried between 56 and 1100 gal	N	Y (140, 150, 183)	N	M
RSS – Road salt storage	N	Y (140)	N	

Potential Source Type	Well #1 207090	Well #3 112238	Well #4 824078	Level of Risk
SBA – Sewer buried, approved, air tested	Y (77, 62)	Y (118)	N	L
SB2- Sewer, buried collector, municipal, serving a facility handling infections pr pathological wastes open jointed or unapproved materials	N	Y (50, 65)	Y (99, 121)	L
SD1 – Storm water drain pipe, 8 inches or greater in diameter	Y (90, 107, 68)	Y (65, 136)	Y (80, 85)	L
WB2 – Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	N	Y (140)	N	L
WEL – Operating well	N	Y (146)	Y (146)	L

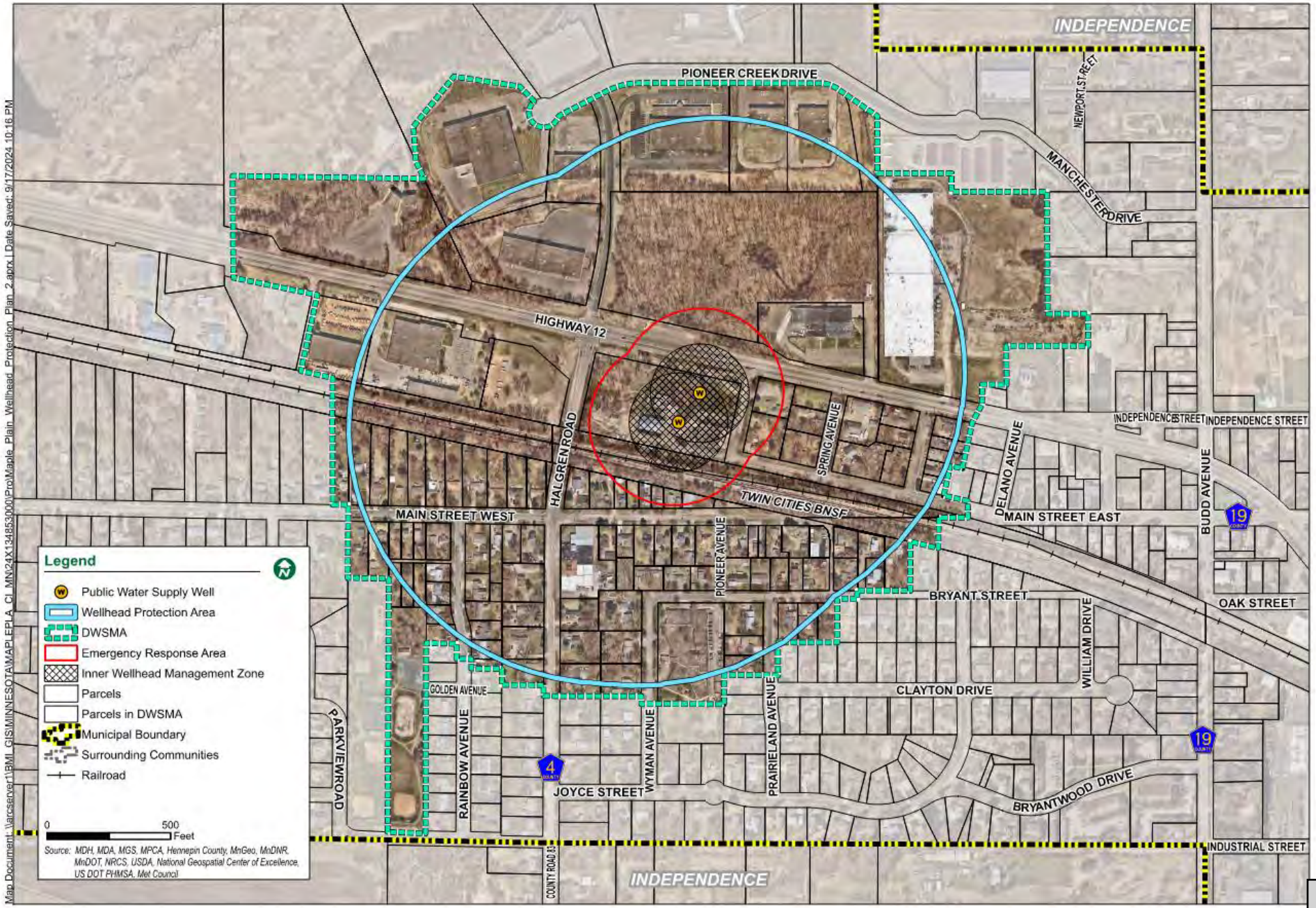
Strategies to address IWMZ potential contaminant sources include continuous monitoring within the IWMZ and an updated survey during the 10-year WHPP period. Should issues be identified during monitoring activities, the city will work to address these to continue protecting the public water supply. Current IWMZ survey reports can be found in **Appendix D**.

Table 8: Potential Contamination Sources and Assigned Risk

Potential Contaminant Source Type		Total	Low Vulnerability: Status and Level of Risk A=Active, I=Inactive, U=Unknown, C=Closed, R=Removed L=Level of Risk: *H=High, M=Medium, L=Low*					
PCS Codes	**PCS Material**		**A**	**I**	**U**	**C**	**R**	**L**
WEL	Public Water Supply Wells	2	2					L
Total		**2**	2	0	0	0	0	

Both public water supply wells will be addressed in the management strategies with emphasis on identifying and monitoring any new wells within one mile of the DWSMA.

Figure 8: PCSI



CHAPTER 3: IMPACT OF CHANGES ON PUBLIC WATER SUPPLY WELLS

Minnesota Rules 4720.5220

Anticipated changes to the physical environment, land use, surface water, and groundwater that may occur within Maple Plain throughout the ten-year period that the WHP plan is in effect are outlined in **Table 9.** The purpose of this exercise is to determine whether new potential sources of contamination may be introduced in the future, as well as to begin identifying future actions for mitigating these potential contamination sources.

Land and water use changes may introduce new contamination sources or result in changes to groundwater use and quality. The anticipated changes may occur within the jurisdictional authority of the city. These anticipated changes are described in relationship to a) the influence that existing governmental land and water programs and regulations may have on the anticipated change; and b) administrative, technical, and financial considerations of Maple Plain and property owners within the DWSMA.

Table 9: Expected Land Use and Water Use Changes

Expected Change	Impact on the Source Water Aquifer	Influence of Existing Government Programs and Regulations	Administrative, Technical, and Financial Considerations
Physical Environment	No anticipated changes	N/A	N/A
Land Use Potential development projects may increase impervious surfaces within the DWSMA.	An increase in water usage may occur depending on the industry or business development activities.	Land use and zoning controls provide applicable development standards on proposed industrial or business developers.	City and county planning and zoning officials will monitor and assess development project proposals. MDH planners are available for assistance.
Surface Water	No anticipated changes	N/A	N/A
Groundwater No additional high-capacity users are expected within the ten-year implementation period. The city may explore the need for a new public water supply well to replace aging infrastructure or to accommodate new area businesses.	A new public water supply well may increase groundwater usage as the city develops or expands its service area.	The city will coordinate with MDH to site any future wells, conduct preliminary sampling, and other associated activities. MNDNR's water appropriation program should support groundwater use and continued conservation practices.	The WHP team will assist and help guide the implementation plan. MDH may provide funds and technical assistance for a new public water supply well

CHAPTER 4: ISSUES, PROBLEMS, AND OPPORTUNITIES

Minnesota Rules 4720.5230

A. Identification of Issues, Problems, and Opportunities

The City of Maple Plain has identified water and land use issues and problems and opportunities related to 1) the aquifer used by the city water supply wells, 2) the quality of the well water, or 3) land or water use within the DWSMA. The City assessed various sources for this information including input from public meetings, the data elements identified by MDH during the scoping meetings, and the adequacy of the local, state, and federal administrative controls.

The results of this effort are presented in **Table 10**, which defines the nature and magnitude of contaminant source management issues in the city's DWSMA. Identifying issues, problems, and opportunities, including resource needs, enables Maple Plain to make effective use of existing resources, set meaningful priorities for source water management, and solicit support for implementing specific source management strategies.

B. Comments Received

There have been several occasions for local governments, state agencies, and the general public to identify issues and comment on the city's WHPP. At the beginning of the planning process, local units of government were notified that the city was going to develop its WHPP and were given the opportunity to identify issues and concerns. A public information meeting was held to review the results of the delineation of the wellhead protection area, DWSMA, and the vulnerability assessments. The public information meeting and public hearing on the WHPP Part 2 were held on **April 14, 2025**, before the completed WHPP was sent to MDH for state agency review and approval.

While there were no issues identified during the local government review and/or the public informational meeting, the wellhead protection team has identified the following:

Table 10: Issues, Problems, and Opportunities

Issue Identified	Impact Featured	Problem Associated with the Identified Issue	Opportunity Associated with the Addressed	Adequacy of Existing Controls to Address the Issue
Issues identified during IWMZ survey	• Aquifer • Well Water Quality • DWSMA	The city needs to address any issues identified in the IWMZ, with prioritization of Well #3 and Well #4.	The city will pursue funding to address potential concerns within the IWMZ	The city owns or has access to the property within the IWMZ
Location and reporting of new wells within one mile of the DWSMA	• Aquifer • Well water Quality • DWSMA	The city has limited information regarding wells using the same public water supply aquifer as the city.	The city can apply for grant funding to purchase handheld GPS units and coordinate with MDH to verify new well locations.	The city does not have authority over proposed wells drilled within the area

Issue Identified	Impact Featured	Problem Associated with the Identified Issue	Opportunity Associated with the Addressed	Adequacy of Existing Controls to Address the Issue
Water quality monitoring per MDH	• Aquifer • Well water Quality • DWSMA	MDH requests monitoring of wells for the next plan amendment.	The city will work with the MDH to establish and implement a monitoring plan in 6 years.	The city can complete the collection of samples for testing. Testing will be completed by MDH.
Inadequate educational materials	• Aquifer • Well Water Quality	The city does not have adequate educational materials on its website and wishes to improve public awareness and understanding.	The city can apply for MDH SWP grant funding to develop its website to address wellhead protection.	The city currently has a website for providing community information.
Inadequate physical and cybersecurity protection measures	• Aquifer • Well water quality	The city needs to protect the drinking water aquifer. The Fire Department may purchase property adjacent to Wells 3 and 4.	The city can apply for MDH grant funding to assess and update ordinances, as needed.	The city has and will maintain physical and regulatory authority over its public water supply wells.
Aquifer and water conservation measures	• Aquifer • DWSMA	Mount Simon aquifer is reasonably characterized and would not be available for additional drinking water needs.	The city can update and improve its water conservation measures to limit impacts to the Mount Simon aquifer.	MN Statute 103G.271, subdivision 4a limits new or increased water use permits from the Mount Simon aquifer. The city has authority over its ordinances, policies, and practices.

While it is difficult to foresee the future, Maple Plain will use its planning and management capabilities to respond to any new or unknown source water protection issues that may impact the quality or quantity of its future drinking water resources.

C. Controls, Plans and Programs

In addition to its own controls, the City of Maple Plain will rely upon partnerships formed with local units of government, state agencies, and federal agencies with regulatory controls or resource management programs in place to help implement its WHPP. The level of support that a local, state, and federal agency can provide depends on its legal authority, as well as the resources available to local governments.

1. Maple Plain Existing Controls and Programs

The DWSMA is located within the Maple Plain city limits. The DWSMA is located within Hennepin County, Minnesota. **Table 11** shows the legal controls and/or programs that the city has identified to support the management of potential contamination sources within the DWSMA.

Table 11: Maple Plain Controls and Programs

Type of Control	Program Descriptions
City Ordinances: • Zoning • Utility Regulations • Ordinance Sec. 9-23. – Restricted hours for sprinkling. • Ordinance Sec. 9-24 – Permits for service connections • Ordinance Sec. 9-25 – Tapping and connection fees and charges • Ordinance Sec. 9-26 – Excavation permits required. • Ordinance Sec. 9-35 – Connections beyond City Boundaries	Zoning Permits: • City Water/Sewer Connection
Water Supply Plan	Guides staff and City Council on water supply activities and opportunities
Surface Water Management Plan	Guide for City Council on how to manage surface waters

2. Other Local Government Controls and Programs

Additional local government controls and programs are predominantly managed through Hennepin County.

Table 12: Local Agency Control and Programs

Government Unit	Name of Control/Programs	Program Description
Hennepin County Planning and Zoning	Zoning Comprehensive Land Use Planning	Controls for land use and zoning outside Maple Plain city limits
Pioneer-Sarah Watershed Management Commission	Surface Water Management	Protect, preserve, and manage natural surface water systems
South Fork Crow River One Watershed, One Plan (1W1P)	Surface Water Management	Protect, preserve, and manage natural surface water systems.

3. State Agency and Federal Agency Support

MDH will serve as the contact for enlisting the support of other state agencies on a case-by-case basis regarding technical or regulatory support that may be applied to the management of potential contamination sources. Participation by other state agencies and the federal government is based on legal authority granted to them and resource availability. Furthermore, MDH 1) administers state regulations that affect specific potential sources of contamination and 2) can provide technical assistance to property owners to comply with these regulations.

Table 13 the specific regulatory programs or technical assistance that State and federal agencies may provide to the city to support implementation of the WHPP. It is likely that other opportunities for assistance may be available over the 10-year period that the plan is in effect due to changes in legal authority or increases in funding granted to state and federal agencies.

Table 13: State and Federal Agency Controls and Programs

Government Unit	Type of Program	Program Description
MDH	State Well Code for Municipal Wells (Minnesota Rules, Chapter 4725)	MDH has authority over the construction of new municipal and private wells and the sealing of those wells. MDH staff in the Well Management Program offer technical assistance for enforcing well construction codes, maintaining setback distances for certain contamination sources, and well sealing.
MDH	WHP	MDH has staff that will help the city identify technical or financial support that other governmental agencies can provide to assist with managing potential contamination sources.
MNDNR	Water appropriation permitting (Minnesota Rules, Chapter 6115)	MNDNR can require that anyone requesting an increase in existing permitted appropriations, or to pump groundwater, must address concerns regarding the impacts to drinking water if these concerns are included in a WHPP.
EPA	Class V Wells	The EPA has authority over Class V wells. Owners are required to notify the EPA.

CHAPTER 5: WELLHEAD PROTECTION GOALS

Minnesota Rules 4720.5240

Goals define the overall purpose for the WHPP, as well as the endpoints for implementing objectives and their corresponding actions. The city's overall goal for its WHPP is to improve water quality, increase public awareness, and advance data collection to protect the city's drinking water source.

The WHP team identified the following goals after considering the impacts that 1) changing land and water uses have presented to drinking water quality over time and 2) future changes that need to be addressed to protect the community's drinking water:

1. Improve water quality to maintain a safe and adequate drinking water supply for community members.
2. Educate public officials, landowners, and the general public about the importance of wellhead protection to protect the public drinking water supply.
3. Advance data collection to identify issues, plan for city growth, and ensure aquifer protection and PCSI accuracy.
4. Maintain an active, community-wide water conservation program.

CHAPTER 6: OBJECTIVES AND PLAN OF ACTION

Minnesota Rules 4720.5250

Objectives provide the focus for ensuring that the goals of the WHPP are met and that priority is given to specific actions that support multiple outcomes of plan implementation.

Both the objectives and the wellhead protection measures (actions) that support them are based on assessing the data elements (Chapter 1), the potential contaminant source inventory (Chapter 2), the impacts that changes in land and water use present (Chapter 3), and issues, problems, and opportunities referenced to the adequacy of official controls and plans at the local, state and federal levels (Chapter 4).

A. Objectives

The WHP Team has identified the following WHPP objectives to help achieve the goals outlined in Chapter 5.

1. Collect data and manage potential contaminants to maintain an adequate and safe drinking water supply.
2. Improve awareness, education, and understanding about the importance of source water protection.
3. Implement water conservation measures.
4. Coordinate with other agencies and organizations to assist with aquifer protection and WHPP implementation.
5. Conduct regular evaluations of the WHPP implementation and effectiveness.

B. WHP Measures and Action Plan

Based upon the factors, the WHP team has identified WHP measures that will be implemented by the city over the 10 years that its WHPP is in effect. The objective that each measure supports is noted as well as the lead party and any cooperators, the priority assigned to that measure, the anticipated cost for implementing the measure, and the year(s) in which it will be implemented.

The following categories are used to further clarify each WHP measure focus area, in addition to helping organize the measures listed in the action plan (**Table 14**):

A. Monitoring, Data Collection, and Assessment

B. Well and Contaminant Source Management

C. Stakeholder Education and Outreach

D. WHP Coordination, Reporting, and Evaluation

C. Establishing Priorities

WHP measures reflect the administrative, financial, and technical requirements needed to address the risk to water quality or quantity presented by each potential contamination source. Not all of these can be implemented at the same time, so the WHP team assigned a priority (High, Medium, Low) to each WHP measure. Several factors must be considered when WHP action items are selected and prioritized (part 4720.5250, subpart 3):

- Contamination of the public water supply wells by substances that exceed federal drinking water standards.

- Quantifiable levels of contamination resulting from human activity.
- The location and type of potential contaminant sources relative to the wells.
- The capability of geologic material to absorb a contaminant.
- The effectiveness of existing controls.
- The time needed to acquire cooperation from other agencies and cooperators.
- Administrative, legal, technical, and financial resources needed.

Table 14: WHP Plan of Action

A. Monitoring, Data Collection, and Assessment

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Groundwater Quality & Quantity Monitoring WHP Measure #A1 The city will contact the MDH Hydrologist to conduct water quality monitoring for city wells during year 6. MDH to provide sampling and analysis costs. Information will be used to refine the vulnerability assessment update.	1, 4	H	Staff Time	Maple Plain MDH						X				
Public Water Supply Well WHP Measure #A2 If the city determines a new well is necessary and/or feasible, pending available funding and resources, they will work with MDH Hydro to determine a suitable site.	1, 4	L	TBD	Maple Plain MDH Hydrologist	← If Needed →									
High-Capacity Wells WHP Measure #A3 Coordinate with MDH and MNDNR to identify any new high-capacity wells within 1-mile of the DWSMA or 2-miles of the city limits.	1, 4	M	Staff Time	Maple Plain MDH MNDNR	← Ongoing →									

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Aquifer Testing WHP Measure #A4 Coordinate with MDH and MNDNR to monitor water levels in the production wells to identify trends in the aquifer(s) or wells that may indicate long-term drawdown or well screen cleaning.	1, 4	M	TBD	Maple Plain MDH MNDNR	← Ongoing →									
Well Inventory and Prioritization WHP Measure #A5 Update the PCSI as needed. Review the status of existing wells and add new wells identified within one mile of the DWSMA.	1	H	Staff Time	Maple Plain MDH	← Ongoing →									
WHP Measure #A6 The city will coordinate with landowners and MDH to verify the location of wells within one-mile of the DWSMA or two-miles of the city limits.	1, 2, 4	L	TBD	Maple Plain MDH Landowners	← Ongoing →									

B. Well and Contaminant Source Management

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Well Management WHP Measure #B1 Coordinate with MDH to identify and seal any unused or unsealed wells.	1, 4	H	TBD / Staff Time	Maple Plain MDH Hennepin County	← As Needed →									
WHP Measure #B2 If a well is discovered of unknown depth or ≥270-feet deep, apply for MDH Grant or use county or city well management funds to seal wells.	1,4	M	TBD / Staff Time	Maple Plain MDH Hennepin County	← As Needed →									
IWMZ WHP Measure #B3 Contact MDH to update the IWMZ inventory for all system wells in either Year 6 or Year 7.	1, 4	M	Staff Time	Maple Plain MDH						X	X			
WHP Measure #B4 Monitor setbacks for new potential contaminant sources within the IWMZ.	1, 5	H	Staff Time	Maple Plain	← Ongoing →									

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
WHP Measure #B5 Ensure emergency response procedures are updated, especially for potential issues within the IWMZ. Focus should be on transportation corridors (highway and railroad).	1, 4	H	Staff Time	Maple Plain Emergency Response Agencies			X			X			X	
Class V Wells WHP Measure #B6 Notify MDH if a Class V Well is identified.	1, 4	L	Staff Time	Maple Plain EPA MDH	← As Needed →									
Physical and Cybersecurity WHP Measure #B7 Identify areas and opportunities to improve both physical and cybersecurity measures to protect the city's public water supply wells and distribution system.	1	M	TBD	Maple Plain MDH Hennepin County	← As Needed →									

C. Stakeholder Education and Outreach

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Stakeholder Education WHP Measure #C1 Develop WHP webpage on the city website with regular updates. Use social media and other public outreach resources to update the public on well management, unused wells, water conservation practices, and well sealing information. Link to information on MRWA and/or MDH websites.	2, 3	M	Staff Time	Maple Plain MDH Hennepin County PSWMC SFCRWD	X	X	X	X	X	X	X	X	X	X
WHP Measure #C2 Provide well management and well sealing information at city hall and through utility invoices. Request MDH brochures or links to websites with updated information.	2, 4	M	Staff Time	Maple Plain MDH	X			X			X			X
Water Conservation Measures WHP Measure #C3 Identify and implement water conservation best management practices for city operations, residents, and area businesses.	2, 3	L	Staff Time	Maple Plain PSWMC	← Ongoing →									

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administrative Controls WHP Measure #C4 Apply for MDH funding to assess and update local ordinances and plans with well-management language for protecting the city's drinking water supply aquifer.	2, 4	M	Staff Time	Maple Plain MDH	X				X				X	

D. WHP Coordination, Reporting and Evaluation:

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
WHP Coordination WHP Measure #D1 Hold meetings with the WHP Team and local resource partners every 2.5 years to discuss WHP issues, past year's accomplishments, and complete an evaluation report.	4, 5	M	Staff Time	Maple Plain MDH			X		X			X		X
Implementation Tracking and Reporting WHP Measure #D2 Maintain a "WHP folder" that contains documentation of WHP activities and dates completed.	1, 5	H	Staff Time	Maple Plain	X	X	X	X	X	X	X	X	X	X
WHP Measure #D3 Develop a spreadsheet that coincides with measures found in your plan to track and monitor plan implementation activities and completion dates.	5	H	Staff Time	Maple Plain	X	X	X	X	X	X	X	X	X	X
WHP Program Evaluation Plan Reporting WHP Measure #D4 Summarize WHPP implementation efforts in a report to MDH in the 8th year.	4, 5	M	Staff Time	Maple Plain MDH								X		

The agencies listed in **Table 15** have indicated their support to the city of Maple Plain in implementing the WHP measures in which they are identified.

Table 15: Cooperating Agencies List

Agency	Measure(s)
Emergency Response Agencies	B5
Environmental Protection Agency (EPA)	B6
Hennepin County Environmental Services	B1-B2, B7, C1
Minnesota Department of Health (MDH)	A1-A6, B1-B3, B6-B7, C1-C2, C4, D1, D4
Minnesota Department of Natural Resources (MNDNR)	A3-A4
Pioneer-Sarah Watershed Management Commission (PSWMC)	C1, C3
South Fork Crow River Watershed District (SFCRWD)	C1

CHAPTER 7: EVALUATION PROGRAM

Minnesota Rules 4720.5270

Evaluation is used to support plan implementation and is required under Minnesota Rules, part 4720.5270, prior to amending the city's WHPP. Plan evaluation is specified under Objective 5 and provides the mechanism for determining whether WHP action items are achieving the intended result or whether they need to be modified to address changing administrative, technical, or financial resource conditions within the DWSMA. The city has identified the following procedures that it will use to evaluate the success with implementing its WHPP:

- The WHP team will meet every two and one-half years to assess the status of the plan implementation and to identify issues that impact the implementation of action steps throughout the DWSMA.
- The city will assess the results of each action item at the time of its regularly scheduled evaluations to determine whether the action items have accomplished their purpose or whether modification is needed.
- The city will prepare a written report that documents how it has assessed plan implementation and the action items that were completed. The report will be presented to MDH at the first scoping meeting held with the city to begin amending the WHPP.

CHAPTER 8: WATER SUPPLY EMERGENCY AND CONTINGENCY PLAN

Minnesota Rules 4720.5280

The City's Water Supply Contingency Plan can be found in **Appendix F** of this document. The purpose of this plan is to establish, provide, and keep updated, certain emergency response procedures and information for the city of Maple Plain. These may become vital in the event of a partial or total loss of the city's public water supply services as a result of a natural disaster, chemical contamination, or civil disorder-caused disruptions.

Appendix A: Part 1 Wellhead Protection Plan

Appendix B: Part 2 WHPP Scoping Decision and 2013 Part 2 Wellhead Protection Plan

Appendix C: Potential Contaminant Source Inventory and DWSMA Parcels

Appendix D: Inner Wellhead Management Zone (IWMZ) Surveys

Appendix E: Old Municipal Well Report

Appendix F: Water Supply Emergency and Contingency Plan

Appendix G: Glossary of Terms and Controls and Programs

Appendix H: Implementation Schedule

Appendix I: LGU Review and Public Hearing

Hydrogeologic Assessment of the Drinking Water Source and Wells for the City of Maple Plain

DELINEATIONS – WELLHEAD PROTECTION AREA AND DRINKING WATER SUPPLY MANAGEMENT AREA

VULNERABILITY ASSESSMENTS – WELLS AND DRINKING WATER SUPPLY MANAGEMENT AREA

October 3, 2023

Hydrogeologic Assessment of the Drinking Water Source and Wells for the City of Maple Plain

Public Water Supply ID: 1270021

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Contents

List of Tables

List of Figures

I hereby certify that this plan, document or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature: Anneka Munsell

Digitally signed by Anneka Munsell
Date: 2023.10.03 14:18:56 -05'00'

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Glossary of Terms

Data Element. A specific type of information required by the Minnesota Department of Health to prepare a wellhead protection plan.

Drinking Water Supply Management Area (DWSMA). The area delineated using identifiable landmarks that reflects the scientifically calculated wellhead protection area boundaries as closely as possible (Minnesota Rules, part 4720.5100, subpart 13).

Drinking Water Supply Management Area Vulnerability. An assessment of the likelihood that the aquifer within the DWSMA is subject to impact from land and water uses within the wellhead protection area. It is based upon criteria that are specified under Minnesota Rules, part 4720.5210, subpart 3.

Emergency Response Area (ERA). The part of the wellhead protection area that is defined by a one-year time of travel within the aquifer that is used by the public water supply well (Minnesota Rules, part 4720.5250, subpart 3). It is used to set priorities for managing potential contamination sources within the DWSMA.

Inner Wellhead Management Zone (IWMZ). The land that is within 200 feet of a public water supply well (Minnesota Rules, part 4720.5100, subpart 19). The public water supplier must manage the IWMZ to help protect it from sources of pathogen or chemical contamination that may cause an acute health effect.

Wellhead Protection (WHP). A method of preventing well contamination by effectively managing potential contamination sources in all or a portion of the well's recharge area.

Wellhead Protection Area (WHPA). The surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field (Minnesota Statutes, section 103I.005, subdivision 24).

Well Vulnerability. An assessment of the likelihood that a well is at risk to human-caused contamination, either due to its construction or indicated by criteria that are specified under Minnesota Rules, part 4720.5550, subpart 2.

Acronyms

CWI - County Well Index

DNR - Minnesota Department of Natural Resources

EPA - United States Environmental Protection Agency

FSA - Farm Security Administration

MDA - Minnesota Department of Agriculture

MDH - Minnesota Department of Health

MGS - Minnesota Geological Survey

MnDOT - Minnesota Department of Transportation

MnGEO - Minnesota Geospatial Information Office

MODFLOW - Three-Dimensional Finite-Difference Groundwater Model

MPCA - Minnesota Pollution Control Agency

NRCS - Natural Resource Conservation Service

SWCD - Soil and Water Conservation District

UMN - University of Minnesota

USDA - United States Department of Agriculture

USGS - United States Geological Survey

Summary

Protection Areas - The recharge area for the wells is known as the wellhead protection area, or WHPA, and represents the area that contributes water to the city's wells within a 10-year time period. The area that contributes water within a one-year time period is known as the emergency response area (ERA). Practical reasons require the designation of a management area that fully envelops the wellhead protection area, called the drinking water supply management area, or DWSMA. Each of these areas is shown in Figure 1.

Geology and Groundwater Flow – The city of Maple Plain has two primary wells screened in sandstone bedrock aquifers that are buried beneath a layer of clay-rich sediment. Wells #3 and #4 are 534 and 392 feet deep, respectively (Table 1). Regionally, groundwater flow is to the south/southeast.

Table 1 - Water Supply Well Information

Local Well ID	Unique Number	Use/ Status	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer	Well Vulnerability
Well #1	207090	Emergency	10	238	418	1939	Tunnel City-Wonewoc	Not Vulnerable
Well #2	207407	Emergency (Out Long Term)	16	241	435	1959	Tunnel City-Wonewoc	Not Vulnerable
Well #3	112238	Primary	18	534	534	1978	Mt. Simon	Not Vulnerable
Well #4	824078	Primary	18 x 12	343	392	2017	Wonewoc	Not Vulnerable

Well Vulnerability - The vulnerability of each well has been assessed based on 1) well construction details, especially conformance with standards required by the state well code, 2) the geologic sensitivity of the aquifers, and 3) past monitoring results. Both wells meet current state Well Code specifications (Minnesota Rules 4725) and the wells themselves do not provide a pathway for contaminants to enter the aquifer used by the public water supplier. Both wells are considered non-vulnerable to contamination. Well #3 (112238) is grouted. Well #4 (824078)

was constructed using the cable tool method, which minimize the risk of the well acting as a conduit for flow of surface water and contaminants into the buried aquifer. Also, water samples from the wells lacked detectable tritium (detection indicates the presence of young water), so they are not considered vulnerable at this time (Table 2). This is reinforced by the low chloride/bromide ratios presented below.

Table 2 - Isotope and Water Quality Results

Unique Number (Well Name)	Tritium	Nitrate (mg/L)	Chloride (mg/L)	Bromide (mg/L)	Chloride/ Bromide Ratio
112238 (Well #3)	< 0.8 (05/03/2021) < 1 (07/09/1991)	< 0.05 (05/03/2021)	8.63 (05/03/2021)	0.0491 (05/03/2021)	176 (05/03/2021)
824078 (Well #4)	<0.8 (05/03/2021)	< 0.05 (05/03/2021)	1.15 (05/03/2021)	0.0177 (05/03/2021)	65 (05/03/2021)

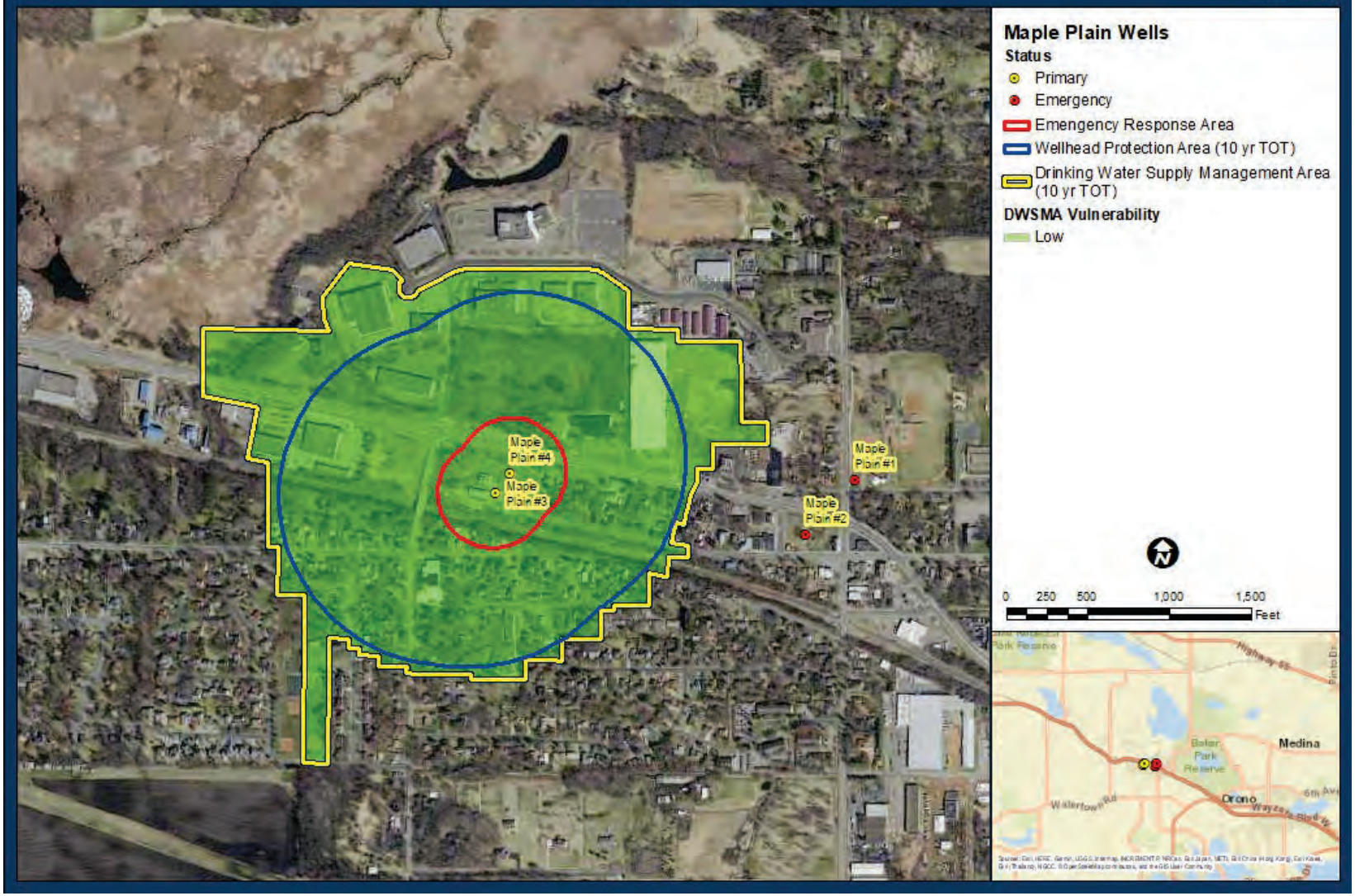
DWSMA Vulnerability - The vulnerability of the city's aquifers throughout the DWSMA is based on the geologic sensitivity ratings of wells and their monitoring data. Based on this information MDH has assigned a low vulnerability to the DWSMA. This suggests that the clay-rich sediments that overlie the city's aquifers prevent water and contaminants from moving quickly from the land surface into the city's aquifers and implies a time of travel of decades or longer. The principal threats to these aquifers are unsealed abandoned wells that penetrate through this clay layer. Such wells are 270 feet or greater in depth in the Maple Plain area.

Water Quality Concerns - At present, none of the contaminants for which the Safe Drinking Water Act has established health-based standards has been found above maximum allowable levels in the city's water supply, nor are any present at one-half of those levels. Maple Plain currently treats for radium which is above the safe drinking water standard in the source aquifer.

Recommendations - Recommendations have been generated to improve future delineations and vulnerability assessments and should be considered for inclusion as management strategies in the city's wellhead protection plan. These activities include well locating and water quality monitoring. Further details can be found in the Recommendations section of this report.

Hennepin County
Minnesota

Figure 1
Drinking Water Supply Management Area and Vulnerability
Maple Plain



Technical Report

Discussion

This document describes the amendments to Part 1 of the wellhead protection (WHP) plan for The city of Maple Plain (PWSID 1270021). The purpose for amending the plan is to address the changes that have occurred since the plan was last approved, in order to update the WHP measures that are needed to protect public drinking water. In addition, the locations of the city's wells were adjusted for greater accuracy. The amended areas are somewhat smaller (Figure 7) because an updated groundwater flow model, more accurate than the ones used in the previous delineations, was used. The work was performed in accordance with the Minnesota Wellhead Protection Rule, parts 4720.5100 to 4720.5590.

This report presents delineations of the wellhead protection area (WHPA) and drinking water supply management area (DWSMA), and the vulnerability assessments for the public water supply wells and DWSMA. Figure 1 shows the boundaries for the WHPA and the DWSMA. The WHPA is defined by a 10-year time of travel. Figure 1 also shows the emergency response area (ERA), which is defined by a one-year time of travel. An inner wellhead management zone (IWMZ), which is the area within a 200-foot radius around the well, serves as the wellhead protection area for emergency wells and is not displayed in this report. Definitions of rule-specific terms used are provided in the “Glossary of Terms.”

In addition, this report documents the technical information required to prepare this portion of the WHP plan in accordance with the Minnesota Wellhead Protection Rule. Additional technical information is available from MDH.

Table 1 lists all the wells in the public water supply system. Only wells listed as primary are required to be included in the WHP plan.

Assessment of the Data Elements

MDH staff met with representatives of the city of Maple Plain on March 30, 2021, for a scoping meeting that identified the data elements required to prepare Part I of the WHP plan. Appendix A presents the assessment of these data elements relative to the present and future implications of planning items specified in Minnesota Rules, part 4720.5210.

General Descriptions

Description of the Water Supply System

The city of Maple Plain obtains its drinking water supply from two primary wells. Table 1 summarizes information regarding them.

Description of the Hydrogeologic Setting

The city of Maple Plain draws groundwater from the Wonewoc and the Mt Simon aquifers. The description of the hydrologic setting for the aquifer used to supply drinking water is presented in Tables 3a and 3b.

The distribution of the aquifer and its stratigraphic relationships with adjacent geologic materials are shown in Figures 3, 4a and 4b. They were prepared using well record data contained in the CWI database. The geological maps and studies used to further define local hydrogeologic conditions are provided in the “Selected References” section of this report.

Table 3a - Description of the Local Hydrogeologic Setting at Maple Plain Well 3 (112238), Mt. Simon aquifer

Attribute	Descriptor	Data Source
Aquifer Material	Sandstone	Well Logs
Primary Porosity	0.20	Estimated and used in Metro Model 3
Aquifer Thickness (ft)	105	Well Log (Well #3 [112238])
Stratigraphic Top Elevation	545	Well Log (Well #3 [112238])
Stratigraphic Bottom Elevation	440	Well Log (Well #3 [112238])
Hydraulic Confinement	Confined	Well Log (Well #3 [112238])
Transmissivity (T)	Reference Value: 770 ft^2/day Range: 380 to 1160 ft^2/day	The aquifer test plan was approved on January 25, 2021, and T was determined from a specific capacity test at Well #3 (112238).
Hydraulic Conductivity	Reference Value: 7.4 ft/day Range: 3.7 to 11 ft/day	The values were obtained from the transmissivity range and aquifer thickness at and T was determined from a specific capacity test at Well #3 (112238).
Groundwater Flow Field	Flow to the east.	Calibrated Groundwater Model.

Table 4a - Description of the Local Hydrogeologic Setting at Maple Plain Well #4 (824078), Wonewoc Aquifer

Attribute	Descriptor	Data Source
Aquifer Material	Sandstone	Well Logs
Primary Porosity	0.20	Estimated and used in Metro Model 3
Aquifer Thickness (ft)	49	Well Log Well #4 (824078)
Stratigraphic Top Elevation	678	Well Log Well #4 (824078)
Stratigraphic Bottom Elevation	629	Well Log Well #4 (824078)
Hydraulic Confinement	Confined	Well Log Well #4 (824078)
Transmissivity (T)	Reference Value: 4,150 ft^2/day Range: 2,075 to 6,227 ft^2/day	The aquifer test plan was approved on January 25, 2021, and T was determined from a specific capacity test at Well #4 (824078).
Hydraulic Conductivity	Reference Value: 81.4 ft/day Range: 40.7 to 122.1 ft/day	The values were obtained from the transmissivity range and aquifer thickness at and T was determined from a specific capacity test at Well #4 (824078).
Groundwater Flow Field	Flow to the south/southeast.	Calibrated Groundwater Model.

Delineation of the Wellhead Protection Area

Delineation Criteria

The boundaries of the WHPA for the city of Maple Plain are shown in Figure 1. Table 4 describes how the delineation criteria specified under Minnesota Rules, part 4720.5510, were addressed.

Table 5 - Description of WHPA Delineation Criteria

Criterion	Description	How the Criterion was Addressed
Flow Boundary	Mississippi, Minnesota, and Crow Rivers	The rivers provide boundary conditions to the original regional model that extends to these natural boundaries. They were included in the original regional model and set the regional groundwater flow.
Flow Boundary	Other High-Capacity Wells	There are no other high-capacity wells within two-miles that pump in the same aquifer as the public water supplier and that may have an impact on the public water supplier's well capture zone. Other high-capacity wells, located further away, were included in the regional model.
Daily Volume of Water Pumped	See Table 5	Pumping information was obtained from the DNR, Appropriations Permit Number 1977-6403, and was converted to a daily volume pumped by a well.
Groundwater Flow Field	See Figures 2a and 2b	The model calibration process addressed the relationship between the calculated versus observed groundwater flow field.

Criterion	Description	How the Criterion was Addressed
Aquifer Transmissivity (T)	Reference Value: ft^2/day	The aquifer test plans were approved on May 19, 2021. The transmissivities were determined from specific capacity tests at Well #3 (112238) and at Well #4 (824078). Uncertainty regarding aquifer transmissivity was addressed as described in Addressing Model Uncertainty section.
Time of Travel	10 years	The public water supplier selected a 10-year time of travel.

Pumping data was obtained from the DNR Permit and Reporting System (MPARS) for the public water supply's Appropriation Permit Number 1977-6403. These values, confirmed by the public water supplier, were used to identify the maximum volume of water pumped annually by each well over the previous five-year period, as shown in Table 5. An estimate of the pumping for the next five years is also shown. The maximum daily volume of discharge used as an input parameter in the model was calculated by dividing the greatest annual pumping volume by 365 days.

Table 6 - Annual Volume of Water Discharged from Water Supply Wells

Well Name	Unique Number	2016	2017	2018	2019	2020	(Year) Pumping	Daily Volume (cubic meters)
Well #1	207090	0	148,000	19,000	119,000	0	Not Applicable	Not Applicable
Well #2	207407	0	0	0	0	0	Not Applicable	Not Applicable
Well #3	112238	57,465,551*	49,296,000	28,582,000	25,243,500	35,100,000	57,465,551	595.9
Well #4	824078	0	5,969,000	27,054,000*	26,585,000	21,5712,000	27,054,000	280.5

(Expressed as gallons. *Indicates greatest annual pumping volume.)

In addition to the wells used by the public water supplier, Table 6 shows other high-capacity wells included in the delineation to account for their pumping impacts on the capture areas for the public water supply wells. Pumping data was obtained from the DNR MPARS database.

Table 7 - Other Permitted High-Capacity Wells

Unique Number	Well Name	DNR Permit Number	Aquifer	Use	5-Year Average Annual Volume of Water Pumped	Daily Volume (cubic meters)
448765	Independence #2	1976-6030	Quaternary Buried Artesian Aquifer	Municipal/Public Water Supply	9,748,900	9.87
100219	Independence #1	1976-6030	Quaternary Buried Artesian Aquifer	Municipal/Public Water Supply	966,620	0.97

Method Used to Delineate the Wellhead Protection Area

The WHPA for the city of Maple Plain's wells was determined using a modified version of an existing regional MODFLOW model (Metro Model 3) that was developed by Barr Engineering Company for the Metropolitan Council. Original model construction detail, data files, and calibration results are outlined in the Metropolitan Council report (2014).

MODFLOW was developed by the United States Geological Survey and is publicly available. The specific software code used for this delineation was MODFLOW-2005 (Harbaugh, 2005). The program has been thoroughly documented, is widely used by consultants, government agencies, and researchers and consistently accepted in regulatory proceedings. MODFLOW is also an extremely versatile program capable of simulating groundwater flow in up to three dimensions while offering a variety of boundary condition options, confined or unconfined aquifer conditions and allowing for vertical discretization through the use of layering.

The regional Metro Model 3 consists of nine layers that represent the major aquifers and aquitards within the eleven-county metropolitan area. These layers represent, from top to bottom, the following units: (1) surficial aquifer of glacial deposits, (2) St. Peter Sandstone or Quaternary Buried Artesian Aquifer, (3) Prairie du Chien Group, (4) Jordan Sandstone, (5) St. Lawrence Formation (aquitard), (6) Tunnel City Group, (7) Wonewoc, (8) Eau Claire Formation (aquitard), and (9) Mt. Simon Sandstone. The regional groundwater model was calibrated to steady-state water levels and river base flows.

A local-scale model was extracted from the regional Metro Model (Appendix B, Figure B-1). All modeling for this amendment was completed using GMS (Aquaveo, 2015), a pre- and post-processor for MODFLOW. The model grid consists of 454 rows, 310 columns, and nine layers. It has variable areal grid spacing ranging from 12 meters near the city's well and grading to 50 meters at the boundaries of the model domain. Constant head boundary conditions were specified at the boundaries of the model (Appendix B, Figure B-2). River boundaries represent cells where water is flowing both into and out of the aquifer and were used to simulate the many lakes and rivers within the model domain.

Prior to its use in the delineations, the following modifications were incorporated in the local model:

- Local areas of modified horizontal conductivity were included in the model to reflect the reference transmissivity value in Tables 3a and 3b.
- The flow rate for the Maple Plain wells were updated to match wellhead protection rule requirements. Modeled rates are shown in Table 5.
- The average modeled flow rates for high-capacity wells located within two-miles were modified to reflect the period from 2015 to 2019 (Table 6).

To determine the WHPA, the groundwater flow model was used along with a particle tracking program called MODPATH (Pollock, 2012). MODPATH is used to evaluate advective transport of simulated particles moving through the simulated flow system. A series of 50 particles were

launched at each well. A porosity of 20 percent was used and a reverse time of travel was calculated at 10 years.

Representative aquifer parameters were used in the base case model scenario. Additional modeling scenarios were then simulated using reasonable estimations of parameters to demonstrate model sensitivity and to reflect uncertainty conditions, which are addressed in the next section. The model parameters for all model runs are listed in Table 6.

The capture zones of all model scenarios were composited to create the final WHPA (Figures 1a and 1b).

