CITY OF EDEN VALLEY

WELLHEAD PROTECTION PLAN AMENDMENT PART II

POTENTIAL CONTAMINANT SOURCE MANAGEMENT STRATEGY

AUGUST 2020
TO
AUGUST 2030

City of Eden Valley
Making a difference together.

DEPARTMENT OF HEALTH

BAYERL WATER RESOURCES

TABLE OF CONTENTS

PUBLIC WATER SUPPLY PROFILE

PUBLIC WATER SUPPLY	
NAME	City of Eden Valley
ADDRESS	PO Box 25
	Eden Valley, MN 55329
TELEPHONE NUMBER	320-453-5251
E-MAIL	cityofev@meltel.net

WELLHEAD PROTECTION MANAGER	
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	City of Eden Valley
ADDRESS	PO Box 25
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TELEPHONE NUMBER	320-453-5252
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	City of Watkins
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	Watkins, MN 55389
TELEPHONE NUMBER	320-764-6400
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CONSULTANT	
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	Bayerl Water Resources
ADDRESS	9083 State Hwy 114 SW
	Alexandria, MN 56308
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GENERAL INFORMATION		
UNIQUE WELL NUMBERS	#2 (211666), #3 (211662), #4 (649153)	
POPULATION SERVED:	Eden Valley: 1,042	Watkins: 962
CONNECTIONS:	Eden Valley: 438	Watkins: 381
COUNTY:	Meeker	

DOCUMENTATION LIST

STEP	DATE PERFORMED
Scoping Meeting 2 Held (4720.5340, subp. 1)	May 14, 2018
Scoping 2 Letter Received (4720.5340, subp. 2)	June 5, 2018
Remaining Portion of Plan Submitted to Local Units of Government (LGUs) (4720.5350)	March 24, 2020
Review Received From Local Units of Government (4720.5350, subp. 2)	May 26, 2020
Review Comments Considered (4720.5350, subp. 3)	May 27, 2020
Public Hearing Conducted (4720.5350, subp.4)	June 3, 2020
Remaining Portion WHP Plan Submitted (4720.5360, subp. 1)	
Final WHP Plan Review Received (4720.5360, subp. 4)	

Members of the Wellhead Protection Team

NAME	REPRESENTING
Cindy Anderson	Clerk/Treasurer, City of Eden Valley
Deb Kramer	Clerk/Treasurer, City of Watkins
Zach Blonigen	Public Works Director, City of Eden Valley
Steven Geislinger	Public Works Director, City of Watkins
Mark Berg	Water Operator, City of Eden Valley
Troy Huschle	City of Eden Valley Council Member – Water Commission
Jason Laumer	City of Watkins Council Member
Vic Geislinger	Forest Prairie Township Board
Wayne Cymbaluk	Water Resources Specialist, Stearns County SWCD
Karen Voz	Planner – MDH Drinking Water Protection
Marilyn Bayerl	Bayerl Water Resources

Abbreviations

BMP Best Management Practices
BWSR Board of Water and Soil Resources
CRP Conservation Reserve Program
DNR MN Department of Natural Resources
DWSMA Drinking Water Supply Management Area
EPA Environmental Protection Agency
GIS Geographic Information Systems
HEL Highly Erodible Land
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
Mg/Y Million Gallons per year
MN Minnesota
MNDOT MN Department of Transportation
MPCA MN Pollution Control Agency
MRWA MN Rural Water Association
NHEL Non Highly Erodible Land
NRCS Natural Resources Conservation Services
NWI National Wetlands Inventory
OBWEL Observation Well
OHW Ordinary High Water Level
PCSI Potential Contaminant Source Inventory
PHEL Partially Highly Erodible Land
PWS Public Water Supply
RST Registered Storage Tank
SSTS Sub-surface Sewage Treatment Systems
SWCD Soil & 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 Plan

EXECUTIVE SUMMARY

Part Two of the City of Eden Valley's Wellhead Protection Plan Amendment speaks to sections 4720.5220 through 4720.5290 of MN Rules. This portion of the plan is based on the requirements outlined in the scoping document found in ***Appendix II*** of this plan. It addresses:

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

In Part One of the Plan, the delineation of the Wellhead Protection Area (WHPA), the Drinking Water Supply Management Area (DWSMA), vulnerability of the wells, and vulnerability status of the aquifer in which the city's wells are located were completed and approved by the Minnesota Department of Health (MDH). This important information was utilized in the completion of this document.

The vulnerability of the aquifer that underlies the city's well fields was assessed based on geologic logs from wells in the area, surficial geologic and soils maps, and chemical and isotope data. Stable isotopes were measured quarterly for one year on all three city wells and the public ditch located near them, indicating likely influence from surface water resources. These results, along with the detection of tritium and elevated chloride, is the reasoning for the change in the size and vulnerability of the DWSMA – and the addition of a surface water component. ***Figure One*** maps the areas of vulnerability for the city's wells. The DWSMA encompasses two types of areas – the WHPA with high vulnerability in both groundwater and surface water, and the additional area with a surface water contribution Area (SWCA). The DWSMA is comprised of 6,925 acres – 1,551 acres are considered high vulnerability in both groundwater and surface water and 5,374 acres surface water only. The Groundwater Capture Area (GWCA) WHPA is the highest priority for implementation. ***Figure Two*** depicts the surface water contribution area, which encompasses the entire DWSMA, and ***Figure Three*** compares the previous DWSMA with the current DWSMA. There is a significant increase in the area and vulnerability has changed from low to high. The City will prioritize implementation in the Priority A area, which is the groundwater capture area. This area is shown in ***Figures One*** and ***Four.*** Strategies for this area will be highest priority. This plan will differentiate between the two areas based on required potential contaminant considerations required for each.

Further monitoring over the next ten years will help to gain a better understanding of the aquifer and the layers between it and the land above. Management Strategies in Chapter Five focus on actions the city, along with the wellhead team, can focus on for the next ten years. These strategies focus on the following areas of concern: Inner Wellhead Management Zone, One-year Time of Travel, Transportation Corridors, Surface Water Discharges, Feedlots, SSTS, Chemical / Nutrient Use, Wells and Class V Wells.

The Wellhead Protection Team intends to work with Meeker County, Meeker SWCD, the Cities of Eden Valley and Watkins, Sauk River Watershed District, Manannah and Forest Prairie Townships, and state and local agencies to mitigate land use within the DWSMA to the extent available. It is the hope of the Wellhead Protection Team that through increased public awareness, habits will be established that will decrease the potential for future water problems and the community can continue to enjoy the current quality of water it has come to expect.

