City of Maple Plain
Wellhead Protection Plan
Part 2

October 2025 – October 2034

DEPARTMENT OF HEALTH

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Public Water Supply Profile

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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.
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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)

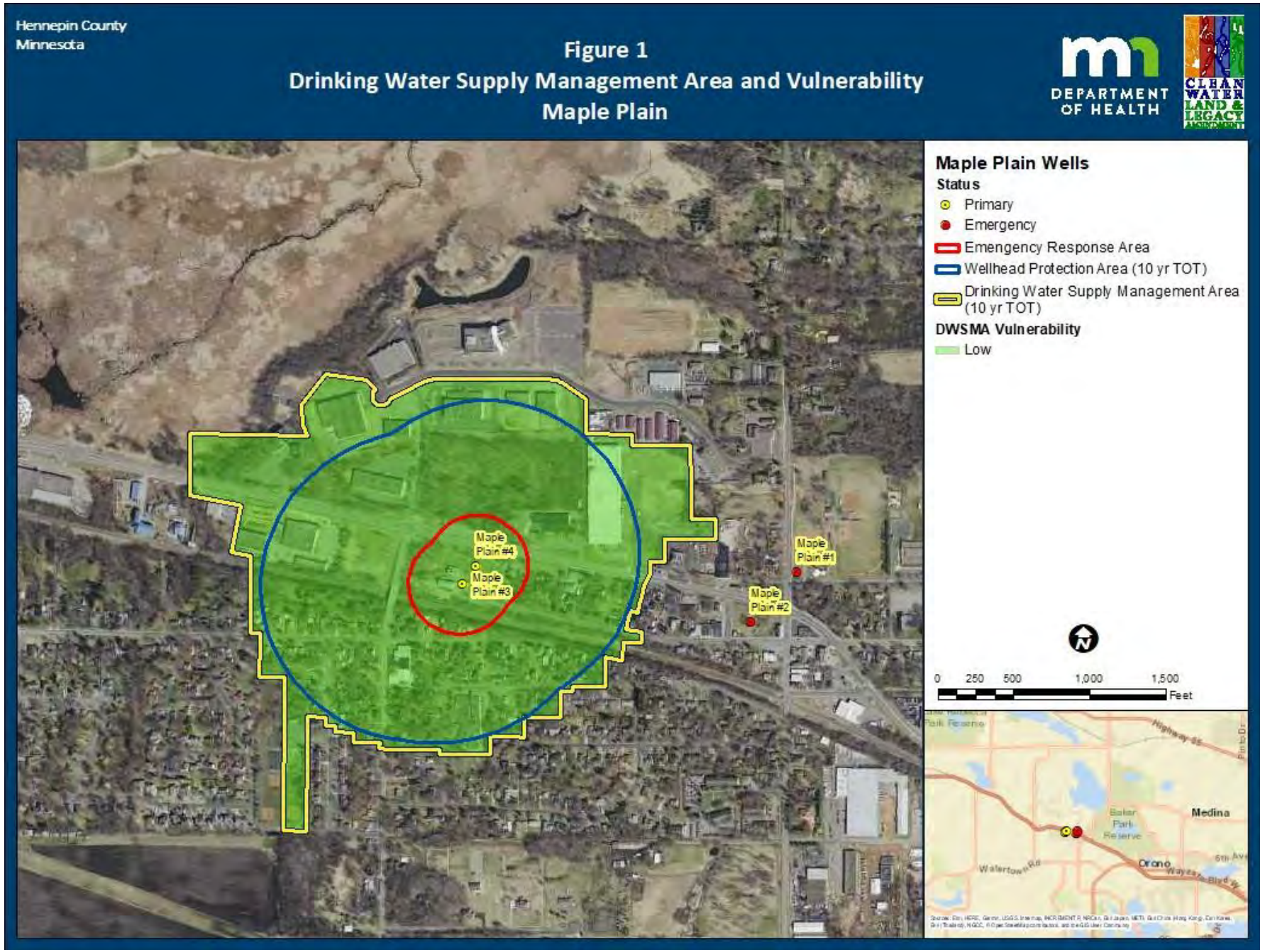
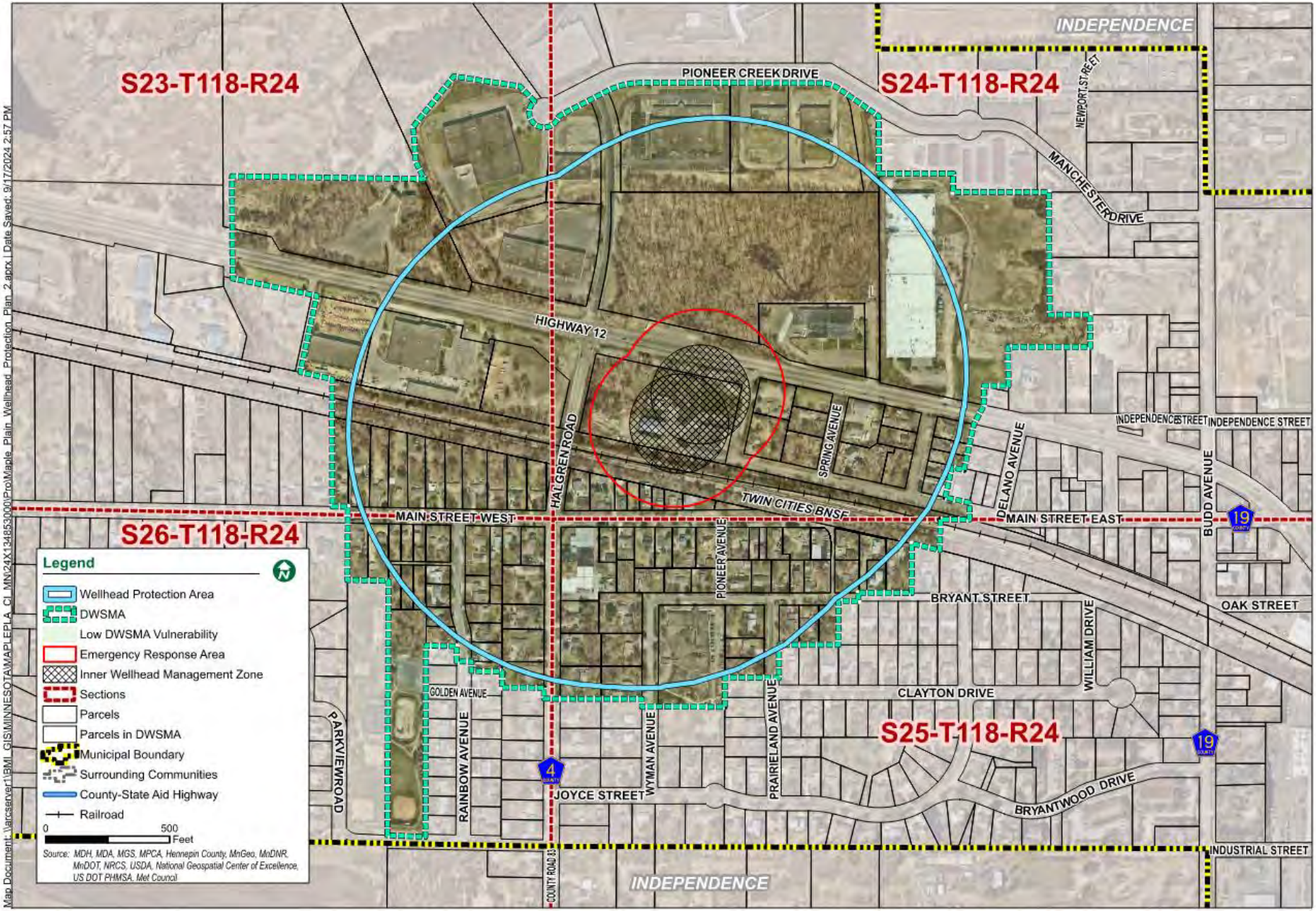