Results of Model Calibration and Sensitivity Analysis

Model calibration is a procedure that compares the results of a model based on estimated input values to measured or known values. This procedure can be used to define model validity over a range of input values, or it helps determine the level of confidence with which model results may be used. As a matter of practice, groundwater flow models are usually calibrated using water elevation and/or flux. The sensitivity analysis quantifies the differences in model results produced by the natural variability of a particular parameter. Uncertainty analysis addresses the effects of poor data quality (lack of local detailed information or deficiencies in the data) on the model results. Together, sensitivity and uncertainty analyses are commonly used to evaluate the effects that natural variability and uncertainties in the hydrogeologic data have on the size and shape of the capture zones. Regarding the WHPA delineation, these analyses are used to document that the delineation is optimal, conservative, and protective of public health based on existing information.

Modeled heads were compared to observed heads for Wonewoc wells and Mt. Simon. The local calibration dataset includes water level information from all Wonewoc and Mt. Simon wells within the model domain. The graph of modeled versus observed hydraulic heads are included as Figure B-3 in Appendix B. A quantitative measure by which to evaluate the success obtained during calibration is to compute the normalized mean square of the residuals (RMS). The normalized RMS is the ratio on the RMS and the maximum observed head difference of the calibration dataset. A calibration is acceptable if the normalized RMS is less 15 percent (Anderson et al., 2015). The RMS of the calibration dataset (i.e., Wonewoc and Mt. Simon wells) is 14.43 feet with a normalized RMS of 3.25 percent (Figure B-3, Appendix B). The calibration is therefore acceptable, and no additional calibration is needed.

Sensitivity Analysis

Model sensitivity is the amount of change in model results caused by the variation of a particular input parameter. Because of the relative simplicity of this particular MODFLOW model, the direction and extent of the modeled capture zone may be very sensitive to any of the input parameters:

- The **pumping rate** directly affects the volume of the aquifer that contributes water to the well. An increase in pumping rate leads to an equivalent increase in the volume of

aquifer and an expanded capture zone, proportional to the porosity of the aquifer materials.

> **How Addressed and Results** – The pumping rate is based on the results presented in Table 5 and is not considered a variable factor that will influence the delineation of the WHPA. The modeled pumping rate is based on the largest annual pumping during the last five years of record, as shown in Table 5. The sensitivity of the delineation to this parameter is assumed to be minimal when compared with the other parameters discussed below.

- The **direction of groundwater flow** determines the orientation of the capture zone. Variations in the direction of groundwater flow will not affect the size of the capture zone but are important for defining the areas that are contributing water to the well.

  > **How Addressed and Results** – General flow direction was determined based on the calibrated regional and local models. The local model calibration was verified for static water levels of similarly screened wells within the local model. Overall, the sensitivity of the WHPA to the direction of groundwater flow should not be significant, given the current knowledge of the hydraulic head distribution in the aquifer.

- The **hydraulic gradient** (along with aquifer hydraulic conductivity) determines the rate at which water moves through the aquifer materials.

  > **How Addressed and Results** – The flow fields shown in Figures 2a and 2b provide the basis for determining the extent to which each model run reflects the conceptual understanding of the orientation of the capture area for each well. The regional model has been calibrated to hydraulic heads. The sensitivity of the WHPA to the hydraulic gradient should not be significant given the current knowledge of the hydraulic head distribution in the aquifer.

- The **horizontal hydraulic conductivity** influences the size and shape of the capture zone. A decrease in hydraulic conductivity decreases the length of the capture zone and increases the distance to the stagnation point, making the capture zone more circular in shape and centered on the well.

  > **How Addressed and Results** – Additional scenarios were modeled by increasing/reducing the reference horizontal hydraulic conductivity by a factor of two. The sensitivity of the delineated capture zone to a change in horizontal hydraulic conductivity is minimal as depicted in Figure 5.

- The **aquifer porosity** influences the size and shape of the capture zone.

  How Addressed and Results – Decreasing the porosity causes a linear, proportional increase in the areal extent of the capture zone. A literature value of 20 percent was used for the delineation and this value was not varied (Fetter, 2001).

- The **aquifer thickness** influences the size and shape of the capture zone.

  How Addressed and Results – Aquifer thicknesses used in this model were obtained from the stratigraphic information at the regional Metro Model whose layering closely follows the overall stratigraphy through the region. Near the city wells, aquifer thickness was obtained the well logs.

Addressing Model Uncertainty

Using computer models to simulate groundwater flow involves representing a complicated natural system in a simplified manner. Local geologic conditions may vary within the capture area of the public water supply well, but the amount of existing information needed to accurately define this degree of variability is often not available for portions of the WHPA. In addition, the current capabilities of groundwater flow models may not be sufficient to represent the natural flow system exactly. However, the results are valid within a range defined by the reasonable variation of input parameters for this delineation setting.

The steps employed for this delineation to address model uncertainty were:

1. Pumping Rate – For each well, a maximum historical (five-year) pumping rate or an engineering estimate of future pumping, whichever is greater (Minnesota Rules, part 4720.5510, subpart 4).
2. Multiple model runs were conducted for the range of horizontal conductivity values used in the sensitivity analysis.

For each run, the capture areas were delineated for times of travel of one and 10 years (Figure 5). The different resulting capture zones were combined to make the final WHPA.

Delineation of the Drinking Water Supply Management Area

The boundaries of the Drinking Water Supply Management Area (DWSMA) were defined by the city of Maple Plain using the following features (Figure 1):

- Public Land Survey coordinates.
- Property or fence lines.

Vulnerability Assessments

The Part I wellhead protection plan includes the vulnerability assessments for the city of Maple Plain's wells and DWSMA. These vulnerability assessments are used to help define potential contamination sources within the DWSMA and select appropriate measures for reducing the risk that they present to the public water supply.

Assessment of Well Vulnerability

The vulnerability s for each well used by the city of Maple Plain are listed in Table 1 and are based upon the following conditions:

1. Well construction meets current State Well Code specifications (Minnesota Rules, part 4725), meaning that the wells themselves should not provide a pathway for contaminants to enter the aquifer used by the public water supplier.
2. The geologic conditions at the well sites include a cover of clay-rich geologic materials over the aquifer that is sufficient to retard or prevent the vertical movement of contaminants.
3. None of the human-caused contaminants regulated under the federal Safe Drinking Water Act have been detected at levels indicating that the wells themselves serve to draw contaminants into the aquifer as a result of pumping.
4. Water samples were collected from wells #3 and #4 (112238 and 824078) on 05/03/2021 and were analyzed for tritium, nitrate, chloride and bromide (Table 2). No tritium or nitrate was detected in the sample, confirming the non-vulnerable nature of the well (Alexander and Alexander, 1989). In addition, the chloride and bromide results confirm that the well has not been impacted by land-use activities (Mullaney et. al, 2009).

Assessment of Drinking Water Supply Management Area Vulnerability

The DWSMA vulnerability is shown in Figure 1 and is based upon the following information:

1. Isotopic and water chemistry data from wells located within the DWSMA indicate that the aquifer contains water that has no detectable levels of tritium or human-caused contamination.
2. Review of the geologic logs contained in the CWI database and geological maps and reports indicate that the aquifer exhibits a low geologic sensitivity throughout the DWSMA and is isolated from the direct vertical recharge of surface water.
3. Radium, which is a naturally occurring contaminant, has been detected in the water from public water supply Well #3 (Unique Number 112238, 7.3 pCi/L). Maple Plain treats the source water for radium to safe drinking water standards. The presence of a naturally occurring contaminant does not indicate that there is a direct pathway between the aquifer and potential contamination sources that occur at or near the land surface.

Therefore, given the information currently available, it is prudent to assign a low vulnerability rating to the DWSMA, in accordance with the Minnesota Wellhead Protection Rule (parts 4720.5100 to 4720.5590).

Recommendations

The following recommendations have been generated to inform the next amendment of the city of Maple Plain's Wellhead Protection Plan.

1. Well Locating: This delineation is based on very little well data. If wells are constructed within two miles of the city or one mile of the DWSMA, their locations should be verified. This information may allow a better understanding of the extent and thickness of the city's aquifers and the overlying clay confining units and result in a more refined WHPA in the future.
2. Water Quality Monitoring: The standard assessment monitoring package should be analyzed during year six, including the primary wells and river, contingent on funding assistance from MDH for sampling and analysis. The city may need to collect the samples and ship them to MDH. Information generated by this sampling will be used to refine vulnerability assessments for the next amendment.

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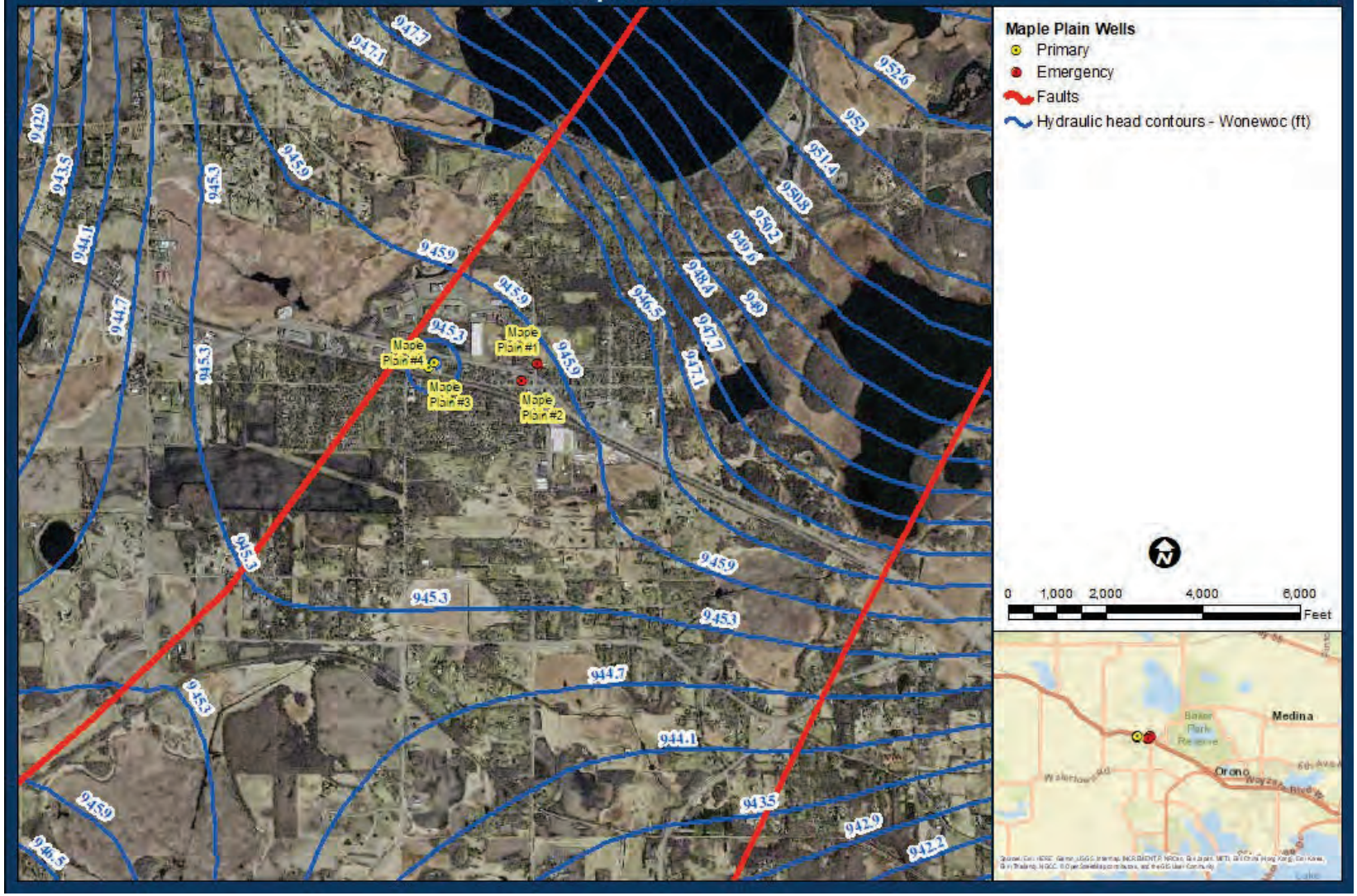
Figures

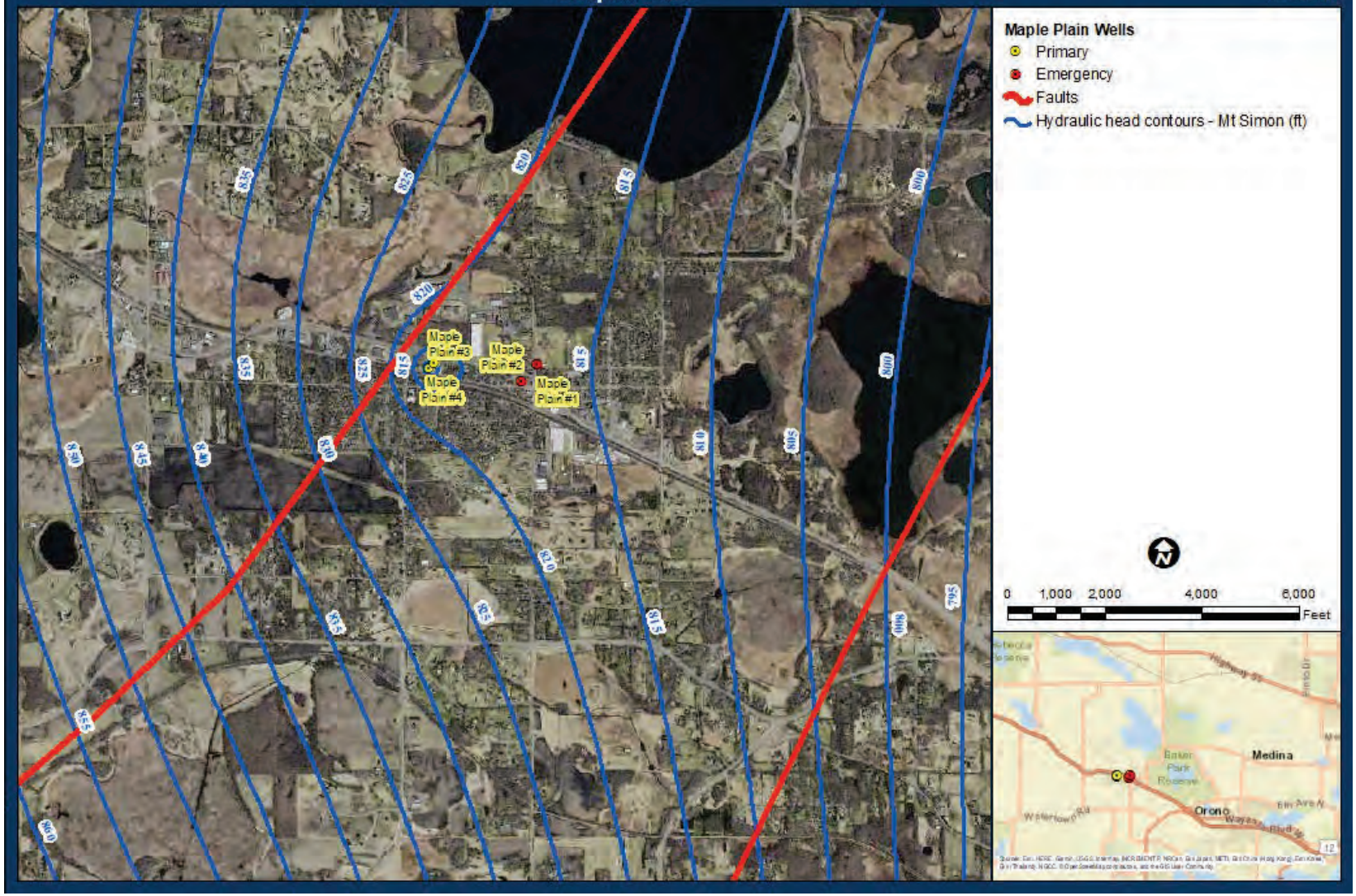
Hennepin County
Minnesota

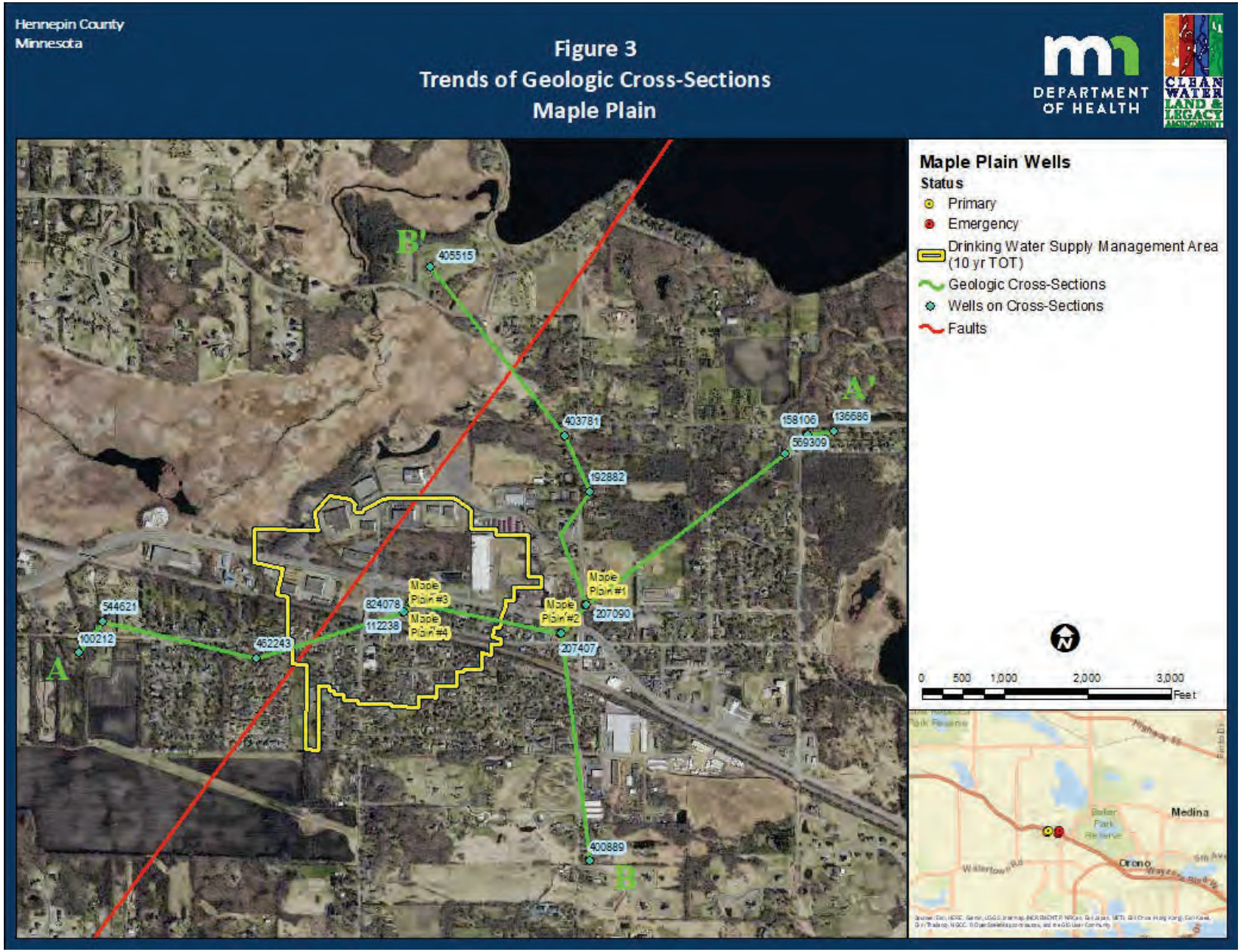
Figure 2a
Ambient Groundwater Flow Field
Wonewoc
Maple Plain



Hennepin County
Minnesota

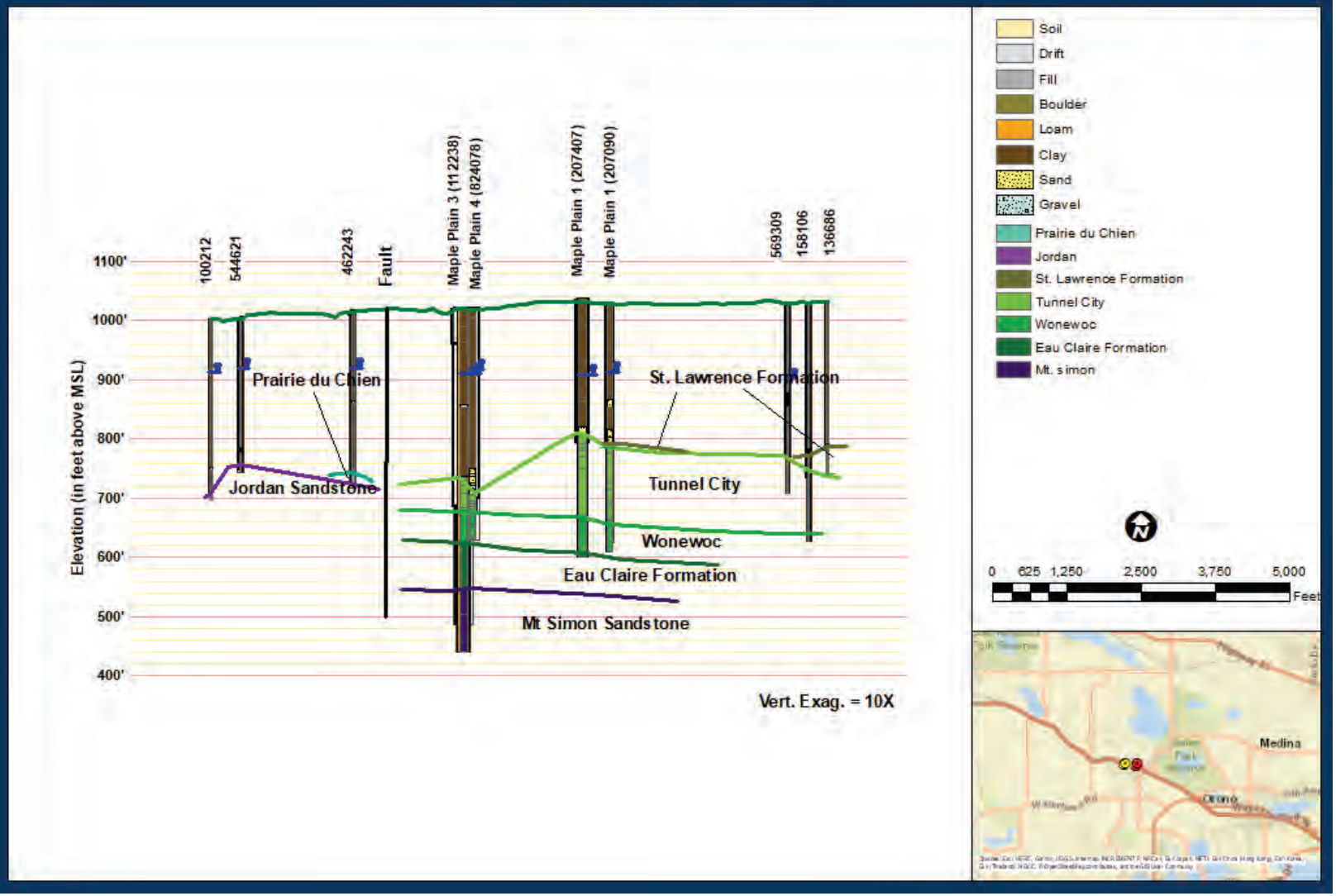
Figure 2b
Ambient Groundwater Flow Field
Mt. Simon
Maple Plain




Hennepin County
Minnesota
Figure 3
Trends of Geologic Cross-Sections
Maple Plain
DEPARTMENT OF HEALTH
CLEAN WATER LAND & LEGACY
Maple Plain Wells
Status
Primary
Emergency
Drinking Water Supply Management Area (10 yr TOT)
Geologic Cross-Sections
Wells on Cross-Sections
Faults
0 500 1,000 2,000 3,000
Feet
B'
405515
403781
158106
136686
569309
192882
A'
Maple Plain #1
207090
Maple Plain #2
207407
Maple Plain #3
824078
Maple Plain #4
112238
544621
100212
462243
A
400889
B
Medina
Orono

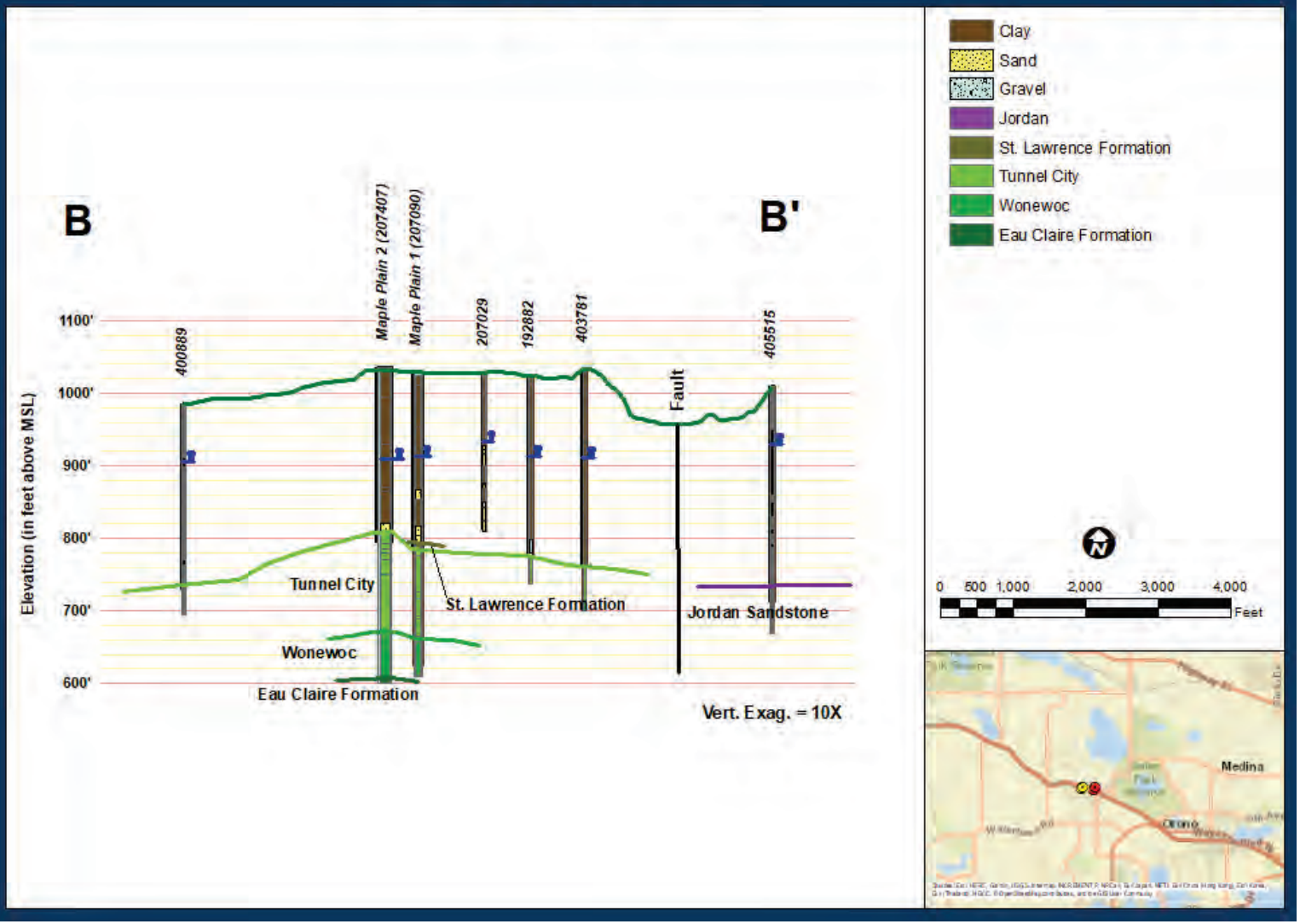
Hennepin County
Minnesota

Figure 4a
Geologic Cross-Section A-A'
Maple Plain



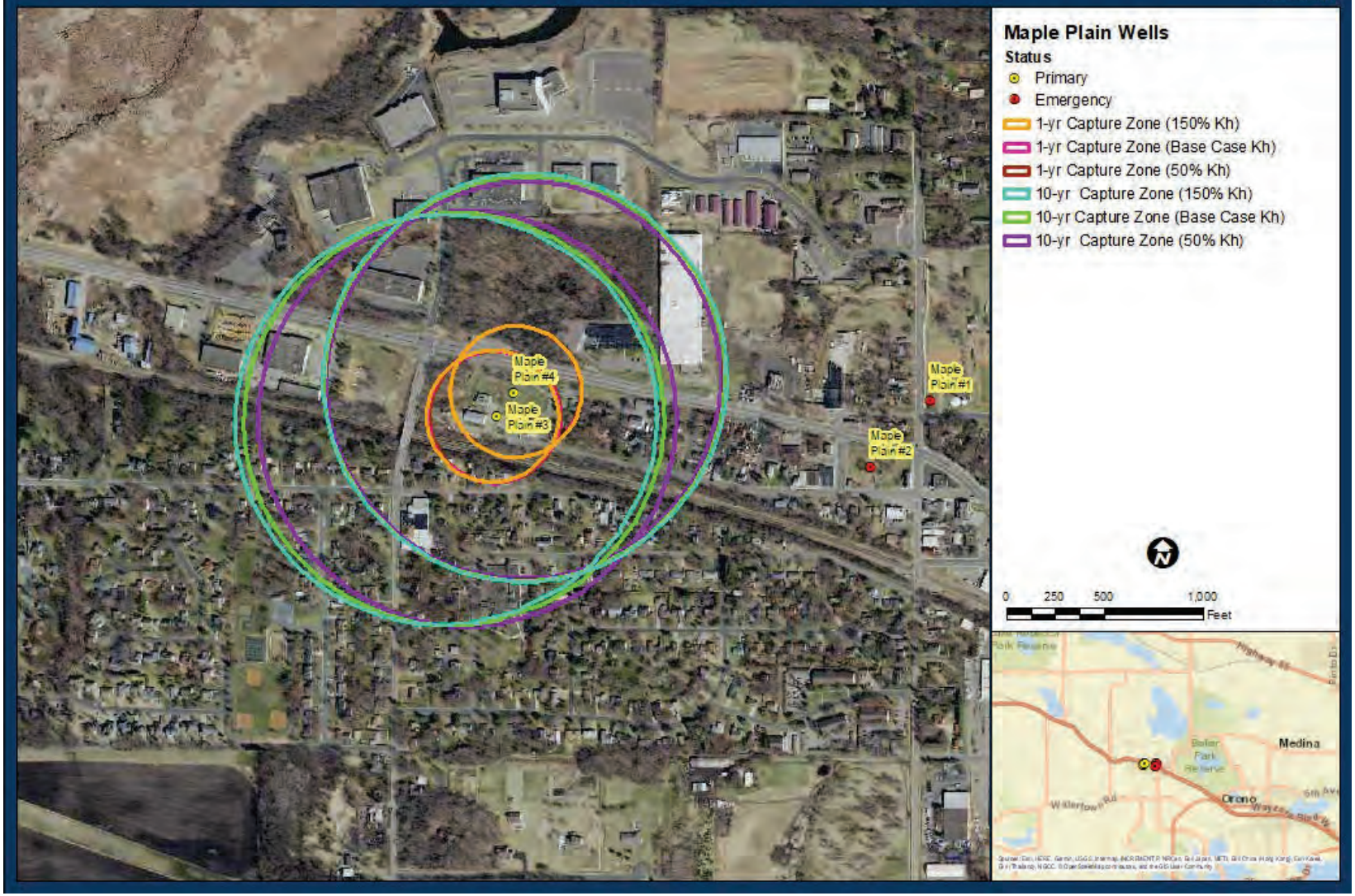
Hennepin County
Minnesota

Figure 4b
Geologic Cross-Section B-B'
Maple Plain



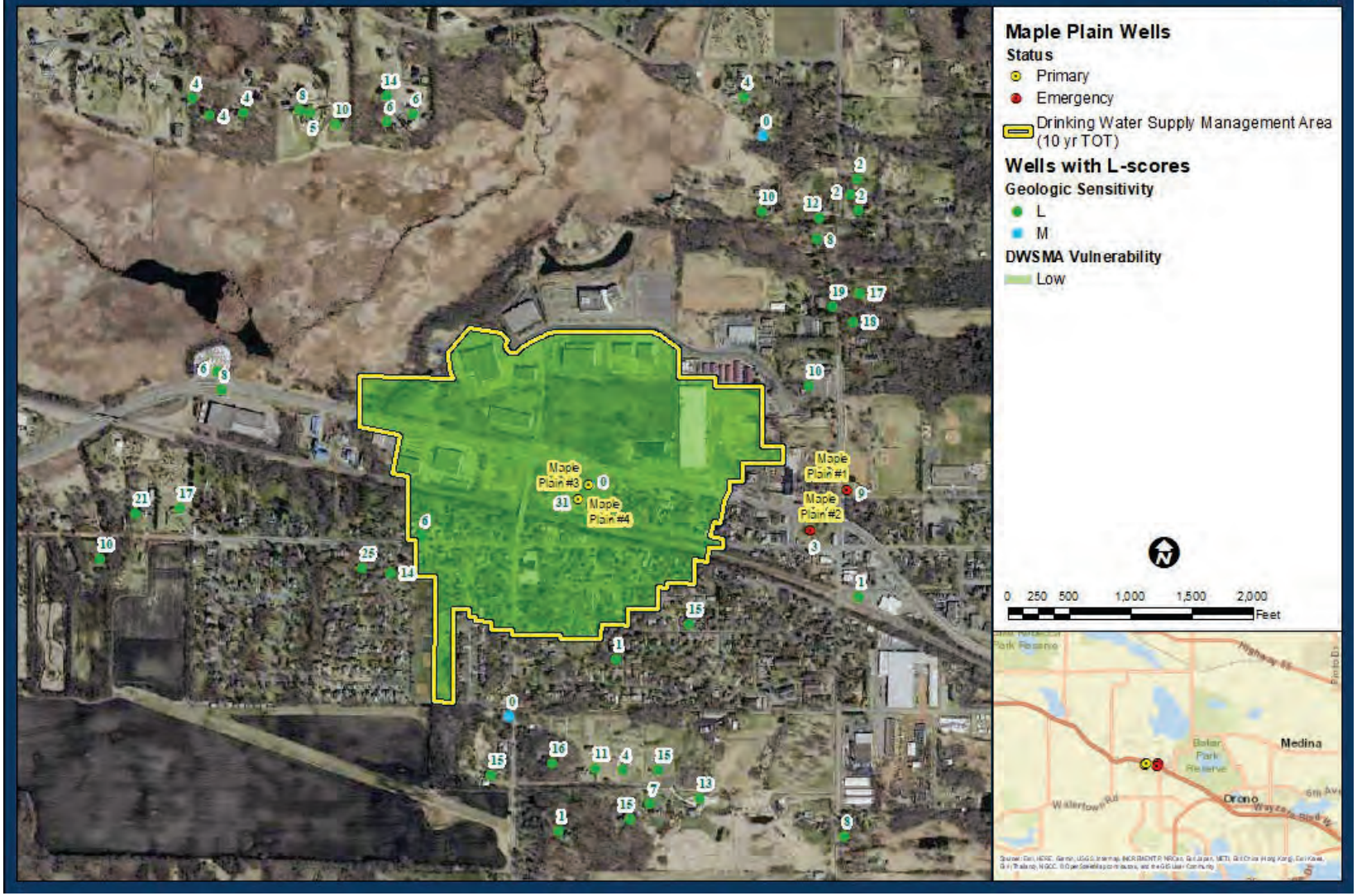
Hennepin County
Minnesota

Figure 5
Capture Zones from MODFLOW Used in the Delineations of the WHPA and ERA
Maple Plain



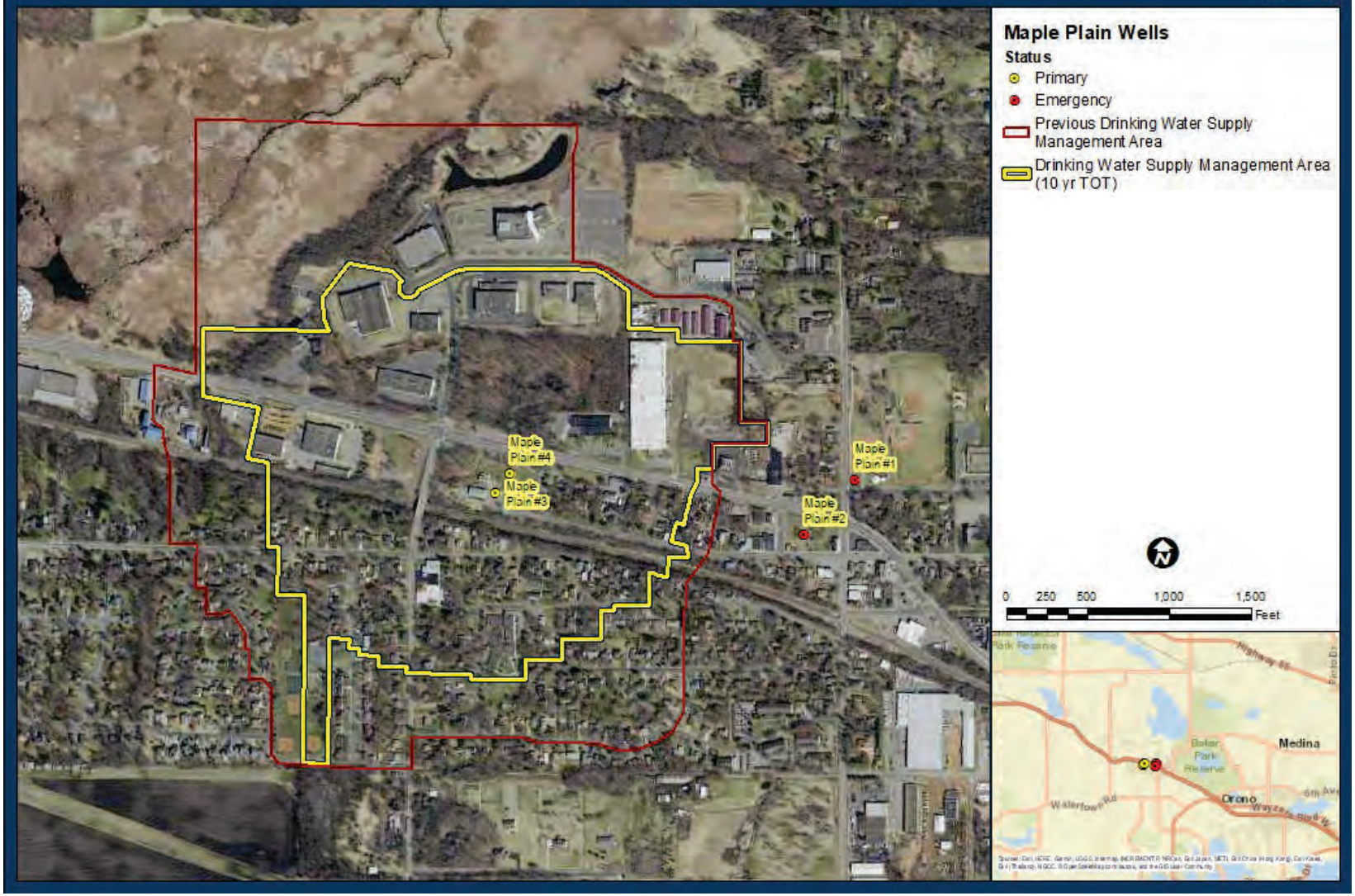
Hennepin County
Minnesota

Figure 6
Drinking Water Supply Management Area Vulnerability
Maple Plain



Hennepin County
Minnesota

Figure 7
Comparison with Previous Drinking Water Supply Management Area
Maple Plain



Appendix A: Data Elements Assessment

Data Type	Data Element	Use of the Well(s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	Data Source
Climate	Precipitation					
Geology	Maps and geologic descriptions	M	H	H	H	MGS, DNR, USGS, Consultant Reports
Geology	Subsurface data	M	H	H	H	MGS, MDH, MPCA, DNR, MDA
Geology	Borehole geophysics	M	H	H	H	None available
Geology	Surface geophysics	L	L	L	L	None available
Soils	Maps and soil descriptions					
Soils	Eroding lands					
Water Resources	Watershed units					
Water Resources	List of public waters					
Water Resources	Shoreland classifications					
Water Resources	Wetlands map					
Water Resources	Floodplain map					
Land Use	Parcel boundaries map	L	H	L	L	Hennepin County
Land Use	Political boundaries map	L	H	L	L	MnGEO, City
Land Use	Public Land Survey map	L	H	L	L	MnGEO
Land Use	Land use map and inventory					
Land Use	Comprehensive land use map					
Land Use	Zoning map					
Public Utility Services	Transportation routes and corridors	L	L	L	L	MnDOT, MnGEO
Public Utility Services	Storm/sanitary sewers and PWS system map					
Public Utility Services	Oil and gas pipelines map					
Public Utility Services	Public drainage systems map or list					
Public Utility Services	Records of well construction, maintenance, and use	H	H	H	H	City, CWI, MDH
Surface Water Quantity	Stream flow data					
Surface Water Quantity	Ordinary high water mark data					
Surface Water Quantity	Permitted withdrawals					

Data Type	Data Element	Use of the Well(s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	Data Source
Surface Water Quantity	Protected levels/flows					
Surface Water Quantity	Water use conflicts					
Groundwater Quantity	Permitted withdrawals	H	H	H	H	DNR
Groundwater Quantity	Groundwater use conflicts	H	H	H	H	No relevant data found
Groundwater Quantity	Water Levels	H	H	H	H	No relevant data found
Surface Water Quality	Stream and lake water quality management classifications					
Surface Water Quality	Monitoring data summary					
Groundwater Quality	Monitoring data	H	H	H	H	MPCA, MDH, MDA, USGS
Groundwater Quality	Isotopic data	H	H	H	H	MPCA, MDH, MDA, USGS, Hennepin County, UMN
Groundwater Quality	Tracer studies	H	H	H	H	No relevant data found
Groundwater Quality	Contamination site data	M	M	M	M	MPCA, MDA
Groundwater Quality	Property audit data from contamination sites					
Groundwater Quality	MPCA and MDA spills/release reports	M	M	M	M	MPCA, MDA

Definitions Used for Assessing Data Elements

- High (H): the data element has a direct impact.
- Moderate (M): the data element has an indirect or marginal impact.
- Low (L): the data element has little if any impact.
- Shaded: the data element was not required by MDH for preparing this delineation.

Acronyms used in this report are listed after the “Glossary of Terms.”