Eden Valley
Meeker County
Minnesota

Eden Valley Drinking Water Supply Management Area (DWSMA) MN-01181 - High Vulnerability

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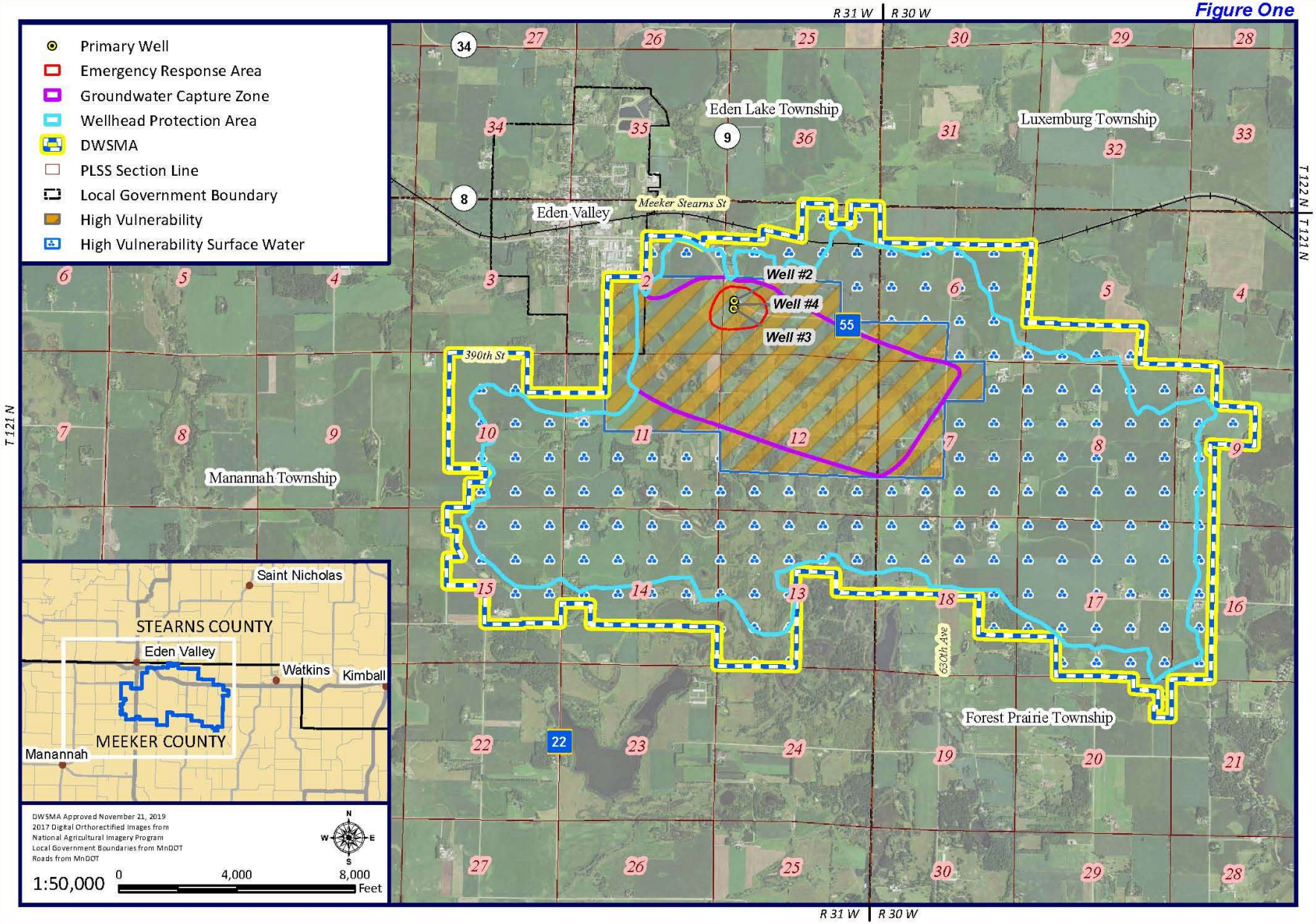
Figure One