Figure 2: Section-Township-Range



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

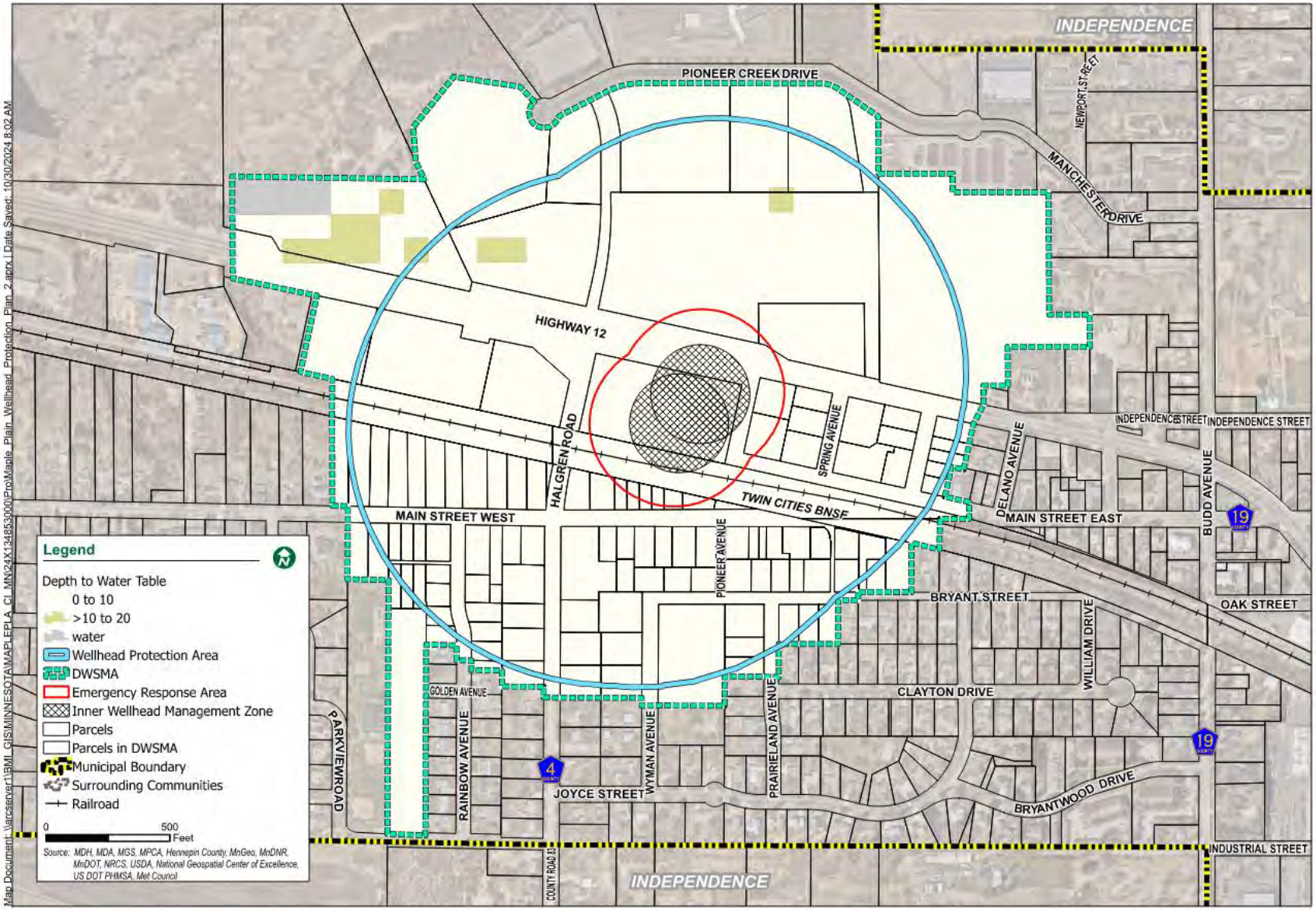