Appendix B: Local MODFLOW Model

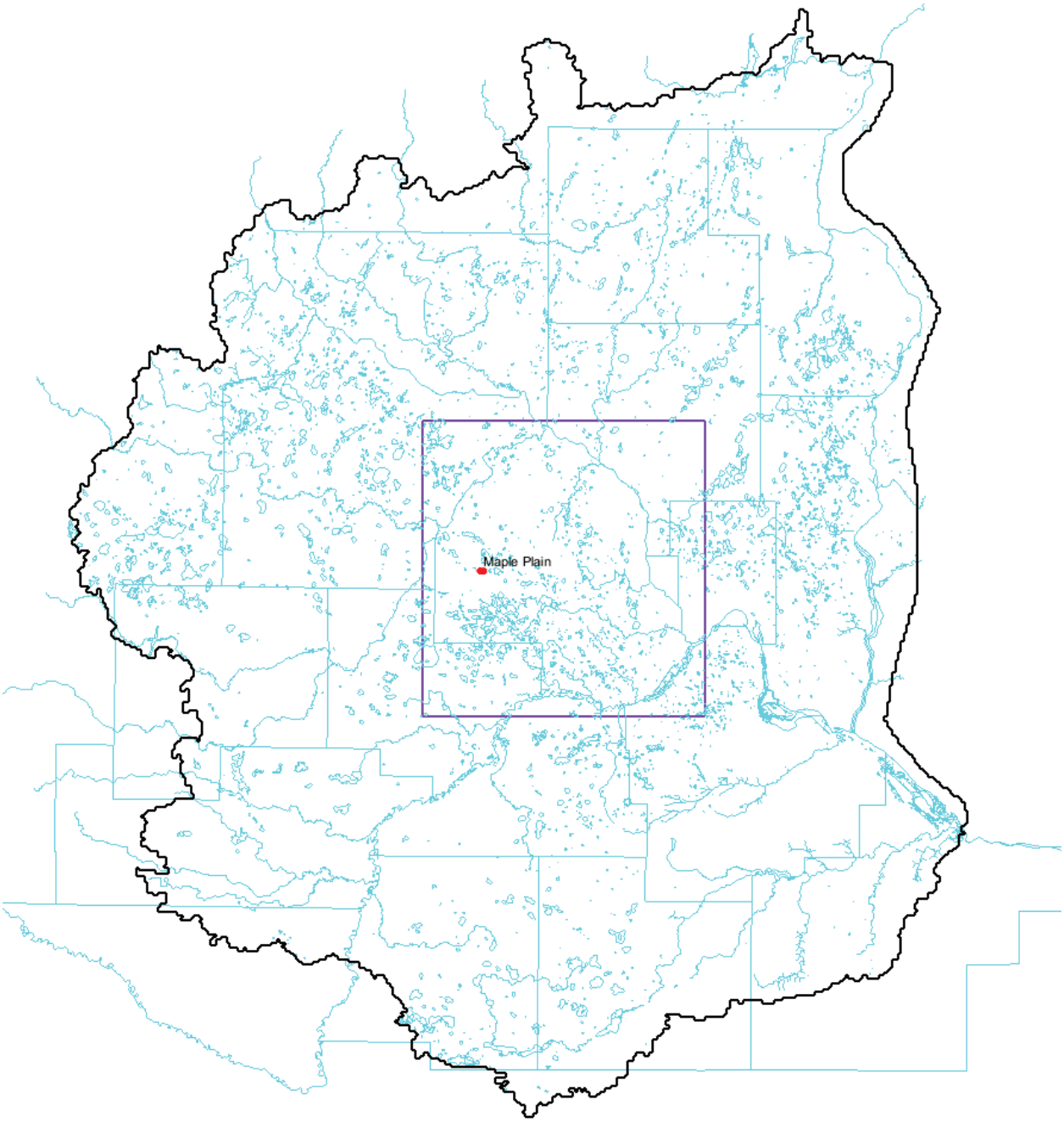


Figure B1 – Local Model/Regional Model Relationship

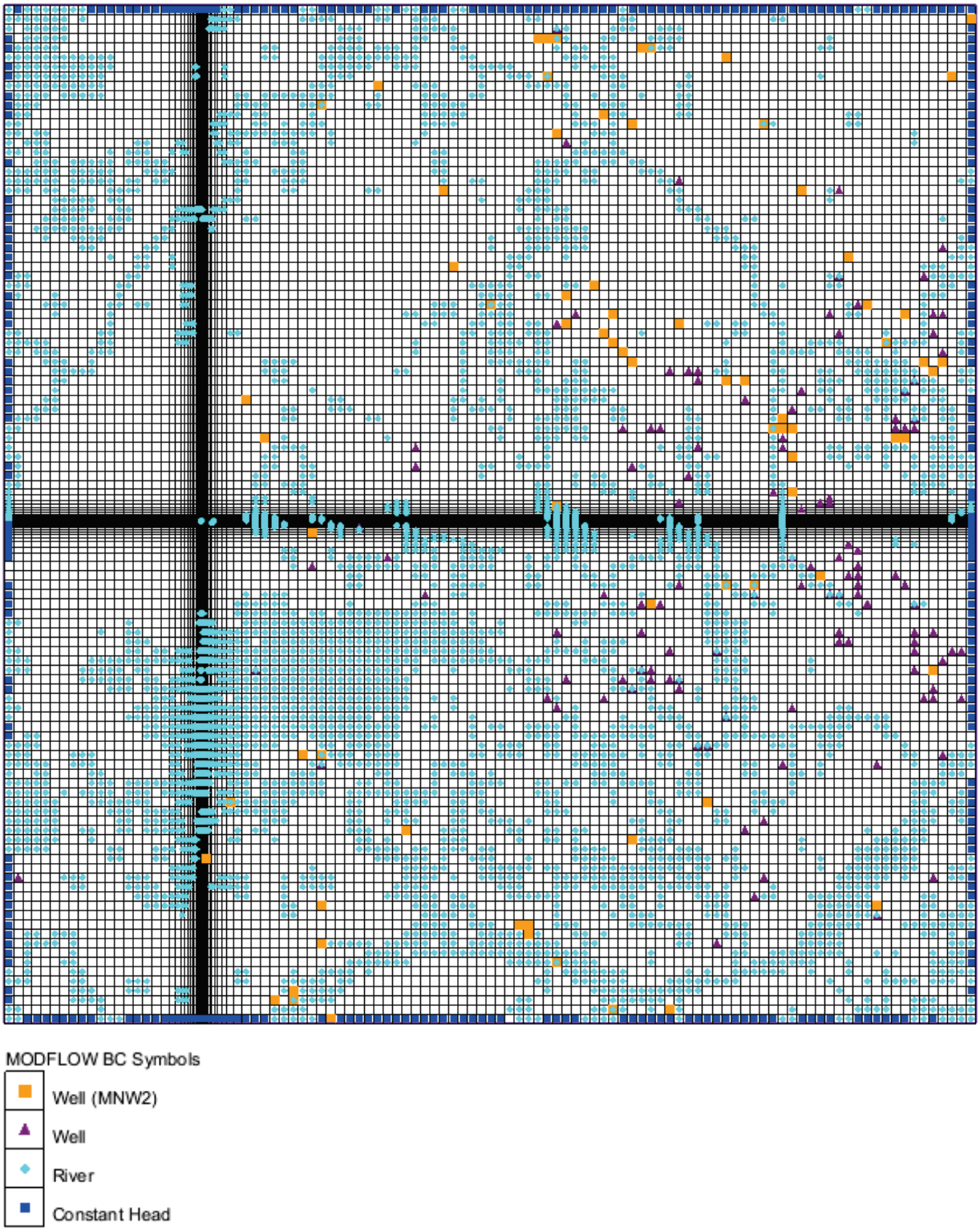
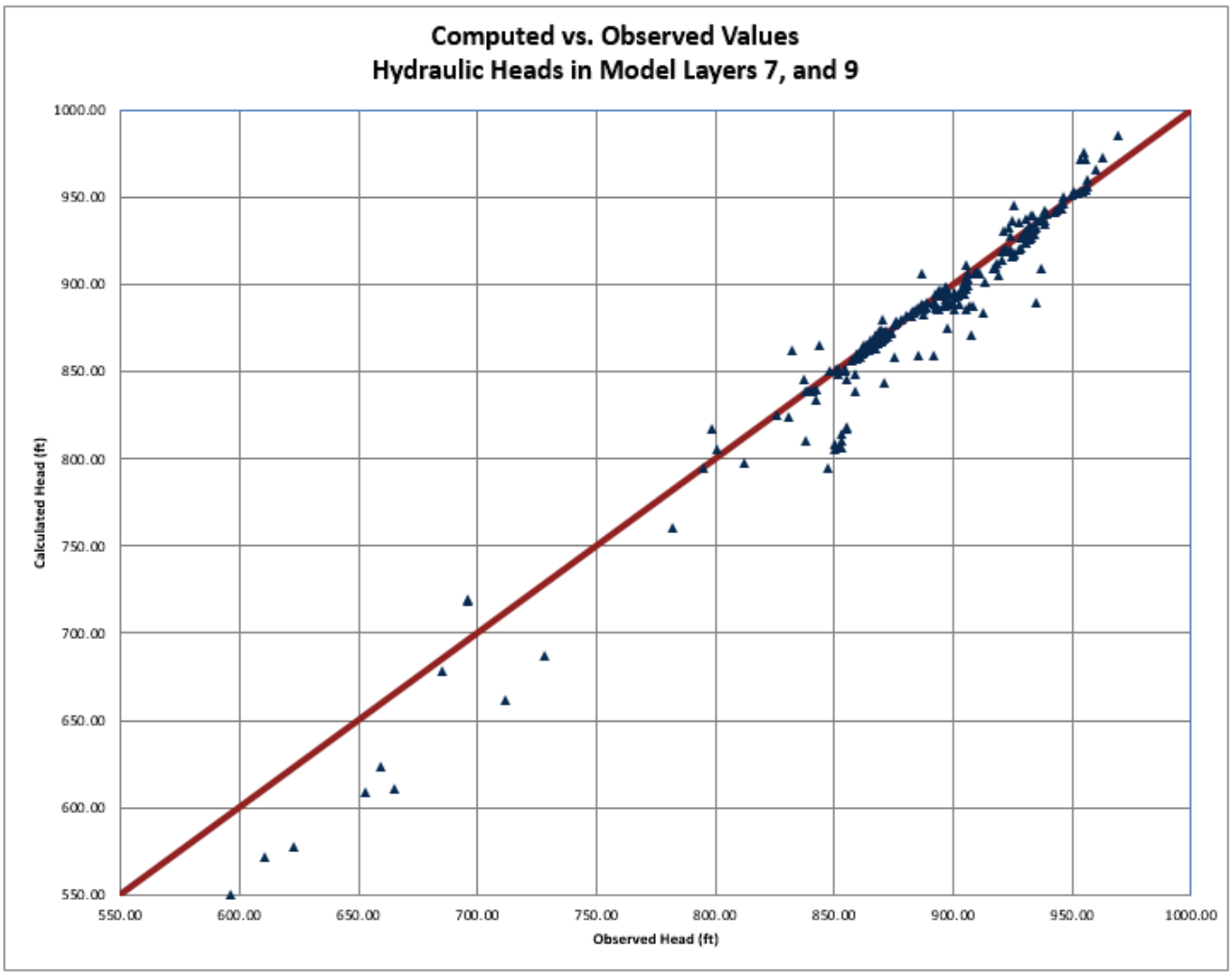


Figure B-2 – Model Layout – Local MODFLOW Model



5.43	= Mean Residual
7.50	= Mean Absolute Residual
14.43	= Root Mean Squared Residual
3.25%	= Normalized RMS

Figure B-3 – Computed vs. Observed Hydraulic Heads in Wonewoc/Mt. Simon Aquifers

DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

February 6, 2024

Mr. Jacob Kolander, Administrator
City of Maple Plain
P.O. Box 97
Maple Plain, Minnesota 55359

Dear Mr. Kolander:

Subject: Scoping 2 Decision Notice and Meeting Summary – City of Maple Plain – 1270021

This letter provides notice of the results of a scoping meeting held with you (city of Maple Plain), Dylan Hoflock (People Service), and me on January 17, 2024, at Maple Plain City Hall regarding wellhead protection (WHP) planning. During the meeting, we discussed the data elements that must be compiled and assessed to prepare the part of the WHP plan related to the management of potential contaminants in the approved drinking water supply management area. The enclosed Scoping 2 Decision Notice lists the data elements discussed at the meeting. We also discussed a summary of planning issues and recommendations that were identified during the Part 1 WHP Plan development process which should be considered for inclusion in your Part 2 WHP Plan.

The city of Maple Plain has met the requirements to distribute copies of the first part of the WHP plan to local units of government and hold an informational meeting for the public. The city of Maple Plain will have until October 30, 2025, to complete its WHP plan.

It is our understanding that a consultant will be working with you to develop a draft of the remainder of the WHP plan. I will be contacting you to review the progress of the development of Part 2 of your plan. Upon request, the Technical Assistance Planner can provide a glossary of terminology, identification of information sources for the required Data Elements, and other technical assistance documents. If you have any questions regarding the enclosed notice, contact me by email at abby.shea@state.mn.us or by phone at 651-201-4386.

Sincerely,

Abby Shea, Planner
Source Water Protection Unit
Environmental Health Division
P.O. Box 64975
St. Paul, Minnesota 55164-0975

AS:jk
Enclosures: Scoping 2 Decision Notice, PCSI Requirements, WHP Planning Summary
cc: Brian Noma, MDH Engineer, St. Paul District Office

Wellhead Protection Plan

Minnesota Department of Health
Source Water Protection Unit Staff
PO Box 64975
St. Paul, MN 55164-0975
Fax: 651-201-4701
health.drinkingwater@state.mn.us
www.health.state.mn.us

To obtain this information in a different format, call: 651-201-4700.

SCOPING 2 DECISION NOTICE – LOW VULNERABILITY DWSMA

Date: February 6, 2024

Name of Public Water Supply: City of Maple Plain

PWSID: 1270021

Name of the Wellhead Protection Manager: Jacob Kolander

Address: P.O. Box 97

City: Maple Plain

Zip: 55359

Phone: 763-479-0516

Primary Unique Well Numbers: 112238 (Well #3) and 824078 (Well #4)

DWSMA Vulnerability: ☒ Low

The purpose for the second scoping meeting, as required by Minnesota Rules, part 4720.5340, is to discuss the information necessary for preparing Part 2 of a Wellhead Protection Plan. The Part 1 Plan identifies the area that provides the source of drinking water for the public water supply (PWS) and assesses how vulnerable that area is to contamination. The PWS can utilize that information to develop land use and management practices that protects their groundwater resource from contamination.

The wellhead rule (Minnesota Rules, part 4720.5340) refers to the information required for wellhead planning as data elements. This notice lists the data elements that are stated in Minnesota Rules, part 4750.5400 and are selected for the PWS because of the low vulnerability of the drinking water supply management area (DWSMA) as determined in Part 1.

Scoping 2 Data Elements Needed for the Part 2

Data Elements are pieces of information in the form of a map, a list, records, tables and inventories. Where appropriate, they should be reviewed and assessed in terms of their present and/or future implications on the 1) use of the well(s), 2) quality and quantity of water supplying the public water supply wells(s), and 3) land and groundwater uses in the DWSMA. It is important to discuss the relevance of the data elements to management of the DWSMA. Check the technical assistance comments for guidance on reviewing the data elements and conducting these assessments. Clearly identify in the plan which data elements are associated with which tables/figures. If a data element does not exist, state that in the narrative.

Submit –

The following information, highlighted with an asterisk* with blue text, MUST be submitted in the Part 2 by including it in the plan narrative and/or appendix.

- ☐ *A map that indicates the vulnerability and includes the DWSMA, WHP Area, and Emergency Response Area must be included in the Part 2. This map with vulnerability is a product of the Part 1 and provides a basis for planning activities in Part 2. SWP Planner can provide the DWSMA figure.

DATA ELEMENTS ABOUT THE LAND USE –

Land Use

- ☐ *An existing map of political boundaries.
- ☐ *An existing map of public land surveys including township, range, and section.

Technical Assistance Comments: A map or maps showing updated political boundaries and township, range, section with labels is required for determining land use authorities for the land within the DWSMA. DWSMA figure map provided by SWP Planner will also contain political boundaries with township, range, and section. Determine and discuss how the various land use authorities may affect the management of the DWSMA.

- A map and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources.
  - ☐ *The Potential Contaminant Source Inventory (PCSI) data in both a table and map format must be created and included in the Part 2. Include potential contaminant sources as listed on the PCSI attachment provided for each existing vulnerability within the DWSMA.
    - Inventory wells greater than 270 feet in depth. Also inventory wells of undocumented or unknown depths.
    - The inventory should include your community wells but not include any wells that are known to have been sealed according to the Minnesota Well Code (MN Rules 4725).
  - ☐ *A land use/land cover map and table. SWP Planner can provide a land cover map and data/table from federal sources. This data set should be used unless an alternative electronic data set that is more current and detailed is available. Assess and discuss changes in land use that could impact management of the DWSMA.

- ☐ *An inventory of the Inner Wellhead Management Zone (IWMZ). A recent IWMZ inventory (within six years) for each primary well with management recommendations on the MDH form, or a table that summarizes the number and type of contaminant sources with the management recommendations must be included. Incorporate or reference the recommendation(s) from the IWMZ into the Part 2. IWMZ will be completed by the SWP Planner with assistance from the PWS staff. A copy will be provided to the PWS.

Technical Assistance Comments: This section encompasses the Potential Contaminant Source Inventory known as the PCSI. See the Scoping 2 Decision Notice Potential Contaminant Source Inventory Requirement Attachment(s) and endorsement procedures/fact sheets for further information. Utilize the PCSI geo-database attribute template provided by SWP Planner. Management strategies must be developed for potential sources of contamination that pose a risk to the drinking water supply.

- ☐ *An existing comprehensive land-use map.
- ☐ *An existing zoning map.

Technical Assistance Comments: This information can indicate areas in the DWSMA where growth or the addition of potential contaminant sources is likely to occur. Furthermore, the review of local zoning and comprehensive land-use maps facilitates the evaluation of the degree of compatibility current and future land uses have with the PWS goals of protecting the drinking water wells and aquifer.

Required to be discussed in plan -

The following information (if existing) MUST be reviewed and discussed in the development of the Part 2. The Part 2 narrative must contain a description identifying whether/how the information may influence the management of the DWSMA. The data element may be located in the public domain. While the map or document reviewed is not required to be included in the Part 2, the source of the data element must be provided in the plan narrative by indicating a web address or reference to its location. Provide a statement in the plan narrative if the data element does not apply or does not exist.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT –

Water Resources

- An existing map showing those areas delineated as floodplain by existing local ordinances.

Technical Assistance Comments: Assess and describe any issues and management needed in the DWSMA based on the Federal Emergency Management Agency (FEMA) Floodplain 100-year FIRM (Flood Insurance Rate Map) and (or) other State and local floodplain or flooding information. Consult with the WHP Manager to evaluate any potential or historical flooding impacts on the public water supply wells or aquifer. The Inner Well Management Zone report and Sanitary Survey may be used to identify flooding issues and impacts.

DATA ELEMENTS ABOUT THE LAND USE –

Land Use

- An existing map of parcel boundaries.

Technical Assistance Comments: Parcel boundaries may have been used for delineation of the DWSMA in Part 1. In Part 2, parcel identification information must be included or linked and must be used for education or targeting activities or practices in addressing potential contaminants. In the narrative indicate if parcel data is available from the public domain (i.e. county GIS or associated website such as Beacon).

Part 1 -

The following information was reviewed and assessed in developing the Part 1. Some data elements may be in the public domain or non-existent, and others may have been determined by the MDH hydrogeologist to be not applicable to the physical setting, so discussion was not included in the Part 1. The Part 1 should be used as a data source for the Part 2. The technical assistance comments provide the requirements for how this information must be discussed and/or included in the Part 2. Include relevant excerpts or summaries from the Part 1 where indicated.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT –

- An existing geologic map and a description of the geology, including aquifers, confining layers, recharge areas, discharge areas, sensitive areas as defined in Minnesota Statutes, section 103H.005, subdivision 13, and groundwater flow characteristics.
- Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.
- Existing borehole geophysical records from wells, borings, and exploration test holes.
- Existing surface geophysical studies.

Technical Assistance Comments: Provide a summary in the plan narrative (few sentences/paragraph) of the Description of the Hydrologic Setting from Part 1. Provide the conclusions regarding the Well and DWSMA Vulnerabilities related to the geologic conditions and how these conditions influence the management of the DWSMA.

DATA ELEMENTS ABOUT THE LAND USE –

Public Utility Services

- An existing record of construction, maintenance, and use of the public water supply well and other wells within the DWSMA.

Technical Assistance Comments: Well construction records indicate what is known about the well(s) and can indicate if the well(s) have structural integrity or groundwater protection issues. Briefly summarize in the plan narrative what is discussed about each well from the Assessment of Well Vulnerability in Part 1.

DATA ELEMENTS ABOUT WATER QUANTITY –

Groundwater Quantity

- An existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.
- An existing description of known well interference problems and water use conflicts.
- An existing list of state environmental bore holes, including unique well number, aquifer measured, years of record, and average monthly levels.

Technical Assistance Comments: This information, if known, was incorporated into the Part 1 and was used to assist in determining hydrologic boundary conditions and area static water levels. In Part 2, information about Department of Natural Resources appropriation permit holders and any known well interference problems or water use conflicts must be discussed, including how this information could affect the management of the DWSMA.

DATA ELEMENTS ABOUT WATER QUALITY –

Groundwater Quality

- An existing summary of water quality data, including: 1. bacteriological contamination indicators; 2. inorganic chemicals; and 3. organic chemicals.
- An existing list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.
- An existing report of groundwater tracer studies.

Technical Assistance Comments: This information, if known, was incorporated into the Part 1. Provide a summary of the assessment of well vulnerability and/or any relevant chemistry and isotopic composition data available from PWS wells and other wells/sources.

Revision Date: 01/2022

DEPARTMENT OF HEALTH

Maple Plain Scoping 2 Meeting
Wellhead Protection (WHP) Planning Issues Summary

NOTE: This document is intended to be a summary of issues identified to date and is **not intended to replace the required data elements identified in the Scoping 2 Decision Notice** nor is it intended to be an exhaustive list of all potential drinking water issues.

Drinking Water Protection Issues Identified to Date:

- The city of Maple Plain has two primary wells screened in sandstone bedrock aquifers that are buried beneath a layer of clay-rich sediment. Wells #3 and #4 are 534 feet and 392 feet deep, respectively. Regionally, groundwater flow is to the south/southeast.
- MDH has assigned a low vulnerability to the DWSMA. This suggests that the clay-rich sediments that overlie the city's aquifers prevent water and contaminants from moving quickly from the land surface into the city's aquifers and implies a time a travel of decades or longer. The principal threats to these aquifers are unsealed abandoned wells that penetrate through this clay layer. Such wells are 270 feet or greater in depth in the Maple Plain Area.

Water Quality Detections and Implications:

- Water samples were collected from city wells and were analyzed for tritium, nitrate, chloride, and bromide. Detectable tritium indicates the presence of some young (post-1953) water within the aquifer. At present, none of the contaminations for which the Safe Drinking Water Act has established health-based standards have been found above maximum allowable levels in the city's water supply, nor are any present at one-half of those levels. Maple Plain currently treats for radium which is above the safe drinking water standard in the source aquifer.

Old Municipal Well Information:

The Minnesota Department of Health has compiled historical information for use in the planning process.

Sanborn Maps:

☐ Sanborn Maps are available for this area.

☒ Sanborn Maps are not available for this area.

Recommended WHP Measures:

1. Well Locating: This delineation is based on very little well data. If wells are constructed within two miles of the city or one mile of the DWSMA, their locations should be verified. This information may allow a better understanding of the extent and thickness of the city's aquifers and the overlying clay confining units and result in a more refined WHPA in the future.
2. Water Quality Monitoring: The standard assessment monitoring package should be analyzed during year six, including the primary wells and river, contingent on funding assistance from MDH for sampling and analysis. The city may need to collect the samples and ship them to MDH. Information generated by this sampling will be used to refine vulnerability assessments for the next amendment.

Other: None.

WELLHEAD PROTECTION PLAN
PART 2

JUNE 27, 2013

STANTEC FILE 193800408

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Public Water Supply Profile

PUBLIC WATER SUPPLY

NAME: City of Maple Plain PWSID #: 1270021

ADDRESS: 1620 Maple Avenue, Maple Plain, MN 55359

TELEPHONE NUMBER: (763) 479–0515

E–MAIL: publicworks@mapleplain.com FAX #: (763) 479–0519

WELLHEAD PROTECTION MANAGER

NAME: Brent Mickolichek, Public Works

ADDRESS: 1620 Maple Avenue, Maple Plain, MN 55359

TELEPHONE NUMBER: (763) 479–0525

E–MAIL: publicworks@mapleplain.com FAX #: (763) 479–0519

CONSULTANT/TECHNICAL ASSISTANCE

NAME: Mark Janovec, Stantec

ADDRESS: 2335 West Highway 36, St. Paul, MN 55113

TELEPHONE NUMBER: (651) 604–4831

E–MAIL: mark.janovec@stantec.com FAX #: (651) 636–1311

Documentation List

STEP	DATE PERFORMED
Part 1 Approval Notice Received from MDH	September 23, 2011
Scoping 2 Meeting Held (4720.5349, subp. 1)	March 5, 2012
Scoping 2 Decision Notice Received (4720.5340, subp. 2)	April 3, 2012
Remaining Portion of Plan Submitted to Local Units of Government (LGU's) (4720.5350, subp. 1 & 2)	March 13, 2013
Review Received From Local Units of Government (4720.5350, subp. 2)	May 2013
Review Considered (4720.5350, subp. 3)	May 2013
Public Hearing Conducted (4720.5350, subp.4)	June 10, 2013
Remaining Portion WHP Plan Submitted (4720.5360, subp. 1)	June 27, 2013
Approved Review Notice Received	

Executive Summary

This portion of the wellhead protection (WHP) plan for the City of Maple Plain includes:

- The results of the Potential Contaminant Sources Inventory,
- The Potential Contaminant Sources Management Strategy,
- The Emergency/Alternative Water Supply Contingency Plan, and
- The Wellhead Protection Program Evaluation Plan.

Wells covered under this WHP Plan are listed in Table 1 on Page 4.

Part 1 of the wellhead protection plan presented the delineation of the wellhead protection areas (WHPA) and the drinking water supply management areas (DWSMA) and the vulnerability assessments for the system's wells and the aquifer within the DWSMA. Part 1 of the WHP plan was submitted to the Minnesota Department of Health (MDH) and approved on September 23, 2011. The Part 1 plan is included in this report as Appendix A. The boundaries of the WHPA and DWSMA are shown in Figure 1 on Page 2.

The **vulnerability assessment for the aquifer within the DWSMA** was performed using available information and indicates that the aquifer used by the City is not considered to be vulnerable to contamination because it is covered by fine-grained geologic materials that hydraulically separate it from surface water. Consequently, the principle potential sources of contamination to the aquifer are other wells that reach or penetrate it. This information was presented to the WHP team during the Scoping 2 Meeting held with the MDH on March 5, 2012 when the necessary requirements for the content of Part 2 were outlined and discussed in detail.

The **vulnerability assessment for the public water supply system's well** indicates that Well No. 3 is considered non-vulnerable to contamination, based on the well construction information and geologic data recorded at the time the well was drilled.

The information and data contained in Chapters 1 – 4 of this part of the WHP Plan (hereafter referred to as Plan) support the approaches taken to address potential contamination sources that have been identified as potentially affecting the aquifer used by the public water supply. The reader is encouraged to concentrate attention on Chapters 1 – 4 in order to better understand why a particular management strategy is included in Chapter 5.

In Chapter 1, the required data elements indicated by the MDH in the Scoping 2 Notice are addressed as well as the data's degree of reliability. Pertinent data elements include information about the geology, water quality and water quantity. The data elements and information supplied in Part 1 of the WHP Plan are based on the assessment that the aquifers providing drinking water for this system are most likely to be vulnerable to other wells that penetrate the same aquifer.

Chapter 2 addresses the possible impacts that changes in the physical environment, land use, and water resources have on the public water supply. The City of Maple Plain has evaluated the support necessary to implement its wellhead protection plan.

The problems and opportunities concerning land use issues relating to the aquifer, well water and the DWSMA, and those issues identified at public meetings are addressed in Chapter 3. The non-vulnerable status of the aquifer, and the good quality of water currently produced by the system's wells leaves only two major concerns: other wells located within the DWSMA that could become pathways for contamination to enter the aquifer; and the pumping effects of high capacity wells that may alter the boundaries of the delineated WHPA, reduce the hydraulic head in the aquifer, or cause the movement of contamination toward public water supply well(s).

The drinking water protection goals that the City of Maple Plain would like to achieve with this plan are listed in Chapter 4. In essence, the City would like to maintain or improve on the current drinking water quality, increase public awareness of groundwater protection issues, protect the aquifer, and collect data to support future efforts in wellhead protection planning.

The objectives and action plans for managing the potential sources of contamination (wells that penetrate the aquifer utilized by the water system for their drinking water source) are contained in Chapter 5. Actions aimed toward educating the general public about groundwater issues, gathering information about other wells, and collecting data relevant to wellhead protection planning are the general focus.

Chapter 6 contains a guide to evaluate the implementation of the identified management strategies of Chapter 5. The wellhead protection program for the City of Maple Plain will be evaluated every two years.

The existing emergency/contingency plan is referenced to address the possibility that the water supply system is interrupted due to either emergency situations or drought. Chapter 7 references the Water Conservation Plan approved by the DNR and the EPA certified Vulnerability Assessment and Emergency Response Plan.

Chapter 1 – Data Elements; Assessment (4720.5200)

REQUIRED DATA ELEMENTS

A. Physical Environment Data Elements

1. Precipitation – This data element does not apply because there is not a direct hydraulic connection between surface waters and the aquifer serving this water supply system.

2. Geology – This data element is required for and is presented in the first part of the WHP Plan. Geologic data presented in the first part of the WHP Plan (attached as Appendix A) are generally sufficient. Geologic data collected during the construction of new wells or through future publicly documented geologic studies will be considered when the Plan is updated.

The main impact of geology on the development of the Part 2 Wellhead Protection Plan pertains to the level of vulnerability assigned to the aquifers from which the City of Maple Plain obtains its water supply. The level of geologic protection over these aquifers was sufficient to classify these aquifers as being “low” in vulnerability. The vulnerability level influences the degree to which the DWSMA should be managed.

3. Soils – This data element does not apply because there is not a direct hydraulic connection between surface waters and the aquifer serving this water supply system.

4. Water Resources – This data element applies as it relates to future groundwater uses that may influence the ability of the aquifer to yield water to the public water supply. Increased water use may result in a reduction in aquifer yield or increase the likelihood that contaminants of human or natural origin may affect the quality of drinking water.

B. Land Use Data Elements

1. Land Use – A map showing the boundaries of land parcels within the WHPA/DWSMA is included as Figure 1 of this report. Due to the information contained in Part 1, which indicate that the public water supply is not vulnerable to most land use activities, only an inventory of other wells (including shallow disposal wells and large septic systems serving 20 or more people) located within the DWSMA is required. A map showing the locations of wells inventoried within the DWSMA is provided as Figure 2. Well data are provided in Appendix B.

V:\1938\active\193800408\GIS\Projects\Figure 1 - WHPA and DWSMA.mxd Thursday, December 1

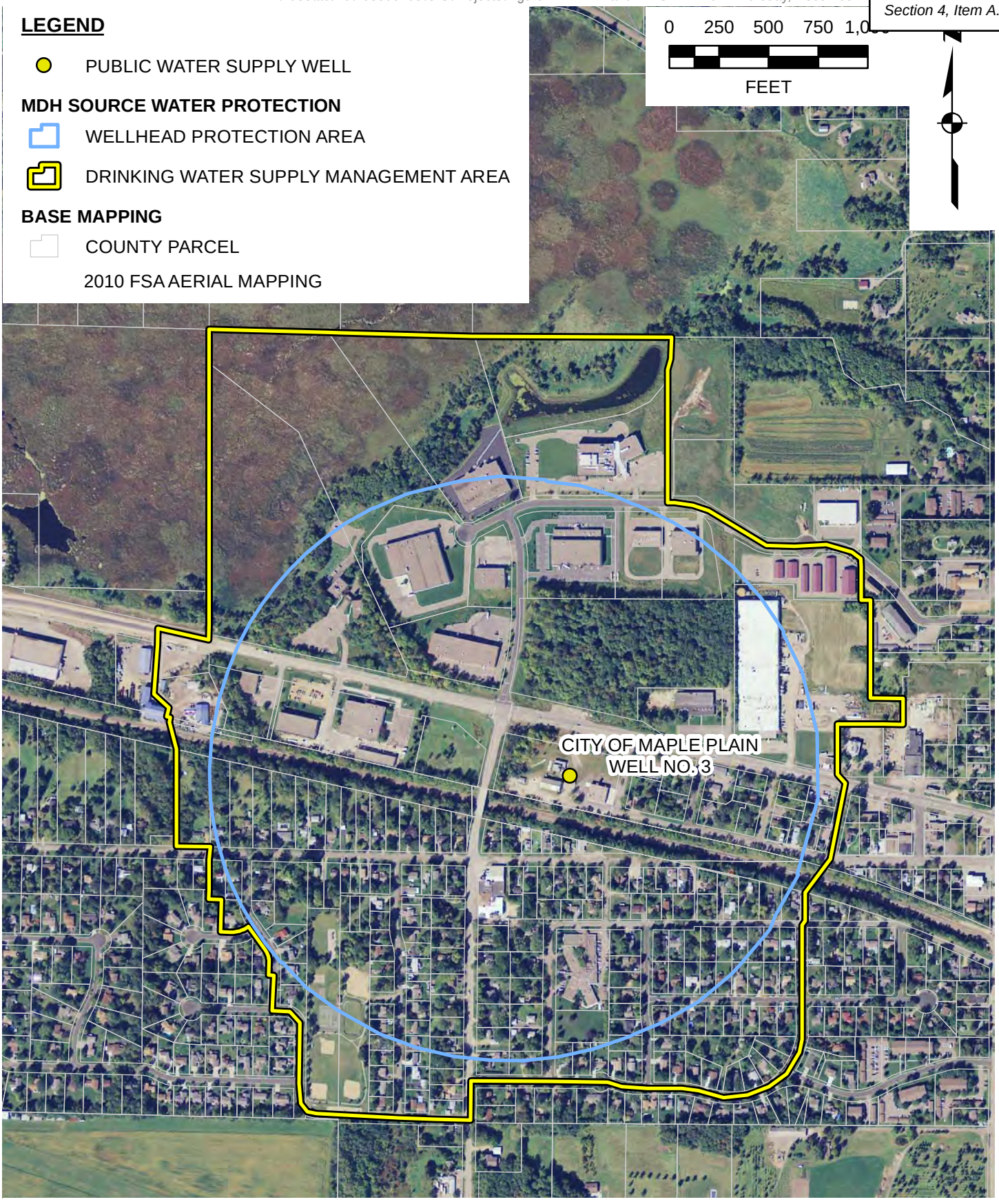


FIGURE 1 - WELLHEAD PROTECTION AREA AND DRINKING WATER SUPPLY MANAGEMENT AREA

CITY OF MAPLE PLAIN
WELLHEAD PROTECTION PLAN

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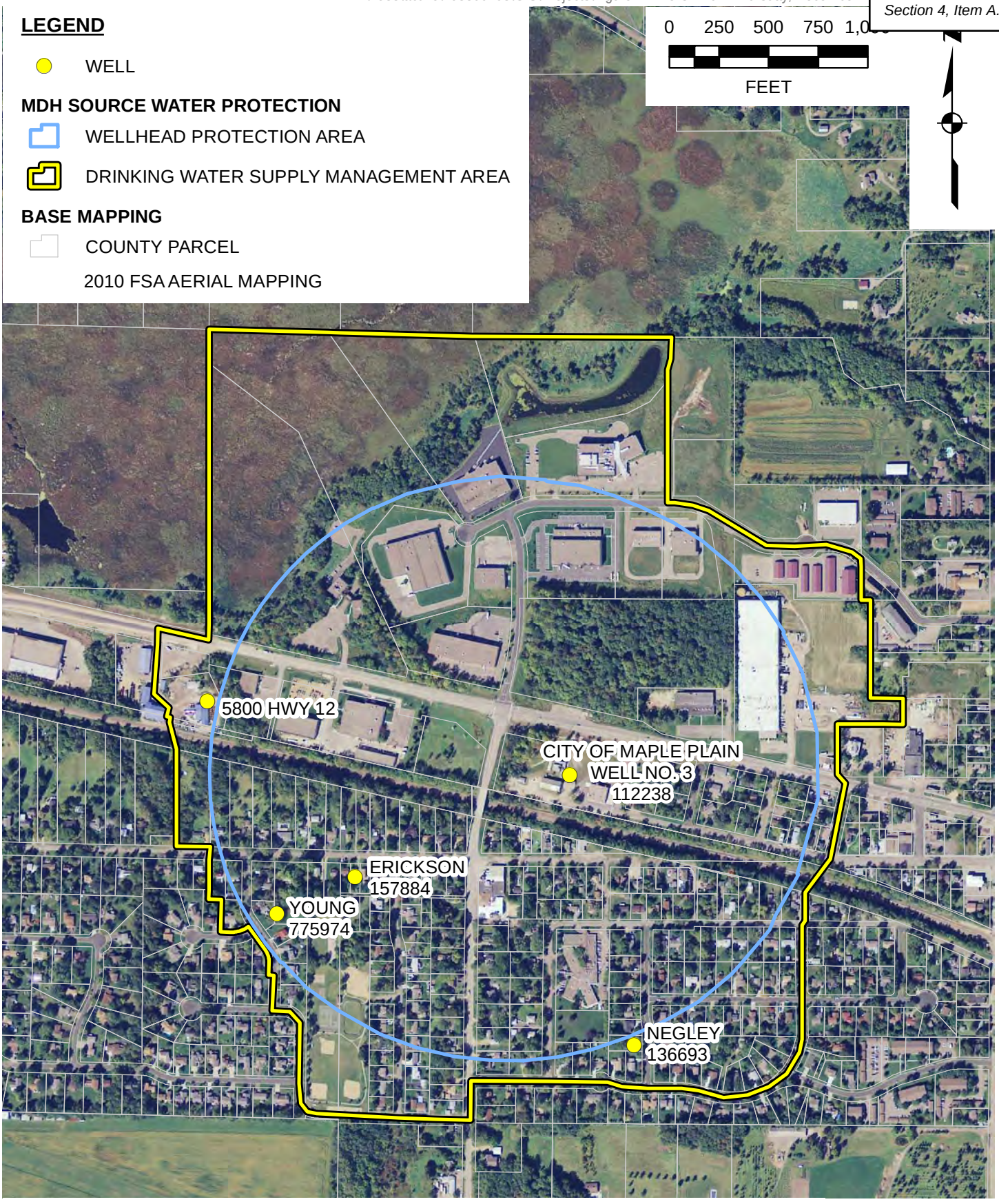

FIGURE 2 - WELLS IN DRINKING WATER SUPPLY MANAGEMENT AREA

Other information relating to land use such as political boundary maps, a comprehensive land use map and a zoning maps for the area located within the DWSMA were specifically required in the Scoping Decision notice to be included with this plan despite the low vulnerability of the aquifer within the DWSMA (See Chapter 2 for land use maps). This information can be helpful to decision makers during future planning efforts by keeping awareness of WHP and groundwater quality issues in consideration.

2. Public Utility Services – Records of well construction and maintenance apply to this data element. This information was provided in Part 1 of the Plan. The City of Maple Plain's public water supply well covered by this Plan is presented in Table 1.

Table 1 – Water Supply Well information, City of Maple Plain

Well Name	Unique Number	Aquifer	Casing Depth	Well Depth	Date Constructed/ Reconstructed	Vulnerability Status
Well No. 3	112238	Mt. Simon	534 ft	580 ft	1978/1994	Not Vulnerable

C. Water Quantity Data Elements

1. Surface Water Quantity – This data element does not apply because there is not a direct hydraulic connection between surface waters and the aquifer serving this water supply system.

2. Groundwater Quantity – Groundwater levels are adequate for the amounts that the City of Maple Plain currently is permitted for under the groundwater appropriations program that is administered by the Minnesota Department of Natural Resources (DNR). There are currently are no other high capacity wells within or near the DWSMA for which well interference complaints with the City wells have been documented. At this time, there appears to be sufficient groundwater quantity based upon existing pumping capacity of all wells completed in the aquifer used by the City.

D. Water Quality Data Elements

1. Surface Water Quality – This data element does not apply because there is not a direct hydraulic connection between surface waters and the aquifer serving this water supply system.

2. Groundwater Quality – This data element applies to this portion of the Plan for the City of Maple Plain. At present, there is no isotopic data from the existing well to indicate the age of the water being pumped. However, an analysis of the local geology indicates a sufficient thickness of fine-grained geologic deposits between the land surface and the aquifer to suggest that travel time from water infiltrating from the surface is very slow. As

such, there is a low probability that current land use has a direct impact on the quality of drinking water. Additional groundwater quality information should be collected over the ten year life of the plan, including collection of isotopic data to better define the age of the water in the well.

Based on the low vulnerability of the aquifer underlying the DWSMA, it was determined that other wells are the primary potential sources (or pathways) for contaminants that need to be inventoried and managed in this plan. Any observed changes in the general chemistry of the well water may indicate that the aquifer is receiving recharge from different pathways such as improperly constructed or sealed wells or through different geological materials.

ASSESSMENT OF DATA ELEMENTS

A. Use of the Well

General information describing this public water supply system is presented in Part 1of this Plan (Appendix A).

B. Wellhead Protection Area Delineation Criteria

See Part 1 of this Plan (Appendix A) for documentation regarding how the following delineation criteria were applied to determining the boundaries of the WHPA:

1. Time of Travel – 10 years
2. Flow Boundaries – geologic information
3. Daily Volume – provided by the City
4. Ground Water Flow Field – groundwater models
5. Aquifer Transmissivity – aquifer test plan

C. Quality and Quantity of Water Supplying the Public Water Supply Well

Water quality monitoring results indicate no evidence of contamination from: human origin such as fuel and fuel break down products, pesticides, or commercial fertilizer; or naturally occurring contaminants such as arsenic and boron. At this time problems with water quality are not an issue as the system has enjoyed water quality that meets or exceeds standards in the Federal Safe Drinking Water Act.

D. The Land and Groundwater Uses in the Drinking Water Management Area

An inventory of water wells, shallow disposal wells and large septic systems within the DWSMA was compiled. A listing of the wells found in the DWSMA is provided in Table 2. Besides the City of Maple Plain water supply wells, all other wells are domestic use wells. The inventory does not include properly sealed wells and borings. However, it is possible that other unknown or abandoned/unsealed wells exist within the DWSMA.

Table 2 – Well Inventory, City of Maple Plain Wellhead Protection Plan

Well Owner	Unique Number	Address	Depth	Aquifer	Well Type	Date Drilled	Status
City of Maple Plain	112238	1645 Pioneer Avenue	580 ft	Mt. Simon	Municipal	1978	Active
Negley	136693	1459 Prairieland Avenue	157 ft	-	Domestic	1977	Active
Erickson	157884	5687 Main Street	114 ft	-	Domestic	1979	Active
Young	775974	1554 Parkview Road	300 ft	-	Irrigation	2010	Active
Unknown	-	5800 Hwy 12	-	-	Domestic	-	Active

No known Class V injections well were identified within the DWSMA. No large septic systems were identified within the DWSMA. The management strategies selected and documented in Chapter 5 of this Plan will focus in on activities that have the most potential to impact the aquifers this public water supply system is using for its drinking water supply.

Chapter 2 – Impact of Changes on Public Water Supply Well (4720.5220)

CHANGES IDENTIFIED

A. Physical Environment

Large scale changes in the physical environment within the DWSMA are not anticipated during the 10 year period that this Plan is in effect. The geologic conditions that protect the water supply are such that changes in physical environment should have little to no effect on the aquifer within the DWSMA.

B. Land Use

Existing and future land use was reviewed as prepared for the City of Maple Plain 2030 Comprehensive Plan, finalized in June 2008. Current land use in the DWSMA is illustrated in Figure 3. Future planned land use is shown in Figure 4. No major land use changes are expected based on the existing and future land use in the City comprehensive plan. The northern portion of the DWSMA includes some additional industrial and mixed use growth to fill in currently undeveloped parcels. The southern half of the DWSMA is expected to remain relatively unchanged, as this area is already developed as single family residential. Due to the low vulnerability of the aquifer, land use changes in the DWSMA will likely have little impact on the aquifer unless additional wells are developed or water demand is increased to the point that additional loss in hydraulic head occurs within the aquifer used by the public water supply. Constructing additional wells into the aquifer(s) may increase the points of entry or draw naturally occurring or human caused contaminants towards the PWS wells.

It is not anticipated that new domestic wells will be installed in areas under development or to be developed in the DWSMA. If new wells are installed and constructed according to Minnesota Well Rules, they are not expected to pose a threat to aquifer water quality. Withdrawal rates from domestic wells are not high enough to have a significant impact on the groundwater flow field or the wellhead protection area.

C. Surface Water

There appears to be no direct hydraulic connection between surface water and the aquifer used by the public water supply system as a drinking water source. Therefore, any changes to the conditions of surface waters will have little or no impact on the quality or quantity of the public water supply.