Eden Valley
Meeker County
Minnesota

Eden Valley Drinking Water Supply Management Area (DWSMA) MN-01181 - Vulnerable

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Figure Two

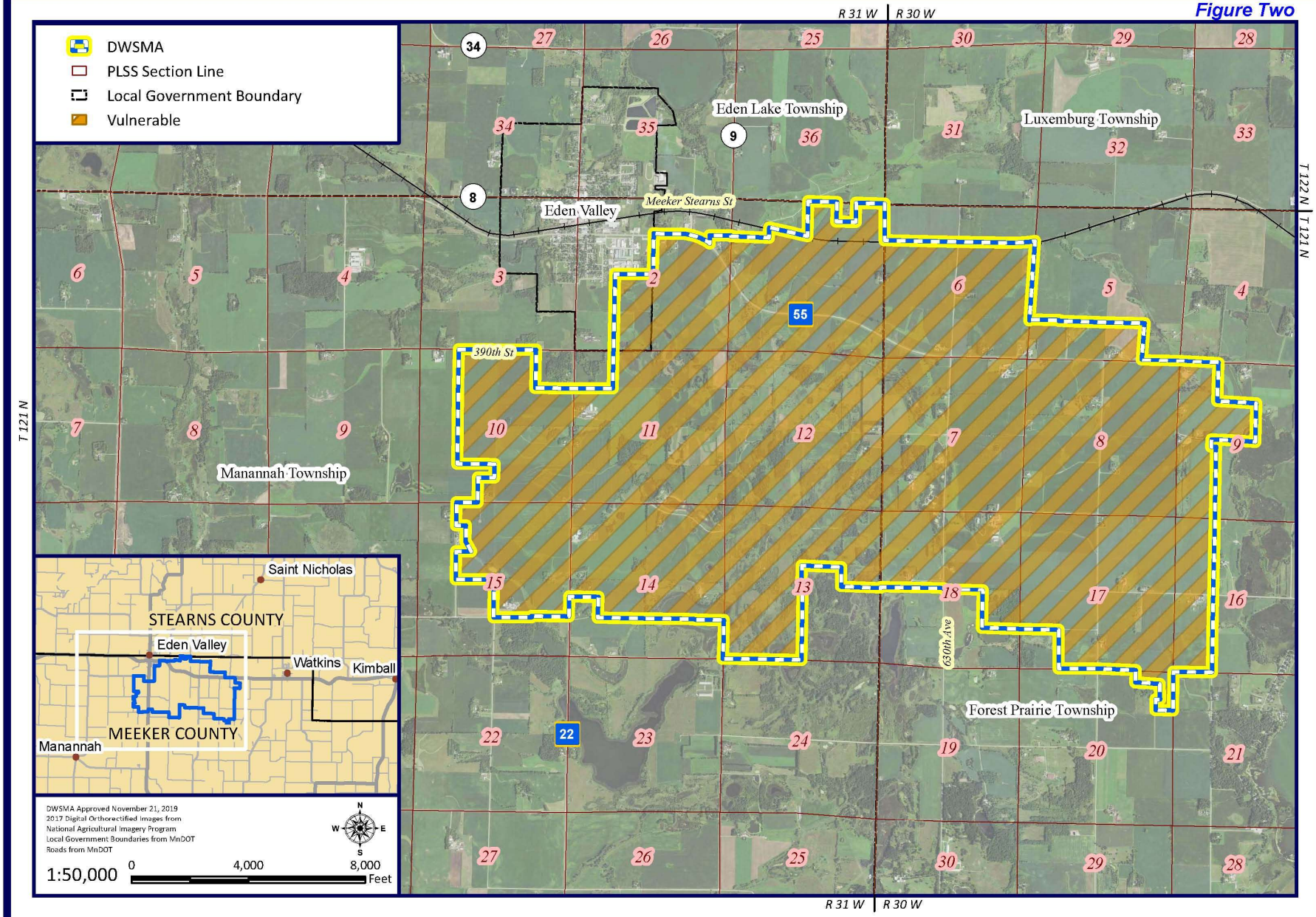

Figure Three

EDEN VALLEY - DWSMA

Current & Historical Drinking Water Supply Management Area

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0 900 1,800 3,600 Feet

Data sources accessed August, 2019
Map produced by Rick Moore, Moore GIS

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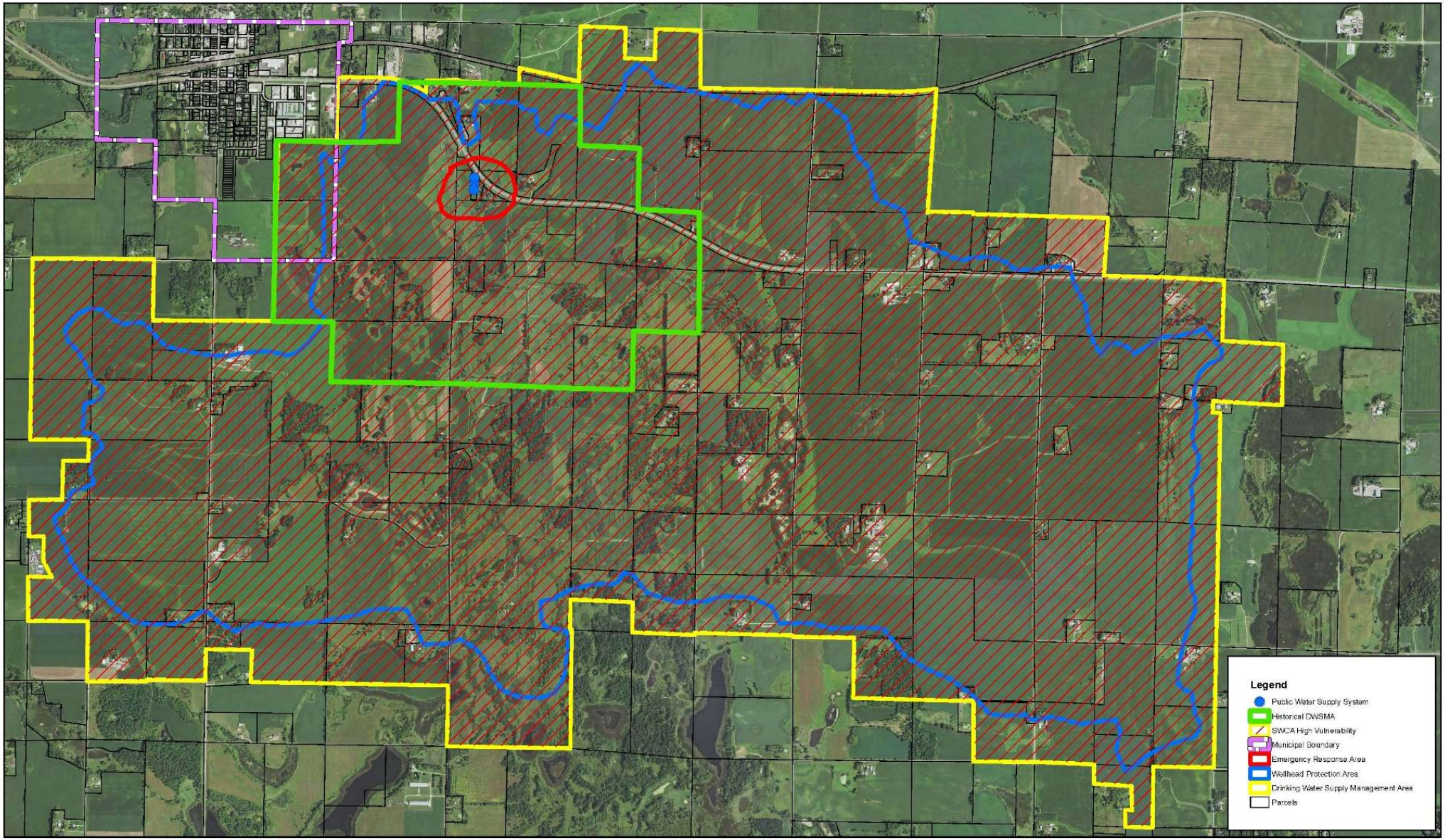