Figure 3B: Geologic Conditions – Soil Erosion

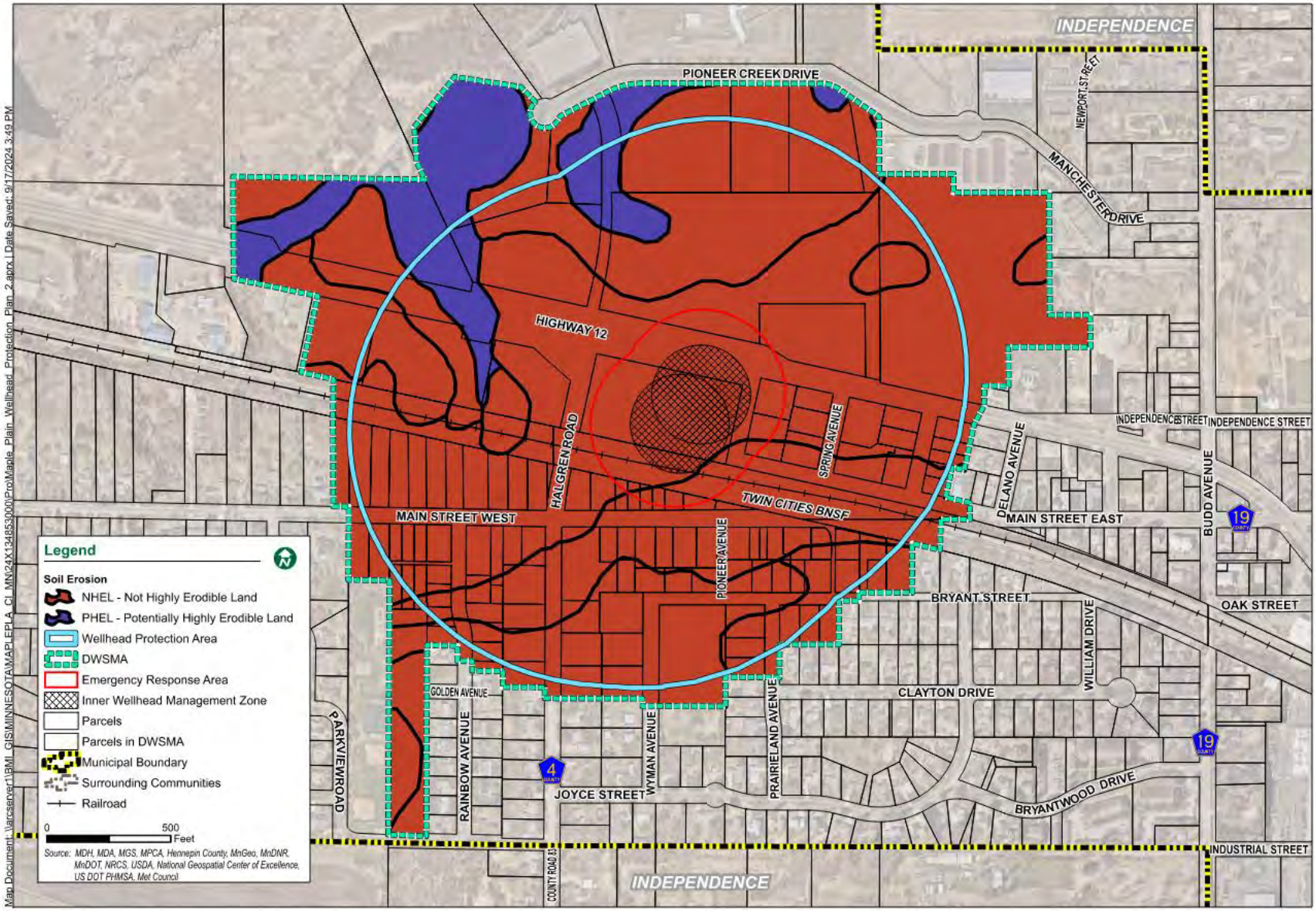