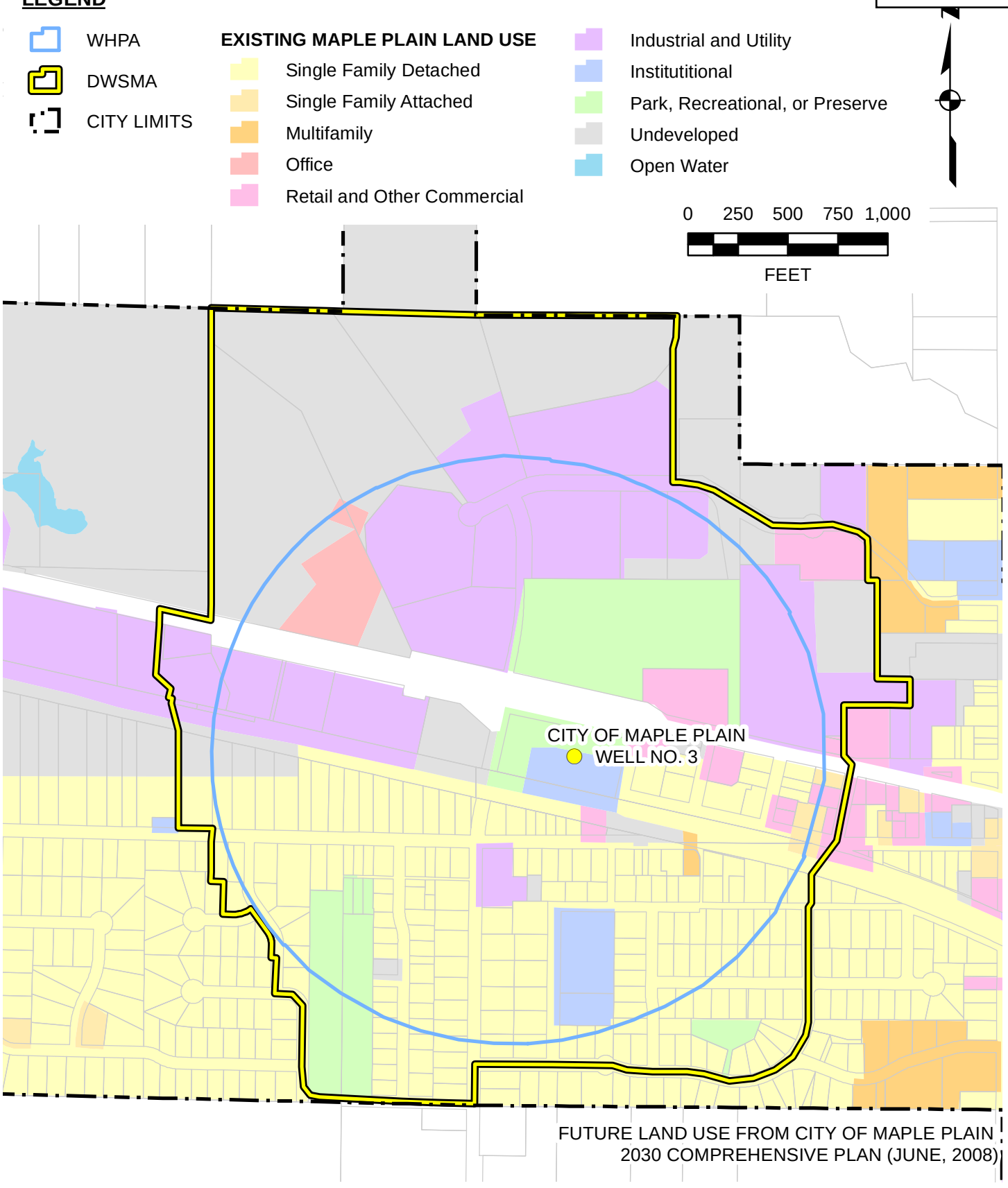

FIGURE 3 - CITY OF MAPLE PLAIN EXISTING LAND USE

CITY OF MAPLE PLAIN
WELLHEAD PROTECTION PLAN

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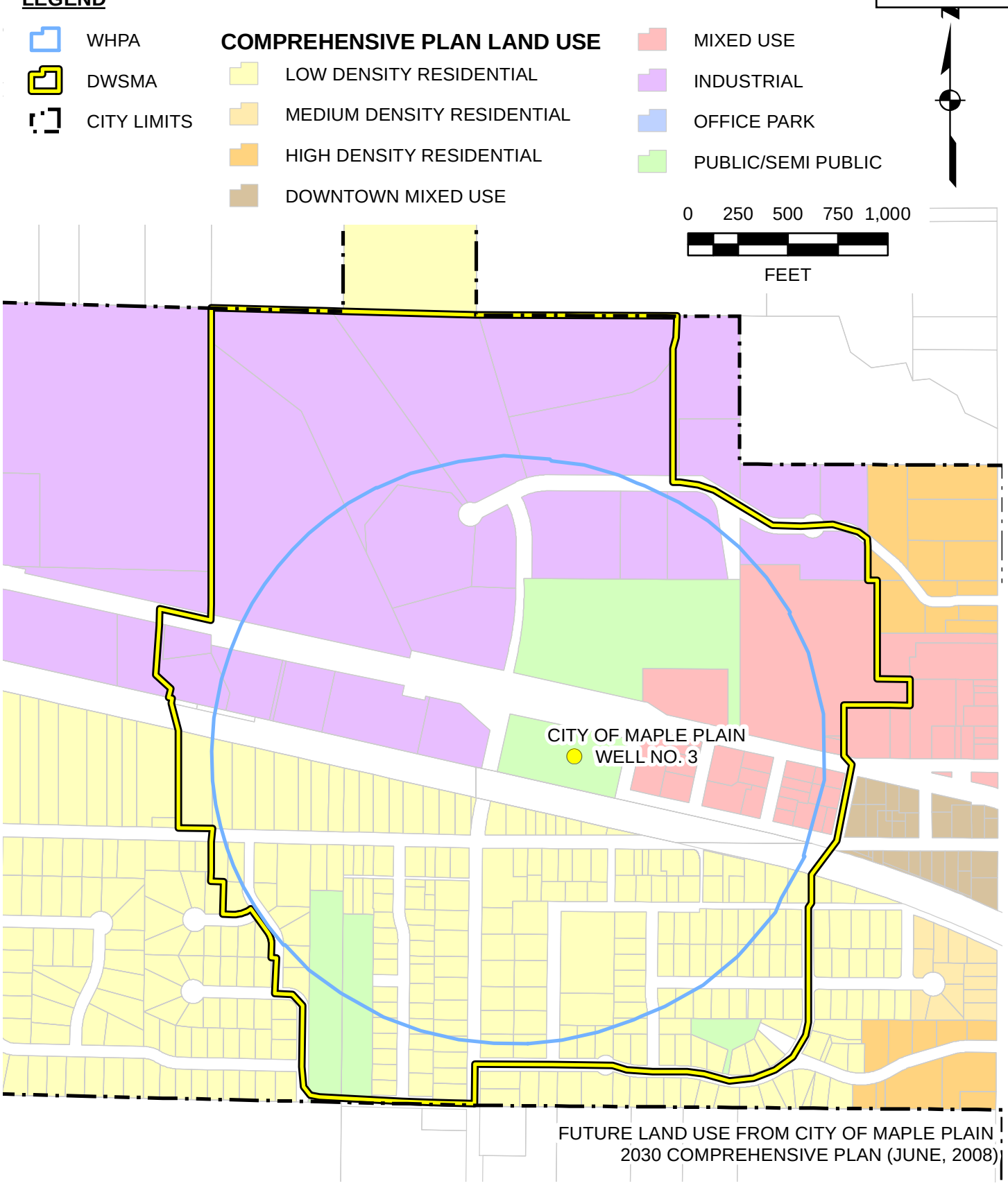

FIGURE 4 - CITY OF MAPLE PLAIN FUTURE LAND USE

CITY OF MAPLE PLAIN
WELLHEAD PROTECTION PLAN

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D. Groundwater

The public water supply system's well has historically provided groundwater of sufficient quality and quantity. Well No. 3 became the primary water source after the City completed a water treatment plant for removal of radium in 2008. Water needs will increase slightly with an estimated 2030 served population of 2,510. The City has developed agreements with neighboring communities to serve certain properties adjacent to the Maple Plain's City limits.

Water use has increased steadily over the years; however there has been a decrease in the last few years due to the loss of a wet commercial/industrial user. Additionally, the City's adoption of the mandated conservation rate structure and other rate increases have led to a decrease in consumption. Maple Plain currently pumps an average of 230,000 gallons each day. Over the past 10 years, the maximum day occurred in 2001, with 0.57 million gallons per day (MGD) being pumped. The projected water demand for 2030 is a daily average of 0.33 MGD with an estimated daily maximum of 0.82 MGD. A single future well is recommended to meet projected 2030 water demands.

Construction of a future well will necessitate an update to the Wellhead Protection Plan before the ten year life of this Plan has expired. A future well near Well No. 3 is anticipated as a near term improvement. Vulnerability of the aquifer for the future well may be higher than the vulnerability of the DWSMA at Well No. 3. As such, updates to the Wellhead Protection Plan may need to inventory and manage more than just groundwater wells.

IMPACT OF CHANGES

A. Expected Changes in Water Use

The addition of new wells automatically places a water supplier at the top of the wellhead protection scoping list. This Plan will be updated if new wells are scoped in before the ten year life of this Plan has expired. It is expected that this plan will need to be updated before ten years, as construction of Well No. 4 is in the near term capital improvements plan.

B. Influence of Existing Water and Land Government Programs and Regulation

Recognizing that the State Well Code has sole authority in permitting wells, the City of Maple Plain and Hennepin County have existing land use ordinances that could be revised in the future to address new private wells within the DWSMA. However, there is no discussion, or intention at this time of requiring additional regulation related to managing wells within the City's DWSMA. Hennepin County Environmental Services will assist with addressing additional unused/unsealed wells as they are identified.

The US EPA sets requirements regarding Class V injection wells, which include shallow disposal wells. Federal rules regarding injection wells are contained in CFR–40, Part 144. Shallow waste disposal systems (dry well, cesspool, septic system, French drain, etc.) that receive or have received fluids from vehicular repair or maintenance activities are banned in approved Drinking Water Supply Management Areas. US EPA may allow owners and operators to seek a waiver from the ban and obtain a permit, however. Although a federal ban on large capacity cesspools will also go into effect, these have not been permitted in Minnesota for many years. No significant changes in Class V injection well regulations or programs are anticipated at this time.

C. Administrative, Technical, and Financial Considerations

The City of Maple Plain has supported wellhead protection efforts. A budget will be established to implement tasks identified in this plan.

Hennepin County Environmental Services provides funding to help achieve the goals set forth in this Plan through their well sealing cost share grant program, and MDH provides assistance with determining the correct measures for sealing unused wells, constructing new wells, and requiring the sealing of unused wells if this becomes necessary.

The Wellhead Protection Manager will be responsible for implementation of wellhead protection plans of action and regular evaluations of the implementation of this Plan.

Chapter 3 – Issues, Problems, and Opportunities (4720.5230)

LAND USE ISSUES, PROBLEMS, AND OPPORTUNITIES

A. Aquifer

The non-vulnerable aquifer, identified as the sources of the City's water supply, should be relatively unaffected by land use activities with the exception of other wells that penetrate the same aquifers.

B. Well Water

The wellhead protection plan is primarily concerned with other water supply wells located within the DWSMA. The potential contaminant source inventory performed by the Wellhead Protection Team shows the inventoried wells in Table 2. Some of these wells may extend into the aquifers that supply the City with its water. These wells, if maintained improperly, could convey pollutants to the aquifer.

The placement of additional high capacity wells, increased pumping from existing wells, or significant changes in current groundwater appropriations within or near the DWSMA may have an impact on groundwater availability to all users, increased risk that contamination may enter the part of the aquifer used by the community water supply wells, or the delineation of the wellhead protection areas.

C. Drinking Water Supply Management Area

The principal concern is to ensure that consistent and long term management of water wells, environmental bore holes, and observation wells occur within the DWSMA. The entire DWSMA is located within the corporate limits of Maple Plain, making management of the affected areas somewhat easier in this regard.

Changes in land use that increase pumping of the aquifer used by the City's well will need to be assessed for possible impacts on water availability and quality. Since the majority of the increased pumping will likely be to supply future well fields within the City, Maple Plain has some flexibility to manage impacts of the increased pumping.

Finally, the City has no regulatory authority over water appropriations and must rely on the State of Minnesota to address issues and concerns related to pumping. The opportunity exists to develop a management plan with input from local units of government and state agencies.

OTHER PROBLEMS AND OPPORTUNITIES

A. Problems and Opportunities Disclosed at Public Meetings and in Written Comments

At the beginning of the planning process other Local Units of Government (LUGs) were identified and informed that the City was beginning the wellhead protection planning process. Each unit of government was also sent a copy of the City's delineated WHPA and DWSMA and vulnerability assessment for the wells and DWSMA. Also, LUGs were given a copy of the draft Part 2 plan for a 60 day review period that ran from March 2013 to May 2013. No comments were received from local units of government during this period.

The general public was also given opportunities to participate in the planning process and to comment at the Public Informational Meeting and at a Public Hearing held on June 10, 2013 (see Appendix D). No comments were received from the general public during the public hearing.

B. Data Elements

The state's Wellhead Protection Rule requires that existing information be utilized in developing the initial Wellhead Protection Plan. Much of the data collected and utilized to delineate the City's WHPA and DWSMA and to determine the vulnerability of the aquifer to possible contamination, come from regional studies. There is a limited amount of subsurface information available to define local groundwater flow conditions and the groundwater chemistry of the aquifer within the DWSMA.

The direction of groundwater flow was evaluated to address concerns that the current amount of subsurface information does not permit an unquestioned determination of local groundwater flow conditions toward the City water supply wells. As a result, delineation of the WHPA represents a composite of capture zones generated by varying aquifer properties as approved by the Minnesota Department of Health.

The City plans to utilize public education opportunities, both existing and proposed, to address potential contamination of the aquifer by other wells. Additionally, the City will work in cooperation with Hennepin County Environmental Services to utilize the well sealing cost share program currently available. The City will set high priority on well sealing for existing wells that are unused or not properly maintained.

The City will work with MDH to identify proposed wells that may present these additional concerns, ensure these wells are properly constructed, and identify water use and

conservation requirements that the DNR may specify with the groundwater appropriations permit.

The City plans to continue to focus its data collection efforts on the following activities throughout the 10 year life of this plan:

1. The City will work with MDH to identify new wells that are constructed within the DWSMA and to verify their locations.

2. The City will inform MDH when any of the City wells are repaired so that information regarding well construction, static water level, and pumping capacity can be verified or updated.

3. The City will collect water samples on a biennial basis from each well and analyze the well water for total anions and cations. The results of this monitoring will be used to determine trends in natural water quality.

4. The City and MDH will inform each other of additional high capacity wells that are to be constructed within the DWSMA or within a mile of its boundary. MDH will determine with the DNR whether the applicant for a water appropriations permit needs to conduct an aquifer test to evaluate the long term pumping impacts on the City water supply wells.

5. Inform MDH of any wells that are to be properly sealed within the DWSMA so that the Minnesota Geological Survey can be notified and determine whether it can run a borehole geophysical survey of the well.

6. Inform MDH if the City is considering the construction of a new water supply well so that MDH can determine whether any potential sites for the new well present concerns over well interference or the movement of existing contamination plumes toward existing City or private water supply wells.

C. Status and Adequacy of Official Controls, Plans, and Other Local, State, and Federal Programs on Water Use and Land Use

There are many tools available to the City and other regulating agencies that may be used to achieve the wellhead protection planning goals identified by the wellhead planning team. State and local governmental units such as MDH, Hennepin County, the DNR and the City of Maple Plain regulate

- well construction – MDH
- well sealing – MDH
- state groundwater appropriation permits – DNR

- public water supply quality – MDH
- Setbacks for specific contaminant sources from a well – MDH and local governments through conditional use permitting
- Land use controls – local governments
- Class V injection wells (shallow disposal wells) – U.S. EPA

The wellhead protection planning team recommends that no additional regulations be imposed at this time and are confident that local issues may be adequately addressed through existing processes. These include public education, adoption of best management practices for well maintenance and water conservation, and good communication with other landowners within the DWSMA.

Hennepin County Environmental Services has been contacted to determine the availability of cost share funds to assist with the sealing of identified unused/unsealed wells within the DWSMA.

Chapter 4 – Wellhead Protection Goals (4720.5240)

The public water supply is located deep underground and is classified as non-vulnerable based on the geologic characteristics in the area that tend to confine the aquifer and protect it from contamination resulting from land use activities. Consequently, this WHP Plan will focus on addressing the placement and usage of other wells that may be used for domestic, public or commercial purposes. The overall goal is to prevent contamination of the aquifer and manage the aquifer cooperatively to assure sustainable water supplies for all users.

The public water supply system has enjoyed a sufficient and safe water supply in the past and proposes that through the implementation of this WHP Plan to continue supplying safe, potable water for its customers into the future.

The WHP team identified the following goals to be achieved with the action items contained in this Plan:

1. Maintain or improve the current level of water quality which meets or exceeds all state and federal standards.

2. Educate public officials, landowners, and the general public about the importance of wellhead protection to protect the public drinking water supply.

3. Assess the impact on the City's aquifers from existing and planned wells within the DWSMA.

4. Address priority action regarding identification and inventory of wells within the DWSMA.

5. Maintain an active, community wide, water conservation program.

Chapter 5 – Objectives and Plans of Action (4720.5250)

ESTABLISHING PRIORITIES

The aquifers supplying the system's drinking water supply have been identified as non-vulnerable to contamination from typical land use activities, with the exception of other wells that penetrate the confining layers to reach into the aquifer(s). A number of factors must be considered when WHP measures are selected and prioritized (part 4720.5250, subpart 3). Such factors include:

- Contamination of a public water supply well
- Quantities of the potential contamination sources
- Location of the source in relation to the well
- Capability of the geologic material to absorb a contaminant
- Existence and effectiveness of existing official controls
- Time required to obtain cooperation
- Administrative, legal, technical, and financial resources needed

The Wellhead Protection Planning Team would like to concentrate management efforts on the following factors to create awareness of groundwater protection and help prevent future contamination of the aquifer:

A. Manage wells

B. Inform the public about groundwater issues

C. Collect additional data relating to local groundwater issues

D. Conserve water

A. WELL MANAGEMENT

Objective A1 – Identify and seal abandoned/unused wells and automotive disposal wells located within the DWSMA.

WHP Measure A1–1: Provide MDH with a list of abandoned and unsealed well locations as City staff discover them

Source of Action:	City of Maple Plain staff, Wellhead Protection Manager
Cooperators:	MDH, Carver County, neighboring communities
Time Frame:	Ongoing, as wells are discovered
Estimated Cost:	City staff time
Goal achieved:	Abandoned and unsealed wells will be registered with the regulating authority.

WHP Measure A1–2: Work with the Hennepin County Environmental Services and MDH to encourage sealing of abandoned/unused wells through the County well sealing cost share program and MDH source water protection grants.

Source of Action:	City of Maple Plain staff
Cooperators:	Hennepin County, MDH, property owners
Time Frame:	Ongoing
Estimated Cost:	City staff time, existing County program funds
Goal achieved:	Providing cost share funds will help encourage property owners to seal abandoned/unused wells.

WHP Measure A1–3: Provide a list of automotive disposal wells (and other Class V wells) to MDH as City staff discovers them and inform property owners of their reporting responsibilities.

Source of Action:	City of Maple Plain staff
Cooperators:	MDH, U.S. EPA
Time Frame:	Ongoing, as wells are discovered
Estimated Cost:	City staff time
Goal achieved:	Cooperate with MDH and EPA to develop means to reduce impacts to groundwater of shallow disposal wells.

Objective A2 – Educate the public about wells and well management.

WHP Measure A2–1: Use existing programs (City newsletter, flyers, and/or direct mailings) to educate property owners about well management techniques.

Source of Action:	City of Maple Plain staff, Wellhead Protection Manager
Cooperators:	MDH
Time Frame:	Annually
Estimated Cost:	City staff time
Goal achieved:	Well owners learn about well maintenance. Informed well owners may be more likely maintain their wells and seal abandoned wells.

Objective A3 – Manage the 200 foot radius Inner Wellhead Management Zones to prevent contaminants from entering the area immediately surrounding the wells.

WHP Measure A3–1: Continue to monitor setbacks for all new potential sources of contamination located within the IWMZ.

Source of Action:	City Staff
Cooperators:	MDH
Time Frame:	Annually
Estimated Cost:	Staff time
Goal Achieved:	New regulated activities will meet the required setbacks.

B. PUBLIC EDUCATION

Objective B1 – Educate the public about wellhead protection management.

WHP Measure B1–1: Use existing programs (newsletters, flyers, website, and postings) to inform the public about wellhead protection management techniques.

Source of Action:	City of Maple Plain staff
Cooperators:	MDH
Time Frame:	Annually
Estimated Cost:	City staff time
Goal achieved:	The general public and property owners become better informed about wellhead protection and groundwater principles. Coverage will extend beyond the DWSMA to encompass areas that may be part of future updates to the wellhead protection delineations.

C. DATA COLLECTION

Objective C1 – Evaluate the water quality monitoring strategy and results to ensure consistency with federal and state requirements yet also take into account local conditions.

WHP Measure C1–1: Maintain water quality sampling requirements mandated by MDH and analyze trends in water chemistry, looking for any possible degradation of water quality in the City's wells.

Source of Action:	City of Maple Plain staff
Cooperators:	MDH
Time Frame:	Ongoing
Estimated Cost:	City staff time
Goal achieved:	Identify changes or trends in water chemistry.

Objective C2 – Maintain up to date information about wells and potential contaminant sources within the DWSMA.

WHP Measure C2–1: In cooperation with state and/or local programs, create and maintain a database of wells and shallow disposal wells within the DWSMA.

Source of Action:	City of Maple Plain staff
Cooperators:	MDH, U. S. EPA, City's engineering and environmental consultant
Time Frame:	Revise every two years
Estimated Cost:	City staff time
Goal achieved:	Water wells and Class V shallow disposal wells along with parcel identification numbers will be in the database, which enables the City to determine which property owners to target with any particular WHP educational materials.

WHP Measure C2–2: Conduct a written survey of property owners in and near the DWSMA to inquire whether a well is located on their property and, if so, the status of the well(s). Record whether or not each property owner responds.

Source of Action:	City of Maple Plain staff
Cooperators:	Property owners
Time Frame:	Within two years of adoption of this Plan.
Estimated Cost:	City staff time, copying and postage costs.
Goal achieved:	The survey results will provide more accurate information about the number and status of wells in the DWSMA.

WHP Measure C2–3: Request that MDH inform the City of any proposed high capacity wells and request that DNR inform the City of any changes in appropriations to existing wells that may impact the capture zones for the City of Maple Plain's public supply wells.

Source of Action:	City of Maple Plain staff
Cooperators:	MDH, DNR
Time Frame:	Within one year of adoption of this Plan
Estimated Cost:	City staff time
Goal achieved:	The City will be informed when a significant change in water appropriations occurs that may alter the groundwater flow field and/or water availability near the DWSMA.

WHP Measure C2–4: Request assistance from the MDH to conduct age dating isotope testing on the City's existing well. If another City well has been constructed by the time testing occurs, request that well also be considered for testing.

Source of Action:	City of Maple Plain staff
Cooperators:	MDH
Time Frame:	Within one year of adoption of this Plan
Estimated Cost:	City staff time
Goal achieved:	The City and MDH will have isotope data necessary to determine the relative age of groundwater in the aquifer(s). This information will be needed for updates to the Part 1 Wellhead Protection Plan.

D. WATER CONSERVATION

Objective D1 – Maintain an active, community wide water conservation program.

WHP Measure D1–1: Implement long term and short term (as needed) conservation measures included in the Water Supply Plan.

Source of Action:	City of Maple Plain
Time Frame:	Already implemented
Estimated Cost:	No additional costs
Goal achieved:	The City has a plan to reduce rate of growth in water demand.

Chapter 6 – Evaluation Program (4720.5270)

The success of the wellhead protection source management program must be evaluated in order to determine whether the plan is actually accomplishing what the City of Maple Plain set out to do. The following activities will be implemented to:

- Track the implementation of the objectives identified in Chapter 5 of this Plan
- Determine the effectiveness of specific management strategies regarding the protection of the public water supply
- Identify possible changes to these strategies which may improve their effectiveness
- Determine the adequacy of financial resources and staff availability to carry out the management strategies planned

1. The City will continue to cooperate with the Minnesota Department of Health in the annual monitoring of the water supply to determine whether the management strategies are having a positive effect and to identify water quality problems that may arise that must be addressed.

2. The Wellhead Protection Manager will make a written report every two years to the MDH regarding progress in implementing the wellhead protection management objectives of this Plan. The reports will be compiled and used to review the overall progress in implementing source management strategies when the City's wellhead protection plan is updated in 10 years (or as the MDH mandates updates due to new well construction). A copy of the reports will be sent to the Minnesota Department of Health Source Water Protection Unit in St. Paul, MN and another copy will be placed in the City's Wellhead Protection file.

Chapter 7 – Alternative Water Supply, Contingency Strategy (4720.5280)

The City of Maple Plain Water Emergency and Conservation Plan was submitted in 2007 to the MN DNR Division of Waters Appropriation Permit Program and the Metropolitan Council and approval was received in 2009. Notice of approval of this plan is provided in Appendix C. This approved plan contains the required elements of the MN Wellhead Protection Rule and is accepted as an equivalent to an Alternative Water Supply/Contingency Plan as defined in 4720.5280. Implementation of the Plan has begun with the aid and assistance of local emergency management agencies. A copy of the Plan is available for review at by contacting the Wellhead Protection Manager (Contact information is provided on page i).

The Water Emergency and Conservation Plan includes the following sections: water supply system description and evaluation, emergency response procedures, water conservation planning, and Metropolitan Land Use Planning. Updates to the Water Emergency and Conservation Plan, when they occur, will be incorporated into this WHP if required.

Appendix A Part 1 Wellhead Protection Plan

Wellhead Protection Plan

Part I

Delineation of Wellhead Protection Area
Drinking Water Supply Management Area Delineation
Well and Drinking Water Supply Management Area Vulnerability Assessments

Prepared for

The City of Maple Plain

March 2011

Amal M. Djerrari, P.E., Hydrologist
Minnesota Department of Health

Table of Contents

Page

List of Tables

Table of Contents - Continued

List of Figures **Page**

Glossary of Terms

Data Element. A specific type of information required by the Minnesota Department of Health to prepare a wellhead protection plan.

Drinking Water Supply Management Area (DWSMA). The area delineated using identifiable land marks that reflects the scientifically calculated wellhead protection area boundaries as closely as possible (Minnesota Rules, part 4720.5100, subpart 13).

Drinking Water Supply Management Area Vulnerability. An assessment of the likelihood that the aquifer within the DWSMA is subject to impact from land and water uses within the wellhead protection area. It is based upon criteria that are specified under Minnesota Rules, part 4720.5210, subpart 3.

Emergency Response Area (ERA). The part of the wellhead protection area that is defined by a one-year time of travel within the aquifer that is used by the public water supply well (Minnesota Rules, part 4720.5250, subpart 3). It is used to set priorities for managing potential contamination sources within the DWSMA.

Inner Wellhead Management Zone (IWMZ). The land that is within 200 feet of a public water supply well (Minnesota Rules, part 4720.5100, subpart 19). The public water supplier must manage the IWMZ to help protect it from sources of pathogen or chemical contamination that may cause an acute health effect.

Wellhead Protection (WHP). A method of preventing well contamination by effectively managing potential contamination sources in all or a portion of the well's recharge area.

Wellhead Protection Area (WHPA). The surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field (Minnesota Statutes, part 103I.005, subdivision 24).

Well Vulnerability. An assessment of the likelihood that a well is at risk to human-caused contamination, either due to its construction or indicated by criteria that are specified under Minnesota Rules, part 4720.5550, subpart 2.

Acronyms

CWI - County Well Index

DNR - Minnesota Department of Natural Resources

EPA - United States Environmental Protection Agency

FSA - Farm Security Administration

MDA - Minnesota Department of Agriculture

MDH - Minnesota Department of Health

MGS - Minnesota Geological Survey

MnDOT - Minnesota Department of Transportation

MnGEO - Minnesota Geospatial Information Office

MPCA - Minnesota Pollution Control Agency

NRCS - Natural Resource Conservation Service

SWCD - Soil and Water Conservation District

UMN - University of Minnesota

USDA - United States Department of Agriculture

USGS - United States Geological Survey

1. Introduction

The Minnesota Department of Health (MDH) developed Part I of the wellhead protection (WHP) plan at the request of the city of Maple Plain (public water supply identification number 1270021). The work was performed in accordance with the Minnesota Wellhead Protection Rule, parts 4720.5100 to 4720.5590.

This report presents the delineation of the wellhead protection area (WHPA), the drinking water supply management area (DWSMA), and the vulnerability assessments for the public water supply well and DWSMA. Figure 1 shows the boundaries for the WHPA and the DWSMA. The WHPA is defined by a 10-year time of travel. Figure 1 also shows the emergency response area (ERA), which is defined by a 1-year time of travel. An inner wellhead management zone (IWMZ), which is the area within a 200-foot radius around the well, serves as the wellhead protection area for emergency wells and is also displayed on Figure 1. Definitions of rule-specific terms that are used are provided in the "Glossary of Terms."

This report also documents the technical information that was required to prepare this portion of the WHP plan in accordance with the Minnesota Wellhead Protection Rule. Additional technical information is available from MDH.

The wells included in the WHP plan are listed in Table 2.

2. Assessment of the Data Elements

MDH staff met with representatives of the public water supplier on August 17, 2010, for a scoping meeting that identified the data elements required to prepare Part I of the WHP plan. Table 1 presents the assessment of these data elements relative to the present and future implications of planning items that are specified in Minnesota Rules, part 4720.5210.

Table 1 - Assessment of Data Elements

Data Element	Present and Future Implications				Data Source
	Use of the Well s	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Precipitation					
Geology					
Maps and geologic descriptions	M	H	H	H	MGS
Subsurface data	M	H	H	H	MGS, MDH, CWI
Borehole geophysics	M	H	H	H	MGS
Surface geophysics	L	L	L	L	
Maps and soil descriptions					
Eroding lands					

Data Element	Present and Future Implications				Data Source
	Use of the Well s	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Water Resources					
Watershed units					
List of public waters					
Shoreland classifications					
Wetlands map					
Floodplain map					
Land Use					
Parcel boundaries map	L	H	L	L	Metropolitan Council
Political boundaries map	L	L	L	L	
PLS map	L	H	L	L	MDH
Land use map and inventory	M	H	M	M	
Comprehensive land use map	L	L	L	L	
Zoning map	L	L	L	L	
Public Utility Services					
Transportation routes and corridors					
Storm/sanitary sewers and PWS system map					
Oil and gas pipelines map					
Public drainage systems map or list					
Records of well construction, maintenance, and use	H	H	H	H	City, CWI, MDH files
Surface Water Quantity					
Stream flow data					
Ordinary high water mark data					
Permitted withdrawals					
Protected levels/flows					
Water use conflicts					
Groundwater Quantity					
Permitted withdrawals	H	H	H	H	DNR
Groundwater use conflicts	H	H	H	H	Not Applicable
Water levels	H	H	H	H	DNR, MDH, City
Surface Water Quality					
Stream and lake water quality management classification					
Monitoring data summary					

Data Element	Present and Future Implications				Data Source
	Use of the Well s	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Groundwater Quality					
Monitoring data	H	H	H	H	MDH
Isotopic data	H	H	H	H	MDH, UMN
Tracer studies	H	H	H	H	Not Available
Contamination site data	M	M	M	M	
Property audit data from contamination sites					
MPCA and MDA spills/release reports					

Definitions Used for Assessing Data Elements:

High (H) - the data element has a direct impact

Moderate (M) - the data element has an indirect or marginal impact

Low (L) - the data element has little if any impact

Shaded - the data element was not required by MDH for preparing the WHP plan

3. General Descriptions

3.1 Description of the Water Supply System

The city of Maple Plain obtains its drinking water supply from one primary well and two emergency wells (Table 2). Information about the primary well is used to define the ERA, WHPA, and DWSMA.

3.2 Description of the Hydrogeologic Setting

The description of the hydrologic setting for the aquifer that is used to supply drinking water is presented in Table 3.

Figures 3, 4a and 4b show the distribution of the aquifer and its stratigraphic relationships with adjacent geologic materials. They were prepared using well record data that is contained in the County Well Index (CWI) database. The geological maps and studies that were used to further define local hydrogeologic conditions are provided in the “Selected References” section of this report.

Table 2 - Water Supply Well Information

Local Well Name	Unique Number	Use/Status	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Well Vulnerability	Aquifer	
Well 1	207090	Emergency	10	238	418	1939	Not Vulnerable	Bedrock	Franconia-Iron-Galesville
Well 2	207407	Emergency	16	241	435	1959	Not Vulnerable	Glacial Deposits	Franconia-Iron-Galesville
Well 3	112238	Primary[1]	18	534	580	1978/1994	Not Vulnerable	Bedrock	Mt. Simon

[1] Well 3 is the primary well since February 20, 2009; after the construction of the new treatment plant in December 2008.

Table 3 - Description of the Hydrogeologic Setting at Maple Plain Well 3 (112238)

Aquifer	Attribute	Descriptor	Data Source
Mt. Simon Sandstone (CMTS)	Aquifer Material	Sandstone	Well Logs
	Primary Porosity	0.20	Metro Council (2009)
	Aquifer Thickness (ft)	122	Estimated from Hilltop Elementary School Well Log (207002)
	Stratigraphic Top Elevation	527	Well Logs
	Stratigraphic Bottom Elevation	405	Well Logs and Estimated Thickness of Aquifer
	Hydraulic Confinement	Confined	Well Logs
	Transmissivity (T)	774 ft^2/day	The aquifer test plan was approved on September 13, 2010, and T was determined from a specific capacity test at Well 3 (112238).
	Hydraulic Conductivity	6.3 ft/day	The value was obtained from the reference transmissivity value and the estimated aquifer thickness at Well 3 (112238).
	Groundwater Flow Field	Flow to the southeast. Hydraulic Gradient: 8.0×10^{-3} feet/ft	Hennepin County Atlas

4. Delineation of the Wellhead Protection Area

4.1 Delineation Criteria

The boundaries of the WHPA for the public water supplier are shown in Figure 1. Table 4 describes how the delineation criteria that are specified under Minnesota Rules, part 4720.5510, were addressed.

Table 4 - Description of WHPA Delineation Criteria

Criterion	Descriptor	How the Criterion was Addressed
Flow Boundary	Mississippi, Minnesota, and Crow Rivers	The rivers provide boundary conditions to the original regional model that extends to these natural boundaries. They were included in the original regional model and set the regional groundwater flow (See Section 4.2).
Flow Boundary	Other High-Capacity Wells	There are no other high-capacity wells within two miles that pump in the same aquifer as the public water supplier and that may have an impact on the public water supplier's well capture zone. Other high-capacity wells, located further away, were included in the regional model.
Daily Volume of Water Pumped	See Table 5	Pumping information was obtained from the Minnesota Department of Natural Resources Appropriations Permit 1977-6403. The annual pumped volumes were converted to a daily volume pumped by a well.
Groundwater Flow Field	See Figure 2	The model calibration process addressed the relationship between the calculated versus observed groundwater flow field.
Aquifer Transmissivity	See Table 3	The aquifer test plan was approved on September 13, 2010. The transmissivity was determined from a specific capacity test at Well 3 (112238). Uncertainty regarding aquifer transmissivity values was addressed using a range in transmissivity values to reflect changes in aquifer composition and thickness as well as uncertainties related to the quality of existing aquifer test data, as described in Section 4.3.
Time of Travel	10 years	The public water supplier selected a 10 year time of travel.

Information provided by the public water supplier was used to identify the maximum volume of water pumped annually by each well over the previous five-year period, as shown in Table 5. Previous pumping values have been reported to the DNR, as required by the city's Groundwater Appropriation Permit No. 1977-6403. The estimated future pumping amounts for the next five years are also shown. The maximum daily volume of discharge used as an input parameter in the model was calculated by dividing the greatest annual pumping volume by 365 days.

Table 5 - Annual Volume of Water Discharged from Water Supply Wells

Well Name	Unique Number	Use Status	Total Annual Withdrawal[1] (gal/yr)					Projected 2014 Withdrawal (gal/yr)	Withdrawal Used in WHPA (gal/yr)
			2005	2006	2007	2008	2009[2]		
1	207090	Emergency	668,500	337,800	821,600	**1,778,000**	771,400	0	0
2	207407	Emergency	**87,894,300**	80,172,300	83,835,000	68,454,700	39,200	0	0
3	112238	Primary	7,854,000	1,866,700	153,200	3,415,400	**69,045,500**	96,416,800	96,416,800
4	Proposed	Not Applicable						30,000,000[2]	
Totals			**96,416,800**	82,376,800	84,809,800	73,648,100	69,856,100	126,416,800[3]	96,416,800

[1]Bolding indicates greatest annual pumping volume. Source: The DNR State Water Use Database System Permit No. 1977-6403.

[2] Data provided by the city.

[3] Used in future Scenario Analysis.

4.2 Method Used to Delineate the Wellhead Protection Area

The WHPA for the city of Maple Plain was determined using an existing regional MODFLOW Model that was developed by Barr Engineering Company for the Metropolitan Council (Metro Council, 2009). MODFLOW is a 3D, cell-centered, finite difference, saturated flow model developed by the U.S. Geological Survey (McDonald and Harbaugh, 1988; Harbaugh et al., 2000).

The regional Metro Model consists of nine layers that represent the major aquifers and aquitards within the seven-county metropolitan area. These layers represent, from top to bottom, the following units: (1) surficial aquifer of glacial deposits; (2) St. Peter Sandstone or Quaternary Buried Artesian Aquifer; (3) Prairie du Chien Group; (4) Jordan Sandstone; (5) St. Lawrence Formation (aquitard); (6) Franconia Formation; (7) Ironton-Galesville Aquifer, (8) Eau Claire Formation (aquitard); and (9) Mt. Simon Sandstone. The regional groundwater model was calibrated to steady-state water levels and river base flows.

A regional model was constructed to model flow in the lower four aquifers/aquitard: (1) Franconia Formation; (2) Ironton-Galesville Sandstones, (3) Eau Claire Formation (aquitard); and (4) Mt. Simon Sandstone Aquifer. This model was constructed in a two-step procedure:

- First, a nine-layer regional model limited to Hennepin and Carver Counties was extracted from the regional seven-county model. This model extends to the natural hydraulic boundaries, the Mississippi River to the north and east, the Minnesota River to the south, and the Crow River to the northwest. These river boundaries, along with wells, lakes, and infiltration, provided the model boundary conditions.
- Second, a four-layer Hennepin/Carver regional model was constructed. This four-layer model has the same extent as the nine-layer Hennepin/Carver model. Hydraulic heads, extracted from the Hennepin/Carver model were applied to head-specified cells located along the edge of the model. Leakage to and from the bottom of the St. Lawrence Formation was extracted from the nine-layer Hennepin/Carver model, and applied as recharge on top of the Franconia Formation in the Hennepin/Carver four-layer regional model.

The model grid was also refined around the city of Maple Plain wells. Variable grid spacing was used, ranging from 1 meter near the city of Maple Plain wells to 250 meters at the edge of the grid. This refinement was required for an accurate computation of the particles flow paths for determining the WHPA delineation.

Prior to their use in the delineations, the following modifications were incorporated in the refined models:

- A local area of modified horizontal conductivity was included in the model to reflect the transmissivity in Table 3.
- The pumping rates from Table 5 were assigned to the city of Maple Plain wells.

The delineation was performed by backtracking particles from the wells to a 10-year time of travel using the particle tracking MODPATH Code. A series of 50 particles were launched at each well. A porosity of 20 percent was used for the Franconia Formation, Ironton-Galesville Sandstones, and Mt. Simon Sandstone. A porosity of 40 percent was used for the Eau Claire confining unit.

The resulting WHPA boundaries (Figure 1) are a composite of the 10-year capture zones calculated using this model for the base-case parameters and the parameter values used in the sensitivity and the future scenario analysis, and discussed in the following section. The input files for all model runs are available upon request at MDH.

4.3 Results of Model Calibration and Sensitivity Analysis

Model calibration is a procedure that compares the results of a model based on estimated input values to measured or known values. This procedure can be used to define model validity over a range of input values, or it helps determine the level of confidence with which model results may be used. As a matter of practice, groundwater flow models are usually calibrated using water elevation or flux.

The regional Metro Model was calibrated to the CWI database water level targets and stream flow targets by the Metropolitan Council (2009). The calibration of the regional model was performed applying an automated calibration procedure using PEST, a parameter estimation code that automatically adjusts the recharge rates and hydraulic conductivity values and compares modeled piezometric heads against measured values at observation well locations until a satisfactory fit is obtained.

The calibrated regional Metro Model provided the boundary conditions at the head-specified cells at the boundaries of the four-layer Hennepin/Carver refined model. After construction, the refined MODFLOW Model calibration was verified by comparing modeled head results to the static water elevations in wells that were selected from the CWI database. The selected wells were completed in the aquifers used by the city of Maple Plain for which observed data is readily available (i.e., the Franconia-Ironton-Galesville Aquifer). A similar calibration check was not performed for the Mt. Simon Aquifer because of the scarcity of local water level data.

The graph of computed versus observed piezometric heads for wells in the Franconia-Ironton-Galesville Aquifer, along with the calibration statistics, are displayed in Figure 5. The standard deviation of the model prediction error represented less than 10 percent of the total change in measured heads across the model domain, which is within an acceptable range for a calibrated model. The model residuals and the modeled groundwater elevation contour map are depicted in Figures 2a and 2b. No residuals are shown in Figure 2b because of the scarcity of local water level data in the Mt. Simon Aquifer.

Model sensitivity is the amount of change in model results caused by the variation of a particular input parameter. The direction and extent of the modeled capture zone may be very sensitive to any of the input parameters:

- The pumping rate directly affects the volume of the aquifer that contributes water to the well. An increase in pumping rate leads to an equivalent increase in the volume of aquifer within the capture zone, proportional to the porosity of the aquifer materials. However, the pumping rate is based on the results presented in Table 5 and, therefore, is not a variable factor that will influence the delineation of the WHPA.
- The direction of groundwater flow determines the orientation of the capture area. Variations in the direction of groundwater flow will not affect the size of the capture zone but are important for defining the areas that are the source of water to the well. The ambient groundwater flow field that is defined in Figure 2b provides the basis for determining the extent to which each model run reflects the conceptual understanding of the orientation of the capture area for a well.

- A hydraulic gradient of zero produces a circular capture zone, centered on the well. As the hydraulic gradient increases, the capture zone changes into an elliptical shape, with the well centered on the down-gradient focal point. The hydraulic gradient was determined by calibrating the model to water level elevations that were taken from wells that have verified locations (Figure 2a). Generally, the accuracy of the hydraulic gradient determination is directly proportional to the amount of available data that describes the distribution of hydraulic head in the aquifer.
- The aquifer thickness, permeability, and porosity influence the size and shape of the capture zone. A decrease in either thickness or porosity causes a linear, proportional increase in the areal extent of the capture zone; whereas permeability defines the relative proportions of the capture zone width to length. A decrease in permeability decreases the length of the capture zone and increases the distance to the stagnation point, making the capture zone more circular in shape and centered on the well.

4.4 Addressing Model Uncertainty

Using computer models to simulate groundwater flow involves representing a complicated natural system in a more simplified manner. Local geologic conditions likely vary within the capture area of the well, but existing information for the area around the city of Maple Plain wells is not sufficiently detailed to define this. In addition, the current capabilities of groundwater flow models may not be sufficient to represent the natural flow system exactly. As a result, the MODFLOW Model cannot represent the natural flow system exactly, but the results are valid within a range defined by the reasonable variation of input parameters for this delineation setting. This is accomplished by performing an uncertainty analysis to evaluate uncertainties in the hydrogeologic data that may affect the size and shape of the capture zone for the well.

The following discussion identifies the model input parameters that have the most significant impacts on the well capture zone analyses direction and extent the modeled capture zone may be sensitive.

- Horizontal hydraulic conductivities could have an impact on the WHPA delineation. In the base case scenario, the transmissivity estimated from the specific capacity test conducted at Well 3 (112238) was used in the local model to delineate the 10 year time of travel capture zones. Because no pump tests were conducted in the Maple Plain Mt. Simon well, the uncertainty of the transmissivity can be great. To evaluate the impact of this uncertainty on the WHPA delineation, the horizontal hydraulic conductivity was increased by a factor of two. Increasing the hydraulic conductivity did not affect the length and shape of the capture zone.
- Pumping rates could have an impact on the WHPA delineation. The city of Maple Plain also plans to add one Franconia-Ironton-Galesville well to their well field, near the existing Mt. Simon Well 3 (112238) well. The city of Maple Plain provided the approximate location, and estimated the projected pumping volume from this well to be 30 millions gallons per year. This well was added to the model and its 10-year capture zone was delineated. Because of its location and its smaller annual pumping rate, its 10-year zone of capture was completely contained by that of Well 3 (112238). Adding this well did not alter the Well 3 (112238) capture zone.

Addressing Model Uncertainty - A composite of the results was used to delineate the capture zone for the primary well used by the city of Maple Plain (Figure 1). This provided a conservative approach to addressing model uncertainty and produced a capture zone that will most likely be protective of public health.

5. Delineation of the Drinking Water Supply Management Area

The boundaries of the DWSMA were defined by the public water supplier using the following features (Figure 1):

- Public Land Survey coordinates; and
- Property or fence lines.

6. Vulnerability Assessments

The Part I wellhead protection plan includes the vulnerability assessments for the public water supply wells and DWSMA. These vulnerability assessments are used to help define potential contamination sources within the DWSMA and to select appropriate measures for reducing the risk that they present to the public water supply.

6.1 Assessment of Well Vulnerability

The vulnerability assessment for each well used by the city of Maple Plain is listed in Table 2 and is based upon the following conditions:

1) Well construction meets current state Well Code specifications (Minnesota Rules 4725) and the wells themselves do not provide a pathway for contaminants to enter the aquifers used by the public water supplier;
2) The geologic conditions at the well sites include a cover of clay-rich geologic materials and/or a thick shale confining unit over the aquifers that is sufficient to retard or prevent the vertical movement of contaminants; and
3) Except for nitrate that was detected in all three city of Maple Plain wells at a very low concentration (i.e., less than 0.6 mg/L), concentrations likely representative of naturally occurring nitrate, none of the human-caused contaminants regulated under the federal Safe Drinking Water Act have been detected at levels indicating that any well serves to draw contaminants into the aquifers as a result of pumping.

None of the city of Maple Plain wells are vulnerable.

6.2 Assessment of Drinking Water Supply Management Area Vulnerability

The vulnerability of the DWSMA is very low and is based upon the following information:

1) Isotopic and water chemistry data from wells located within the DWSMA indicate that the aquifers contain water that has no detectable levels of tritium.
2) Review of the geologic logs contained in the CWI database and geological maps and reports indicate that the aquifers exhibit a low geologic sensitivity throughout the DWSMA and are isolated from the direct vertical recharge of surface water.