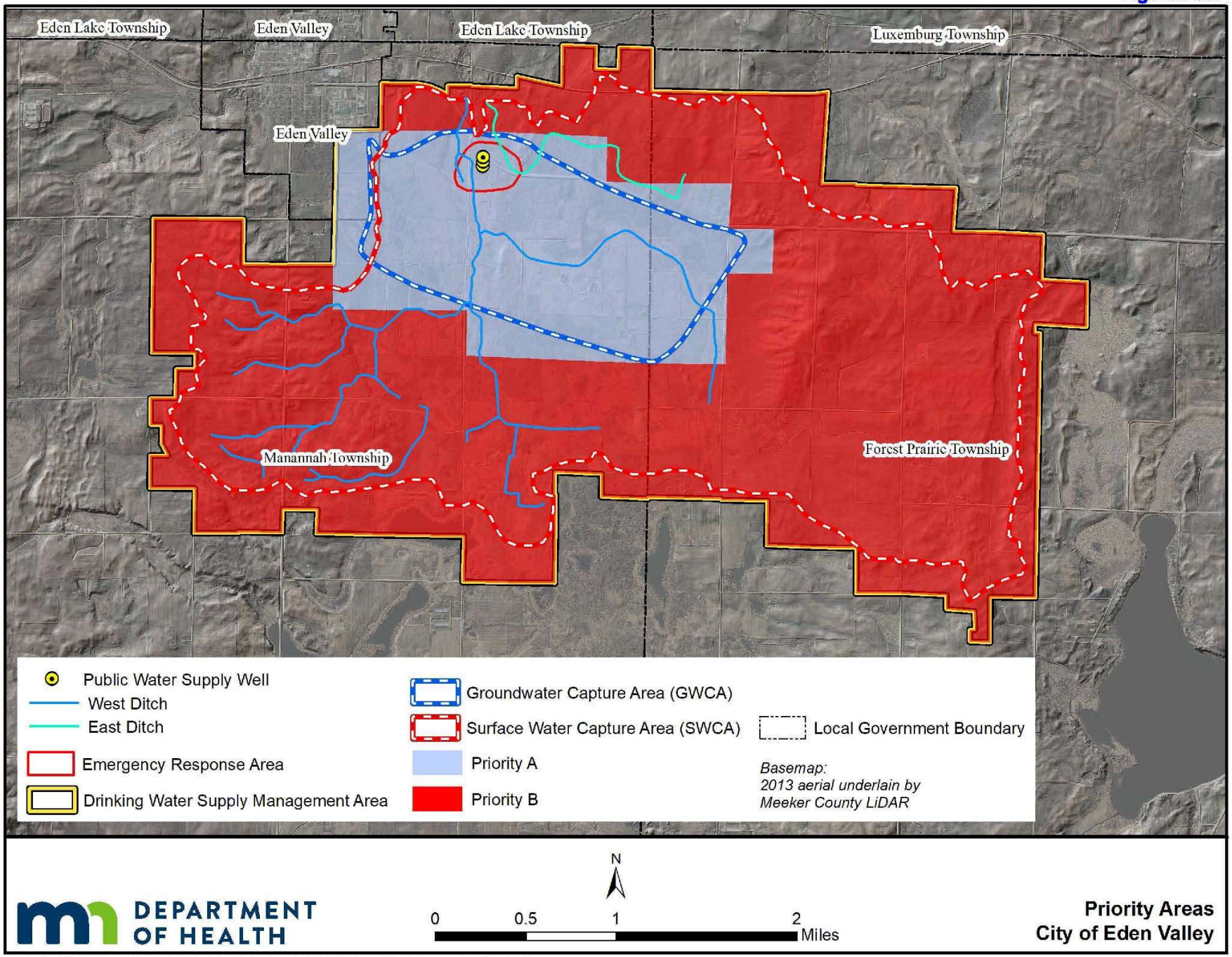
Eden Lake Township
Eden Valley
Eden Lake Township
Luxemburg Township
Eden Valley
Manannah Township
Forest Prairie Township
Public Water Supply Well
West Ditch
East Ditch
Emergency Response Area
Drinking Water Supply Management Area
Groundwater Capture Area (GWCA)
Surface Water Capture Area (SWCA)
Priority A
Priority B
Local Government Boundary
Basemap:
2013 aerial underlain by
Meeker County LiDAR
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DEPARTMENT OF HEALTH
Priority Areas
City of Eden Valley
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CHAPTER ONE

DATA ELEMENTS/ASSESSMENT

Minnesota Rules 4720.5200

I. REQUIRED DATA ELEMENTS

A. PHYSICAL ENVIRONMENT DATA ELEMENTS

1. Precipitation

Average annual precipitation during the past five years at a Sauk River Watershed District (SRWD) home located in Forest Prairie Township in section 6 and along hwy 55, showed an average of 29.2 inches, with variation between 25.7 and 33.3 inches, as shown in ***Table 1***. The city will work to procure the equipment to supply the rainfall data for the next plan amendment. Data was obtained from the National Weather Service on the Minnesota Climatology website at *http://climate.umn.edu/hidenannual/*.

Rain falling on the ground can filter through the layers of sediment and enter the aquifer containing the city's vulnerable wells. The city wells are vulnerable to contamination through surface and groundwater infiltration and the rest of the DWSMA is vulnerable to runoff on the land into the ditch system due to the connectivity of the city wells to the water in the public ditch. It is important to address areas where rainfall could cause infiltration of contaminants.

Precipitation Data for SRWD-Forest Prairie Township ***Table 1***

Based on DNR Climatology Data

Measured in inches

	2014	2015	2016	2017	2018
				County	Average
January	.62	.15	.19	.66	.05
February	.67	.27	.67	.57	.88
March	.45	.35	1.85	.45	1.05
April	2.88	.59	1.10	2.98	1.00
May	3.66	5.03	2.56	3.55	1.97
June	7.72	4.81	4.19	2.53	4.79
July	1.80	7.27	7.29	1.15	4.56
August	3.69	6.21	5.53	5.80	5.93
September	2.16	1.58	5.61	3.70	2.16
October	.47	1.79	1.74	5.92	3.16
November	.77	2.92	1.39	.82	.76
December	.81	.78	1.21	.21	.76
Total	**25.70**	**31.75**	**33.33**	**28.34**	**27.07**

2. Geology

A geologic atlas of Meeker County has been completed. Geologic information such as 1) bedrock geology, 2) surficial geology, 3) quaternary stratigraphy, 4) sand distribution model and Precambrian bedrock geology, and 5) bedrock topography and

depth to bedrock was completed in 2015. The Hydrogeology and sensitivity to groundwater pollution was finished in 2019. This will help identify areas of concern.

Geologic data elements pertinent to the Wellhead Protection Area (WHPA) delineation and vulnerability status are included in Part One of this Wellhead Protection Plan (WHPP) and were utilized in the delineation. Part One can be found in ***Appendix I*** and is on file with the Minnesota Department of Health (MDH) and the City of Eden Valley.

Overall, the geology of the Quaternary Artesian Aquifer, the aquifer the city wells are contained in, is in confined sands and gravels with till layers. Due to this information and isotope information, the DWSMA has high vulnerability and a surface water component.

3. Soils

A map of the soils, ***Figure Five*** shows the major soil types and erodibility of soils located within the DWSMA. None of the land located within the highly vulnerable WHPA is considered erodible, meaning the soils do not tend to run off the land during storm events, therefore erosion and sedimentation have been determined not to have impact in the high vulnerability area surrounding the city wells. Within the Surface Water Capture Area (SWCA), are areas on the edges of the DWSMA that have steeper slopes and thus are considered Highly Erodible Land (HEL). This area will be considered in the implementation of this Plan.

Figure Six shows Hydric Soil Groups, which designates a soil as permanently or seasonally saturated by water. Permeability of soils, as shown in ***Table 2***, describes how fast water on the surface of the land travels through the soils to the aquifer below. Hydrologic Soil Group (HSG*) "A" infiltrates greater than .30 inches per hour – this soil constitutes most of the land surrounding the city wells. When the HSG denotes more than one letter, the first letter is the drained (usually current) condition and the second letter denotes the original drainage rate. Land use is important to the protection of the aquifer in the High Vulnerability areas. Strategies to address land use will be discussed in Chapter Five.