Figure 3C: Geologic Conditions – Soil Infiltration

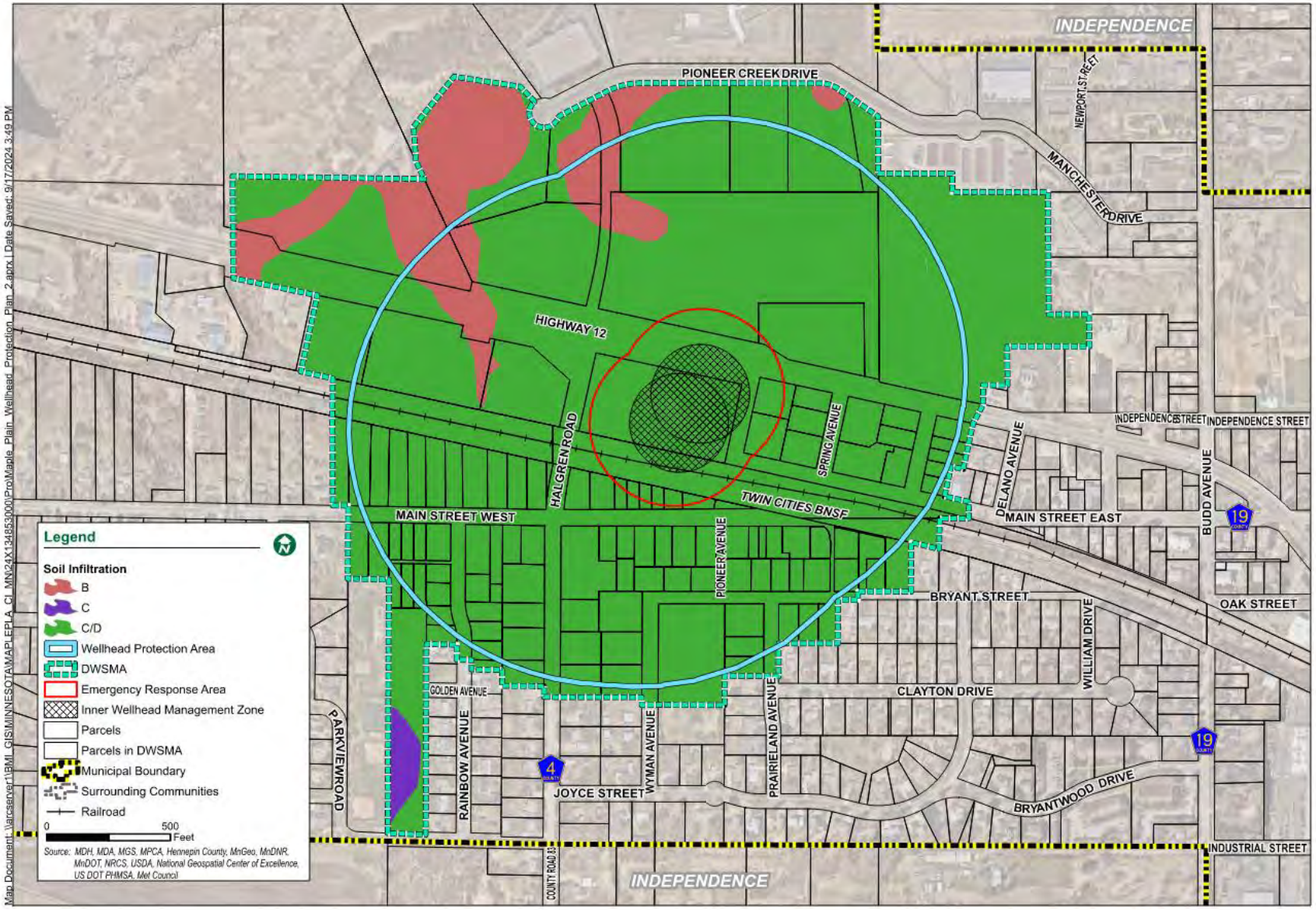
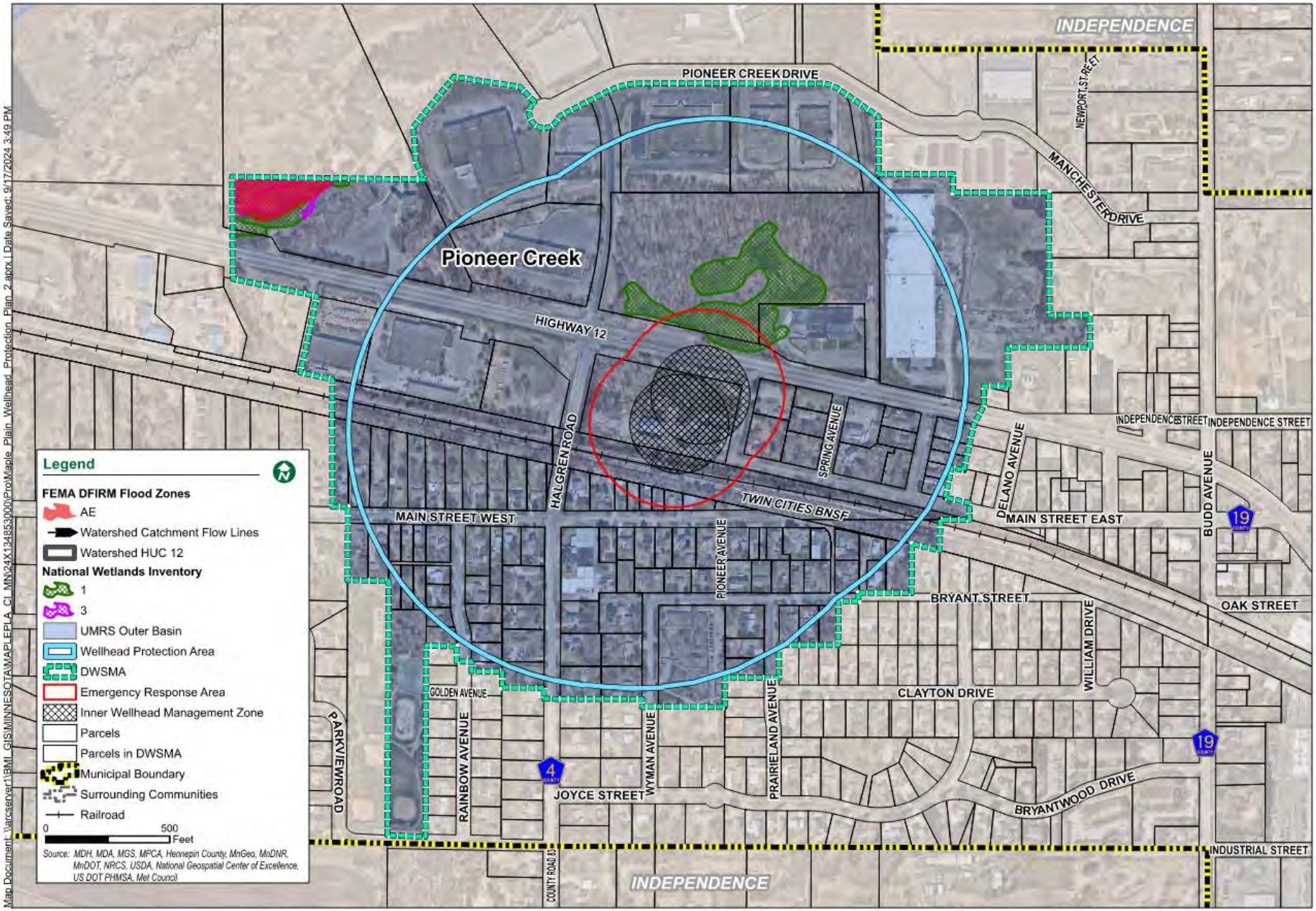