7. Selected References

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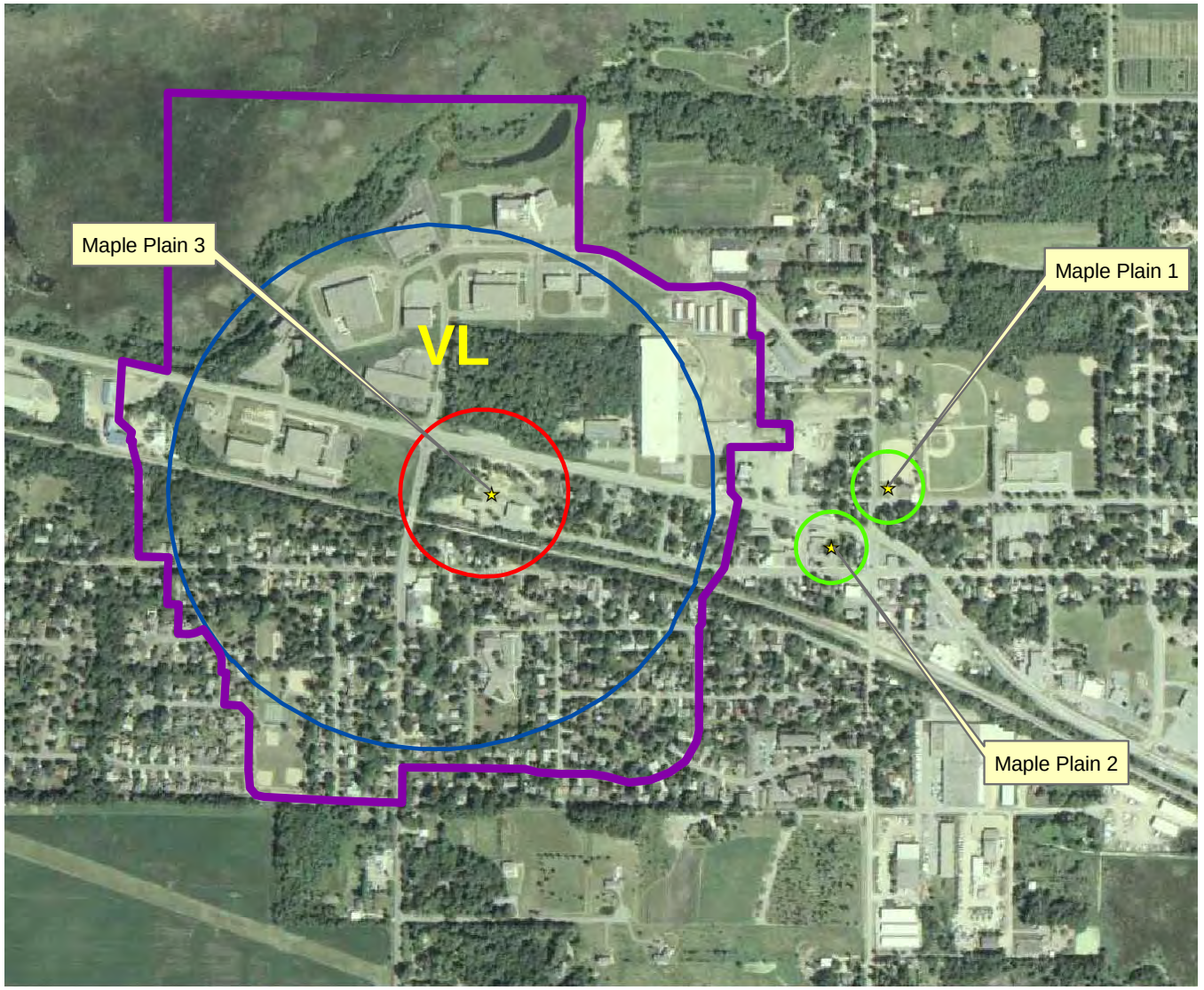
Figures

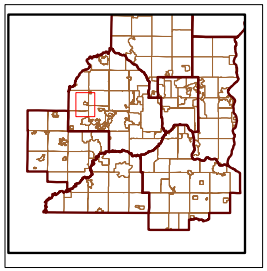


Maple PLain Wells
Inner Wellhead Management Zone
Drinking Water Supply Management Area
Wellhead Protection Area
Emergency Response Area

VL: Very Low Vulnerability

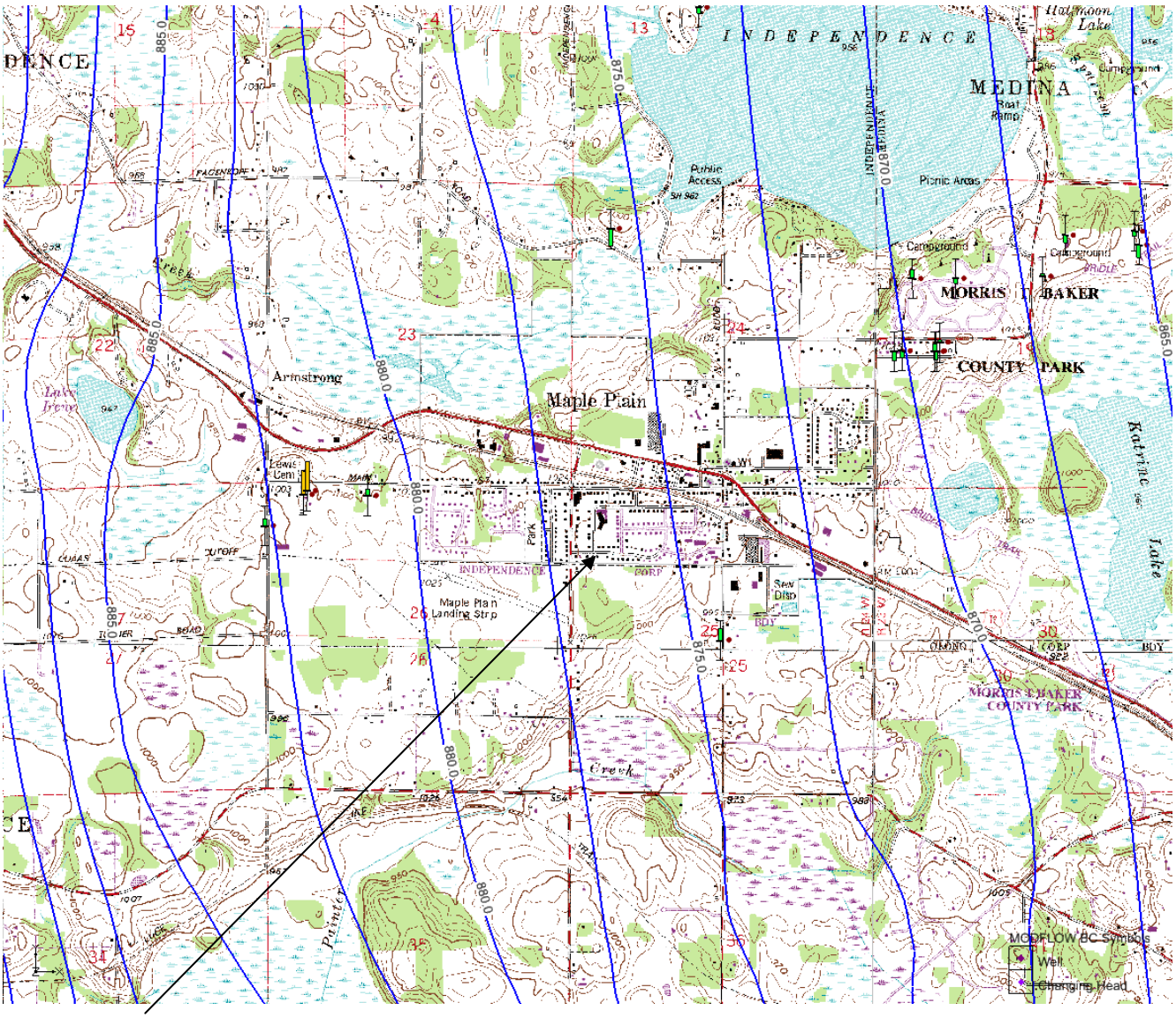
550 275 0 550 Feet

Enlarged Area



MINNESOTA MDH DEPARTMENT OF HEALTH

Figure 1
Drinking Water Supply Management Area
(Maple Plain, MN)



Maple Plain

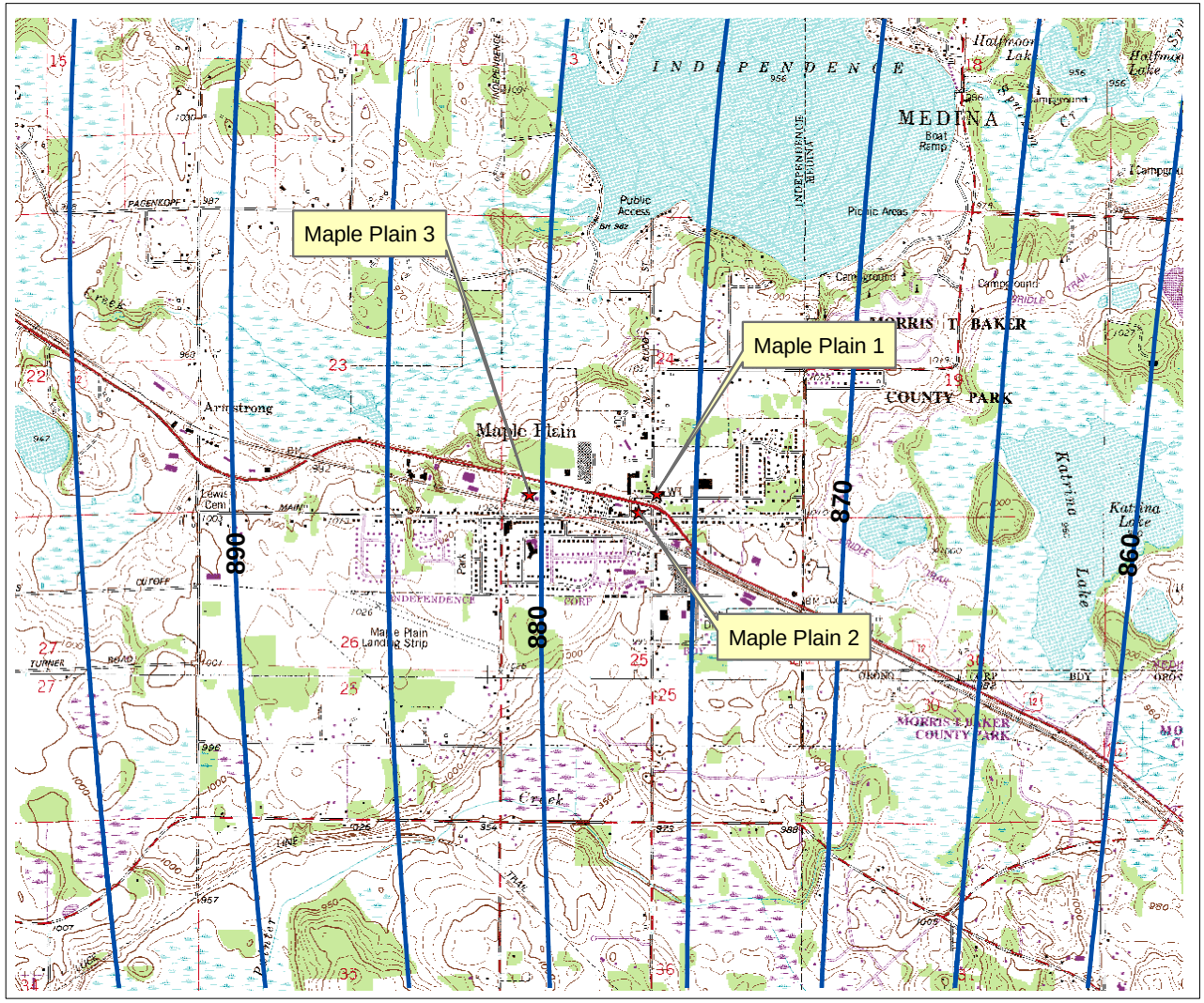
(Groundwater Contour Elevation in feet)

Red: 10m < |Residual|
Yellow: 5m < |Residual| < 10m
Green: |Residual| < 5m

0 1000

Scale (in feet)

Figure 2a
Modeled Groundwater Flow Field and Spatial Distribution of Modeling Errors
Franconia–Ironton-Galesville Aquifer
City of Maple Plain, MN



Modeled Groudwater Elevation Contours (in feet above MSL)

2,100 1,050 0 2,100 Feet

Enlarged Area

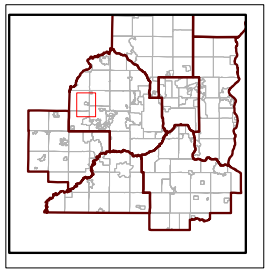
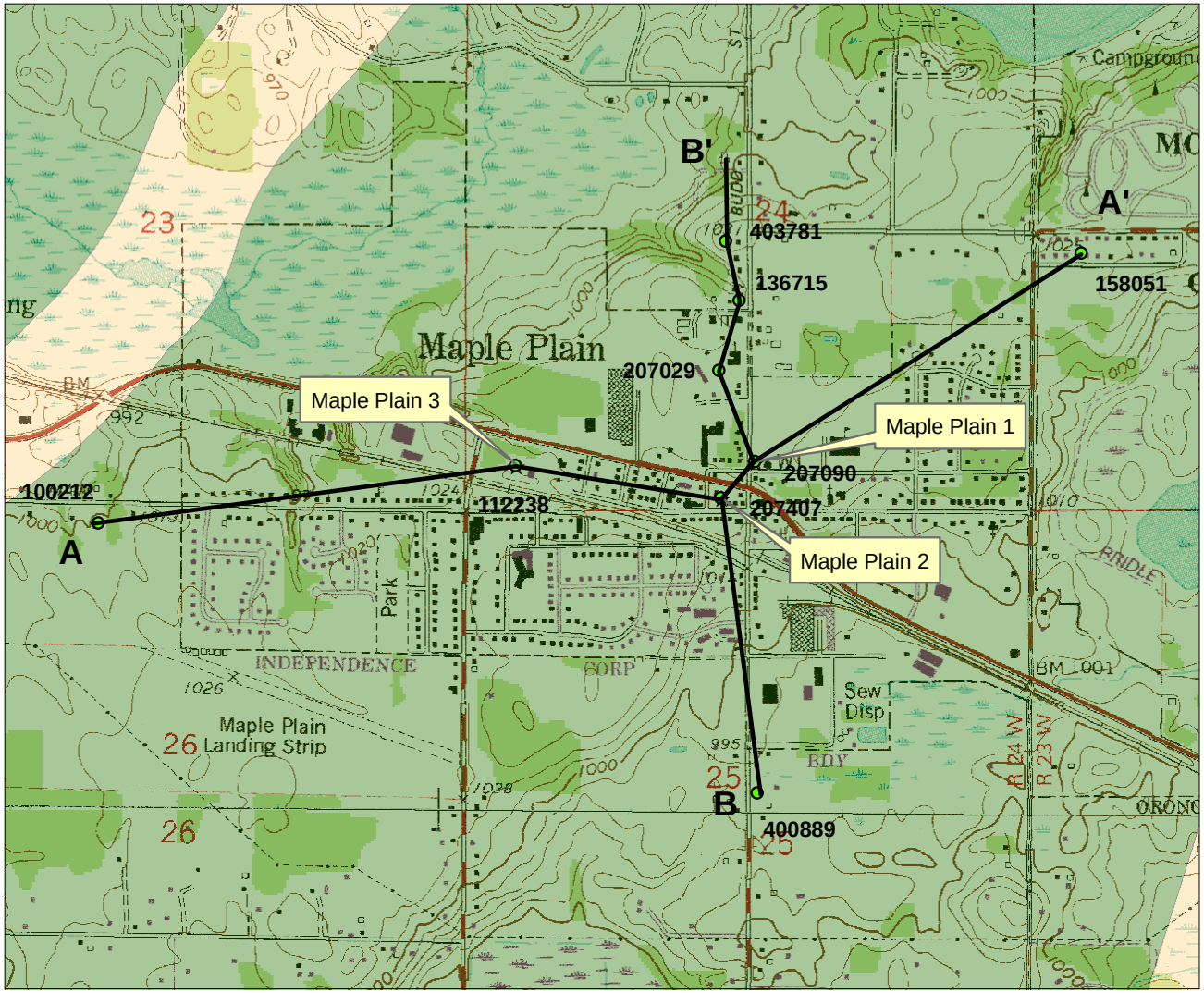


Figure 2b
Modeled Ambient Groundwater Flow Field
Mt. Simon Aquifer
(Maple Plain, MN)



Bedrock Geology

- St. Lawrence- Franconia
- Ironton - Galesville

900 450 0 900 Feet

Enlarged Area

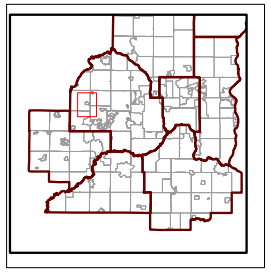
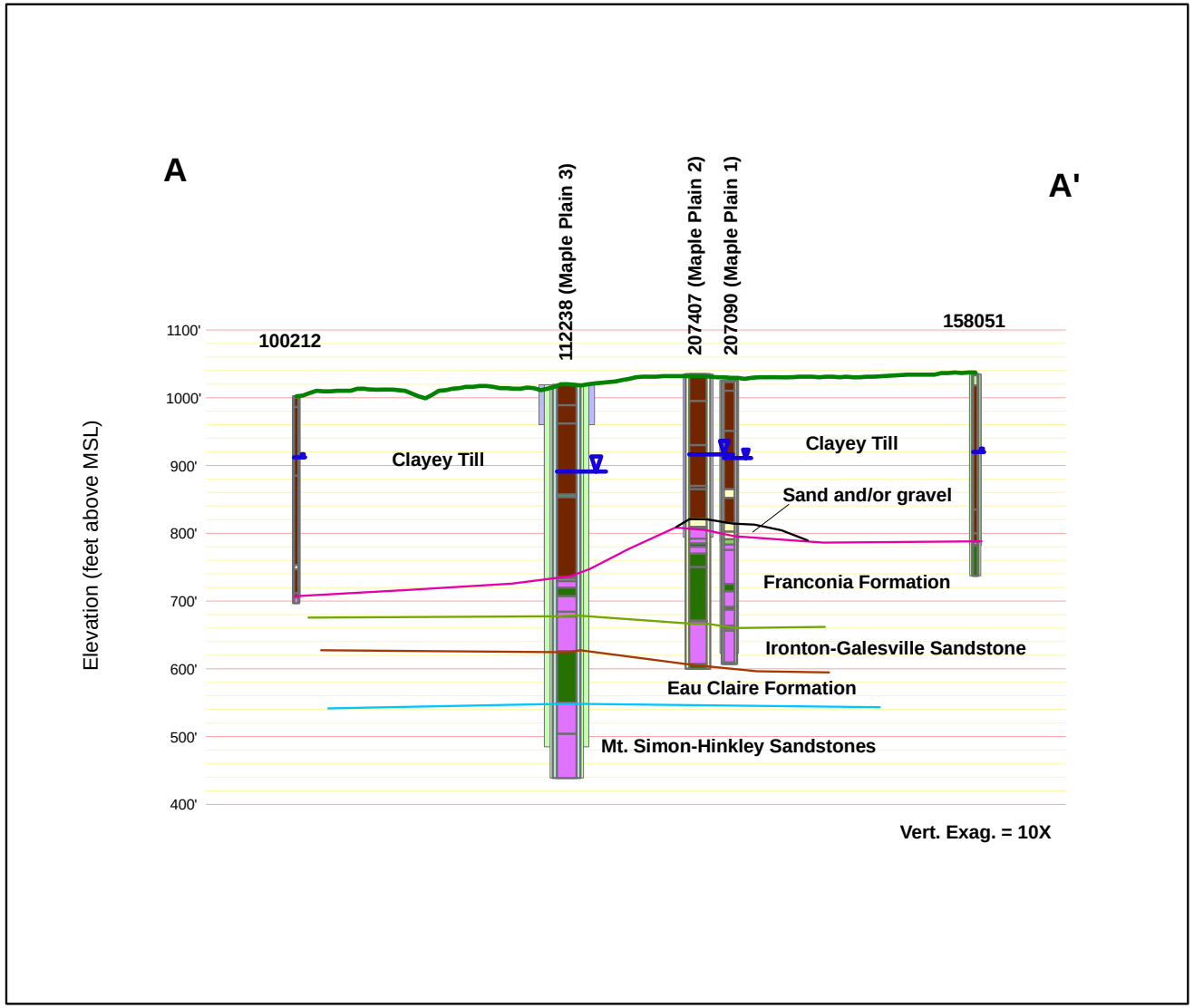


Figure 3
Geologic Cross-Sections Locations
(Maple Plain, MN)



Stratigraphy

Lithology

- Clay
- Drift
- Gravel
- Sand
- Shale
- Siltstone
- Sandstone
- Soil

2,600 1,300 0 2,600

Ft

Enlarged Area

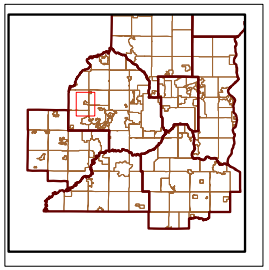


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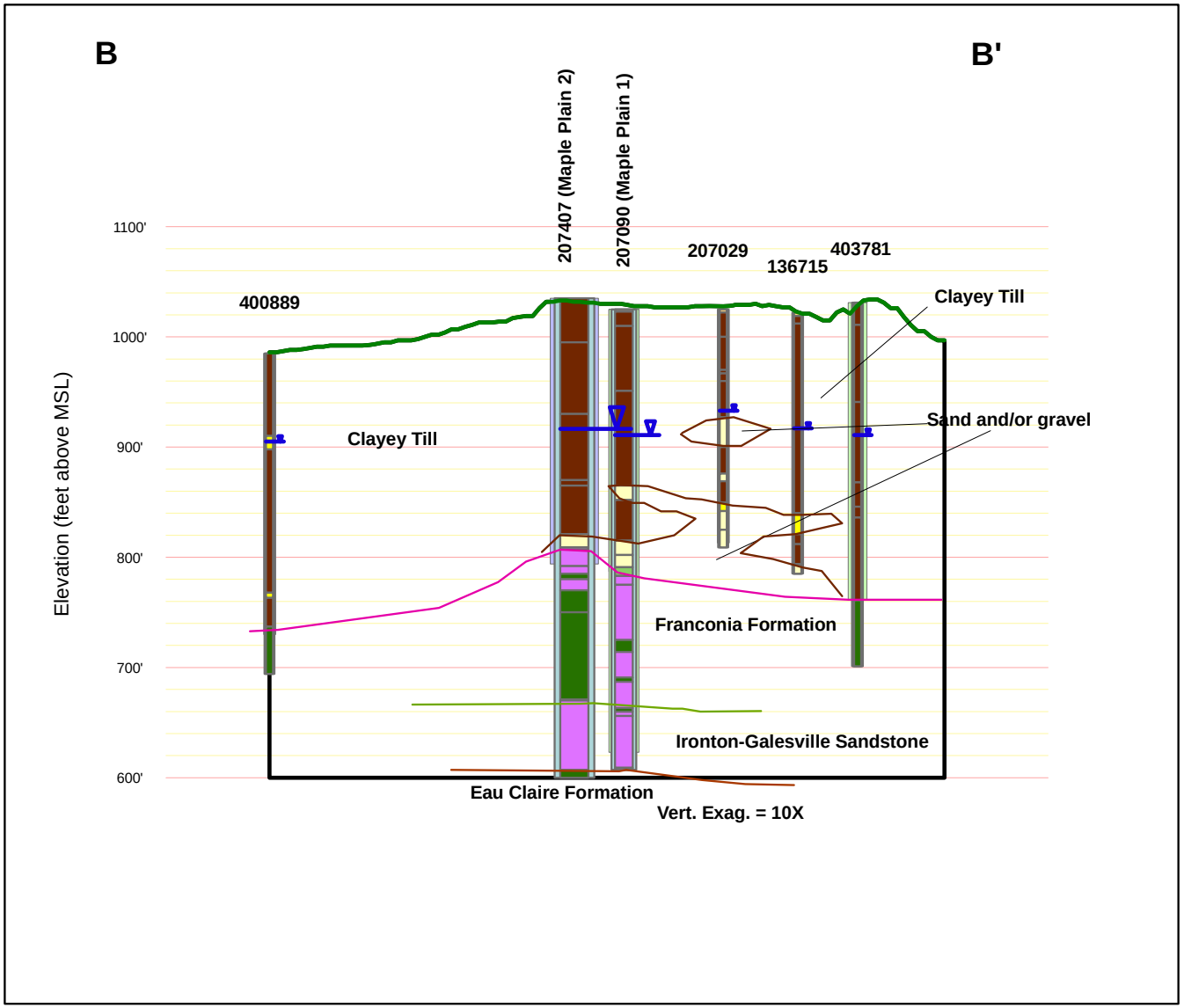
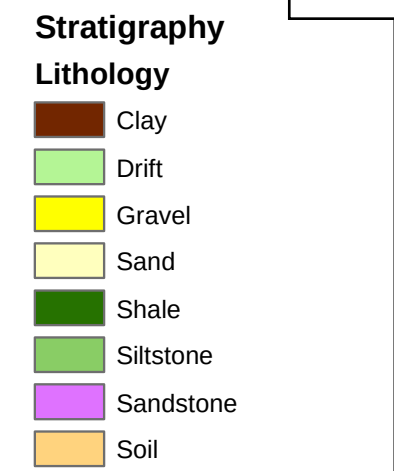
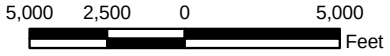
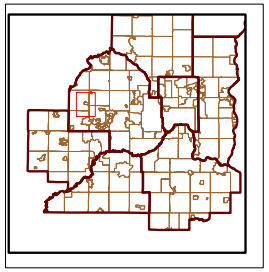
Figure 4a
Geologic Cross-Section A-A'
(Maple Plain, MN)





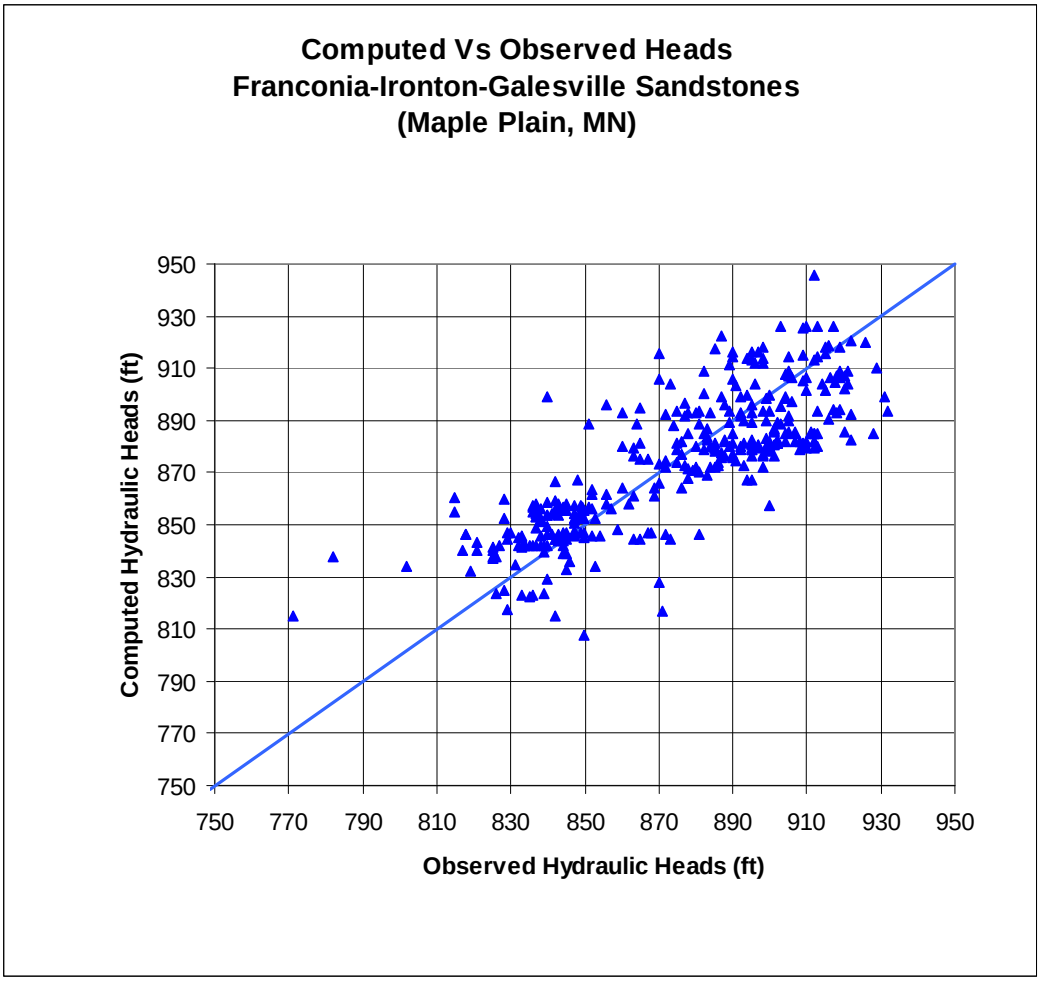


Enlarged Area



MINNESOTA MDH DEPARTMENT OF HEALTH

Figure 4b
Geologic Cross-Section B-B'
(Maple Plain, MN)



Refined Model
Calibration Statistics

Residual Mean (ft)	0.53
Coefficient of Correlation	0.860
Coefficient of Determination	0.74
number of observations	365
Absolute Max Head	932.00
Absolute Min Head	705.00
Residual Standard Dev.	20.391
Res Std Dev./Range	8.98%

Figure 5
Refined Model Calibration Statistics
FIG Aquifer
City of Maple Plain, MN

Appendix B Well Logs

Minnesota Unique Well No. **112238**

County Hennepin
Quad Rockford
Quad ID 121C

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

Entry Date 08/24/1991
Update Date 02/06/2012
Received Date

Well Name MAPLE PLAIN 3
Township Range Dir Section Subsections Elevation 1019 ft.
118 24 W 24 CCCACD Elevation Method 7.5 minute topographic map (+/- 5 feet)

Well Depth	Depth Completed	Date Well Completed
580 ft.	580 ft.	04/20/1978

Drilling Method Cable Tool

Well Address
MAPLE PLAIN MN 55359

Drilling Fluid --
Well Hydrofractured? ☐ Yes ☐ No From Ft. to Ft.

Use Community Supply PWS ID 1270021 Source S03

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☐ Yes ☑ No Above/Below 2 ft.

Geological Material	Color	Hardness	From	To
CLAY			0	30
SANDY CLAY	BLUE		30	57
CLAY	BLUE		57	162
GRAVEL			162	166
CLAY	BLUE		166	284
HARD-PACKED GRAVEL		HARD	284	286
HARD PACKED GRAVEL		HARD	286	290
SAND, SHALE, AND LIME			290	299
SHALE STICKY			299	312
SAND, SHALE, AND LIME			312	335
SHALEY SANDROCK			335	342
SHALEY, SANDROCK			342	393
SHALEY, SANDROCK			393	469
EAU CLAIRE-MT. SIMON TRANSITION	GRAY	SOFT	469	515
MT. SIMON	WHITE	SOFT	515	580

Casing Diameter	Weight	Hole Diameter
30 in. to 59 ft.	lbs./ft.	24 in. to 534 ft.
24 in. to 333 ft.	lbs./ft.	18 in. to 580 ft.
18 in. to 534 ft.	lbs./ft.	

Open Hole from 534 ft. to 580 ft.

Screen YES Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
128 ft. from Land surface Date Measured 09/27/1994

PUMPING LEVEL (below land surface)
220 ft. after hrs. pumping 650 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
GAMMA LOGGED 5-13-1993 & 7-14-1993 AFTER GRAVEL PACK REMOVED.
IN 1994 SCREEN WAS PULLED AND THE WELL WAS DEEPENED.
M.G.S. NO. 3619.
MAPLE PLAIN MUNI #3 MP=2.25
WELL GRAVEL PACKED HAS 70 FT. OF SCREEN AND 60 FT. OF LEADER PIPE.

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement	from 0 to 534 ft.	36 yrds.
Grout Material: Neat Cement	from 0 to 60 ft.	0

Located by: Minnesota Department of Health
Method: GPS SA On (averaged)
Unique Number Verification: Information from owner
Input Date: 04/06/1999
System: *UTM - Nad83, Zone15, Meters*
X: 447662 Y: 4984133

Nearest Known Source of Contamination
_feet _direction _type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed 00/07/1994
Manufacturer's name JOHNSTON Model number TK-61554A HP 125 Volts 240
Length of drop Pipe 280 ft. Capacity 650 g.p.m Type Turbine Material Steel (black or low carbon)

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

Cuttings Yes Borehole Geophysics Yes
First Bedrock Franconia
Last Strat Mt.Simon Sandstone
Aquifer Mt.Simon
Depth to Bedrock 286 ft.

Well Contractor Certification

Bergerson-Caswell	27058	MANTHIE, D.
License Business Name	Lic. Or Reg. No.	Name of Driller

County Well Index Online Report 112238 Printed 12/13/2012
HE-01205-07

Minnesota Unique Well No.
136693

County Hennepin
Quad Rockford
Quad ID 121C

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

Entry Date 08/24/1991
Update Date 09/11/1991
Received Date

Well Name WILLIAM NEGLEY
Township Range Dir Section Subsections Elevation 1035 ft.
118 24 W 25 BBDBCD Elevation Method 7.5 minute topographic map (+/- 5 feet)

Well Depth	Depth Completed	Date Well Completed
157 ft.	157 ft.	06/18/1977

Drilling Method --

Well Address
1459 PRAIRIELAND AV
MAPLE PLAIN MN

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Geological Material	Color	Hardness	From	To
TOPSOIL			0	1
CLAY	YELLOW		1	24
CLAY + GRAVEL	BLUE		24	66
COARSE GRAVEL		HARD	66	79
COARSE SAND	GRAY	SOFT	79	105
CLAY + GRAVEL	GRAY		105	115
MUCKY SAND	RED	SOFT	115	148
SAND	GRY/YEL		148	157

Casing Type Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below 0 ft.

Casing Diameter	Weight	Hole Diameter
4 in. to ft.	lbs./ft.	

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
4	15	4	0 ft. and ft.

Static Water Level
68 ft. from Land surface Date Measured 06/18/1977

PUMPING LEVEL (below land surface)
0 ft. after hrs. pumping 80 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
NORTH 0.5 SECT.

Grouting Information Well Grouted? ☐ Yes ☐ No

Located by: Minnesota Geological Survey Method: Digitization (Screen) - Map (1:24,000)
Unique Number Verification: N/A Input Date: 12/11/2001
System: *UTM - Nad83, Zone15, Meters* X: 447760 Y: 4983721

Nearest Known Source of Contamination
_feet _direction _type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed
Manufacturer's name DEMPSTER Model number D175B HP 0.5 Volts 230
Length of drop Pipe 81 ft. Capacity _g.p.m Type Submersible 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

First Bedrock
Last Strat sand
Aquifer Quat. Buried Unconf. Aquife
Depth to Bedrock ft.

Well Contractor Certification
Stevens Well Co. 27194
License Business Name Lic. Or Reg. No. Name of Driller

County Well Index Online Report 136693 Printed 12/13/2012
HE-01205-07

Minnesota Unique Well No.
157884

County Hennepin
Quad Mound
Quad ID 105B

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

Entry Date 07/05/1991
Update Date 01/03/2007
Received Date

Well Name ERICKSON, DOUGLAS
Township Range Dir Section Subsections Elevation ft.
118 24 W 25 ABB Elevation Method

Well Depth	Depth Completed	Date Well Completed
114 ft.	114 ft.	05/31/1979

Drilling Method Non-specified Rotary

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Steel (black or low carbon) Joint Threaded Drive Shoe? ☑ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 106 ft.	11 lbs./ft.	6.25 in. to 114 ft.

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
4	18	8	106 ft. and 114 ft.

Geological Material	Color	Hardness	From	To
TOPSOIL			0	2
CLAY	YELLOW		2	21
CLAY	BLUE		21	91
SANDY CLAY	RED		91	96
GRAVEL			96	106
SAND			106	114

Static Water Level
79 ft. from Land surface Date Measured 05/31/1979

PUMPING LEVEL (below land surface)
ft. after hrs. pumping 20 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☐ Yes ☑ No

Nearest Known Source of Contamination
_feet _direction _type

Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 06/07/1979
Manufacturer's name DEMPSTER Model number MF3-50-S2 HP 0.5 Volts 230
Length of drop Pipe 90 ft. Capacity 15 g.p.m Type Submersible Material Galvanized

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

License Business Name	Lic. Or Reg. No.	Name of Driller
Stevens Well Co.	27194	DVORAK, J.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report 157884 Printed 12/13/2012
HE-01205-07

Minnesota Unique Well No.
775974

County Hennepin
Quad
Quad ID

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

Entry Date 09/02/2011
Update Date 11/30/2012
Received Date 01/18/2011

Well Name YOUNG, JERRY
Township Range Dir Section Subsections Elevation ft.
118 24 W 26 AAB Elevation Method

Well Depth	Depth Completed	Date Well Completed
300 ft.	300 ft.	11/03/2010

Drilling Method Non-specified Rotary

Well Address
1554 PARKVIEW RD
MAPLE PLAIN MN 55359

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☑ No
From Ft. to Ft.

Use Irrigation

Geological Material	Color	Hardness	From	To
CLAY	BROWN	MEDIUM	0	32
CLAY	GRAY	SOFT	32	68
SANDY CLAY	GRAY	SOFT	68	162
CLAY	GRAY	MEDIUM	162	252
SANDY CLAY	GRAY	MEDIUM	252	272
SAND	VARIED	SOFT	272	300

Casing Type Plastic Joint Welded Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 280 ft.	lbs./ft.	8 in. to 20 ft.

Open Hole from ft. to ft.

Screen YES Make SLOTTED Type plastic

Diameter	Slot/Gauze	Length	Set Between
4	10	20	280 ft. and 300 ft.

Static Water Level
109 ft. from Land surface Date Measured 10/15/2010

PUMPING LEVEL (below land surface)
280 ft. after 3 hrs. pumping 35 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
10-R-28226.

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Bentonite from 0 to 60 ft. 4 bags

Nearest Known Source of Contamination
_feet _direction _type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 11/03/2010
Manufacturer's name AERMOTOR Model number __ HP 1 Volts 220
Length of drop Pipe 140 ft. Capacity 12 g.p.m Type Submersible 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

Bergerson Caswell, Inc.	1767	SCHULTZ, C.
License Business Name	Lic. Or Reg. No.	Name of Driller

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

775974

Printed 12/13/2012
HE-01205-07

Appendix C Correspondence

Minnesota Department of Natural Resources
Central Region Waters - 1200 Warner Road, St. Paul, MN 55106-6793
Telephone: (651) 259-5845 Fax: (651) 772-7977

November 2, 2009

Dennis Nelsen
City of Maple Plain
1620 Maple Avenue
Maple Plain, MN 55359

RE: APPROVAL OF CITY OF MAPLE PLAIN'S WATER SUPPLY PLAN

Dear Mr. Nelsen:

We are in receipt of your faxed letter of July 6, 2009, in which you provided additional information and commitments regarding well monitoring and water use record keeping in connection with the City's Water Supply Plan, as requested in Kate Drewry's letter of June 19, 2009.

Based on the information and commitments outlined in your letter, I am pleased to advise you that in accordance with Minnesota Statutes, Section 103G.291, Subdivision 3, and on behalf of the Commissioner of Natural Resources, your Plan is hereby approved. **This approval is effective upon the Department's receipt of a completed copy of the enclosed "Certification of Adoption" form**. The form is to be returned to my office when it has been completed and signed.

Note that this approval is contingent upon the City incorporating the monitoring plan proposed in your letter into the final version of the Water Supply Plan officially adopted by the City. Please submit the well measurement data quarterly in an Excel spreadsheet to the DNR Ground Water Level Monitoring Coordinator at gwlevelcoordinator@dnr.state.mn.us, along with surveyed land surface and well measure-point elevations. If you have questions regarding data reporting and to obtain a reporting form template, please email the Monitoring Coordinator.

Also, as you have been previously notified, *Minnesota Statutes*, Section 103G.291 was amended last year to require all public water suppliers in the metropolitan area serving over 1000 people to adopt a conservation rate structure by 2010. This approval of the City's Water Supply Plan does not eliminate that statutory requirement.

Thank you for your efforts in completing the Water Supply Plan and your commitment to water conservation.

Sincerely,

Dale E. Homuth
Regional Hydrologist

Enclosure

c:
Jason Ziemer , City of Maple Plain
Metropolitan Council, Sara Smith
Mike MacDonald, Observation Well Program
Laurel Reeves, Water Appropriation Program Manager
Kate Drewry, Area Hydrologist

April 3, 2010

Mr. Dennis Nelsen
Water Superintendent - City of Maple Plain
P.O. Box 97
Maple Plain, Minnesota 55359-0097

Dear Mr. Nelsen:

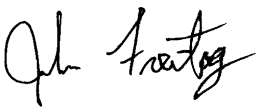
Subject: Second Scoping Decision Notice for the City of Maple Plain - PWSID 1270021

This letter provides notice of the results of a scoping meeting I held with you and Jason Ziemer (city of Maple Plain) and Mark Janovec (Stantec Consulting Service) on March 5, 2012, at Maple Plain City Hall regarding wellhead protection (WHP) planning. During the meeting we discussed the data elements that must be included and used to prepare the part of the WHP plan related to the management of potential contaminants in the approved drinking water supply management area. The enclosed Scoping 2 Decision Notice lists the data elements that were discussed at the meeting.

Maple Plain has met the requirements to distribute copies of the first part of the wellhead protection plan to local units of government and hold an informational meeting for the public. The city of Maple Plain will have until February 16, 2013, to complete its wellhead protection plan.

If a data element is marked on the enclosed notice as a data element that must be used and it does not exist, it is helpful if your plan notes this. Stantec Consulting Service will be working with you to develop a draft of the remainder of the wellhead protection plan. I will be contacting you to review the progress of the development of Part II of your plan. If you have any questions regarding the enclosed notice, contact me by email at john.freitag@state.mn.us or by phone at 651/201-4669.

Sincerely,



John J. Freitag, Principal Planner
Environmental Health Division
P.O. Box 64975
St. Paul, Minnesota 55164-0975

JJF:kmc
Enclosures
cc: Isaac Bradlich, MDH Engineer, Snelling Office Park
Byron Adams, Water Monitoring Section, Minnesota Pollution Control Agency
Joe Richter, Division of Waters, Minnesota Department of Natural Resources
Brian Williams, Pesticide & Fertilizer Mgmt. Division, Minnesota Department of Agriculture
Eric Mohring, Hydrologist, Board of Water and Soil Resources
Jason Ziemer, City Administrator, City of Maple Plain
Mark Janovec, Stantec Consulting Services Inc.

SCOPING 2 DECISION NOTICE

э **Remainder of the Wellhead Protection Plan**

Name of Public Water Supply:		**Date:**
City of Maple Plain **PWSID 1270021**		April 3, 2012
Name of the Wellhead Protection Manager:		
Mr. Dennis Nelsen, Water Superintendent		
Address: 1620 Maple Avenue P.O. Box 97	**City:** Maple Plain	**Zip:** 55359-0097
Unique Well Numbers: 112238 (Well 3), 207407 (Well 2 - Emergency*), 207090 (Well 1 - Emergency*)		**Phone:** 763/479-0525

*Emergency wells only use the IWMZ Form for data collection.

Instructions for Completing the Scoping 2 Form

N	R	S	
X			**N = Not required.** If this box is checked, this data element is **NOT** necessary for your wellhead protection plan because it is not needed or it has been included in the first scoping decision notice. **Please go to the next data element**.

N	R	S	
	X		**R = Required for the remainder of the plan.** If this box is checked, this data **MUST** be used for the "**remainder of the plan**."

N	R	S	
		X	**S = Submit to MDH.** If this box is checked, this data element **MUST** be included in your **wellhead protection plan and submitted to MDH**. If there is **NO** check mark in the **"S"** box but there is an **X** in the **"R"** box, this data element **MUST** be included in your plan, but should **NOT be submitted to MDH**. This box will only be checked if MDH does not have access to this data element. This will help to reduce the cost by reducing the amount of paper and time to reproduce the data element.

Note: Any data elements required in the first scoping decision notice must also be used to complete the remainder of the wellhead protection plan.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT

PRECIPITATION

N	R	S	
X			An existing map or list of local precipitation gauging stations.

Technical Assistance Comments:

N	R	S	
X			An existing table showing the average monthly and annual precipitation in inches for the preceding five years.

Technical Assistance Comments:

GEOLOGY

N	R	S	
	X		An existing geologic map and a description of the geology, including aquifers, confining layers, recharge areas, discharge areas, sensitive areas as defined in Minnesota Statutes, section 103H.005, subdivision 13, and groundwater flow characteristics.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

N	R	S	
	X		Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

N	R	S	
	X		Existing borehole geophysical records from wells, borings, and exploration test holes.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

N	R	S	
	X		Existing surface geophysical studies.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

SOILS

N	R	S	
X			Existing maps of the soils and a description of soil infiltration characteristics.

Technical Assistance Comments:

N	R	S	
X			A description or an existing map of known eroding lands that are causing sedimentation problems.

Technical Assistance Comments:

WATER RESOURCES			
N	**R**	**S**	An existing map of the boundaries and flow directions of major watershed units and minor watershed units.
X			
Technical Assistance Comments:			

N	**R**	**S**	An existing map and a list of public waters as defined in Minnesota Statutes, section 103G.005, subdivision 15, and public drainage ditches.
X			
Technical Assistance Comments:			

N	**R**	**S**	The shoreland classifications of the public waters listed under subitem (2), pursuant to part 6120.3000 and Minnesota Statutes, sections 103F.201 to 103F.221.
X			
Technical Assistance Comments:			

N	**R**	**S**	An existing map of wetlands regulated under chapter 8420 and Minnesota Statutes, section 103G.221 to 103G.2373**.**
X			
Technical Assistance Comments:			

N	**R**	**S**	An existing map showing those areas delineated as floodplain by existing local ordinances.
X			
Technical Assistance Comments:			

DATA ELEMENTS ABOUT THE LAND USE

LAND USE			
N	**R**	**S**	An existing map of parcel boundaries.
	X	**X**	
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

N	**R**	**S**	An existing map of political boundaries.
	X	**X**	
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

N	**R**	**S**	An existing map of public land surveys including township, range, and section.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

N	R	S	
	X	X	A map and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources.

Technical Assistance Comments: The inventory, mapping, and management of land uses and potential sources of contamination for all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements, as follows:

Low Vulnerability - 1) All potential contaminant sources and facility designations as listed on the attachment, 2) a land use/land cover map and table, and 3) an inventory of the Inner Wellhead Management Zone (IWMZ).

As a starting point, MDH will provide a 1992 or 2001 land cover map and table from federal data bases. This data set must be used unless an alternative electronic data set that is more current and detailed is available.

Management strategies must be developed for all land uses and potential sources of contamination.

N	R	S	
	X	X	An existing comprehensive land-use map.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element. Include any urban fringe planning areas.

N	R	S	
	X	X	Existing zoning map.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

PUBLIC UTILITY SERVICES

N	R	S	
X			An existing map of transportation routes or corridors.

Technical Assistance Comments:

N	R	S	
X			An existing map of storm sewers, sanitary sewers, and public water supply systems.

Technical Assistance Comments:

N	R	S	
X			An existing map of the gas and oil pipelines used by gas and oil suppliers.

Technical Assistance Comments:

N	R	S	
X			An existing map or list of public drainage systems.

Technical Assistance Comments:

N	R	S	
	X		An existing record of construction, maintenance, and use of the public water supply well(s) and other wells within the drinking water supply management area.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

DATA ELEMENTS ABOUT WATER QUANTITY

SURFACE WATER QUANTITY

N	R	S	
X			An existing description of high, mean, and low flows on streams.

Technical Assistance Comments:

N	R	S	
X			An existing list of lakes where the state has established ordinary high water marks.

Technical Assistance Comments:

N	R	S	
X			An existing list of permitted withdrawals from lakes and streams, including source, use, and amounts withdrawn.