Soil Permeability within the Eden Valley DWSMA — ***Table 2***

Map Unit Name	Erodibility	HSG*	Acres
Koronis-Sunburg-Hawick Complex, 18 to 40 percent slopes	HEL	A	2.5
Koronis-Sunburg Complex, 12 to 18 percent slopes, Moderately Eroded	HEL	A	31.0
Chelsea-Loamy Fine Sand, 1 to 6 percent slopes	NHEL	A	7.0
Gardencity Very Fine Sandy Loam, 2 to 6 percent slopes	NHEL	A	10.6
Dickman Sandy Loam, 0 to 2 percent slopes	NHEL	A	87.0
Estherville Sandy Loam, 0 to 2 percent slopes	NHEL	A	11.6
Estherville- Hawick Complex, 2 to 6 percent slopes	NHEL	A	4.9
Sparta Loamy Fine Sand, 1 to 6 percent slopes	NHEL	A	62.2
Koronis-Sunburg-Hawick Complex, 2 to 6 percent slopes	NHEL	A	21.3
Litchfield Loamy Fine Sand, 0 to 2 percent slopes	NHEL	A	315.2
Granby Fine Sandy Loam, 0 to 1 percent slopes	NHEL	A/D	77.8
Dassel Mucky Fine Sandy Loam, DEP., 0 to 1 percent slopes	NHEL	A/D	67.6
Fieldon-Dassel, Depressional Complex, 0 to percent slopes	NHEL	A/D	1201.1
Cohoctah Loam, 0 TO 2 percent slopes, Freq. Flooded	NHEL	A/D	14.7

Soil Permeability within the Eden Valley DWSMA			*Table 2 (cont.)*
Map Unit Name	**Erodibility**	**HSG***	**Acres**
Medo, Dassel, and Biscay Soils, Ponded, 0 to 1 percent slopes	NHEL	A/D	496.0
Swedegrove-Lundlake Complex, 0 to 2 percent slopes	NHEL	A/D	310.5
Swedegrove Loam, 0 to 2 percent slopes	NHEL	A/D	136.6
Uniongrove Loam, 0 to 2 percent slopes	NHEL	A/D	285.7
Crowriver Loam, 0 to 2 percent slopes	NHEL	A/D	21.5
Crowriver-Lundlake Complex, 0 to 2 percent slopes	NHEL	A/D	1.5
Houghton Muck, Lundlake Catena, 0 to 1 percent slopes	NHEL	A/D	58.4
Litchfield Sandy Loam, 0 to 2 percent slopes	NHEL	B	122.4
Gardencity Fine Sandy Loam, MOD. WET, 0 to 2 percent slopes	NHEL	B	70.8
Koronis Loam, 2 TO 6 percent slopes	NHEL	B	1151.7
Wadenvill-Sunburg Complex, 2 to 6 percent slopes	NHEL	B	26.9
Wadenvill Loam, 2 to 6 percent slopes	NHEL	B	127.8
Grovecity Loam, 1 to 3 percent slopes	NHEL	B	31.5
Kanaranzi Loam, 0 to 3 percent slopes	NHEL	B	37.6
Cylinder Loam, 0 to 2 percent slopes	NHEL	B/D	3.7
Darfur Loam, 0 to 2 percent slopes	NHEL	B/D	126.8
Mayer-Biscay, Depressional Compled, 0 to 2 percent slopes	NHEL	B/D	71.0
Caseylake Loam, 0 to 2 percent slopes	NHEL	B/D	37.7
Barry Loam, 0 to 2 percent slopes	NHEL	B/D	288.9
Lundlake Silty Clay Loam, 0 to 1 percent slopes	NHEL	B/D	75.9
Forestcity, Overwash-Forestcity Complex, 1 to 4 percent slopes	NHEL	B/D	259.2
Muskego, Blue Earth & Houghton Soils, Lundlake Catena, 0 to 1 percent slopes, Ponded	NHEL	B/D	16.9
Klossner Muck, Lundlake Catena, 0 to 1 percent slopes	NHEL	B/D	21.7
Klossner Soils, Lundlake Catena, 0 to 1 percent slopes	NHEL	B/D	25.2
Klossner and Lundlake Soils, 0 to 1 percent slopes, Ponded	NHEL	B/D	40.2
Marcellon Loam, 0 to 3 percent slopes	NHEL	B/D	556.9
Madelia Silty Clay Loam, 0 to 2 percent slopes	NHEL	C/D	5.2
Spicer Silty Clay Loam, 0 to 2 percent slopes	NHEL	C/D	28.3
Biscay Clay Loam, Depressional, 0 to 1 percent slopes	NHEL	C/D	25.7
Biscay Clay Loam 0 to 2 percent slopes	NHEL	C/D	31.2
Muskego, Blue Earth and Houghton Soils, Ponded	NHEL	C/D	155.8
Houghton and Muskego Soils, Lundlake Catena, 0 to 1 percent slopes	NHEL	C/D	21.1
Koronis-Sunburg-Hawick Complex, 6 to 12 percent slopes, Moderately Eroded	PHEL	A	7.1
Koronis loam, 6 to 10 percent slopes, moderately eroded	PHEL	B	284.9
Sunburg-Wadenill Complex, 6 to 12 percent slopes, Moderately Eroded	PHEL	B	9.3

*Hydrologic Soil Groups: A= greater than 0.30 in/hr, B= 0.15-0.30 in/hr, C= 0.05-0.15 in/hr, D= 0-0.05 in/hr