Figure 4: Water Resources



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%**

Wellhead Protection Plan
City of Maple Plain

Figure 5: Land Cover

2023 USDA Land Cover
September 2024

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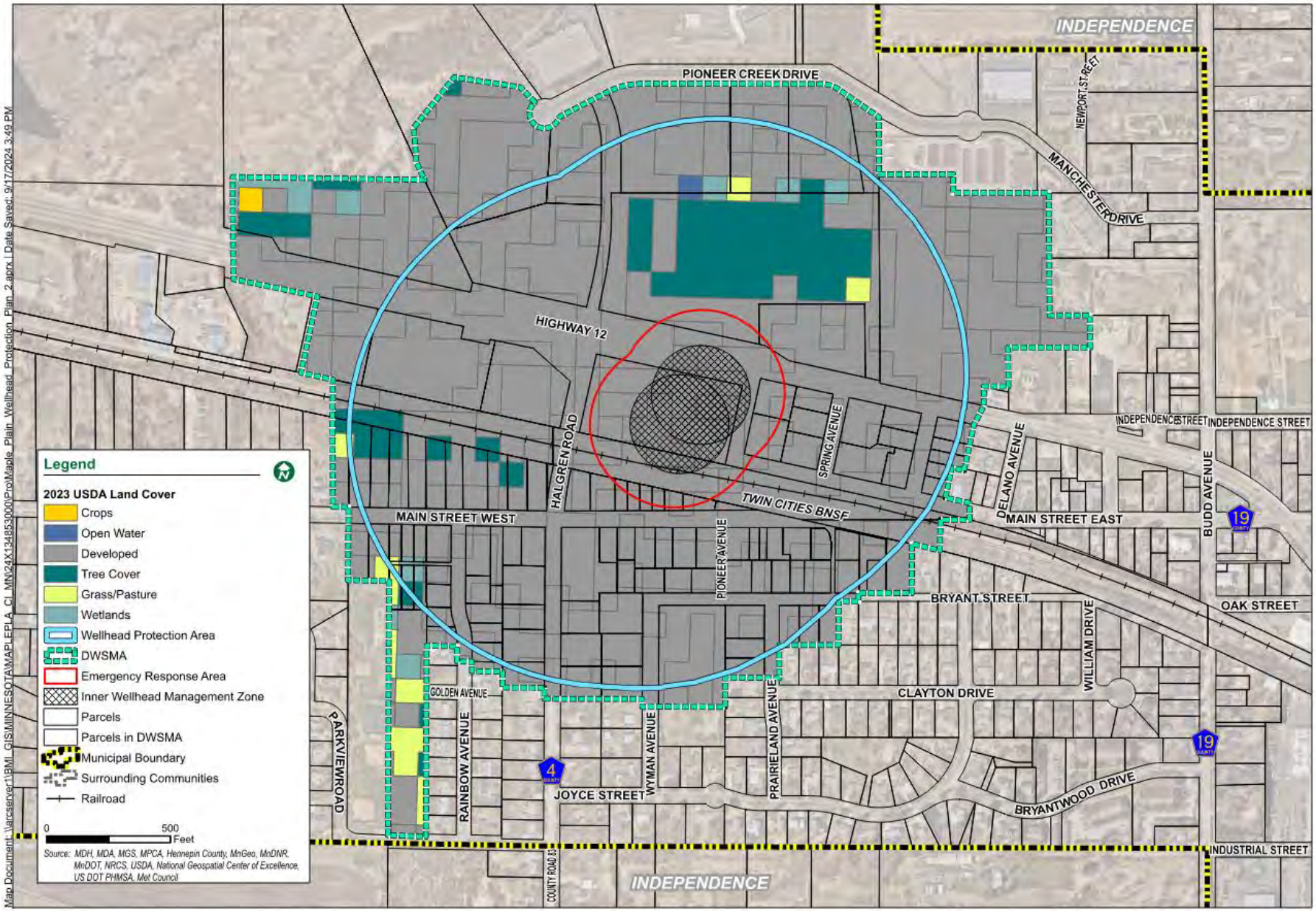