Technical Assistance Comments:

N	R	S	
X			An existing list of lakes and streams for which state protected levels or flows have been established.

Technical Assistance Comments:

N	R	S	
X			An existing description of known water-use conflicts, including those caused by groundwater pumping.

Technical Assistance Comments:

GROUNDWATER QUANTITY

N	R	S	
	X		An existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

N	R	S	
	X		An existing description of known well interference problems and water use conflicts.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

N	R	S	
	X		An existing list of state environmental bore holes, including unique well number, aquifer measured, years of record, and average monthly levels.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

DATA ELEMENTS ABOUT WATER QUALITY

SURFACE WATER QUALITY

N	R	S	
X			An existing map or list of the state water quality management classification for each stream and lake.

Technical Assistance Comments:

N	R	S	
X			An existing summary of lake and stream water quality monitoring data, including: 1. bacteriological contamination indicators; 2. inorganic chemicals; 3. organic chemicals; 4. sedimentation; 5. dissolved oxygen; and 6. excessive growth or deficiency of aquatic plants.

Technical Assistance Comments:

GROUNDWATER QUALITY

N	R	S	
	X		An existing summary of water quality data, including: 1. bacteriological contamination indicators; 2. inorganic chemicals; and 3. organic chemicals.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

N	R	S	
	X		An existing list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

N	R	S	
	X		An existing report of groundwater tracer studies.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

N	R	S	
	X		An existing site study and well water analysis of known areas of groundwater contamination.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

N	R	S	
	X		An existing property audit identifying contamination.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

N	R	S	
	X		An existing report to the Minnesota Department of Agriculture and the Minnesota Pollution Control Agency of contaminant spills and releases.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

Appendix D Documentation of Public Hearing

(Note: Appendix to be completed following public hearing, scheduled to be held in May 2013.)

THE LAKER & THE Pioneer

Legal notice: City of Maple Plain

By **The Pioneer & The Laker** on June 6, 2013 at 5:21 pm

LEGAL NOTICE
CITY OF MAPLE PLAIN

NOTICE OF PUBLIC HEARING

Notice is hereby given that the City Council of the City of Maple Plain will conduct a public hearing at 7 p.m. on Monday, June 10, 2013 at City Hall, 1620 Maple Avenue, to review the City's Part 2 Wellhead Protection Plan. The Plan is designed to help protect the City's drinking water supply by identifying and managing potential sources of contamination which could threaten local groundwater resources.

A brief presentation will provide background information on the request. Following the presentation, the City Council will accept oral statements from the public. Written comments may also be submitted, but must be received no later than 4:30 p.m. on Monday, June 10, 2013. Written comments may be mailed to: Maple Plain City Hall, 1620 Maple Avenue, P.O. Box 97, Maple Plain, MN 55359; or e-mailed to jziemer@mapleplain.com, and must include name and address of person(s) submitting statement(s).

Jason Ziemer
City Administrator

(Published in The Pioneer newspaper June 1 and 8, 2013)

Tags: Maple Plain, Pioneer

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AGENDA
MAPLE PLAIN CITY COUNCIL – REGULAR MEETING
MAPLE PLAIN CITY HALL
JUNE 10, 2013
7:00 PM

I. SPECIAL PRESENTATIONS
A. Centerpoint Energy Community Partnership grant.
B. Step to It Challenge winner.

II. CALL TO ORDER

III. PLEDGE OF ALLEGIANCE

IV. ADOPT AGENDA

V. CONSENT AGENDA
A. Approve May 28, 2013 regular meeting minutes.
B. Accounts payable.
C. Maple Plain Days event stage rental.
D. Wenck & Associates project extension request.
E. Fire Department suburban equipment purchase.

VI. VISITORS TO BE HEARD
Note: This is a courtesy extended to persons wishing to address the council who are not on the agenda. A completed public comment form should be presented to the city administrator prior to the meeting; presentations will be limited to 3 minutes. This session will be limited to 15 minutes.

VII. PUBLIC HEARINGS
A. Maple Plain wellhead protection plan.

VIII. ADMINISTRATIVE REPORTS

IX. OLD BUSINESS
A. Highway 12 red light pedestrian crossing project.
B. Public Works iPAD.

X. NEW BUSINESS
A. Park and pool monument sign.
B. Maple Avenue watermain project.
C. Budd Avenue sanitary sewer.

XI. LEGISLATIVE/INTERGOVERNMENTAL AFFAIRS

XII. COUNCIL REPORTS & OTHER BUSINESS

XIII. CLOSED SESSION

XIV. ADJOURNMENT

Regular Meeting of the Maple Plain City Council
Meeting Minutes
June 10, 2013
Maple Plain City Hall
7:00 PM

I. SPECIAL PRESENTATIONS

A. Centerpoint Energy Community Partnership Grant

Mayor Hackbarth introduced Steve Marsh of Centerpoint Energy. Marsh congratulated the City on receiving grant funds from the Community Partnership Grant and presented a check for $1,800 to the City. The grant money went towards the purchasing of two Automated External Defibrillators (AEDs); one of which will be placed at the Maple Plain Fire Station and one at City Hall.

B. Step to it Challenge winner

Assistant to the City Administrator Margaret McCallum announced City of Maple Plain resident Shauna Shurson as the top stepper for the 2013 Hennepin County Step to It Challenge. McCallum explained that Shurson had a total step count of 792,085. McCallum presented Shurson with 2 tickets to the upcoming June 11 Twins game where Shurson and the top steppers from other participating communities will be recognized at the game.

McCallum recognized Maple Plain's other top ten steppers for the challenge: Sherry Zimmermann, Stephen Shurson, Jenna Mandler, Kevin Lewandowski, Kathy Quandt, Mary Plucinski, Joshua Kitsmann, Mark Lenz and Wayne Marshall.

McCallum announced Stacey Fix as the recipient of the Step to It Challenge helmet and bike prize, courtesy of the West Hennepin Chamber of Commerce. Bobbi Henrich, President/Treasurer of the West Hennepin Chamber of Commerce presented Fix with the prize. Fix's name was randomly drawn from a pool of participants who both participated in the Maple Plain Step to It Challenge kickoff on April 29 and logged steps for all four weeks of the challenge.

McCallum thanked all who participated in the Challenge this year.

II. CALL TO ORDER

Mayor Hackbarth called the meeting to order at 7:09 p.m.

Present: Mayor Roger Hackbarth, and Councilmembers Michael DeLuca, Dave Eisinger, Justin McCoy and Jerry Young; Assistant to the City Administrator Margaret McCallum; City Attorney Jeff Carson; and City Engineer Dan Boyum (Stantec).

III. PLEDGE OF ALLEGIANCE

IV. ADOPT AGENDA

Councilmember McCoy moved to adopt the Agenda as amended; Councilmember Eisinger seconded. Motion passed 5-0.

V. CONSENT AGENDA

Councilmember DeLuca requested that consent agenda item E, Fire Department suburban equipment purchase, be pulled for further discussion

Councilmember McCoy moved to approve the Consent Agenda as amended; Councilmember Young seconded. Motion passed 5-0.

Items approved under the Consent Agenda:

A. Approve May 28, 2013 regular meeting minutes.
B. Accounts payable.
C. Maple Plain Days event stage rental.
D. Wenck & Associates project extension request.
E. Fire Department suburban equipment purchase.

Councilmember DeLuca asked for an explanation as to the changes in the cost for the Fire Department suburban and equipment.

Councilmember/Fire Chief Eisinger explained that the suburban was purchased the following week for $38,693.26. He stated that a cap of $45,000 was originally set for the purchase. He specified that before the purchase, the Truck Committee consulted with Action Fleet Incorporated, who explained that lighting and other equipment on the current truck could be reused and transferred to the new vehicle. Eisinger said that after the new truck was purchased, Action Fleet reassessed the situation and decided that it would be better to purchase new equipment instead of reusing the old. He stated that the Fire Partnership agreed to buy new equipment. Eisinger stated that with the sale of the old equipment, the Department is hoping to not exceed the $45,000 cap by much.

Councilmember DeLuca moved to approve consent agenda item E, Fire Department equipment purchase; Councilmember McCoy seconded. Motion passed 5-0.

VI. VISITORS TO BE HEARD

None.

VII. PUBLIC HEARINGS

A. Maple Plain wellhead protection plan.

Hydrogeologist, Mark Janovec, with Stantec, highlighted the history of and the City's participation in the Minnesota Department of Health's wellhead protection program. Janovec explained that the City had recently completed part one of the program, which helped to identify the City's 10-year capture zone for the City's wells; the wells that provide the City's water supply. He stated that part one of the program also sought to identify any vulnerable areas related to the aquifer. Janovec explained that the research findings suggest that Maple Plain's aquifer has low vulnerability partially due to a protective clay shell surrounding it.

Janovec explained that with part one of the program complete, he would be involved in part two of the program, which involved looking at possible contamination risks to the aquifer. He said that one potential risk of contamination was old private wells that were not properly sealed when abandoned. Janovec explained that four private wells were located in the City; however that he would perform additional research and provide some public awareness education as a means to locate any additional undocumented wells. He stated that the information would then be directed to the Minnesota Department of Health for review and approval. Janovec said that after review and approval of the plan by the Minnesota Department of Health, the City would begin the implement the plan and be eligible to grant funding that would assist private well owners in sealing any unused wells.

Hackbarth opened the public hearing at 7:25 p.m.

Councilmember McCoy moved to close the public hearing at 7:26 p.m.; Eisinger seconded. Motion passed 5-0.

VIII. ADMINISTRATIVE REPORTS

Mayor Hackbarth mentioned that tomorrow night, a joint Council meeting with the City of Independence would be held to swear in a new police officer, Joshua Brodzek, at West Hennepin Public Safety at 6:30 p.m.

Mayor Hackbarth mentioned that Active-Living Hennepin County had scheduled a partnership meeting for June 17th at Brooklyn Center from 9:00 a.m. to 11:00 a.m. He explained that the meeting would focus on policies, strategies and incentives for bicycle parking.

IX. OLD BUSINESS

A. Highway 12 red light pedestrian crossing project

City Engineer Boyum reported on engineering information that was requested from the Council at the previous Council meeting and workshop meeting. Boyum stated that the engineering cost for the HAWK project would not exceed $26,000. He informed the Council that the cost of the installation of decorative street lights, by Xcel Energy, would be about $27,500 for two lights and $77,376 for eight.

Boyum provided technical details on the possible installation of an advanced warning signal to the east of the crosswalk as a means to better prepare west-bound commuters. Boyum explained that the recommended distance away from the signal is 180 feet.

Boyum asked Council for direction regarding:

1. Getting estimates for the sidewalk work,
2. Whether the project should include two or eight decorative lights, and
3. Whether the advanced warning lights should be included in the project.

Boyum explained that the financial information for the project would be discussed at the next Council meeting on June 24.

Mayor Hackbarth inquired into the cost difference between two decorative lights versus eight decorative lights; $27,500 to $77,376. Boyum explained that there was likely a fixed wiring cost that doesn't exponentially change with the addition of more lights; thus bringing the cost of each individual light down when more are added.

Councilmember Eisinger stated that even if engineering was not involved in the sidewalks, he was confident and comfortable with the work of vendors that the City has previously worked with. Boyum explained that the sidewalk plans designed by Stantec could be used as a reference.

Councilmember McCoy moved to approve to fund the full amount of $258,640 for the HAWK signal project, which includes costs for the signal, street lights, sidewalk, engineering and contingencies; Councilmember Deluca seconded. Motion passed 5-0.

B. Public Works iPAD

Assistant to the City Administrator McCallum introduced the Public Works agenda iPAD item. McCallum stated that staff is recommending the purchase of an iPAD for Public Works. The iPAD would replace the laptop of which Public Works is currently using. She explained that this laptop would replace the old laptop at City Hall. McCallum explained that the iPAD would allow Public Works to do their job more efficiently, by having the iPAD with them as work and software programs would allow them quicker access to information and the ability to record information on site.

Councilmember Young expressed concern over the iPAD being compatible with the software Public Works planned to use. McCallum stated that she would gather additional information.

Young moved to approve the purchase of an iPAD for Public Works, pending the confirmation that the software they will use is compatible; Councilmember Eisinger seconded. Motion passed 5-0.

X. NEW BUSINESS

A. Park and Pool monument sign.

City Engineer Boyum reviewed the bids for Park and Pool monument sign project. Boyum reported that City staff sent bid proposals to about 10-12 sign contractors and received 3 bids back. He noted that the bid from Serigraphics Sign Systems was not applicable because it did not meeting a project requirement. Signation Sign Group was the low bidder at $1,850, the highest being Nordquist Sign at $7,440. Boyum stated that the project engineer from MnDOT reviewed the proposals and approved both of the applicable bids. Boyum said that the sign cost would be covered with grant money received from MnDOT in 2010. Boyum stated that staff recommended approving Signation Sign Group bid proposal.

Councilmember Young moved to award the Park and Pool monument sign project to the lowest bidder, Signation Sign Group; Eisinger Seconded.

Mayor Hackbarth questioned why there was such a big difference between the lowest and the highest bid. McCallum stated that Nordquist Sign included a portion of the sign that was not supposed to be included in the proposal, thus bringing up the cost a little bit.

Mayor Hackbarth expressed concern over what would happen to the sign when MnDOT changes the Park and Pool site into a Bus Station.

Councilmember McCoy stated that the project engineer from MnDOT did research on all of the bids and recommended the approval of Signation Sign's bid. McCoy explained that they should trust that recommendation.

Councilmember DeLuca inquired into why Serigraphics Sign Systems was eliminated from the bidding process. Boyum explained that Serigraphics's bid did not incorporate "prevailing wages" into its pricing; something that is required for all state funded projects.

Motion passed 5-0.

B. Maple Plain water main project.

City Engineer Boyum explained that as part of the last Council work session meeting, on June 5, Council discussed the replacement of the water main that broke earlier in the year at Maple Avenue.

Boyum stated that that the Council had previously discussed with how to proceed with the water main project. Boyum stated that at the previous work session, Council was considering one of two options: to replace only the area of concern or to replace a larger section of the water main. He explained that the larger project would include the replacement of the water main from Maple Avenue, under Highway 12, through to Delano Avenue. The cost would be $191,350. Replacement of the smaller problem area would cost $36,100, excluding any street patching. Boyum said that staff was seeking Council's approval to have Stantec draw up specs and plans for the project, which would then be presented at the July 8th meeting.

Councilmember Young suggested holding off on the drawing of specs and plans until the Council discusses how to finance the project. Councilmember DeLuca agreed to wait two weeks until the next Council meeting to discuss the project when at that time financing would be discussed.

Councilmember Young moved to wait until the next meeting to discuss the drawing of the specs and plans for the Maple Avenue water main project; Hackbarth seconded. Motion passed 5-0.

C. Budd Avenue sanitary sewer.

City Engineer Boyum explained that a section of the sanitary sewer system along Budd has a sag in the line and has required regular maintenance. Boyum stated that the line was televised this spring and a hole was discovered in the sag area. He explained that the hole is an issue in that it can start to undermine the soils below the pipe if not fixed. Boyum stated that staff is recommending that the line be replaced. He explained that if the pipe is replaced, staff recommends increasing the size of the pipe from an eight inch

pipe to a ten inch pipe to prepare for any future growth in that area. Boyum estimated the cost to replace the sewer and patch the street to be around $227,000.

Councilmember McCoy stated that it would make more sense to do a total overlay of the road instead of just patching half of the street.

Councilmember Young explained that previous work on the Budd sanitary sewer line was held off because the City was able to maintain and monitor it. He stated that now that it had a hole in it, it needed to be fixed.

Councilmember McCoy moved to approve Resolution No. 13-0610-3 ordering the preparation of plans and specifications for the Budd Avenue sanitary sewer project; Young seconded. Motion passed 5-0.

Councilmember Young asked Boyum to take a look at the footage of the hole in the Budd Avenue sanitary sewer line and provide Council with some insight at the next Council meeting.

XI. LEGISLATIVE/INTERGOVERNMENTAL AFFAIRS

Assistant to the City Administrator McCallum stated that staff had made a request to meet with state legislators, however at this time had not heard back. She stated that staff would continue to work at scheduling a meeting.

XII. COUNCIL REPORTS & OTHER BUSINESS

Councilmember Eisinger asked staff if any additional steps had been taken to get the sign fixed on Highway 12 entering from the east. McCallum stated that staff was working with the artist who designed and constructed the signs to get them fixed. She added that he had been out of the country and that staff was in contact with him.

DeLuca moved to have city staff take the necessary steps to fix the signs; Young seconded. Motion passed 5-0.

McCallum explained that staff would like to reschedule the Council retreat for some time in early July. McCallum asked the Council to discuss and determine if there would be a day that would work for them. Councilmember McCoy recommended cancelling the regular meeting for July 8 and hold the retreat in its place. DeLuca asked McCallum to send an email to Councilmembers detailing possible dates for the retreat. DeLuca explained that the recent scheduling and planning of meetings has been disorganized and inconsistent, stating that meetings needed to be better planned for and communicated in advance and that they were too often getting changed.

McCallum said that staff was looking to schedule a first budget meeting of the year to begin to discuss the 2014 budget. She explained that staff was looking to schedule something at the beginning of July and suggested having the meeting as a workshop. Young asked McCallum to send an email to Councilmembers as a means to coordinate a date for the budget meeting.

Boyum asked Council members to offer advice as to what would be the best way for him to communicate information asked of him from previous meetings. Councilmember Young stated that email is an efficient way to relay information.

XIII. CLOSED SESSION

None.

XIV. ADJOURNMENT

Councilmember Young moved to Adjourn; Councilmember Eisinger seconded. Motion passed 5-0. Meeting adjourned at 8:43 p.m.

Prepared by

Margaret McCallum

Margaret McCallum, Assistant to the City Administrator

PCSI NO.	PROPERTY ID NO.	UNIQUE ID	PCSI NAME	DWSMA VULNERABILITY	PCSI TYPE	STATUS CODE	DEPTH DRILL	PROPERTY OWNER	TAX ADDRESS	PROPERTY ADDRESS	CITY	ZIP	COMMENTS
3	2411824330029	112238	Maple Plain #3	LOW	WEL	A	534.0	CITY OF MAPLE PLAIN	PO Box 97	1655 Pioneer Ave	Maple Plain	55359	Public Water Supply Well
4	2411824330029	824078	Maple Plain #4	LOW	WEL	A	392.0	CITY OF MAPLE PLAIN	PO Box 97	1655 Pioneer Ave	Maple Plain	55359	Public Water Supply Well

City of Maple Plain
DWSMA Parcels

Property ID	Property Owner Name	Tax Address	Property Address (Hennepin County GIS Property Map)	City	State	Zip Code	Area (Acres)	Use Class
2311824410004	WINDMILL PROPERTIES LTD PTNR	4025 WINDMILL DR, LORETTO, 55357	1800 Pioneer Creek Center	Maple Plain	MN	55359	19.94	Commercial
2311824440005	JOANN MARIE REE	P O BOX 2155660 W MAIN	5660 Main St W	Maple Plain	MN	55359	0.43	Residential
2311824440006	DAVID E HERRING	5670 MAIN ST W	5670 Main St W	Maple Plain	MN	55359	0.51	Residential
2311824440020	J & V HOMUTH	PO BOX 234	5710 Main St W	Maple Plain	MN	55359	0.68	Residential
2311824440026	L NIELSEN & E ELLINGSON	5655 U S HWY NO 12	5655 U S Hwy No 12	Maple Plain	MN	55359	3.45	Industrial
2411824320019	COHERENT HOLDINGS LLC	5475 PIONEER CREEK DR	5475 Pioneer Creek Dr	Maple Plain	MN	55359	2.37	Industrial
2411824330011	MARIA'S GARDENS LLC	5025 FERN DRIVE, LORETTO, MN 55357	1665 Spring Ave	Maple Plain	MN	55359	0.34	Residential
2411824330019	J ROBERT KEENA	3625 PARKWAY ST, DEEPHAVEN, MN 55391	5520 Main St W	Maple Plain	MN	55359	0.16	Residential - Misc/ B&B / Multiple
2411824330020	MARY A THAL	5530 MAIN ST W	5530 Main St W	Maple Plain	MN	55359	0.13	Residential
2411824330024	ANDREW STACK	5554 MAIN ST W	5554 Main St W	Maple Plain	MN	55359	0.14	Residential
2411824330036	MP MAIN LLC	5470 MAIN ST E	5470 Main St E	Maple Plain	MN	55359	0.59	Residential
2411824330039	H & H PROPERTIES	1889 CO RD NO 90	Address Unassigned	Maple Plain	MN	00000	13.1	Vacant Land - Industrial
2411824340081	LAWRENCE & JEANNE COURTEAU	5354 MAIN ST E	Address Unassigned	Maple Plain	MN	00000	0.01	Vacant Land - Residential
2511824220004	A W GOOD & J L GOOD	5445 BRYANT ST	5445 Bryant St	Maple Plain	MN	55359	0.29	Residential
2511824220005	KEVIN & RAMONA HAWKINSON TRS	5489 BRYANT ST	5489 Bryant St	Maple Plain	MN	55359	0.48	Residential
2511824220010	LEVI A JOHNSON	1519 WYMAN AVE	1519 Wyman Ave	Maple Plain	MN	55359	0.5	Double Bungalow
2511824220057	HEIDI MARIE EHALT	3250 15TH AVE S, MINNEAPOLIS, MN 55407	5545 Main St W	Maple Plain	MN	55359	0.31	Residential
2511824220076	DUWAYNE FRIESEN	5510 BRYANT ST	5510 Bryant St	Maple Plain	MN	55359	0.23	Residential
2511824220078	T FELLERS & R FELLERS	5555 MAIN ST W	5555 Main St W	Maple Plain	MN	55359	0.22	Vacant Land - Residential
2511824220081	M N HOWAT & R F HOWAT	1519 PRAIRIELAND AVE	1519 Prairieland Ave	Maple Plain	MN	55359	0.29	Residential
2511824220088	MELISSA A MEYER	5485 MAIN ST W	5485 Main St W	Maple Plain	MN	55359	0.29	Residential
2511824220099	MICHAEL D SUEKER	5465 MAIN ST W	5465 Main St W	Maple Plain	MN	55359	0.21	Residential
2511824220101	OLD MAIN COOP ASSOC	5435 MAIN ST W #A	5435 Main St W, Unit: A	Maple Plain	MN	55359	0	Cooperative (Limited Equity)
2511824220106	OLD MAIN COOP ASSOC	5435 OLD MAIN	5435 Main St W, Unit: F	Maple Plain	MN	55359	0	Cooperative (Limited Equity)
2511824220116	KERI E SIDLE/DANIEL J SIDLE	5400 BRYANT ST	5400 Bryant St	Maple Plain	MN	55359	0.23	Residential
2311824440001	THOMAS E LUTZ JR/LISA J LUND	5610 MAIN ST W	5610 Main St W	Maple Plain	MN	55359	0.37	Residential
2311824440002	P STAHLMANN & E STAHLMANN	5620 MAIN ST W	5620 Main St W	Maple Plain	MN	55359	0.4	Residential
2311824440021	R A WOOLEY & A R WOOLEY	5706 MAIN ST W	5706 Main St W	Maple Plain	MN	55359	0.56	Residential
2311824440022	S A OLSON & R K OLSON JR	5690 MAIN ST W	5690 Main St W	Maple Plain	MN	55359	0.55	Residential
2611824110022	SOPHIA E MORYN-MENDOZA	1564 RAINBOW AVE	1564 Rainbow Ave	Maple Plain	MN	55359	0.09	Vacant Land - Residential
2611824110032	CITY OF MAPLE PLAIN	PO BOX 97	Address Unassigned	Maple Plain	MN	00000	0.21	Vacant Land - Residential
2611824110037	K M CARLSON & P CARLSON	1540 RAINBOW AVE	1540 Rainbow Ave	Maple Plain	MN	55359	0.26	Residential
2611824110040	ERIC LOYCANO	1514 RAINBOW AVE	1514 Rainbow Ave	Maple Plain	MN	55359	0.11	Vacant Land - Residential
2611824110057	NICHOLAS M & JESSICA E LAHTI	1525 RAINBOW AVE	1525 Rainbow Ave	Maple Plain	MN	55359	0.22	Residential
2611824110110	ANTHONY THOMAS KERBER	5625 MAIN ST W	5625 Main St W	Maple Plain	MN	55359	0.27	Residential
2411824320008	MAPLOW LLC	C/O THE WINNING EDGE 1821 HALGREN RD	1821 Halgren Rd	Maple Plain	MN	55359	1.79	Industrial
2411824320018	5445 MAPLE LLC	800 TOWER DR, HAMEL, MN 55340	5445 Pioneer Creek Dr	Maple Plain	MN	55359	2.68	Industrial
2411824330004	J J HATECKE & R E HATECKE	5420 MAIN ST E	5420 Main St E	Maple Plain	MN	55359	0.65	Residential
2411824330018	MN BEEF PROMO & RSRCH CNCIL	5469 U S HWY NO 12PO BOX 39	5469 U S Hwy No 12	Maple Plain	MN	55359	0.49	Commercial
2411824330022	ELIZABETH ESTHER JACOBS	5544 MAIN ST W	5544 Main St W	Maple Plain	MN	55359	0.12	Residential
2411824330023	ANDREW STACK	5554 MAIN ST W	5554 Main St W	Maple Plain	MN	55359	0.13	Vacant Land - Residential
2411824330025	FREDRICK JOSEPH DRESSEL	5574 MAIN ST W	5574 Main St W	Maple Plain	MN	55359	0.33	Residential
2411824330026	SCOTT INNES	5584 MAIN ST W	5584 Main St W	Maple Plain	MN	55359	0.39	Residential
2411824330027	J ROBERT KEENA	3625 PARKWAY ST, DEEPHAVEN, MN 55391	5520 Main St W	Maple Plain	MN	55359	0.08	Vacant Land - Residential
2411824340052	KATHLEEN PURDY	15450 ORIC AVE, MINNETONK,A MN 55345	5364 Main St E	Maple Plain	MN	55359	0.16	Residential
2411824340053	M A SHEPHARD & M E SHEPHARD	155 NORTH SHORE DR	1624 Marsh Ave	Maple Plain	MN	55359	0.14	Residential
2411824340054	M A SHEPHARD & M E SHEPHARD	155 NORTH SHORE DR	1624 Marsh Ave	Maple Plain	MN	55359	0.17	Residential
2411824340060	CHANDRA BROUELETTE	1647 MARSH AVE	1647 Marsh Ave	Maple Plain	MN	55359	0.26	Residential
2411824340063	DJ.B FUTURES INC ET AL	1654 MARSH AVE	1654 Marsh Ave	Maple Plain	MN	55359	0.29	Residential
2411824340064	MARIAH J SCHWECKE	1655 MARSH AVE	1655 Marsh Ave	Maple Plain	MN	55359	0.29	Residential
2511824210088	GT NORTHERN RY CO	PROPERTY TAX DEPT, PO BOX 961089, FORT WORTH, TX 76161	Address Unassigned	Maple Plain	MN	00000	4.71	Railroad
2511824220003	K A & B J SCHMID	5439 BRYANT ST	5439 Bryant St	Maple Plain	MN	55359	0.31	Residential
2511824220009	PAUL G SEMPF & TERI SEMPF	1520 HALGREN RD	1520 Halgren Rd	Maple Plain	MN	55359	0.5	Residential
2511824220058	JOSEPH ELLING/HALEY NIELSEN	5525 MAIN ST W	5525 Main St W	Maple Plain	MN	55359	0.36	Residential

City of Maple Plain
DWSMA Parcels

Property ID	Property Owner Name	Tax Address	Property Address (Hennepin County GIS Property Map)	City	State	Zip Code	Area (Acres)	Use Class
2511824220059	KRISTIN BREY	5539 MAIN ST W	5539 Main St W	Maple Plain	MN	55359	0.27	Residential
2511824220060	D B ZAJAC & M A ZAJAC	5505 MAIN ST W	5505 Main St W	Maple Plain	MN	55359	0.31	Residential
2511824220063	DOUGLAS MOHN & KATHLEEN MOHN	5475 MAIN ST W	5475 Main St W	Maple Plain	MN	55359	0.12	Residential
2511824220067	J M & L H JAMES	1225 MAPLEWOOD DR, LONG LAKE, MN 55356	5425 Main St W	Maple Plain	MN	55359	0.27	Residential
2511824220069	GT NORTHERN RY CO	PROPERTY TAX DEPT, PO BOX 961089, FORT WORTH, TX 76161	Address Unassigned	Maple Plain	MN	00000	0.02	Railroad
2511824220071	AMY STEFANIAK/DANIEL WARNER	5444 BRYANT ST	5444 Bryant St	Maple Plain	MN	55359	0.33	Residential
2511824220098	WAYNE DEARTH	5454 BRYANT ST	5454 Bryant St	Maple Plain	MN	55359	0.18	Residential
2511824220104	OLD MAIN COOP ASSOC	5435 OLD MAIN	5435 Main St W, Unit: D	Maple Plain	MN	55359	0	Cooperative (Limited Equity)
2611824110001	M G MELTON & T A MELTON	1539 HALGREN RD	1539 Halgren Rd	Maple Plain	MN	55359	0.39	Residential
2611824110028	DENNIS MOORE & DEBRA MOORE	5665 MAIN ST W	5665 Main St W	Maple Plain	MN	55359	0.34	Residential
2611824110029	ALF WIKSTROM	5679 MAIN ST W	5679 Main St W	Maple Plain	MN	55359	0.17	Residential
2611824110030	THE GROTTING GROUP LLC	P O BOX 111	5687 Main St W	Maple Plain	MN	55359	0.17	Residential
2611824110038	CHELSEY LYNNE JAMES	1530 RAINBOW AVE	1530 Rainbow Ave	Maple Plain	MN	55359	0.23	Residential
2611824110039	ERIC LOYCANO	1514 RAINBOW AVE	1514 Rainbow Ave	Maple Plain	MN	55359	0.22	Residential
2611824110107	A J KARINIEMI & K KARINIEMI	5719 MAIN ST W	5719 Main St W	Maple Plain	MN	55359	0.44	Residential
2611824110111	JASON F PRODAHL	1519 HALGREN RD	1519 Halgren Rd	Maple Plain	MN	55359	0.51	Residential
2311824410008	MACDERMID INCORPORATED	5630 PIONEER CREEK DR	5630 Pioneer Creek Dr	Maple Plain	MN	55359	5.84	Industrial
2311824430023	B N & SANTA FE RR CO	PROPERTY TAX DEPT, FORT WORTH, TX 76161-0089	5805 U S Hwy No 12	Maple Plain	MN	55359	9.02	Railroad
2311824440007	PAULA CULLEN-LUNDGREN	5680 MAIN ST W	5680 Main St W	Maple Plain	MN	55359	0.48	Residential
2311824440010	D & J SPRAGUE	5730 WEST MAIN ST	5730 Main St W	Maple Plain	MN	55359	0.53	Residential
2311824440027	HERC-U-LIFT BUILDING INC	5655 U S HWY NO 12	5625 U S Hwy No 12	Maple Plain	MN	55359	2.03	Vacant Land - Industrial
2311824440029	LESTER & JUNE NIELSEN	5655 HIGHWAY 12 W	5725 U S Hwy No 12	Maple Plain	MN	55359	1.82	Industrial
2311824440031	NEW EARTH TECHNOLOGIES	1110 WRIGHT ST, BRAINERD, MN 56401	1755 Halgren Rd	Maple Plain	MN	55359	4.26	Industrial
2411824320020	MAPLE PLAIN LLC	3449 GRANITE WAY S, ST CLOUD, MN 56301	5555 Pioneer Creek Dr	Maple Plain	MN	55359	4.56	Industrial
2411824330030	S L BOURGERIE & R BOURGERIE	5440 MAIN ST E	5440 Main St E	Maple Plain	MN	55359	0.45	Residential
2411824330037	I J BREKHUS & D L BREKHUS	DAKOTAH LYNN BREKHUS 4527 PLEASANT ST SE, PRIOR LAKE, MN 55372	1660 Spring Ave	Maple Plain	MN	55359	0.62	Commercial
2411824340055	BRADLEY DICKHAUSEN	1644 MARSH AVE	1644 Marsh Ave	Maple Plain	MN	55359	0.17	Residential
2511824220027	ELIM HOMES INC	C/O CASSIA 7171 OHMS LANE ,EDINA, MN 55439	1520 Wyman Ave	Maple Plain	MN	55359	2.53	Apartment
2511824220070	PETER PREUS	5424 BRYANT ST	5424 Bryant St	Maple Plain	MN	55359	0.3	Residential
2511824220072	DEBRA M GJERSTAD	5492 BRYANT ST	5492 Bryant St	Maple Plain	MN	55359	0.32	Residential
2511824220073	RONALD E STEFFENHAGEN ET AL	5464 BRYANT ST	5464 Bryant St	Maple Plain	MN	55359	0.23	Residential
2511824220074	B J HARMON & R HARMON	PO BOX 91 5474 BRYANT ST	5474 Bryant St	Maple Plain	MN	55359	0.24	Residential
2511824220075	JENNIFER M GARDNER REV TRUST	8103 ITHACA LN N	5550 Bryant St	Maple Plain	MN	55359	0.27	Residential
2511824220077	MADELINE FROST	5530 BRYANT ST	5530 Bryant St	Maple Plain	MN	55359	0.25	Residential
2511824220080	J D ALLEN & D J ALLEN	5455 BRYANT ST	5455 Bryant St	Maple Plain	MN	55359	0.29	Residential
2511824220082	K F & B J ROSE	1509 PRAIRIELAND AVE	1509 Prairieland Ave	Maple Plain	MN	55359	0.29	Residential
2511824220108	D S RUHLAND & A D RUHLAND	1495 WYMAN AVE	1495 Wyman Ave	Maple Plain	MN	55359	0.5	Residential
2511824220109	D A BERENT & S J BERENT	1500 HALGREN RD	1500 Halgren Rd	Maple Plain	MN	55359	0.5	Residential
2511824220111	FAE HOLDINGS 466333R	4913 MINNEAPOLIS AVENUE, MINNETRISTA, MN 55364	1570 Halgren Rd	Maple Plain	MN	55359	1.25	Industrial
2611824110011	CITY OF MAPLE PLAIN	PO BOX 97	Address Unassigned	Maple Plain	MN	00000	3.22	Vacant Land - Rural Residential
2611824110025	GILBERT T GIESE ETAL	5645 MAIN ST W	5645 Main St W	Maple Plain	MN	55359	0.46	Residential
2611824110033	CITY OF MAPLE PLAIN	PO BOX 97	Address Unassigned	Maple Plain	MN	00000	0.21	Vacant Land - Residential
2611824110035	M E PRINZING & J W PRINZING	1565 RAINBOW AVE	1565 Rainbow Ave	Maple Plain	MN	55359	0.17	Residential
2611824110056	CHRIST LUTHERAN CHUR INC	5084 MAIN ST E	1535 Rainbow Ave	Maple Plain	MN	55359	0.19	Residential
2611824110112	SHANNON A SCHULTZ	1509 HALGREN RD	1509 Halgren Rd	Maple Plain	MN	55359	0.41	Residential
2311824440003	BARBARA J MERWIN	5632 MAIN ST W	5632 Main St W	Maple Plain	MN	55359	0.42	Residential
2311824440004	ZACHARY T CHRISTENSON	5650 W MAIN ST	5650 Main St W	Maple Plain	MN	55359	0.57	Residential
2411824330021	P & T BECK	5536 W MAIN	5536 Main St W	Maple Plain	MN	55359	0.1	Residential
2411824330029	CITY OF MAPLE PLAIN	PO BOX 97	1645 Pioneer Ave	Maple Plain	MN	55359	4.52	Commercial
2411824330033	DONNA K PETERSON IRR TRUST	12700 ANDERSON LAKES PKWY, EDEN PRAIRIE, MN 55344	5410 U S Hwy No 12	Maple Plain	MN	55359	2.39	Industrial
2411824330034	BURLINGTON NORTHERN INC	PROPERTY TAX DEPT PO BOX 961089, FORT WORTH, TX 76161	Address Unassigned	Maple Plain	MN	00000	4.77	Railroad
2411824330041	KAAJ ENTERPRISES LLC	481 PRAIRIE CREEK DR, DELANO, MN 55328	1675 Spring Ave	Maple Plain	MN	55359	0.29	Commercial
2411824340061	J M GOLDADE & N J SWANSON	5390 MAIN ST E	5390 Main St E	Maple Plain	MN	55359	0.34	Residential
2411824340077	OUTCOME LIMITED PARTNERSHIP	SUITE 240 - 309 MCDERMOT AVE, WINNEPEG, MANITOBA CANADA R3A 1T3	5370 U S Hwy No 12	Maple Plain	MN	55359	13.04	Industrial

City of Maple Plain
DWSMA Parcels

Property ID	Property Owner Name	Tax Address	Property Address (Hennepin County GIS Property Map)	City	State	Zip Code	Area (Acres)	Use Class
2511824210070	KATHRYN HOLIDA	5390 BRYANT ST	5390 Bryant St	Maple Plain	MN	55359	0.51	Residential
2511824220043	DOUGLAS MOHN & KATHLEEN MOHN	5475 MAIN ST W	5475 Main St W	Maple Plain	MN	55359	0.09	Residential
2511824220056	T FELLERS & R FELLERS	5555 MAIN ST W	5555 Main St W	Maple Plain	MN	55359	0.22	Residential
2511824220066	OLD MAIN COOP ASSOC	5435 MAIN ST W	5435 Main St W	Maple Plain	MN	55359	0	Cooperative (Limited Equity)
2511824220100	JON ARTHUR THEIS	5445 MAIN ST W	5445 Main St W	Maple Plain	MN	55359	0.32	Residential
2511824220102	OLD MAIN COOP ASSOC	5435 MAIN ST W #B	5435 Main St W, Unit: B	Maple Plain	MN	55359	0	Cooperative (Limited Equity)
2511824220103	OLD MAIN COOP ASSOC	5435 MAIN ST W #C	5435 Main St W, Unit: C	Maple Plain	MN	55359	0	Cooperative (Limited Equity)
2511824220105	OLD MAIN COOP ASSOC	5435 OLD MAIN	5435 Main St W, Unit: E	Maple Plain	MN	55359	0	Cooperative (Limited Equity)
2511824220107	OLD MAIN COOP ASSOC	5435 OLD MAIN	5435 Main St W, Unit: G	Maple Plain	MN	55359	0	Cooperative (Limited Equity)
2511824220110	ANGELA NICHOLLS	5565 MAIN ST W	5565 Main St W	Maple Plain	MN	55359	0.23	Residential
2511824220112	HALVOR E & BEVERLY J JERDE	1545 WYMAN AVE	1545 Wyman Ave	Maple Plain	MN	55359	0.67	Residential
2511824220113	TONKAWOOD INVESTMENTS LLC	C/O CHRISTINE VALERIUS 5488 TONKAWOOD RD, MOUND, MN 55364	1540 Halgren Rd	Maple Plain	MN	55359	0.47	Residential
2511824220117	OTTO J DOEHLING III	5410 BRYANT ST	5410 Bryant St	Maple Plain	MN	55359	0.33	Residential
2611824110021	G D JERDE & J R JERDE	1569 HALGREN RD	1569 Halgren Rd	Maple Plain	MN	55359	0.61	Residential
2611824110024	SOPHIA E MORYN-MENDOZA	1564 RAINBOW AVE	1564 Rainbow Ave	Maple Plain	MN	55359	0.26	Residential
2611824110031	THE GROTTING GROUP LLC	P O BOX 111	5695 Main St W	Maple Plain	MN	55359	0.17	Residential
2611824110034	CITY OF MAPLE PLAIN	PO BOX 97	Address Unassigned	Maple Plain	MN	00000	0.21	Vacant Land - Residential
2611824110069	D L & D A BOIK	1549 RAINBOW AVE	1549 Rainbow Ave	Maple Plain	MN	55359	0.21	Residential
2611824110104	ADAM RUBIN	5635 MAIN ST W	5635 Main St W	Maple Plain	MN	55359	0.27	Residential
2611824110108	DANIEL P & JULIE A RUEGEMER	5715 MAIN ST W	5715 Main St W	Maple Plain	MN	55359	0.44	Residential
2611824110109	TIMOTHY MCCARTHY	5609 MAIN ST W	5609 Main St W	Maple Plain	MN	55359	0.34	Residential

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) POTENTIAL CONTAMINANT SOURCE INVENTORY (PC

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1270021 **COMMUNITY**
NAME	Maple Plain
ADDRESS	Maple Plain Water Operator, c/o Dylan Hoflock, 5050 Independence Street, P.O. Box 97, Maple Plain, MN 553590097

FACILITY (WELL) INFORMATION

NAME	Well #1
SAMPLE POINT ID	S01
UNIQUE WELL NO.	207090
COUNTY	Hennepin

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

☐ **YES** (Please attach a copy)
☐ **NO** ☐ **UNDETERMINED**

PWS ID / SAMPLE POINT ID	1270021 S01	**UNIQUE WELL NO.**	207090

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

PWS ID / SAMPLE POINT ID	1270021 S01	UNIQUE WELL NO.	207090

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		Y	85	Y
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	90	Y
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	107	Y
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	68	Y
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		

PWS ID / SAMPLE POINT ID	1270021 S01	UNIQUE WELL NO.	207090

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
SBA	Sewer buried, approved, air tested	50	20		Y	77	Y
SBA	Sewer buried, approved, air tested	50	20		Y	62	Y
GSP	Gas pipe	5/10	5/10		Y	103	N
GSP	Gas pipe	5/10	5/10		Y	86	N

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

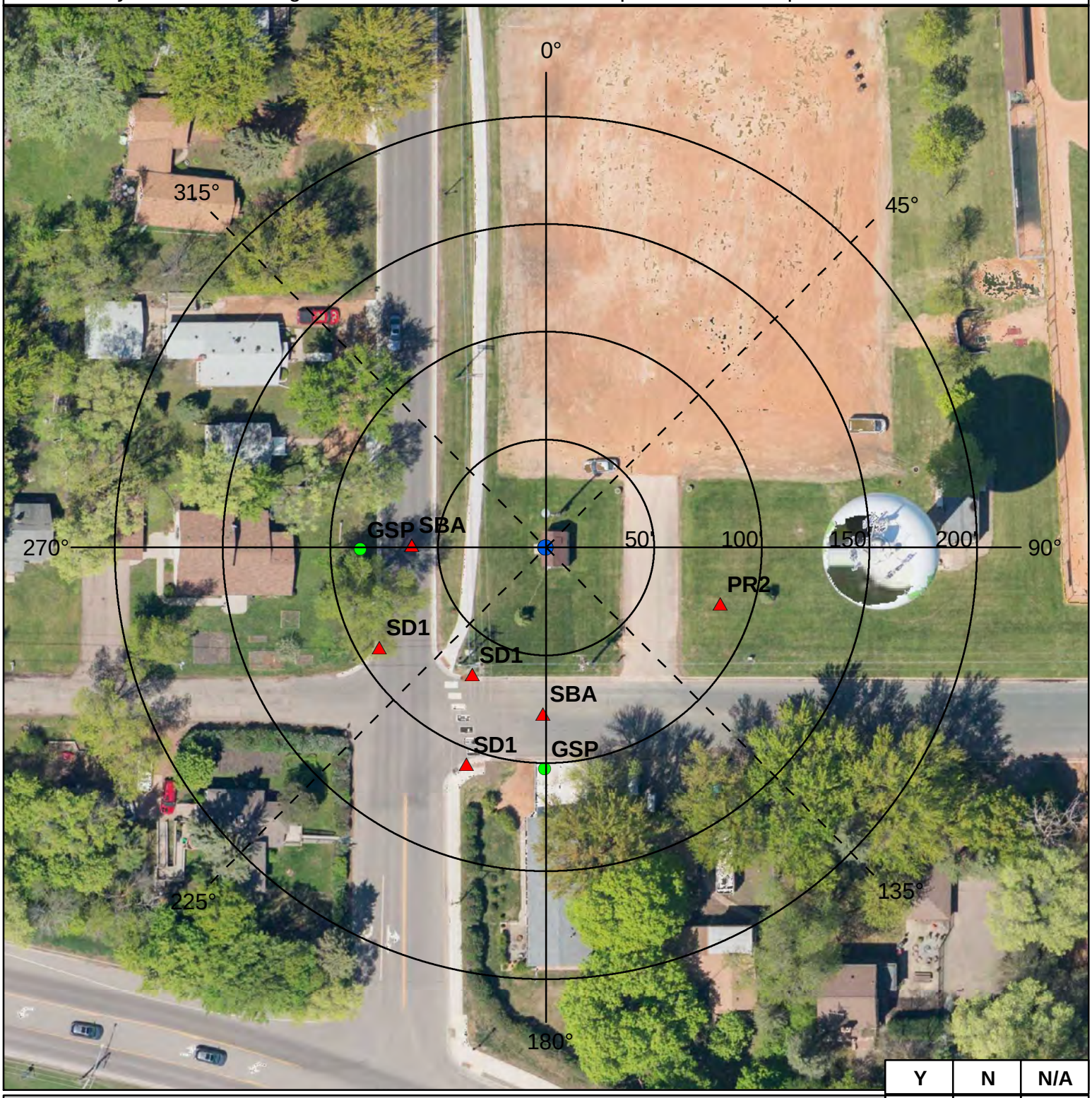
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / SAMPLE POINT ID	1270021 S01	UNIQUE WELL NO.	207090

SETBACK DISTANCES — **All potential contaminant sources must be noted on sketch.**

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Shea, Abby	DATE	7 - 24 - 2024

196

PWS ID / SAMPLE POINT ID	1270021 S01	UNIQUE WELL NO.	207090

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
The portable toilet should be pumped and serviced regularly by a licensed maintenance business in accordance with local, state, and federal requirements. To prevent spills, portable toilets should be located in an area that is easily accessible by a pump truck under all weather conditions.		
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		
The stormwater pipe should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website .		

COMMENTS

Portable toilet on-site for construction was initially approximately 35 feet SE of the well. Upon pointing this out to the operator, the toilet was moved to the other side of the driveway while inspector was on-site, resulting in its location in this report, approximately 85 feet from the well.