EDEN VALLEY - DWSMA

Soil - Erodibility

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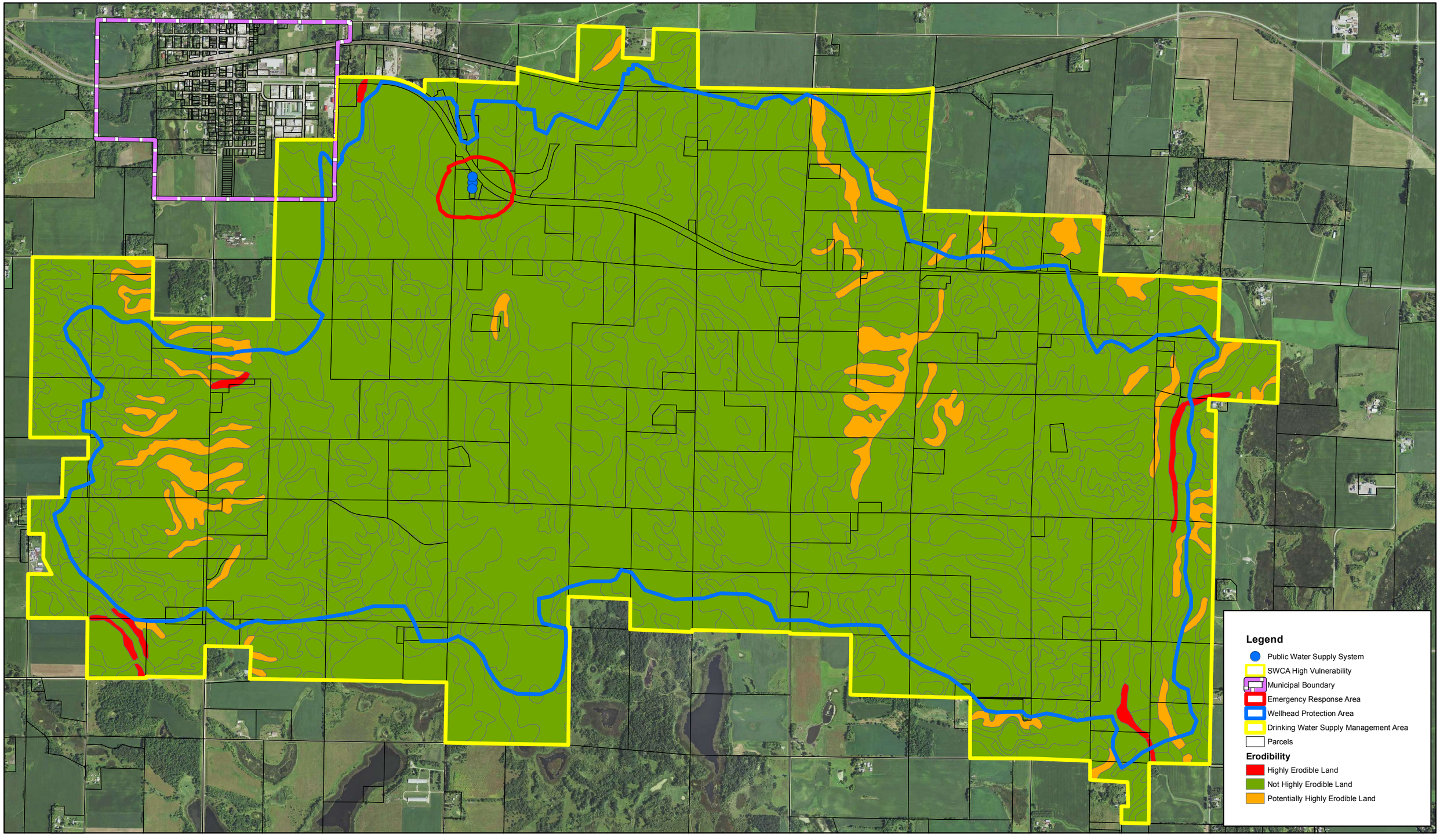
0 900 1,800 3,600 Feet

Data sources accessed August, 2019
Map produced by Rick Moore, Moore GIS

Figure Five

N W E S



EDEN VALLEY - DWSMA

Soil - Hydrologic Soil Group - Infiltration

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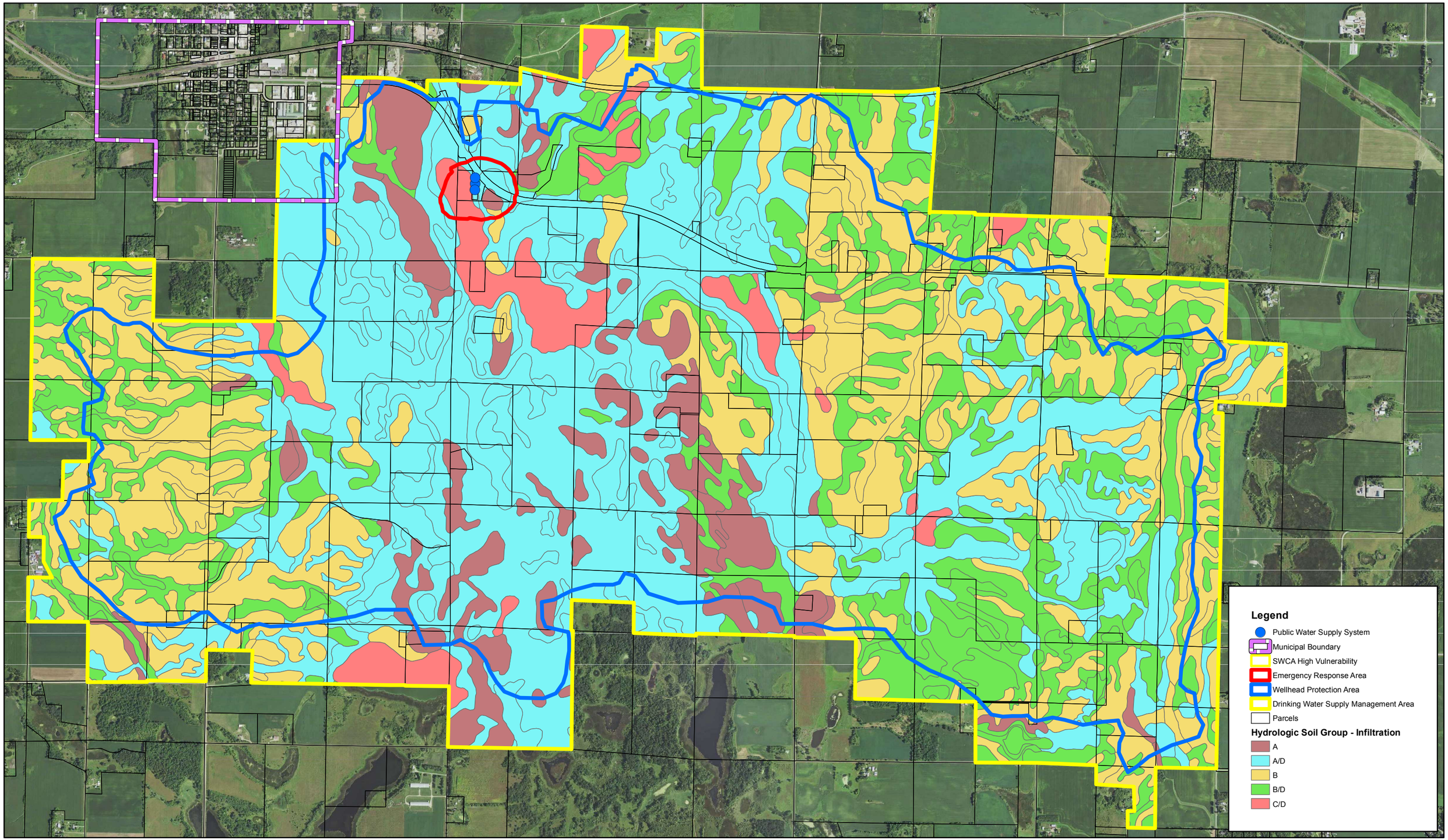
0 900 1,800 3,600 Feet