Figure 6: Zoning

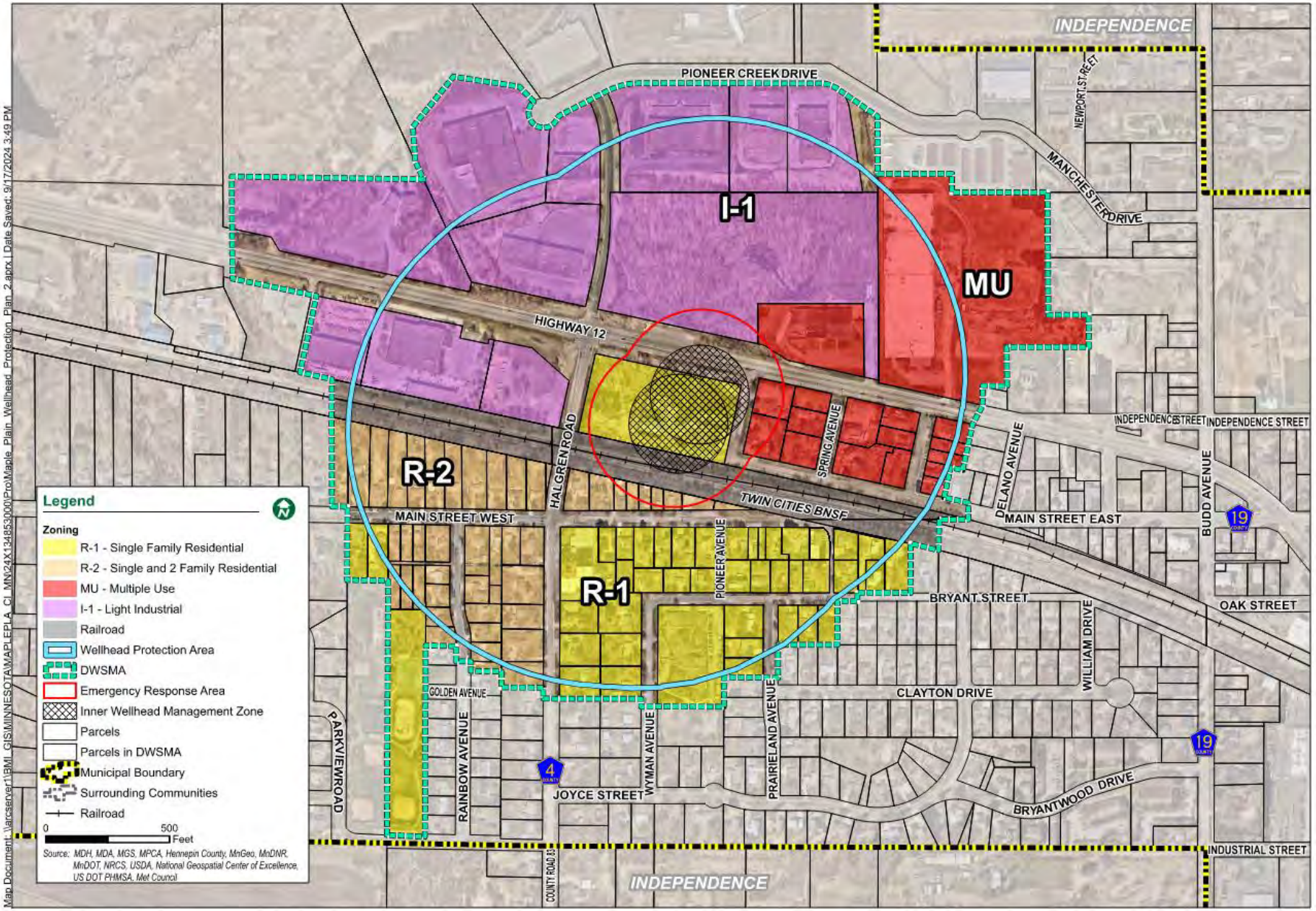
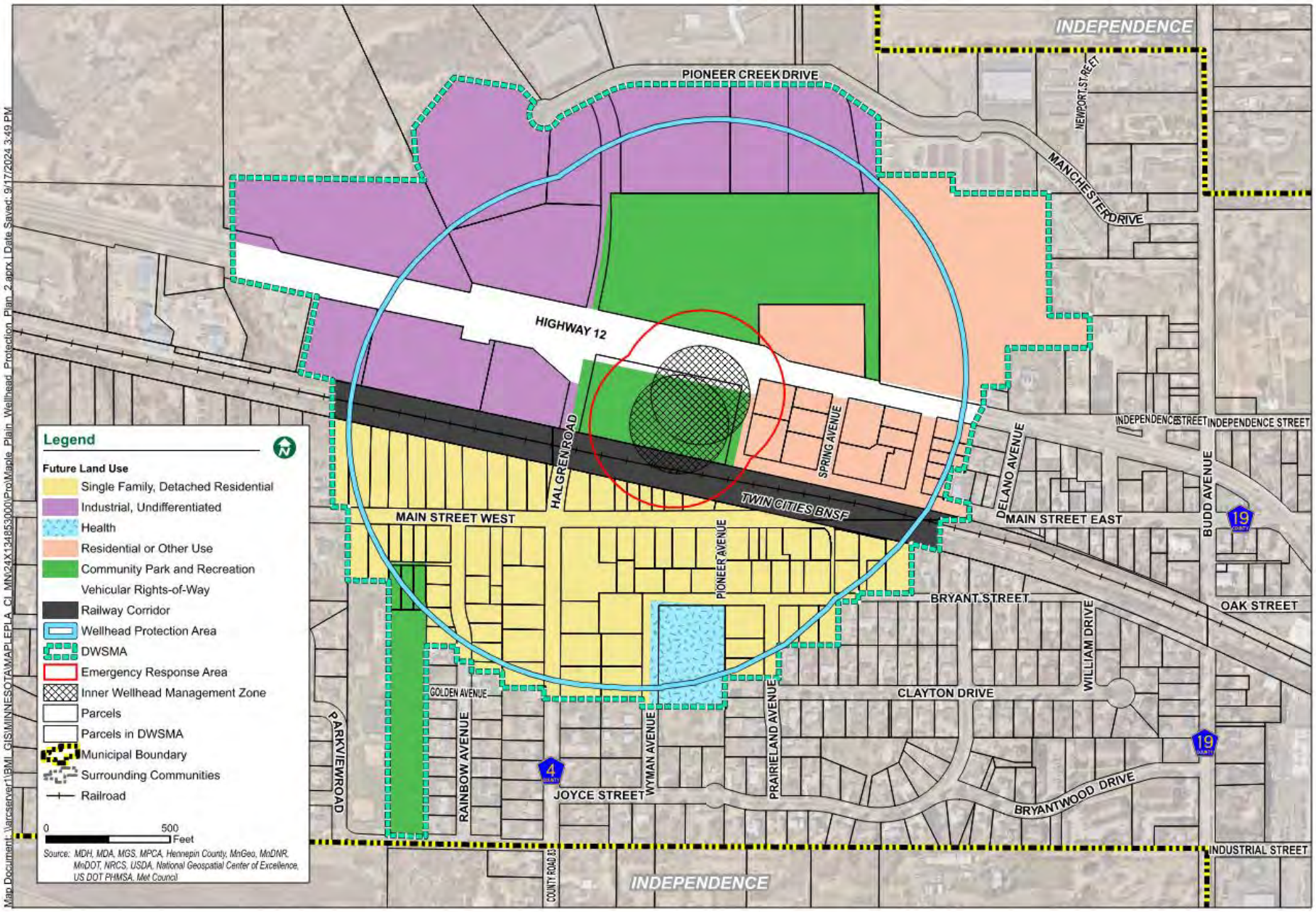