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) POTENTIAL CONTAMINANT SOURCE INVENTORY (PC

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1270021 **COMMUNITY**
NAME	Maple Plain
ADDRESS	Maple Plain Water Operator, c/o Dylan Hoflock, 5050 Independence Street, P.O. Box 97, Maple Plain, MN 553590097

FACILITY (WELL) INFORMATION

NAME	Well #3
SAMPLE POINT ID	S03
UNIQUE WELL NO.	112238
COUNTY	Hennepin

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

☐ **YES** (Please attach a copy)
☐ **NO** ☐ **UNDETERMINED**

PWS ID / SAMPLE POINT ID	1270021 S03	**UNIQUE WELL NO.**	112238

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		Y	87	Y
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

PWS ID / SAMPLE POINT ID	1270021 S03	UNIQUE WELL NO.	112238

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	50	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	65	N
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		Y	140	N
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	136	Y**
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	65	N
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	146	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		

PWS ID / SAMPLE POINT ID	1270021 S03	UNIQUE WELL NO.	112238

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		Y	150	Y
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		Y	140	Y
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		Y	183	Y
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
SBA	Sewer buried, approved, air tested	50	20		Y	118	N
RSS	Road salt storage	50	50		Y	140	Y
GSP	Gas pipe	5/10	5/10		Y	62	N

* New potential contaminant source.

** This number is the estimated distance that this potential source is from this well even though it was identified during an inventory for an adjacent well.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

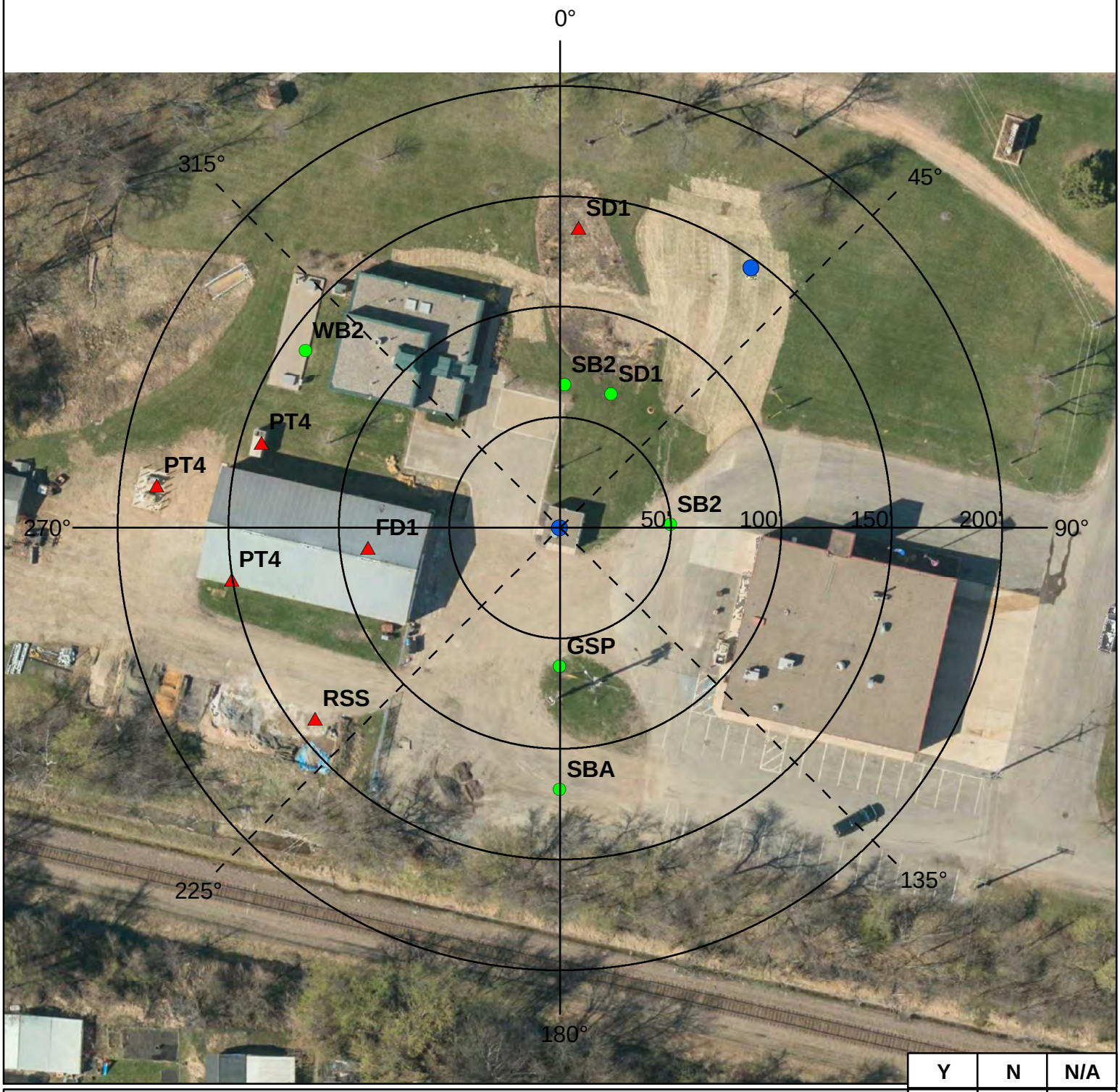
This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

200

PWS ID / SAMPLE POINT ID	1270021 S03	UNIQUE WELL NO.	112238

SETBACK DISTANCES — **All potential contaminant sources must be noted on sketch.**

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Shea, Abby	DATE	7 - 24 - 2024

201

PWS ID / SAMPLE POINT ID	1270021 S03	UNIQUE WELL NO.	112238

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		
Sorbent material should be maintained on site for immediate clean-up of spills.		
The stormwater pipe should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website .		
The owner of a community public water supply well should own or legally control, through a permanent easement, the property within a 50-foot radius of both Well #3 and Well #4. Ownership or control through permanent easement of the area around a well ensures proper land management and control of potential contaminant sources near the well.		

COMMENTS

PT4 inside building along southern wall is borderline in terms of quantity - if full, it could reach 56 gallons of petroleum, so it is recommended to monitor this tank as such.

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) POTENTIAL CONTAMINANT SOURCE INVENTORY (PC

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1270021 **COMMUNITY**
NAME	Maple Plain
ADDRESS	Maple Plain Water Operator, c/o Dylan Hoflock, 5050 Independence Street, P.O. Box 97, Maple Plain, MN 553590097

FACILITY (WELL) INFORMATION

NAME	Well #4
SAMPLE POINT ID	S04
UNIQUE WELL NO.	824078
COUNTY	Hennepin

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

☐ **YES** (Please attach a copy)
☐ **NO** ☐ **UNDETERMINED**

PWS ID / SAMPLE POINT ID	1270021 S04	**UNIQUE WELL NO.**	824078

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

PWS ID / SAMPLE POINT ID	1270021 S04	UNIQUE WELL NO.	824078

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	99	N**
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	121	N**
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	80	Y
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	85	N**
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	146	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		

PWS ID / SAMPLE POINT ID	1270021 S04	UNIQUE WELL NO.	824078

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
GSP	Gas pipe	5/10	5/10		Y	200	N**

* New potential contaminant source.

** This number is the estimated distance that this potential source is from this well even though it was identified during an inventory for an adjacent well.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

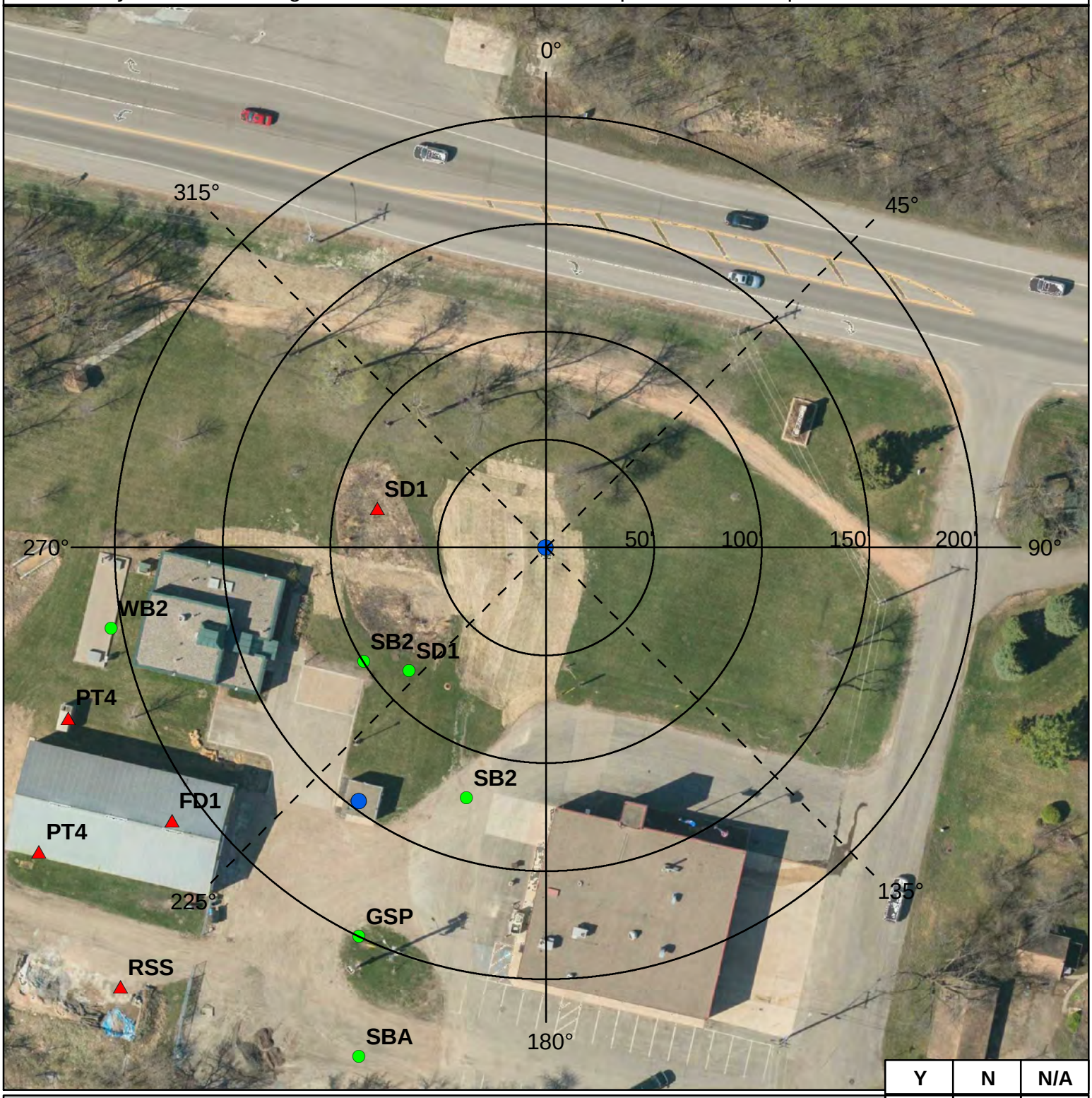
This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / SAMPLE POINT ID	1270021 S04	UNIQUE WELL NO.	824078

Section 4, Item A.

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Shea, Abby	DATE	7 - 24 - 2024

206

PWS ID / SAMPLE POINT ID	1270021 S04	UNIQUE WELL NO.	824078

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		
The stormwater pipe should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website .		
The owner of a community public water supply well should own or legally control, through a permanent easement, the property within a 50-foot radius of both Well #3 and Well #4. Ownership or control through permanent easement of the area around a well ensures proper land management and control of potential contaminant sources near the well.		

COMMENTS

Infiltration basin located approximately 50 feet from well 4 to the W/SW (no required isolation distance) and SD1 is in that basin.

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

Old Municipal Well Report for Maple Plain

PWSID: 1270021

MDH

April 2019

Minnesota Department of Health
Environmental Health in Minnesota

MDH Public Water Supply Sources Report

PWSID: **1270021**
PWS Name: **Maple Plain**
PWS Type: **Community**
PWS Status: **Active**

Public Water Supply Sources: Information from MNDWIS and CWI (sorted by Sample Point ID)
Source Type Codes: **GW** = Ground water; **SW** = Surface water; **GUI** = Ground water under influence
Location Source: **MGS** = digitized by the MN Geological Survey; * indicates imcomplete records
O* = duplicate in Old Municipal Well Data; **R*** = duplicate in MNDWIS PWS Sources Removed from Flow; **S*** = duplicate in MNDWIS PWS Sources in Flow;

MNDWIS PWS SOURCES IN FLOW														
Source Info							MNDWIS Data				CWI Data			
Sample Point ID	Name	Type	Availability	Status	Well No. (link to Well Log(s))	Location Info (link to Map)	Drill Year	Depth (in feet)	Case Depth (in feet)	Case Diam. (in inches)	Drill Date	Depth Completed (in feet)	Case Depth (in feet)	Case Diam. (in inches)
S01	**Well #1**	GW	Emergency	Active	207090 **O***	04/06/1999 (R. Hoerr)	1939	418	238	10	11-00-1939	418	238	10
S02	**Well #2**	GW	Emergency	Out Long Term	207407 **O***	04/06/1999 (R. Hoerr)	1959	435	241	16	10-01-1959	435	241	16
S03	**Well #3**	GW	Primary	Active	112238 **O***	11/30/2016 (A. Djerrari)	1978	**580**	534	18	04-20-1978	**534**	534	18
S04	**Well #4**	GW	Primary	Active	824078	3/13/2017 (B. Bloomgren)	2017	392	343	12	04-13-2017	392	343	12

MNDWIS and CWI data value discrepancies in preceding tables are shown in **RED** (0 or null values excepted).

Old Municipal Wells

The following tables show information on wells whose existence (or previous existence) has not yet been confirmed.

OLD MUNICIPAL Well Data													
Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
Well A	Well No. 1	207090 **S***	418		238	10	1939	Cable Tool/Bored				Pumping station in the north eastern part of town.	Emergency Active
Well B	Well No. 2	207407 **S***	435		241	16	1958	Cable Tool/Bored				Lots 6 and 7, Block 1, Original Plat	Emergency Out Long Term
Well C	Well No. 3	112238 **S***	404		333	24	1978	Cable Tool/Bored					Active

Databases Searched	Remarks

OLD MUNICIPAL Well Data													
Well Search Reference	Name (s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
County Well Index (1-mile radius); MDH DWP Microfiche; MDH 1988-2002 Muni Well Inventory (1Suite); Biennial Report of the MN State Dairy and Food Commissioner-1907; Minnesota Geological Survey City Well File Folders; MGS Bulletin (22, 27, 31, or 32); MDH DWP MNDWIS; MN Historical Soc.- Fire Underwriters Insp. Bureau (Fisher) historical map ; Sanborn Fire Insurance Maps; MDH WELLS													
Old Municipal Well Data Compiled By: **Mara Boulanger** Compiled Date: **4/1/2019 2:12:40 PM**													

OLD MUNICIPAL Well Data - no RAW HYDRO data found.

Source: MN Dep't. of Health - 4/1/2019

Use of MDH Public Water Supply Sources Report

The report you have received shows three classes of Public Water Supply wells:

- In Use (actively used)
- Removed From Flow (for back-up or emergency use; may be disconnected from PWS)
- **Old Municipal Wells (unused wells with no documented location, unique ID number, and/or well sealing record)**

Old Municipal Wells are unsealed, abandoned wells. These wells pose a risk of contamination to existing wells and aquifers. According to State Well Code and under the terms of your Wellhead Protection Plan, your PWS may need to identify, locate, and properly seal Old Municipal Wells within your Drinking Water Supply Management Area, to current MDH standards.

While historical records may indicate that some of these wells were "capped", "abandoned", or "sealed" in the past, unless it can be shown that the sealing was performed to current standards, they may need to be located, cleaned out, and sealed properly with a well sealing record issued.

The report lists database references that were searched to compile the report. Under "Remarks" are notes and questions to help you with this process. State grant funding is available to help fund sealing of these old public water supply wells.

If you have questions, please talk to your MDH Planner or Hydrologist to address your PWS's specific issues. This report is not intended to be the "last word" on the status of Old Municipal Wells and your input will be critical in successfully finding and sealing these potential sources of contamination.

Restart

Maple Plain

8/26/40

to

~~4/20/82~~

5/26/83

MINNESOTA DEPARTMENT OF HEALTH
Division of Sanitation

Report on the Water Supply
Maple Plain, Minnesota
February 26, 1943

Well A The public water supply for this village is obtained from a drilled well. The water is pumped directly into the distribution system while the overflow collects in an elevated steel tank.

Location of Source

The well is located in a pumping station in the northeastern part of town. The ground is level and drains west through a culvert under the road in front of the pump station and thence north into the road ditch.

There is no source of contamination on this site near enough to be considered dangerous.

Well, Pump and Pumphouse

The well is drilled to a depth of 418 feet and is cased with a ten-inch iron pipe to 238 feet below ground level. From 238 feet to 402 feet the well consists of a 10-inch, and from 402 feet to 418 feet of an 8-inch, open drill-hole.

The casing extends to a point 16 inches above the pumproom floor.

The normal water level in the well is 110 feet below the ground surface. A stratographic section of this well shows the following formations:

Formation	Thickness	Depth
Black Soil	2 feet	2 feet
Yellow Clay	13 feet	15 feet
Blue Clay	59 feet	74 feet
Blue Clay and Sand	86 feet	160 feet
Sand and Gravel	13 feet	173 feet
Blue Clay	37 feet	210 feet
Fine Sand	13 feet	223 feet

MINNESOTA DEPARTMENT OF HEALTH
Division of Sanitation

Sanitation Rating of Maple Plain Water Supply

Owner Village of Maple Plain Date November 28, 1946

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Bacteriological safety / Adequacy of treatment	30	30		
Physical quality	2	2		
Chemical quality	4	3		
Biological quality	2	2		
Adequacy of quantity	2	2		
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39		
(B) Prime Moving Equipment				
Well or intake	8	8		
Pumps	7	7		
Piping arrangement	5	5		
Reservoirs	7	7		
Equipment housing	3	3		
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30		
(C) Distribution System				
Street mains	5	4		
Building services	2	2		
Plumbing	3	2		
Hydrants	1	1		
Storage	4	4		
Pressure	2	2		
Tap-water quality	3	3		
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	18		
(D) Operation and Operators				
Control of plant	5	4		
Condition of plant	3	3		
Training and experience	2	1		
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8		
GRAND TOTAL AND RATING	100	95		

Maple Plain 10199 6 19

MINNESOTA DEPARTMENT OF HEALTH
DIVISION OF WATER SUPPLY AND PLUMBING

Sanitation Rating of Maple Plain Water Supply

Owner Municipal Date Dec. 25, 1948

	Perfect Score	As Found	As Recommended	See Recommendation No. in Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	30	30	30	
Physical quality	2	2	2	
Chemical quality	4	3	4	Iron Removal Plant
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	2	2	
Plumbing	3	2	2.5	Recommendation No.1
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	19	19.5	
(D) Operation and Operators				
Control of system	5	4	4	
Condition of system	3	3	3	
Training and experience	2	1	2	Attend Instt. Water School
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8	9	
GRAND TOTAL AND RATING	100	95	97.5	

Grade A: 90 and upward - high degree of safety.
Grade B: 85 to 89 - moderately high degree of safety.
Grade C: 80 to 84 - moderately safe - improvement needed.
Grade D: 70 to 79 - low degree of safety - improvement urgent.
Grade E: 69 and lower - very dangerous condition, emergency measures recommended.

MINNESOTA DEPARTMENT OF HEALTH

DIVISION OF WATER SUPPLY AND PLUMBING

Sanitation Rating of Municipal Water Supply

Owner Maple Plain Date March 29, 1949

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	30	30	30	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	2	2	
Plumbing	3	1	2½	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	17	18½	
(D) Operation and Operators				
Control of system	5	4	4	
Condition of system	3	3	3	
Training and experience	2	1	1	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8	8	

MINNESOTA DEPARTMENT OF HEALTH

DIVISION OF WATER SUPPLY AND PLUMBING

Sanitation Rating of Maple Plain Water Supply

Owner Municipal Date January 11, 1950

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	30	30	30	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	5	7	a
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	2	2	
Plumbing	3	1	2½	b
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	17	18½	
(D) Operation and Operators				
Control of system	5	4	4	
Condition of system	3	3	3	
Training and experience	2	1	2	Attend Dept. water scho
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8	9	

MINNESOTA DEPARTMENT OF HEALTH
DIVISION OF WATER SUPPLY AND PLUMBING

Sanitation Rating of Maple Plain Water Supply

Owner Municipal Date May 10, 1951

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	30	30	30	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	5	7	a
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	2	2	
Plumbing	3	1	2½	b
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	17	18½	
(D) Operation and Operators				
Control of system	5	4	4	
Condition of system	3	3	3	
Training and experience	2	1	2	Attend Dept. water school
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8	9	

MINNESOTA DEPARTMENT OF HEALTH

DIVISION OF MUNICIPAL WATER SUPPLY

Sanitation Rating of Maple Plain Water Supply

Owner Municipal Date January 31, 1952

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety Adequacy of treatment	30	30	30	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	6	7	a
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	29	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	2	2	
Plumbing	3	1	2½	b
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	17	18½	
(D) Operation and Operators				
Control of system	3	2	2	
Condition of system	2	2	2	
Operator qualifications	5	4	5	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8	9	
GRAND TOTAL AND RATING	100	93	96½	

MINNESOTA DEPARTMENT OF HEALTH

Section of Municipal Water Supply

Sanitation Safety Rating of Maple Plain Water Supply

Date January 29, 1953

	Perfect Score	As Found	As Recommended	See Recommendation No. in Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	2	2	
Plumbing	3	1	$2\frac{1}{2}$	a
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	17	$18\frac{1}{2}$	
(D) Operation and Operators				
Control of system	3	2	2	
Condition of system	2	2	2	
Operator qualifications	5	4	5	
Sub-total	10			

MINNESOTA DEPARTMENT OF HEALTH

Section of Municipal Water Supply

Sanitation Safety Rating of Maple Plain Water Supply

Date September 21, 1954

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	2	2	
Plumbing	3	1	2½	a
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	17	18½	
(D) Operation and Operators				
Control of system	3	2	2	
Condition of system	2	2	2	
Operator qualifications	5	4	5	

MINNESOTA DEPARTMENT OF HEALTH

Section of Municipal Water Supply

Sanitation Safety Rating of Maple Plain Water Supply

Date September 8, 1955

	Perfect Score	Found	Recommended	See Recommendation No. in Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	2	2	
Plumbing	3	1	2½	a
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	17	18½	
(D) Operation and Operators				
Control of system	3	2	2	
Condition of system	2	2	2	
Operator qualifications	5	4	5	
Sub-total	10			

MINNESOTA DEPARTMENT OF HEALTH

Section of Municipal Water Supply

Sanitation Safety Rating of Maple Plain Water Supply

Date January 9, 1957

	Perfect Score	As Found	As Recommended	See Recommendation No. in Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	1	2	
Adequacy of quantity	2	1	2	b
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	37	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	2	2	
Plumbing	3	1	2½	a
Hydrants	1	1	1	
Storage	4	4	4	
Pressure -	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	17	18½	
(D) Operation and Operators				
Control of system	3	2	2	
Condition of system	2	2	2	
Operator qualifications	5	4	5	Attend water school

4-17-62

Minnesota Department of Health
District VI
Minneapolis Minnesota

Report on Investigation of Municipal Water Supply
Maple Plain, Minnesota
March 7, 1952

Date of last investigation - September 8, 1955

Rating at last investigation - 94

Changes since last investigation - Well B

A second well has been added to the system. This well, located on lots 6 and 7, Block 1, Original Plat, village of Maple Plain, is a 10-inch well drilled to a depth of 435 feet and provided with 241 feet of casing. The reported log of the well is as follows:

		Depth (ft.)	Thickness (ft.)
Drift	Clay	0 - 214	214
Franconia & lower formations	Sandstone (dirty)	214 - 228	
	Grey shale	228 - 243	
	Green sandy shale	243 - 250	
	Red shale	250 - 255	
	Green sandy shale	255 - 265	
	Shale (hard)	265 - 285	
	Alternate layers of green shale and sandstone	285 - 365	
	White sandstone	365 - 428	
	Shale & sandstone	428 - 435	

Water is drawn from the well by means of a water-lubricated vertical turbine pump which is rated at approximately 350 gallons per minute and powered by a 30 horsepower electric motor. The static water level is reported to be approximately 119 feet and the draw down 68 feet at a pumping rate of 400 gallons per minute. The well is provided with properly constructed and screened casing and discharge vents. The pumphouse is constructed with the floor entirely above grade. The floor drain, constructed of extra-heavy cast-iron pipe, discharges to a gravel

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Maple Plain Municipal Water Supply

Date March 7, 1962

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	1	2	1
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	38	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	2	3	2
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	29	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	1.5	1.5	
Plumbing	3	2.5	2.5	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	2	3	Coliform free sample
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	17	18	
(D) Operation and Operators				
Control of system	3	1	2	3
Condition of system	2	2	2	
Operator qualifications	5	4	5	4
Sub-total	10			

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Maple Plain Municipal Water Supply

Date January 10, 1963

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	2	3	2
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	29	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	1.5	1.5	
Plumbing	3	2.5	2.5	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	~~18~~	~~18~~	
(D) Operation and Operators				
Control of system	3			
Condition of system	2	1	2	1 & 3
Operator qualifications	5	2	2	
Sub-total	10	4	5	4

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Maple Plain Municipal Water Supply

Date September 9, 1964

	Perfect Score	As Found	As Recommended	See Recommendation No. in Attached Report
(A) Source				
Sanitary Safety Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	2	3	2
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	29	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	1.5	1.5	
Plumbing	3	2.5	2.5	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	18	18	
(D) Operation and Operators				
Control of system	3	1	2	1 & 3
Condition of system	2	2	2	
Operator qualifications	5	3	5	4
Sub-total	10			

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Maple Plain Municipal Water Supply

Date September 9, 1964

	Perfect Score	As Found	As Recommended	Sec Recommendation No. In Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	2	3	2
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	29	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	1.5	1.5	
Plumbing	3	2.5	2.5	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	18	18	
(D) Operation and Operators				
Control of system	3	1	2	1 & 3
Condition of system	2	2	2	
Operator qualifications	5	3	5	4
Sub-total	10			

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Maple Plain Municipal Water Supply

Date August 25, 1969

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	1.5	1.5	
Plumbing	3	2.5	2.5	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	18	18	
(D) Operation and Operators				
Control of system	3	1	2	2
Condition of system	2	2	2	
Operator qualifications	5	3	5	3
Sub-total	10			

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Maple Plain Municipal Water Supply

Date January 20, 1971

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	1.5	1.5	
Plumbing	3	2.5	2.5	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	18	18	
(D) Operation and Operators				
Control of system	5	1	3	1 & 2
Condition of system	2	2	2	
Operator qualifications	5	5	5	
Sub-total	10			

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Maple Plain Municipal Water Supply

Date March 21, 1973

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	1.5	1.5	
Plumbing	3	2.5	2.5	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	18	18	
(D) Operation and Operators				
Control of system	3	1	3	1
Condition of system	2	2	2	
Operator qualifications	5	4	5	2
Sub-total	10			

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Maple Plain Municipal Water Supply

Date March 21, 1973

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	4	4	
Building services	2	1.5	1.5	
Plumbing	3	2.5	2.5	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	18	18	
(D) Operation and Operators				
Control of system	3	1	3	1
Condition of system	2	2	2	
Operator qualifications	5	4	5	2
Sub-total	10			

MINNESOTA DEPARTMENT OF HEALTH

REPORT ON INVESTIGATION OF PUBLIC WATER SUPPLY

Name of Water Supply: Maple Plain Municipal Water Supply
PWS ID Number: 1270021
Street: City Hall
Telephone Numbers: City: 479-1123; Operator: ; Engineer: ; Other:
City: Maple Plain
State: MN
Zip Code: 55359
County: Hennepin
District: Metropolitan
Water Superintendent: Allan Elsenpeter
Classification: D
Plant Classification: C
Owner Type: Municipal
Other Operators: Roger Meyer
Classification: D
Plant Type: Community
Plumbing Permits and Inspections Required: [X] Yes [ ] No
Date of Previous Survey: July 24, 1979
Date of Survey: October 28, 1980
City Engineer: McCombs-Knutson and Associates (Dave Hansing)

SERVICE AREA CHARACTERISTICS:

- [X] Municipal
- [ ] Mobile Home Park
- [ ] Company Town
- [ ] Institution
- [ ] School or College
- [ ] Hotel/Motel
- [ ] Resort
- [ ] Restaurant
- [ ] Recreation Area
- [ ] Campground
- [ ] Housing Development
- [ ] Other

Population Served: 1,400
Service Connections: 475 (lead-0)
Storage Capacity (List Separately): 50,000 gal.elevated
Design Capacity (gal/day): 1,300,000
Average Daily Production (gal/day): 200,000
Emergency Capacity (gal/day): 0
Highest Daily Production (gal/day): 550,000
Total: 50,000 gallons

	Source Name	Source Code	Availability	TREATMENT: Disinfection	Aeration	Coagulation	Sedimentation	Filtration	Corrosion Con. Stabilization	Softening	Taste & Odor	Ammoniation	Fluoridation	Other	WELL DATA: Year Installed	Casing Diameter	Casing Depth	Screen Length	Well Depth	Water Bearing Formation	Static Level	Drawdown	Pump Type
Well A	Well #1	G	E												1939				418	Franconia Dresbach			VT 175
Well B	Well #2	G	P	Dc	As			Fl					Va		1958	16	241		435	Franconia Dresbach	119	65	VT 350
Well C	Well #3	G	P										Va		1978	24	233		404	Franconia Dresbach	120	34	VT 390

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Maple Plain Municipal Water Supply

Date October 28, 1980

	Perfect Score	As Found	As Recommended	See Recommendation No. in Attached Report
(A) Source				
Sanitary Safety / Adequacy of treatment	20	20	20	
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	3	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	39	39	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	5	5	1
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	30	30	
(C) Distribution System				
Street mains	5	5	5	
Building services	2	1.5	1.5	
Plumbing	3	2.5	2.5	
Hydrants	1	1	1	2
Storage	4	2.5	4	3,4,5
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20	17.5	19	
Hazard adjustment factor deducted	0	-1		2
Total	20	16.5	19	
(D) Operation and Operators				
Control of system	3	0.5	3	6,7,8,9,10,11
Condition of system	2	2	2	
Operator qualifications	5	3	5	12
Sub-total	10			

ELEVENTH BIENNIAL REPORT

OF THE

Minnesota State Dairy and Food Commissioner

TRANSMITTED TO THE LEGISLATURE

1907

1907
HARRISON & SMITH CO.
MINNEAPOLIS

GOODHUE COUNTY.

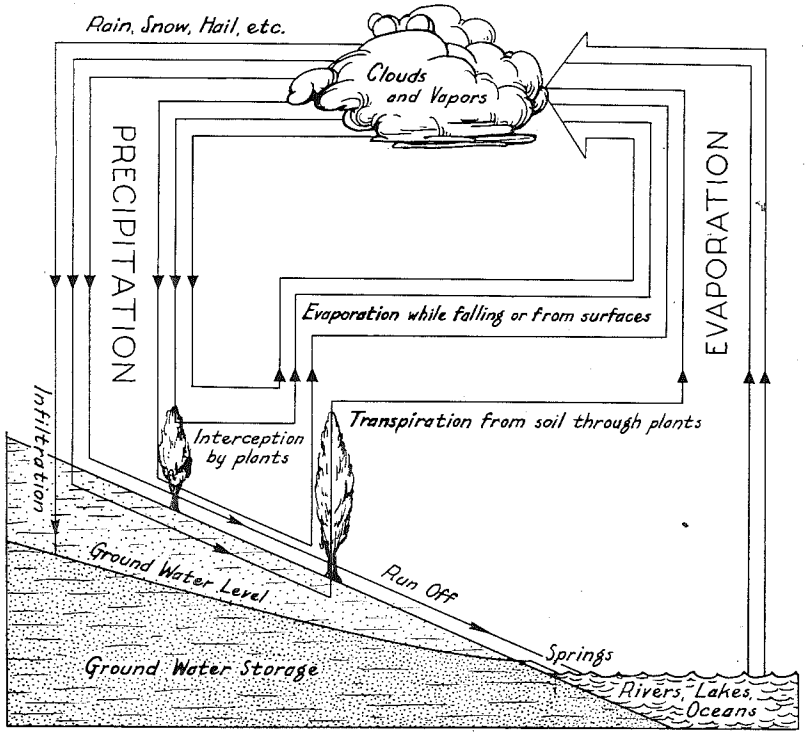
Name of Creamery.	Shipping Station.	Name of Secretary or Manager.	Postoffice Address.	Name of Buttermaker.	Postoffice Address.
Pine Island Creamery Co	Pine Island	C. H. Levit	Pine Island	W. Bumgardner	Pine Island.
North Star	Kenyon	Chris. Talle	Kenyon	M. M. Hjesmstad	Kenyon.
Welch	Welch	Frank Boothryd	Welch	S. Nelson	Welch.
Vasa	Cannon F.	A. J. Velander	Cannon Falls	A. F. Peehl	Cannon Falls.
Goodhue Creamery	Goodhue	E. G. Hammer	Zumbrota	F. W. Meen	Goodhue.
Zumbrota Creamery	Zumbrota	E. G. Hammer	Zumbrota	A. R. Meen	Zumbrota.
Red Wing, A. G. Swanson	Red Wing	A. G. Swanson	Redwing	A. Swanson	Red Wing.
Roscoe Butter and Cheese Association	Zumbrota	N. O. Rommen	Roscoe	Knute Nelson	Roscoe.
Wastedo Creamery Co	Cannon Falls	F. S. Stone	Cannon Falls, R. 1.	J. Bloomquist	Cannon Falls, R. 4.
Belle Creek Co-operative Dairy Assn	Goodhue	A. V. Anderson	Goodhue, R. 5	F. Jacobson	Cannon Falls.
Skyberg Co-operative Creamery Assn	Skyberg	F. J. White	Skyberg	H. H. Lunnow	Skyberg.
Forest Mills	Forest Mills				
Minnecla Creamery	Zumbrota				
Moland Creamery	Kenyon	Hans Dahle			

GRANT COUNTY.

Elbow Lake	Elbow Lake				
Ashby Creamery Co	Ashby	G. T. Hoff	Ashby	A. M. Olson	Ashby
Herman	Herman				

HENNEPIN COUNTY.

Flour City Creamery Co	Minneapolis	J. L. Aakar	1500 E. Franklin Av. Minneapolis	Swan Hanson	1500 E. Franklin Av. Minneapolis.
Minneapolis Milk Co	Minneapolis	A. R. Rihuke	900 S. 6th St., Mpls	N. O. Bendickson	211 8th Av. N. E. Mpls.
Rice County Creamery Co., E. P. Brown	Minneapolis		69 9th St., Mpls	Rob't Higgins	69 9th St., Mpls.
Plymouth Dairy Co	Minneapolis	J. Anderson	421 Plymouth Ave.	J. Anderson	421 Plymouth Ave.
Maple Plain	Maple Plain	C. D. Ingersoll	Maple Plain	C. D. Ingersoll	Maple Plain.
Independence Co-operative Creamery	Maple Plain	Chas. Soley	Maple Plain, R. 1.	Jas. Sorenson	Maple Plain, R. 1.
New Model Creamery	St. Bonifacius	Felix Logelin	St. Bonifacius	Geo. Logelin	St. Bonifacius.
Germania Creamery Association	Minneapolis	Albert Bussch	Rogers	N. C. Iverson	Loretto.
Maple Leaf	Minneapolis	C. Zieberth	Osseo	O. Zieberth	Osseo.
Plymouth Milk Co	Minneapolis	N. C. Strand	Mpls.		
South Minneapolis Creamery Co	Minneapolis				
Minnesota Creamery Co	Minneapolis	J. A. Berg	Mpls.		
North Minneapolis Milk Co	Minneapolis				
Maple Leaf Creamery Co	Rogers	J. G. Owald	Rogers		
Seven Corners Milk Co	Minneapolis				



The Hydrologic Cycle. It has been estimated that a drop of water evaporated from the ocean rains five times before it gets back to the sea. (After National Resources Board Report.)

UNIVERSITY OF MINNESOTA
MINNESOTA GEOLOGICAL SURVEY
WILLIAM H. EMMONS, DIRECTOR

BULLETIN 31

THE GEOLOGY AND UNDERGROUND WATERS OF SOUTHERN MINNESOTA

BY

GEORGE A. THIEL

MINNEAPOLIS · 1944
THE UNIVERSITY OF MINNESOTA PRESS

The figures for hardness in Table 52 are not a true reflection of the character of the water in the formations indicated. In some wells that reach the Dresbach and Hinckley sandstone the water from higher formations is not completely shut off. However, from a study of analyses of water from carefully cased wells, it is safe to conclude that the water in the formations from the St. Peter to the Dresbach inclusive is of about the same hardness. The Hinckley sandstone, however, contains water with only about half as much temporary hardness, or about the same amount as the water in the Mississippi River. The iron content of artesian water taken from any subsurface stratum is much greater than that of Mississippi River water.

The temperature of artesian water varies with depth. As the earth is penetrated the temperature rises slowly, so that deep artesian water is usually warmer than that from shallow wells. This fact should be kept in mind when wells are drilled to obtain water for air-conditioning plants. The water in wells of moderate depth, such as those in the Jordan and the St. Peter sandstones, has a temperature from 45° to 50° F., whereas the water in the Hinckley sandstone is at a temperature of about 55° F.

Osseo

The village of Osseo uses about 4 million gallons of water annually. It obtains the water for its public supply system from a well 10 inches in diameter and 537 feet deep. The well penetrates more than 200 feet of St. Lawrence and Franconia shales, silts, and sandstone, but the chief source of water is the glacial drift, which is 300 feet thick in this vicinity. The static level is about 30 feet below the surface. (See accompanying section.)

Osseo Village Well. Elevation 892 ft.

		DEPTH (feet)	THICKNESS (feet)
Drift	Unclassified	0–300	300
St. Lawrence and Franconia	Shales and sandstone	300–537	237+

Hopkins

The well at Hopkins used for all municipal purposes is 16 inches in diameter and 820 feet deep. Its surface elevation is 920 feet above sea level, and the static water level is about 65 feet below the surface. The estimated annual consumption is about 35 million gallons. The subsurface geologic succession is given in the accompanying section.

Village Well at Hopkins

		DEPTH (feet)	THICKNESS (feet)
Drift	Unclassified	0–95	95
Platteville	Limestone	95–120	25
St. Peter	Sandstone	120–210	
	Shale	210–235	
	Sandstone	235–270	150

		DEPTH (feet)	THICKNESS (feet)
Shakopee-Oneota	Dolomite	270–390	120
Jordan	Sandstone	390–470	80
St. Lawrence	Shale and dolomite	470–535	65
Franconia	Shale and sandstone	535–660	125
Dresbach	Sandstone and shale	660–820	160

Robbinsdale

The village of Robbinsdale obtains water for its public supply system from a well 16 inches in diameter and 636 feet deep, drilled in 1937. The surface elevation is approximately 900 feet above sea level, and the well terminates in the lower part of the Franconia formation. The static water level is about 30 feet below the surface. When pumped at the rate of 800 gallons per minute the well has a drawdown of approximately 5 feet.

Wayzata

The village of Wayzata formerly obtained its water from an artesian well that tapped the Jordan sandstone. Ownership of this well was transferred to the county, and it is now one of the group of seven large-capacity wells used for pumping water into Lake Minnetonka.

The present supply of water for the village is taken from a well 154 feet deep, which terminates in the glacial drift. Its static level is 70 feet below the surface. When pumped at the rate of 860 gallons per minute it has a drawdown of 4 1/2 feet, and when the rate of pumping is increased to 1180 gallons per minute the drawdown is 5 1/2 feet below the static level.

Loretto

The village of Loretto does not have a public well. The formations penetrated by the deep well at the railroad station are shown in the accompanying section.

Well at Soo Line Station, Loretto. Elevation 995 ft.

		DEPTH (feet)	THICKNESS (feet)
Drift	Sand and gravel	0–70	
	Hardpan	70–110	
	Blue clay	110–170	170
Jordan	Sandstone	170–260	90
St. Lawrence and lower formations	Red shale	260–290	
	White sand	290–312	
	Red shale	312–335	
	White sand	335–340	
	Gray shale	340–390	
	Blue shale	390–420	
	Gray shale	420–440	
	Green shale	440–525	
	Sandstone	525–596	336+

Maple Plain

The village of Maple Plain is located north of the western end of Lake Minnetonka, in the western part of the county, where the glacial drift

more than 200 feet thick. The public water supply is pumped from a well 10 inches in diameter and 418 feet deep. The static level is 114 feet below the surface. When pumped at the rate of 175 gallons per minute the well has a drawdown of 12 feet. The geological formations penetrated are shown in the accompanying section.

Village Well at Maple Plain. Elevation 1025 ft. Drilled 1939.*

		DEPTH (feet)	THICKNESS (feet)
Glacial drift	Loam soil	0–2	2
	Yellow clay	2–15	13
	Blue clay	15–74	59
	Blue clay and sand	74–160	86
	Sand and gravel	160–173	13
	Blue clay	173–210	37
	Fine sand	210–223	13
	Fine sand and gravel	223–234	11
Franconia	Green shale	234–242	8
	Sandstone, hard	242–250	8
	Sandstone and shale	250–300	50
	Green shale	300–311	11
	Sandstone, various colors	311–334	23
	Shale	334–338	4
	Sandstone	338–362	24
	Shale	362–365	3
	Sandstone, brown	365–388	23
Dresbach	Sandstone, gray	388–418	30

* Logs of other wells near the village are given in Bulletin 27, Minnesota Geological Survey.

County Wells at Lake Minnetonka

Following the drought years of 1933–35, Hennepin County officials ordered a number of artesian wells drilled (Figure 42), from which water was pumped and allowed to flow into Lake Minnetonka, in an attempt to raise the water in the lake to the level of pre-drought years (Figure 41). The logs of the new wells are shown in Figure 43. The log of well 6 is given elsewhere. Well 6 was formerly the village well at Wayzata. When all the wells were completed they yielded more than 15 million gallons per day. They were pumped almost continuously for approximately two years. Several were pumped for more than three years. The dates of completion of the wells and the fluctuations of the water levels are shown in Figure 43. Each well showed a steep initial drawdown during the first few months of operation, followed by slight fluctuations such as characterize the curves for wells 1 and 2 (Figure 44) during 1939 and 1940. The cumulative effect of the pumping of additional large-capacity wells is shown by the gradual depression of the water level in wells 1 and 2 as wells 3, 5, and 7 were completed and put into operation. (Wells 4 and 6 are not included in Figure 44.) At the beginning of 1939 the water in well 2 stood at about 820 feet above sea level, and by June 1941 it was depressed to 802 feet. Well 1 shows a similar trend. However, when pumping operations were stopped for several months during the summer

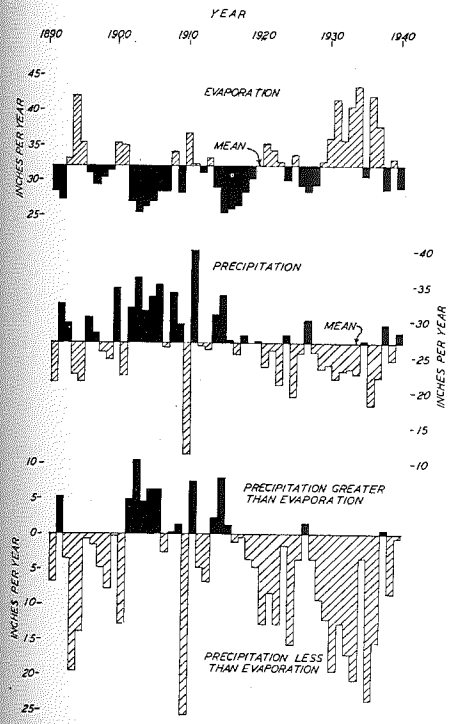


Figure 41. — Graphs of hydrological elements, showing computed annual evaporation from lakes and reservoirs, recorded annual precipitation, and computed evaporation minus recorded precipitation for the Minneapolis area. (Compiled by A. F. Meyer and published by the Minnesota Resources Commission, 1942.)

of 1941, all water levels rose to approximately the same static levels observed when the wells were drilled. Pumping during the winter of 1941–42 again depressed the water surface. All the wells were shut off in April 1942. Observations made in June 1943 showed that the static level in all the wells was as high as or higher than when the wells were drilled.

Precipitation and pumping have now brought the level of Lake Minnetonka to above that of the dam at Gray's Bay, where the crest of the outlet dam is 929.4 feet above sea level. The total precipitation in the area of Minneapolis during 1941 was 27.00 inches, and in 1942, 30.56 inches. The mean annual precipitation is 27.00 inches.

The influence of the seven large-capacity pumps of the Lake Minnetonka wells on the regional static water level is shown by their effect on Pilot Well 5 at Orono, which is nearly two miles from well 1. The location of this well is shown in Figure 42. Observations from March 6, 1940 to June 1, 1943 are given in Table 53.

Table 53. — Showing the Effect of the Seven County Wells on Pilot Well 5 at Orono, Lake Minnetonka. Elevation 932.6 ft.*

Date	Elevation Static Water Level	Other County Pumps in Operation
March 6, 1940	897.80	All pumping
March 28, 1941	896.90	All pumping
July 7, 1941	904.70	None pumping
February 5, 1942	898.60	No. 1 not pumping
April 1, 1942	899.60	No. 1 not pumping
June 9, 1942	909.80	None pumping
August 6, 1942	910.80	None pumping
December 21, 1942	912.30	None pumping
June 1, 1943	913.60	None pumping

* Data from the county engineer's office.