Data sources accessed August, 2019
Map produced by Rick Moore, Moore GIS

Figure Six

N W E S



4. Water Resources

The city DWSMA is located entirely within the Long Lake (HUC 070102020602) minor watershed, which drains into the Sauk River (HUC 07010202) watershed, and ultimately, into the Upper Mississippi River Basin. Water generally flows from the watershed area toward the public ditch system, as shown in ***Figure Seven***. It is then conveyed via the ditch northward to Vails Lake outside the DWSMA to the north. Numerous studies have been completed on the Sauk River Watershed and they are currently in the process of completing a One Watershed One Plan. Information is available on completed studies at the Minnesota Pollution Control Agency (MPCA) site: https://www.pca.state.mn.us/water/watersheds/sauk-river. The Sauk River Watershed District (SRWD) has information regarding current projects and is available at: http://www.srwdmn.org/index.html. No flood plain areas exist within the DWSMA, however in 1983 waters rose above the ditch system, flooding the wellfield area. The city will work to prevent this from impacting the public water supply wells.

Wetlands can provide a "nutrient sink" where the water flows into the wetland and is allowed to settle nutrients to the bottom while evaporation and movement through the soils takes some of the water out of the overland system. There are different types of wetlands, as designated by the National Wetlands Inventory and shown in ***Table 3*** and ***Figure Eight***. There are 835.7 acres of wetlands located in the DWSMA. A survey of restorable wetlands has been completed and there are 639 acres of restorable wetlands within the DWSMA (***Figure Eight***). There are fifty-six acres of restored wetlands shown in the figure, and ten acres of permanent easement riparian land restored. Funding is available to assist property owners in the restoration of these drained or otherwise removed wetlands.

The Wetland Types, as designated by the Cowardin system, was developed by the US Fish and Wildlife Service in 1979. It divides wetlands into types based on depth, vegetation, seasonal wetness and other factors. The main differences in them are depth of water and variety of vegetation.

	NWI Wetland Type *Table 3*	Acres	DWSMA %
1	Seasonally Flooded Basin or Flat	500.8	59.9
2	Wet Meadow	8.9	1.1
3	Shallow Marsh	141.1	16.9
4	Deep Marsh	14.2	1.7
5	Shallow Open Water	28.7	3.4
6	Shrub Swamp	137.0	16.4
7	Wooded Swamp	3.8	0.5
	Municipal and Industrial Activities	0.7	0.1
	Riverine	0.5	0.1
	TOTAL	**835.7**	**100.0**

Connectivity between the city wells and the surface water has been determined. Strategies to mitigate surface water issues and to improve our understanding of the surface-groundwater interaction will be considered in the implementation section of this plan.

EDEN VALLEY - DWSMA

Waters Layer

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0 900 1,800 3,600 Feet

Data sources accessed August, 2019
Map produced by Rick Moore, Moore GIS

Figure Seven

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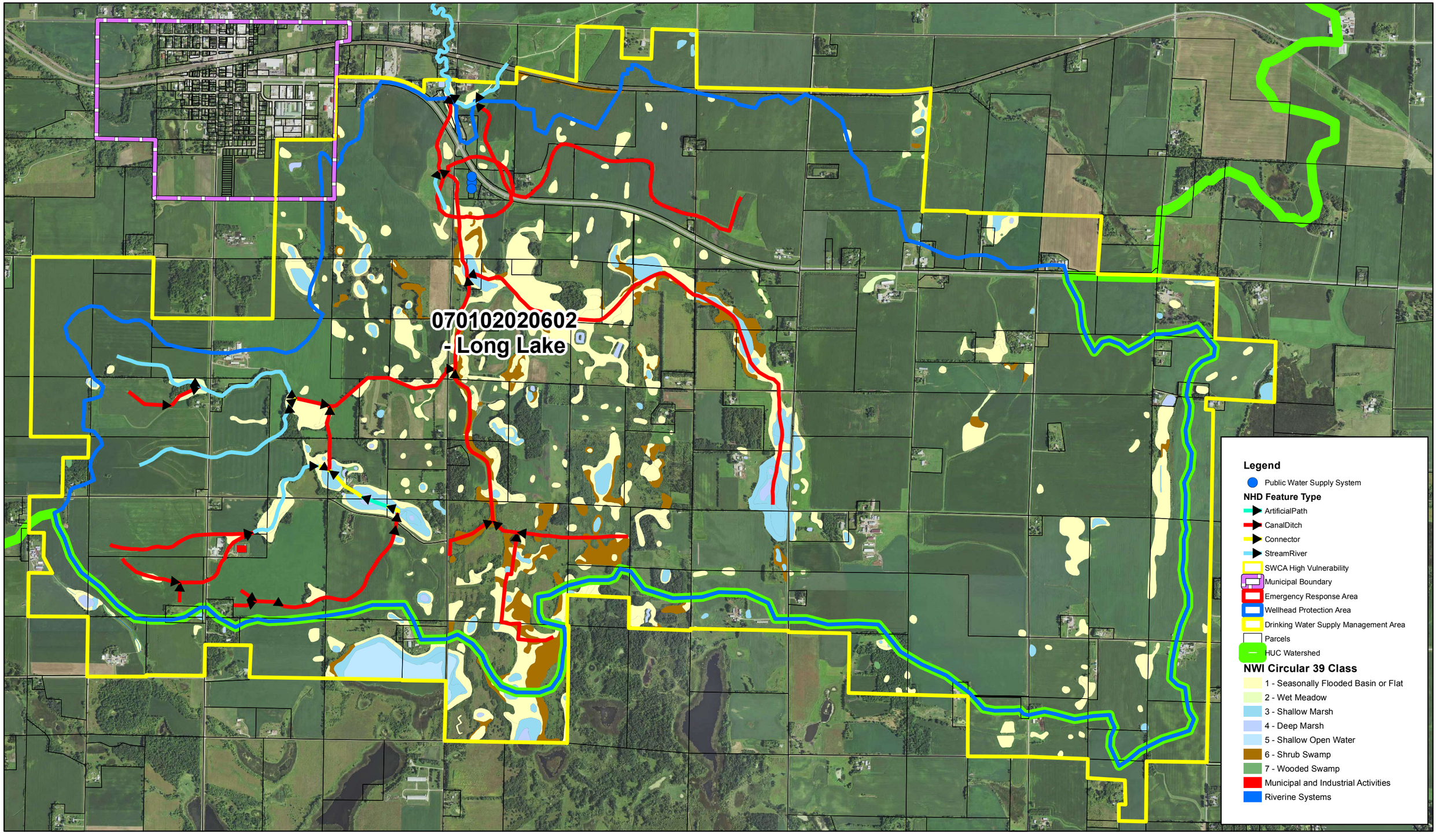