Figure 7: Future Land Use



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

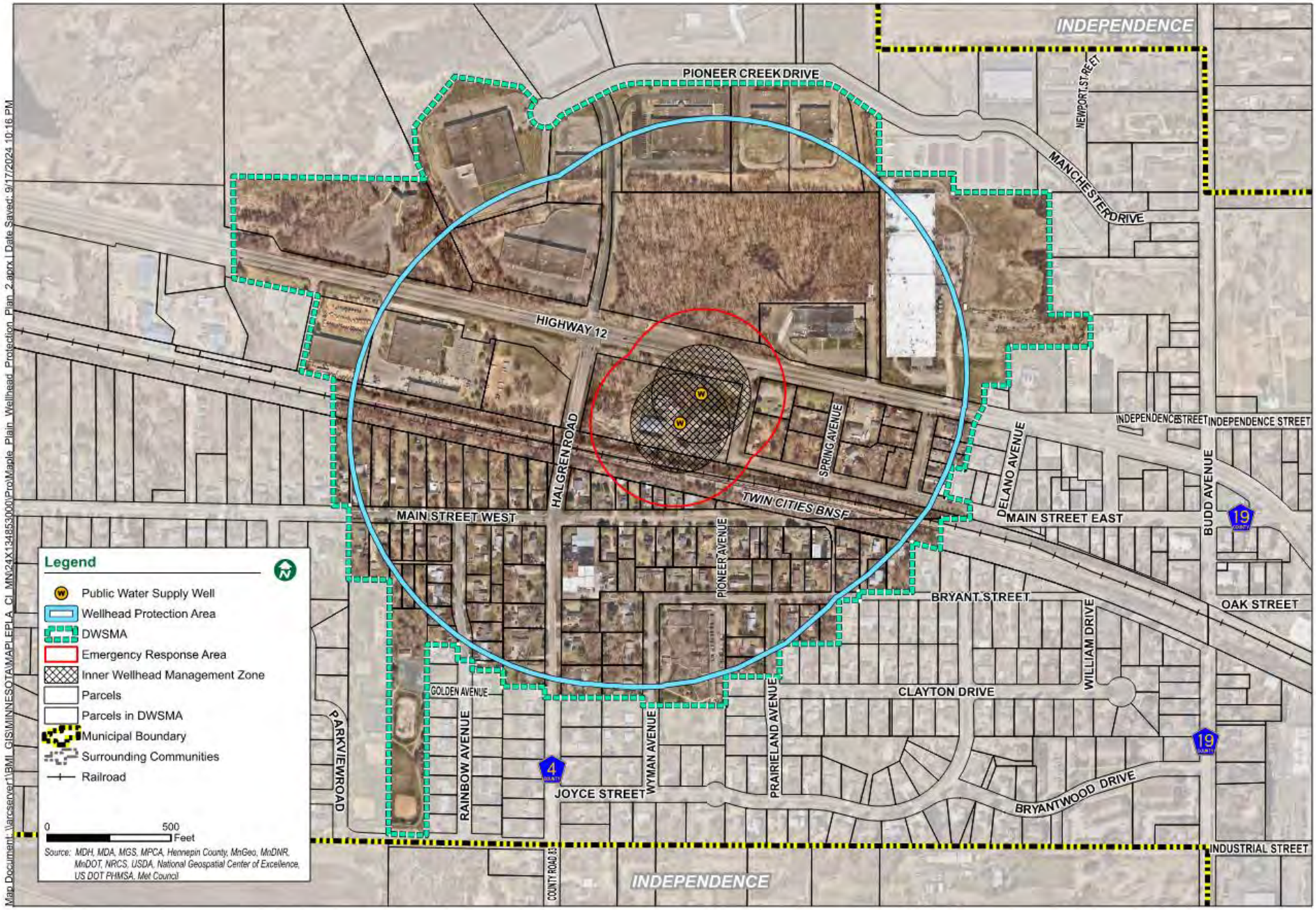
Strategies to address IWMZ potential contaminant sources include continuous monitoring within the IWMZ and an updated survey during the 10-year WHPP period. Should issues be identified during monitoring activities, the city will work to address these to continue protecting the public water supply. Current 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 <u>WHP Measure #C4</u> 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