Unique Well Number 207090

County Hennepin
Quad Rockford
Quad Id 121C

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date 1991/08/24
Update Da
Received Date

Well Name MAPLE PLAIN 1 Well A

Township	Range	Dir	Section	Subsection	Field Located Elevation	MDH
118	24	W	24	DCCBCB	1025.00	ft.

well address MAPLE PLAIN 1

MAPLE PLAIN MN 55359 Changed

contact address CITY OF MAPLE PLAIN

MAPLE PLAIN MN 55359

Description	Color	Hardness	From	To (ft.)
TOP SOIL	BLACK		0	2
CLAY	YELLOW		2	15
CLAY	BLUE		15	74
CLAY AND SAND	BLUE		74	160
SAND AND GRAVEL			160	173
CLAY	BLUE		173	210
FINE SAND			210	223
FINE SAND AND GRAVEL			223	234
SHALE	GREEN		234	242
HARD SANDROCK VARIOUS CO	VARIED		242	250
SANDROCK AND SHALE			250	300
SHALE	GREEN		300	311
SANDROCK VARIOUS COLORS	VARIED		311	334
SHALE			334	338
SANDROCK			338	362
SHALE			362	365
SANDROCK			365	369
SANDROCK			369	416
SANDROCK W/TRACE OF SHALI			416	418

Remarks
IRON 1.7 PPM HARD 320 PPM TASTE-HARD GAMMA, MULTI, AND CALIPER LOGGED 4-27-2006 FOR ST. LAWRENCE-FRANCONIA STUDY. M.G.S. NO. 4526.

First Bedrock CSTL
Last Strat CWOC
Aquifer Tunnel City-Wonewoc
Depth to Bedrock 234.00 ft.

Well Depth 418.00 ft
Depth Completed 418.00 ft
Date Well Completed 1939/11/00

Drillhole Angle

Drilling Method Cable Tool

Drilling Fluid

Well Hydrofractured? ☐ YES ☐ NO
From ft. to

Use community supply(municipal)

Casing Type Steel (black or low Drive Shoe? ☐ YES ☐ NO
Diameter 10 Depth 238
10.00 in. from 0.00 to 238.00 ft. lbs/ft

Hole Diameter (in.)
10.0(To 402.0
8.00 To 418.0

Screen No
Make Type
Diamter Slot Length Set

Open Hole(ft.) From 238.0 to 418.0

Static Water Level
114.00 ft. land surface Date measured 1939/11/00

Pumping Level (below land surface)
141.00 ft. after 5.00 hrs. pumping g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grate (Environmental Wells and Borings ONLY) ☐ Basement offset

Grouting Information Well grouted? ☐ YES ☐ NO ☑ NOT SPECIFIED

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ YES ☐ NO

Pump
☐ Not Installed Date Installed
Manufacture's name
Model number HP 30.00 Volts
Length of drop pipe Material Capacity g.p.m
Type

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 Cerfication
Renner Max Well Co. 27246
License Business Name Lic. or Reg No.

Name of Driller Date

Unique Well Number 207407

County Hennepin
Quad Rockford
Quad Id 121C

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date 1991/08/24
Update Da
Received Date

Well Name MAPLE PLAIN 2 Well B

Township	Range	Dir	Section	Subsection	Field Located Elevation	MDH
118	24	W	24	CDDDCA	1035.00	ft.

well address MAPLE PLAIN 2
1620 MAPLE AV
MAPLE PLAIN MN 55359 Changed

contact address CITY OF MAPLE PLAIN
MAPLE PLAIN MN 55359

Description	Color	Hardness	From	To (ft.)
CLAY			0	40
GRAY CLAY SOME GRAVEL	GRAY		40	105
HARD CLAY, GRAVEL	YELLOW	HARD	105	165
SOFT YELLOW CLAY	YELLOW	SOFT	165	170
HARD CLAY, GRAVEL		HARD	170	214
DIRTY SANDSTONE			214	226
DIRTY SANDSTONE			226	228
SHALE	GRAY		228	243
GREEN SANDY SHALE	GREEN		243	250
RED SHALE	RED		250	255
GREEN SANDY SHALE	GREEN		255	265
HARD SHALE		HARD	265	285
GREEN SHALE AND SANDSTON	GREEN		285	364
GREEN SHALE AND SANDSTON	GREEN		364	365
WHITE SANDSTONE	WHITE		365	428
SHALE AND SANDSTONE			428	435

Remarks
DETONATED 8 SHOTS TOTALING 124 LBS. OF 75 PER CENT GELATINE. GAMMA LOGGED 4-7-1993. MAPLE PLAIN MUNI #2 MP=1.5 PUMPAGE TEST 400 GPM-BEFORE SHOOTING 630 GPM-AFTER SHOOTING

First Bedrock CTCG
Last Strat CECR
Aquifer Tunnel City-Wonewoc
Depth to Bedrock 226.00 ft.

Well Depth 435.00 ft | **Depth Completed** 435.00 ft | **Date Well Completed** 1959/10/01

Drillhole Angle

Drilling Method Cable Tool

Drilling Fluid

Well Hydrofractured? ☐ YES ☐ NO
From ft. to

Use community supply(municipal)

Casing Type Steel (black or low Drive Shoe? ☐ YES ☐ NO
Diameter 16 Depth 241
16.00 in. from 0.00 to 241.00 ft. lbs/ft

Hole Diameter (in.)

Screen No
Make Type
Diamter Slot Length Set

Open Hole(ft.) From 241.0 to 435.0

Static Water Level (Multiple SWL)
125.50 ft. land surface Date measured 1988/06/17

Pumping Level (below land surface)
192.00 ft. after hrs. pumping 630.00 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grate (Environmental Wells and Borings ONLY) ☐ Basement offset

Grouting Information Well grouted? ☐ YES ☐ NO ☑ NOT SPECIFIED

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ YES ☐ NO

Pump
☐ Not Installed Date Installed
Manufacture's name PEERLESS
Model number HP 30.00 Volts 220
Length of drop pipe Material Capacity g.p.m
Type

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 Cerfication
Tri-state Well Co. 27118
License Business Name **Lic. or Reg No.**
BERTTHIAUME,M

Name of Driller **Date**

Unique Well Number 112238

County Hennepin
Quad Rockford
Quad Id 121C

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date 1991/08/24
Update Da
Received Date

Well Name MAPLE PLAIN 3 Well C

Township	Range	Dir	Section	Subsection	Field Located Elevation	MDH	
118	24	W	24	CCCACD		1020.00	ft.

well address MAPLE PLAIN 3

MAPLE PLAIN MN 55359 Changed

contact address CITY OF MAPLE PLAIN

MAPLE PLAIN MN 55349

Description	Color	Hardness	From	To (ft.)
CLAY			0	30
SANDY CLAY	BLUE		30	57
CLAY	BLUE		57	162
GRAVEL			162	166
CLAY	BLUE		166	284
HARD-PACKED GRAVEL		HARD	284	286
HARD PACKED GRAVEL		HARD	286	290
SAND, SHALE, AND LIME			290	299
SHALE STICKY			299	312
SAND, SHALE, AND LIME			312	335
SHALEY SANDROCK			335	342
SHALEY, SANDROCK			342	393
SHALEY, SANDROCK			393	469
EAU CLAIRE-MT. SIMON TRANSI	GRAY	SOFT	469	475
EAU CLAIRE-MT. SIMON TRANSI	GRAY	SOFT	475	515
MT. SIMON	WHITE	SOFT	515	580

Remarks
GAMMA LOGGED 5-13-1993 & 7-14-1993 AFTER GRAVEL PACK REMOVED. IN 1994 SCREEN WAS PULLED AND THE WELL WAS DEEPENED. M.G.S. NO. 3619. CUTTING FROM 450-570 FT. MAPLE PLAIN MUNI #3 MP=2.25 WELL GRAVEL PACKED HAS 70 FT. OF SCREEN AND 60 FT. OF LEADER PIPE.

First Bedrock CTCG
Last Strat CMTS
Aquifer Mt.Simon
Depth to Bedrock 286.00 ft.

Well Depth 580.00 ft
Depth Completed 534.00 ft
Date Well Completed 1978/04/20

Drillhole Angle

Drilling Method Cable Tool

Drilling Fluid

Well Hydrofractured? ☐ YES ☐ NO
From ft. to

Use community supply(municipal)

Casing Type Steel (black or low Drive Shoe? ☐ YES ☑ NO
Diameter 18 Depth 534

30.00	in. from	0.00	to	59.00 ft.	lbs/ft
24.00	in. from	0.00	to	333.00 ft.	lbs/ft
18.00	in. from	0.00	to	534.00 ft.	lbs/ft

Hole Diameter (in.)
24.0(To 534.0
18.0(To 580.0

Screen Yes
Make Type
Diamter Slot Length Set

Open Hole(ft.) From 534.0 to 580.0

Static Water Level (Multiple SWL)
108.70 ft. land surface Date measured 1988/06/17

Pumping Level (below land surface)
220.00 ft. after hrs. pumping 650.00 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grate (Environmental Wells and Borings ONLY) ☐ Basement offset

Grouting Information Well grouted? ☑ YES ☐ NO ☐ NOT SPECIFIED

Material	neat cement	From	0.0	To 60.0 ft.	0.00	
Material	neat cement	From	0.0	To 534.0 ft.	36.00	Cubic yards

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☑ YES ☐ NO

Pump
☐ Not Installed Date Installed 1994/00/07
Manufacture's name JOHNSTON
Model number TK-61554A HP 125.00 Volts 240
Length of drop pipe 280.(Material S Capacity 650 g.p.m
Type Turbine

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 Cerfication
Bergerson-Caswell 27058
License Business Name **Lic. or Reg No.**
MANTHIE, D.
Name of Driller **Date**

Unique Well Number 824078

County Hennepin
Quad Rockford
Quad Id 121C

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date 2017/03/13
Update Da
Received Date

Well Name MAPLE PLAIN 4

Township	Range	Dir	Section	Subsection	Field Located Elevation
118	24	W	24	CCCADB	MGS 1021.00 ft.

well address MAPLE PLAIN 4
1655 PIONEER AV
MAPLE PLAIN MN 55369

contact address CITY OF MAPLE PLAIN
5050 INDEPENDENCE ST
MAPLE PLAIN MN 55369

Description	Color	Hardness	From	To (ft.)
LOAM/CLAY	BLK/YEL	SOFT	0	5
CLAY	YELLOW	MEDIUM	5	15
CLAY W/FINE GRAVEL	GRAY	MEDIUM	15	270
MED SAND	GRAY	MEDIUM	270	280
FINE GRAVEL WITH SAND	VARIED	SOFT	280	285
MED SAND	GRAY	MEDIUM	285	295
FINE SAND W/GRAVEL	GRAY	MEDIUM	295	300
COARSE GRAVEL & COBBLES	VARIED	MEDIUM	300	305
SAND/COARSE GRAVEL	VARIED	MEDIUM	305	314
COARSE GRAVEL	VARIED	MEDIUM	314	315
CEMENTED SHALE/CEMENTED	GRN/TAN	MEDIUM	315	325
CEMENTED SHALE & SANDSTO	GRN/TAN	MEDIUM	325	330
CEMENTED SHALE & SANDSTO	VARIED	MEDIUM	330	335
SHALE AND SANDSTONE	GRN/TAN	MEDIUM	335	340
SHALE	GREEN	MEDIUM	340	343
SHALE	GRN/BLK	MEDIUM	343	345
SANDSTONE	TAN	MEDIUM	345	350
SANDSTONE	GRAY	MEDIUM	350	365
SANDSTONE	GRAY	MED-HRD	365	370
SANDSTONE	GRAY	MEDIUM	370	385
SHALE AND SANDSTONE	GRN/TAN	MEDIUM	385	390
SHALE	GREEN	MEDIUM	390	392

Remarks
GAMMA AND MULTI TOOL LOGGED 3-13-2017. M.G.S. NO. 5661. LOGGED FOR COUNTY ATLAS. DRILLERS: BUTCH GAUNSTAD & JASON JOHNSON.

First Bedrock CTCG
Last Strat CWOC
Aquifer Wonewoc Sandstone
Depth to Bedrock 315.00 ft.

Well Depth 392.00 ft
Depth Completed 392.00 ft
Date Well Completed 2017/04/13

Drillhole Angle

Drilling Method Dual Rotary

Drilling Fluid

Well Hydrofractured? ☐ YES ☐ NO
From ft. to

Use community supply(municipal)

Casing Type Steel (black or low Drive Shoe? ☑ YES ☐ NO
Diameter 12 Depth 343
18.00 in. from 0.00 to 321.00 ft. lbs/ft
12.00 in. from 0.00 to 343.00 ft. lbs/ft

Hole Diameter (in.)
17.0(To 392.0

Screen No
Make Type
Diamter Slot Length Set

Open Hole(ft.) From 343.0 to 392.0

Static Water Level
104.00 ft. land surface Date measured 2017/03/22

Pumping Level (below land surface)
176.00 ft. after 24.00 hrs. pumping 1000.00 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grate (Environmental Wells and Borings ONLY) ☐ Basement offset

Grouting Information Well grouted? ☑ YES ☐ NO ☐ NOT SPECIFIED
Material neat cement From To 343.0 ft. 14.50 Cubic yards

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☑ YES ☐ NO

Pump
☑ Not Installed Date Installed
Manufacture's name
Model number HP Volts
Length of drop pipe Material Capacity g.p.m
Type

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 Cerfication
Mark J Traut Wells, Inc. 1404
License Business Name **Lic. or Reg No.**
SEE REMARKS

Name of Driller **Date**

City of Maple Plain (PWSID 1270021) Minnesota Water Supply Emergency and Contingency Plan

Contents

City of Maple Plain, Minnesota Water Supply Emergency and Contingency P

WELLHEAD PROTECTION MANAGER	
NAME	Jacob Kolander
	City of Maple Plain, Administrator
ADDRESS	5050 Independence St.
	PO Box 97
	Maple Plain, MN 55359
TELEPHONE NUMBER	763-479-0516
E-MAIL	jkolander@mapleplain.com

GENERAL INFORMATION	
PUBLIC WATER SUPPLY ID:	1270021
UNIQUE WELL NUMBERS:	Primary - Well #3 (Unique Number: 112238)
	Primary - Well #4 (Unique Number: 824078)
COUNTY:	Hennepin
POPULATION SERVED:	2,174
SERVICE CONNECTIONS:	736

Section 1 – Public Water Supply Contact Information

The City of Maple Plain has established a Public Water Supply (PWS) team to facilitate contingency and emergency response operations in the case of an incident that disrupts the city's drinking water.

The following elected officials and city staff are current as of October 2024.

Table 1-Public Water System Contacts

Position	Name	Mobile Phone	Home/Work Phone	Other
Mayor	Julie Maas-Kusske		763-479-6010	
Council Member	Andrew Burak		612-221-6578	
Council Member	John Fay		763-213-3271	
Council Member	Mike DeLuca		612-801--5533	
Council Member	Connie Francis		612-554-6193	
Water System Operator	Dylan Hoflock	763-479-9250	763-479-0525	
City Administrator	Jacob Kolander	507-640-0041	763-479-0516	
Assistant City Administrator	Kevin Larson		763-479-0525	
Deputy City Clerk	Sunny Bjorklund Schultz		763-479-0515	

Section 2 – Public Water Supply Characteristics

2.1 Water Source Information

Table 2-Public Water Source Information

Local Well ID	Unique Number	Use/ Status[1]	Casing Diameter (Inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed or Reconstructed	Aquifer	Well Vulnerability
1	207090	E	10	238	418	1939	Tunnel City-Wonewoc	Not Vulnerable
3	112238	P	18	534	534	1978	Mt. Simon	Not Vulnerable
4	824078	P	18x12	343	392	2017	Wonewoc	Not Vulnerable

[1]E=Emergency, P=Primary

2.2 Water Use Prioritization

Table 3-Water Use Prioritization

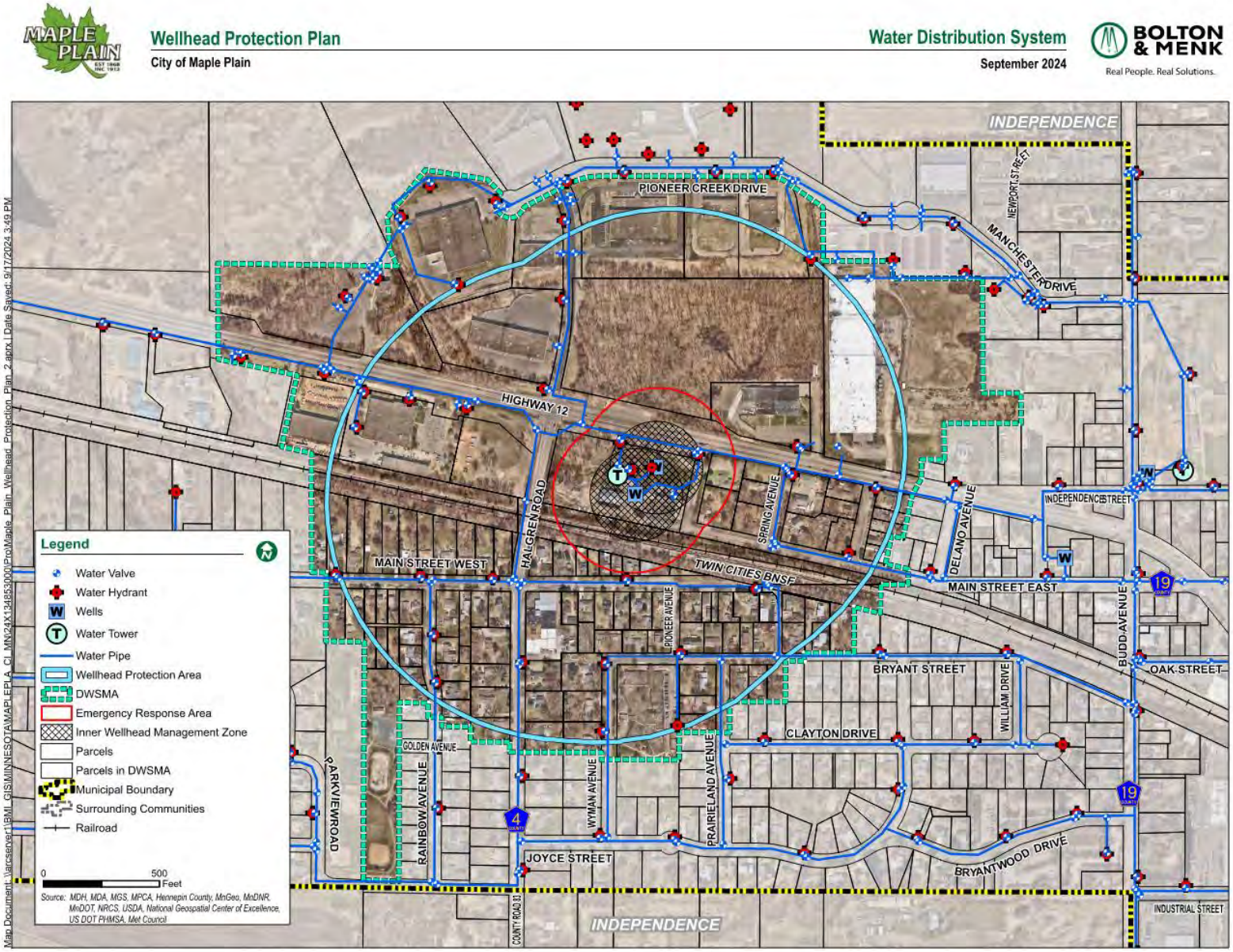
Priority Use Category	Prioritization Rank	Maximum Daily Use (Gallons Per Day)	Minimum Daily Use
Residential			
Institutional			
Commercial			
Unaccounted			

2.3 Water Treatment Process

Well #3 and Well #4 are pre-treated with chlorine and potassium permanganate and sent through an aerator. After aeration water is mixed in a detention tank and then sent through three media filters and stored in a clear well tank. Before leaving the treatment plant and being pumped to the water tower the water is treated again with chlorine, polyphosphate, and fluoride. Only water from Well #3 is treated with hydrous manganese after the detention tank, before being sent through the media filters.

2.4 Water Storage and Distribution System

The city's current water storage capacity is approximately 400,000 gallons in the water tower and 95,000 gallons in the Water Treatment Plant clearwell.



2.5 Water System Construction Blueprints and Maps

The city maintains its construction *As-Builts* in the city's GIS database. If hard copies are required, the city can work with their engineering consultant to print and have them available in a central location.

Section 3 – Communication Procedures and Contact Information

Depending on the emergency, contact the groups listed below in the order provided. The contact information and specific procedures are located in the tables on the following pages.

3.1 Public Water Supply Incident Response Contacts

Table 4-Incident Response and Communication Contacts

Incident	Water Operator	Customers	MDH District Engineer	Emergency Management	Fire Department Chief	MN Duty Officer	West Hennepin Public Safety	Mayor and Council	MPCA	First Responders
Natural disaster that disrupts the supply of water	X	X	X	X		X	X	X		
Chemical Spill	X	X	X	X	X		X	X	X	X
Unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination	X	X				X		X		
Situation that causes a loss of positive water pressure	X		X		X	X	X	X		X
Lack of resources that adversely affect operations due to lengthy power outages	X							X		
Chlorine storage leak	X				X	X	X	X		X
Chemical overfeed	X	X	X			X		X		
Break-in or terroristic acts	X		X			X	X	X	X	
Loss of one or more sources of supply	X		X		X			X	X	

3.2 Response Guidance for Water Supply Emergency Incidents

3.2.1 ***Intentional Events*** or break-in at the facility that is connected to the distribution system or pending a potential contamination incident.

1. Call West Hennepin Public Safety (911) and report the incident
2. MDH District Engineer (651-270-4182).
3. MDH After Hours Engineer (651-201-5386)
4. Call MN State Duty Officer (800-422-0798).

3.2.2 ***Unintentional Event***, or potential contamination incident, chemical spill, significant chemical overfeed, chlorine storage leak, etc.

1. Call local First Responders (911) or Hazardous Materials Response Team
2. Call West Hennepin Public Safety (911) and report the situation.
3. Call MN State Duty Officer (800-422-0798).

3.2.3 ***Event that is or may affect the functionality of the water system***, such as loss of pressure, loss of supply wells.

1. MDH District Engineer (651-270-4182).
2. Call MN State Duty Officer (800-422-0798).
3. Notify MNWARN by requesting the MN State Duty Officer activate network assistance.

3.3 Agency Contact Information

The table below contains local and state agency staff names and telephone numbers that may be notified in the event of a public water supply system emergency. Based on the nature of the emergency and the information available, various representatives from this listing may be selected by the response coordinator to be part of the Emergency Oversight Committee, which will then meet throughout the duration of the emergency to aid in decision-making and positive outcomes.

Table 5-Local and State Agency Contact Information

Personnel	Name	Mobile Phone	Work Phone
Mayor	Julie Maas-Kusske		
City Council	Andrew Burak		
City Council	John Fay		
City Council	Mike DeLuca		
City Council	Connie Francis		
Response Coordinator	Jacob Kolander		763-479-0516
Alt. Response Coordinator	Kevin Larson		763-479-0525
State Incident Duty Officer	N/A	N/A	800-422-0798
West Hennepin Emergency Director	Gary Kroells		763-479-0500

Personnel	Name	Mobile Phone	Work Ph
Fire Chief	Rick Denneson	911	763-479-0520
West Hennepin Public Safety Director	Gary Kroells	911	763-479-0500
Water System Operator	Dylan Hoflock	763-479-9250	763-479-0525
Alt. System Operator			
School Superintendent			
Ambulance			
Clinic			
Medical Facility or Doctor			
Power Company			
County Highway Department	Hennepin County		
State Highway Department	Minnesota Highway Department		
Neighboring Water System			
MPCA			
MDH District Engineer	Brian Noma	51-470-4182	651-201-4683
MDH After Hours Engineer			651-201-5386
MDH Sourcewater Protection	Abby Shea	651-396-0018	651-201-4386

3.4 Emergency Oversight Committee

The Emergency Oversight Committee was formed to assist and provide technical assistance to the Response Coordinator and the City of Maple Plain to help them determine the appropriate action or response during emergency situations.

Table 6-Emergency Oversight Committee Contact Information

Title	Name	Phone	Response Assignment
Response Coordinator	Jacob Kolander	763-479-0516	Coordinate actions to address emergency
Alternate Response Coordinator	Kevin Larson	763-479-0525	Coordinate actions to address emergency
Water Operator	Dylan Hoflock	763-479-9250	Direct or contact individuals and businesses to resolve issue
Primary Spokesperson	Jacob Kolander	763-479-0516	Contact media to inform citizens/businesses of emergency
Alternate Public Relations	Kevin Larson	763-479-0515	Contact media to inform citizens/businesses of emergency
Public Health/Medical			Assist City as needed to address emergency

Title	Name	Phone	Response Assignment
MPCA Groundwater Division			Assist City as needed to address emergency
MDH District Engineer	Brian Noma		Assist City as needed to address emergency

3.5 Inventory of Available Emergency Equipment and Contacts

The Table below contains a list of services, equipment and supplies that are available to the public water supply system to respond to most water system emergencies.

Table 7-Available Emergency Service Providers and Equipment

Description	Name of Business or Provider	Phone	Address	Estimated Response Time
Well Repair	Thein Well	320-894-1533	11355 Hwy 71 NE, Spicer, MN 56288	2 hours
Pump Repair	Thein Well	320-894-1533	11355 Hwy 71 NE, Spicer, MN 56288	2 hours
Electrician	Rc Electric	612-558-5602	1565 Budd Ave, Maple Plain, MN 55359	1 hour
Plumber	Jesse Toutges Plumbing	952-913-5856	3658 Co Rd 90, Independence, MN 55359	30 mins
Backhoe/Excavator	Valley-Rich Co	612-839-8504	147 N Jonathan Blvd #4, Chaska, MN 55318	30 mins
Chemical Feed	Vessco Inc	320-583-9439	8217 Upland Cir, Chanhassen, MN 55317	30 mins
Meter Repair	Metering Technologies and Solutions	651-302-5663	12016 Riverwood Dr, Burnsville, MN 55337	1 hour
Generator	Interstate Power Systems	612-505-9025	2501 American Blvd, Minneapolis, MN 55425	30 mins
Valves	Valley-Rich Co	612-839-8504	147 N Jonathan Blvd #4, Chaska, MN 55318	30 mins
Pipe & fittings	Valley-Rich Co	612-839-8504	147 N Jonathan Blvd #4, Chaska, MN 55318	30 mins

3.6 Media Contacts

The list was formed to assist the Response Coordinator and the City with the task of informing the public of appropriate action or response during water emergency situations.

Table 8-Media Outlet Contact Information

Media	Name	Phone	Address
Newspaper	Laker Pioneer- APG Public Notice Department	763-691-6000	publicnotice@apgecm.com
Television	5 Eyewitness News	651-588-6397	newsreply@kstp.com

Section 4 – City Public Emergency Relations

4.1 Emergency Public Relations Contacts

Table 9-Emergency Public Relations Contacts and Response Assignment

Title	Name	Phone	Response Assignment
Primary Spokesperson	Jacob Kolander	763-479-0516	Contact media to inform citizens/businesses of emergency
Alternate Spokesperson	Kevin Larson	763-479-0516	Contact media to inform citizens/businesses of emergency

4.2 Responsibilities of the Primary Spokesperson:

1. Give public statements that have been prepared by the city regarding the water supply emergency;
2. Coordinate and compile information submitted by responders to the water supply emergency;
3. Schedule official meetings between the city and members of the media; and
4. Coordinate efforts to keep the public informed about the water supply emergency.

4.3 Public Information Center Location During Emergency

Location: City Hall 5050 Independence St Maple Plain, MN 55359

Time available to public: TBD

Alternate information center location: TBD

4.4 Public and Media Information Checklist

- Name of public water supply system
- Nature of the water supply emergency
- Steps being taken to replace or restore water supply
- Steps the public can take
- Other response staff who are cooperating with the city
- In cases of water supply contamination:
  - Contaminant of concern
  - Date of first contaminant detection
  - Source of contamination, if known
  - Public health impacts of the contaminant
  - Steps being taken to eliminate the source of contamination

Section 5 – Alternative Water Supply Options

1. Catastrophic Event--The Minnesota National Guard may be able to supply water trucks to bring water to the public water supply from surrounding communities. The following procedure is recommended:
    a. Contact the West Hennepin Public Safety Director (763-479-0500) or 911 to request assistance from the Minnesota National Guard.
    b. Sheriff contacts the Minnesota National Guard, Division of Emergency Management, State Duty Officer 800-422-0798; and Community Support Group at 651-282-4013 to request assistance for the city.
    c. MNWARN may be a source of assistance through the networking of other municipal utilities who are willing to provide emergency response through equipment or staff.
2. Bottled water supplies, delivery, and distribution: TBD
3. System interconnects with other water supplies: N/A
4. New well: TBD
5. Emergency or backup wells: TBD
6. Emergency treatment of water system: TBD

Glossary of Terms

Data Element. A specific type of information required by the Minnesota Department of Health to prepare a wellhead protection plan.

Drinking Water Supply Management Area (DWSMA). The area, delineated using identifiable landmarks, reflects the scientifically calculated wellhead protection area boundaries as closely as possible (Minnesota Rules, part 4720.5100, subpart 13).

Drinking Water Supply Management Area Vulnerability. An assessment of the likelihood that the aquifer within the DWSMA is subject to impact from land and water uses within the wellhead protection area. It is based upon criteria that are specified under Minnesota Rules, part 4720.5210, subpart 3.

Emergency Response Area (ERA). The part of the wellhead protection area that is defined by a one-year time of travel within the aquifer that is used by the public water supply well (Minnesota Rules, part 4720.5250, subpart 3). It is used to set priorities for managing potential contamination sources within the DWSMA.

Inner Wellhead Management Zone (IWMZ). The land that is within 200 feet of a public water supply well (Minnesota Rules, part 4720.5100, subpart 19). The public water supplier must manage the IWMZ to help protect it from sources of pathogen or chemical contamination that may cause an acute health effect.

Wellhead Protection (WHP). A method of preventing well contamination by effectively managing potential contamination sources in all or a portion of the well's recharge area.

Wellhead Protection Area (WHPA). The surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field (Minnesota Statutes, section 103I.005, subdivision 24).

Well Vulnerability. An assessment of the likelihood that a well is at risk of human-caused contamination, either due to its construction or indicated by criteria that are specified under Minnesota Rules, part 4720.5550, subpart 2

Controls and Programs

In addition to its own controls, the City of Maple Plain will rely upon partnerships formed with local units of government, state agencies, and federal agencies with regulatory controls or resource management programs in place to help implement its WHPP. The level of support that a local, state, and federal agency can provide depends on its legal authority, as well as the resources available to local governments.

A. Maple Plain Existing Controls and Programs

The DWSMA is located within the Maple Plain city limits. The DWSMA is located within Hennepin County, Minnesota. **Table 1** shows the legal controls and/or programs that the city has identified to support the management of potential contamination sources within the DWSMA.

Table 1: Maple Plain Controls and Programs

Type of Control	Program Descriptions
City Ordinances: • Zoning • Utility Regulations • Ordinance Sec. 9-24 – Permits for service connections • Ordinance Sec. 9-26 – Excavation permits required. • Ordinance Sec. 9-23. – Restricted hours for sprinkling.	Zoning Permits: • City Water/Sewer Connection
Water Supply Plan	Guides staff and City Council on water supply activities and opportunities
Surface Water Management Plan	Guide for City Council on how to manage surface waters

B. Local Government Controls and Programs

Additional local government controls and programs are listed in Table 2. These are predominantly managed through Hennepin County with surface water protection falling within the Pioneer-Sarah Watershed Management Commission.

Table 2: Local Agency Control and Programs

Government Unit	Name of Control/Programs	Program Description
Hennepin County Planning and Zoning	Zoning Comprehensive Land Use Planning	Controls for land use and zoning outside Maple Plain city limits
Pioneer-Sarah Watershed Management Commission	Surface Water Management	Protect, preserve and manage natural surface water systems

C. State Agency and Federal Agency Support

MDH will serve as the contact for enlisting the support of other state agencies on a case-by-case basis regarding technical or regulatory support that may be applied to the management of potential contamination sources. Participation by other state agencies and the federal government is based on legal authority granted to them and resource availability. Furthermore, MDH 1) administers state regulations that affect specific potential sources of contamination and 2) can provide technical assistance to property owners to comply with these regulations.

Table 3 the specific regulatory programs or technical assistance that State and federal agencies may provide to the city to support implementation of the WHPP. It is likely that other opportunities for assistance may be available over the 10-year period that the plan is in effect due to changes in legal authority or increases in funding granted to state and federal agencies.

Table 3: State and Federal Agency Controls and Programs

Government Unit	Type of Program	Program Description
MDH	State Well Code for Municipal Wells (Minnesota Rules, Chapter 4725)	MDH has authority over the construction of new municipal and private wells and the sealing of those wells. MDH staff in the Well Management Program offer technical assistance for enforcing well construction codes, maintaining setback distances for certain contamination sources, and well sealing
MDH	WHP	MDH has staff that will help the city identify technical or financial support that other governmental agencies can provide to assist with managing potential contamination sources.

Government Unit	Type of Program	Program Description
MNDNR	Water appropriation permitting (Minnesota Rules, Chapter 6115)	MNDNR can require that anyone requesting an increase in existing permitted appropriations, or to pump groundwater, must address concerns regarding the impacts to drinking water if these concerns are included in a WHPP.
EPA	Class V Wells	The EPA has authority over Class V wells. Owners are required to notify the EPA.

D. Support Provided by Nonprofit Organizations

The South Fork Crow River Watershed Comprehensive Watershed Management Plan can be found at: https://www.mcleodcountymn.gov/services/one_watershed,_one_plan/60_day_review.php. This document provides additional resources and information regarding surface water quality and includes implementation projects to reduce water impairments.

Implementation Plan

A. Monitoring, Data Collection, and Assessment

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Groundwater Quality & Quantity Monitoring WHP Measure #A1 The city will contact the MDH Hydrologist to conduct water quality monitoring for city wells during year 6. MDH to provide sampling and analysis costs. Information will be used to refine the vulnerability assessment update.	1, 4	H	Staff Time	Maple Plain MDH						X				
Public Water Supply Well WHP Measure #A2 If the city determines a new well is necessary and/or feasible, pending available funding and resources, they will work with MDH Hydro to determine a suitable site.	1, 4	L	TBD	Maple Plain MDH Hydrologist	← If Needed →									
High-Capacity Wells WHP Measure #A3 Coordinate with MDH and MNDNR to identify any new high-capacity wells within 1-mile of the DWSMA or 2-miles of the city limits.	1, 4	M	Staff Time	Maple Plain MDH MNDNR	← Ongoing →									

Implementation Plan

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Aquifer Testing WHP Measure #A4 Coordinate with MDH and MNDNR to monitor water levels in the production wells to identify trends in the aquifer(s) or wells that may indicate long-term drawdown or well screen cleaning.	1, 4	M	TBD	Maple Plain MDH MNDNR	← Ongoing →									
Well Inventory and Prioritization WHP Measure #A5 Update the PCSI as needed. Review the status of existing wells and add new wells identified within one mile of the DWSMA.	1	H	Staff Time	Maple Plain MDH	← Ongoing →									
WHP Measure #A6 The city will coordinate with landowners and MDH to verify the location of wells within one-mile of the DWSMA or two-miles of the city limits.	1, 2, 4	L	TBD	Maple Plain MDH Landowners	← Ongoing →									

Implementation Plan

B. Well and Contaminant Source Management

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Well Management WHP Measure #B1 Coordinate with MDH to identify and seal any unused or unsealed wells.	1, 4	H	TBD / Staff Time	Maple Plain MDH Hennepin County	← As Needed →									
WHP Measure #B2 If a well is discovered of unknown depth or ≥270-feet deep, apply for MDH Grant or use county or city well management funds to seal wells.	1,4	M	TBD / Staff Time	Maple Plain MDH Hennepin County	← As Needed →									
IWMZ WHP Measure #B3 Contact MDH to update the IWMZ inventory for all system wells in either Year 6 or Year 7.	1, 4	M	Staff Time	Maple Plain MDH						X	X			
WHP Measure #B4 Monitor setbacks for new potential contaminant sources within the IWMZ.	1, 5	H	Staff Time	Maple Plain	← Ongoing →									

Implementation Plan

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
WHP Measure #B5 Ensure emergency response procedures are updated, especially for potential issues within the IWMZ. Focus should be on transportation corridors (highway and railroad).	1, 4	H	Staff Time	Maple Plain Emergency Response Agencies			X			X			X	
Class V Wells WHP Measure #B6 Notify MDH if a Class V Well is identified.	1, 4	L	Staff Time	Maple Plain EPA MDH	← As Needed →									
Physical and Cybersecurity WHP Measure #B7 Identify areas and opportunities to improve both physical and cybersecurity measures to protect the city's public water supply wells and distribution system.	1	M	TBD	Maple Plain MDH Hennepin County	← As Needed →									

Implementation Plan

C. Stakeholder Education and Outreach

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Stakeholder Education WHP Measure #C1 Develop WHP webpage on the city website with regular updates. Use social media and other public outreach resources to update the public on well management, unused wells, water conservation practices, and well sealing information. Link to information on MRWA and/or MDH websites.	2, 3	M	Staff Time	Maple Plain MDH Hennepin County PSWMC SFCRWD	X	X	X	X	X	X	X	X	X	X
WHP Measure #C2 Provide well management and well sealing information at city hall and through utility invoices. Request MDH brochures or links to websites with updated information.	2, 4	M	Staff Time	Maple Plain MDH	X			X			X			X
Water Conservation Measures WHP Measure #C3 Identify and implement water conservation best management practices for city operations, residents, and area businesses.	2, 3	L	Staff Time	Maple Plain PSWMC	← Ongoing →									

Implementation Plan

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administrative Controls WHP Measure #C4 Apply for MDH funding to assess and update local ordinances and plans with well-management language for protecting the city's drinking water supply aquifer.	2, 4	M	Staff Time	Maple Plain MDH	X				X				X	

Implementation Plan

D. WHP Coordination, Reporting and Evaluation:

Description	Objective	Priority	Cost	Responsible Party and Cooperators	Implementation Time Frame									
					2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
WHP Coordination WHP Measure #D1 Hold meetings with the WHP Team and local resource partners every 2.5 years to discuss WHP issues, past year's accomplishments, and complete an evaluation report.	4, 5	M	Staff Time	Maple Plain MDH			X		X			X		X
Implementation Tracking and Reporting WHP Measure #D2 Maintain a "WHP folder" that contains documentation of WHP activities and dates completed.	1, 5	H	Staff Time	Maple Plain	X	X	X	X	X	X	X	X	X	X
WHP Measure #D3 Develop a spreadsheet that coincides with measures found in your plan to track and monitor plan implementation activities and completion dates.	5	H	Staff Time	Maple Plain	X	X	X	X	X	X	X	X	X	X
WHP Program Evaluation Plan Reporting WHP Measure #D4 Summarize WHPP implementation efforts in a report to MDH in the 8th year.	4, 5	M	Staff Time	Maple Plain MDH								X		

Maple Plain WHPP Part 2 Draft Feedback

Note: page numbers refer to the numbers on the pages of the plan themselves, not the pages of the PDF.

Required Changes

The following are required to be addressed for the plan to receive approval from MDH:

- Be sure to update the dates on page v – the plan was submitted to LGUs on February 5, 2025, and review was open through April 6, 2025.
- The unique well number listed for Well #3 on page 4 is incorrect. Change to 112238 and ensure all well numbers are correct throughout the plan.
- The text in the first paragraph on page 10 appears to match Figure 5, however, this does not match what is in Table 1. Ensure the same dataset was used for the text, figure, and table and update accordingly.
- Many measures in the Plan of Action use “As/If Needed” or “Ongoing”. In order to keep on track and to pass an audit should the city be selected for a WHPP Audit in the future, change at least a couple of these measures to have a specific checkpoint or a few checkpoints throughout the process. You can add this in addition to what you have (“As/If Needed” or “Ongoing”) if you like that flexibility, but this way you have a timeframe to aim for. Examples I was thinking you could do this with:
  - Measure #A5: Maybe mark this one as annual or every other year to review status of existing wells and such? Then can be ongoing for new wells?
  - Measure #B1: Can also include “as needed”, but should call out a year or two where you will investigate the potential unsealed wells previously discussed – the potential creamery well noted in the Old Municipal Well Report and the potential well(s) identified by staff at the Scoping 2 Meeting.
    - I did notice that the Old Municipal Well Report was included as an Appendix, but not mentioned anywhere in the plan.
  - Measure #B6: Would like to see this one more specific. Can a timeframe be picked for when the system will first be assessed? Could be “as needed” after that.
  - Measure #C3: Can there be specific years city practices and plans will be looked at/evaluated (for the “identify” portion of the measure)? And then also “Ongoing” for the implementation part?
- Contingency Plan:
  - Table 3 is incomplete. The WHP Rule says to "prioritize water uses and demands into low, medium, and high categories". At minimum, fill in the “Prioritization Rank” for each priority use category.
  - Table 6 is incomplete. The WHP Rule indicates a public health contact is necessary ("the names, addresses, telephone numbers, and response assignments of personnel for public health, water supply operations, and public relations;"). At minimum, fill in the public health/medical contact information.

Recommended Changes

The following are highly recommended to be addressed to improve the plan:

- On page vi, eliminate the abbreviations not used anywhere in the plan. I noticed many such abbreviations and it can add confusion for the reader.
  - Also, WHPP should be Wellhead Protection Plan.
- Consider specifying on page 4 that the "aquifer exhibits a low geologic sensitivity throughout the DWSMA and is isolated from any [*direct*] surface water recharge interaction.
- More information than required was provided for various data elements, particularly regarding Water Resources. This is OK to do but focus on or come back to and highlight the impact to drinking water. For example, BMPs and water quality improvements surrounding surface water may have benefits to surface water quality and biological communities within the DWSMA, but will that influence the management of the DWSMA? Will that impact the confined aquifer in the next 10 years?
  - Also in the Water Resources section (page 4), it was a bit confusing to read about the land uses in this section. It is very helpful to note the close proximity of Highway 12 and the BNSF Railroad to the wells, but this is not the location I would look for this information. Recommend relocating this information.
  - The presence of a flood area in the DWSMA is noted – will this influence management of the DWSMA? If not, why not and if yes, how? What management is needed?
  - What documents are being referred to in the first full paragraph on page 5? Recommend specifying to provide context.
  - The watershed management plan is not available on the website linked in the last paragraph on page 5.
- The link on page 11 to Maple Plain's 2040 Comprehensive Plan does not work. Replace with correct link.
- Reword the text in the first paragraph on page 15 that says, "each of the wells located within the DWSMA". Wells 1 and 2 are not in the DWSMA, and there are non-city wells also within the DWSMA (they were just not deep enough to inventory in the PCSI).
  - Also, Well #2 was sealed in 2024 – refer to this date in addition to or instead of the date of the well being "capped", as it was not properly sealed until 2024.
- Recommend clarifying in the second paragraph on page 15 that the other high-capacity wells included in the delineation are not within the DWSMA itself.
- Reword the first sentence under "Groundwater Quality" on page 16. Water samples collected from wells #3 and #4 were analyzed for these parameters. The table represents the available chemical and isotopic information from the wells.
- Large chunks of text were directly copy-and-pasted from the Part 1 plan. This is the city's plan, so it is OK to do so, but ensure it makes sense to do so. Examples of issues with this:

  - The last paragraph under "Well Vulnerability Assessment" on page 17 refers to Table 2. This is the Table 2 from the Part 1 plan, as Table 2 in this plan is "Zoning in the Maple Plain DWSMA". Delete this reference or refer to the correct table. The paragraph also includes in-text citations for two sources cited in the Part 1 – either delete or include a full citation somewhere in this plan.
  - The first full paragraph on page 18 starts with "once the geologic sensitivity was determined…" but then goes on to explain how this was determined. Ensure copy-and-pasted sections of text make sense.
- Other sentences and groups of sentences in the plan appear to be copy-and-pasted from other sources as well. Recommend citing sources as a best practice, but also to help staff, partners, and other readers find the information referenced in the future.
- Not all sources in Table 7 have a level of risk assigned. Recommend assigning at least a Medium to FD1 and RSS could be Medium or Low.
- Regarding the statement on page 23 "The city does not have authority over proposed wells drilled within the area", does the city have any ordinances requiring connection to city water if available? The city is within its rights to deny a property owner to drill a well as a land use authority.
- In Table 10, consider if the issues identified in the first column are really issues – is water quality monitoring per MDH the actual issue to be addressed? How about aquifer and water conservation measures – are the measures really the issue or is demand on the aquifer the issue?

Plan of Action

- The subject heading of "Aquifer Testing" doesn't really make sense for measure #A4 since the measure is not an aquifer test. I think this is due to removing some other measures per advice of MDH Hydro. It would make a lot more sense to be under the "Groundwater Quality & Quantity Monitoring" subject heading. Recommend rearranging this.
- Measure #A6 was a recommendation from the MDH Hydro – recommend changing to a Medium priority.
- Measure #B3: Recommend just having the "X" in year 7. You can always do it earlier, but this could commit you to doing this twice or earlier than you want to.
- Recommend a measure for implementing the measures listed out in the IWMZ reports. We have some standard suggested language for such a measure if the team wants to use that.

Contingency Plan

- Regarding the references to MNWARN, I believe MNWARN can only be utilized by cities that are members. Is Maple Plain a member?

- Various tables in the plan are not complete. Recommend continuing to fill these out as much as possible. If any blanks remain, consider putting "TBD" instead and have city staff make a plan to address these in the near future. If I can be of assistance in identifying any contacts or other information, please let me know. See above for a few instances that are required to be completed.
- On the last page, under "Emergency or backup wells" list Well 1 and its unique well number. If something happens to wells 3 and 4, the city could use Well 1 before having to purchase and distribute bottled water.
- Lots of "TBD" in the plan – I know I said above to put TBD instead of blanks, but I encourage the team to see if any of these "TBDs" can be thought out a bit more before finalizing this plan. Either way, have staff make a plan to address the rest of the TBDs in the near future to have a robust contingency plan.