EDEN VALLEY - DWSMA

Wetlands - NWI and RWI

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0 900 1,800 3,600 Feet

Data sources accessed August, 2019
Map produced by Rick Moore, Moore GIS

Figure Eight

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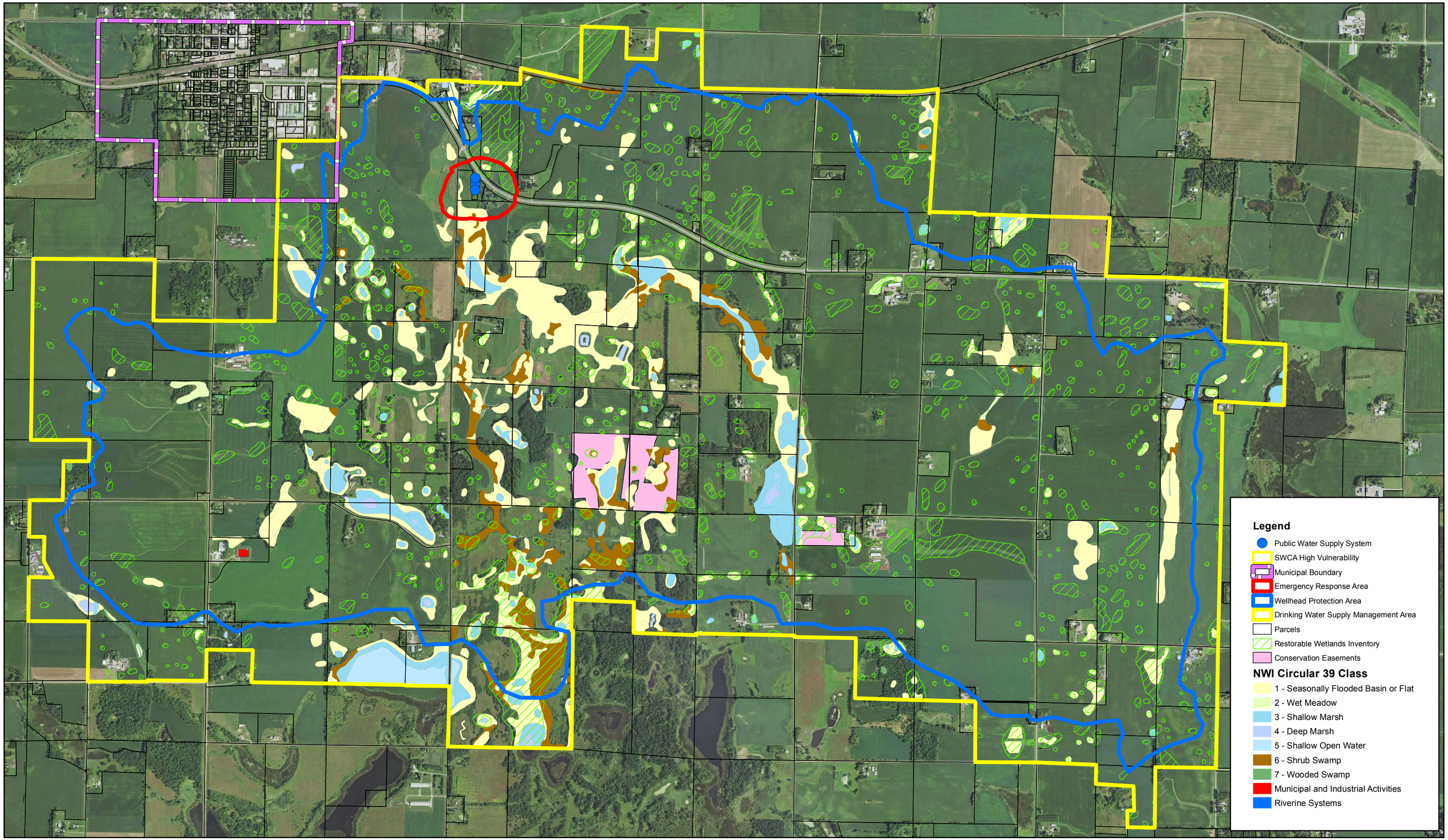

B. LAND USE DATA ELEMENTS

1. Land Use

The City of Eden Valley is located in Meeker County in central Minnesota. MN State Highway 55 traverses across the DWSMA from east to west in the northern third. This highway occupies the Inner Wellhead Management Zone (IWMZ), 200-feet, of city well #2 and is within the Emergency Response Area (ERA), or one-year time-of-travel of all city wells. The total area of the DWSMA (6,925 acres) encompasses a small parcel within the city limits of Eden Valley – 39 acres. The rest is located within Manannah (3,761 acres) and Forest Prairie (3,125 acres) townships. Based on the 2018 land use by the MN Department of Agriculture, land use within the DWSMA of the city is predominantly Cultivated crops and pasture – as shown in ***Table 4*** and ***Figure Nine.***

Table 4

2018 Land Use / Land Cover	Acres	% of Total
Developed	330.2	4.8
Cultivated Crops	4,828.1	70.1
Shrubland	6.3	0.1
Deciduous Forest/Evergreen Forest	323.0	4.7
Grassland / Pasture	708.5	10.3
Barren	5.2	0.1
Water	58.9	0.9
Wetlands	626.0	9.1
Total	**6886.2**	**100.0**

Land use can potentially impact the aquifer containing the City wells. Based on the Scoping 2 Document from MDH found in ***Appendix II***, land use activities will be considered in the DWSMA in the strategies outlined in Chapter Five. In the Surface Water Contribution Area (SWCA) activities that provide runoff into the public ditch will be considered.

2. Zoning

Official zoning within the DWSMA is shown in ***Figure Ten***. Jurisdictional authority varies by location. The land located within the DWSMA of the Eden Valley water supply wells is over ninety-nine percent within Meeker County and less than one percent within the city limits of Eden Valley. The majority of the DWSMA is zoned Ag Preservation (99.2-percent). The rest includes a 6-acre manufacturing facility within Manannah Township zoned Industrial, 31-acres within city limits zoned Industrial, 8-acres within city limits zoned Single Family Residential, 2-acres along highway 55 zoned Commercial and 14-acres along the highway zoned Rural Residential.

Management practices regarding industrial waste products for manufacturing will be investigated and recommendations proposed to the property owner, if needed. Within the city limits of Eden Valley, the industrial area is not currently developed. The city will consider surface water runoff potential when proposals are presented for development in the DWSMA.

EDEN VALLEY - DWSMA

Land Cover

DEPARTMENT OF HEALTH

0 950 1,900 3,800 Feet

Data sources accessed August, 2019
Map produced by Rick Moore, Moore GIS

Figure Nine

N W E S

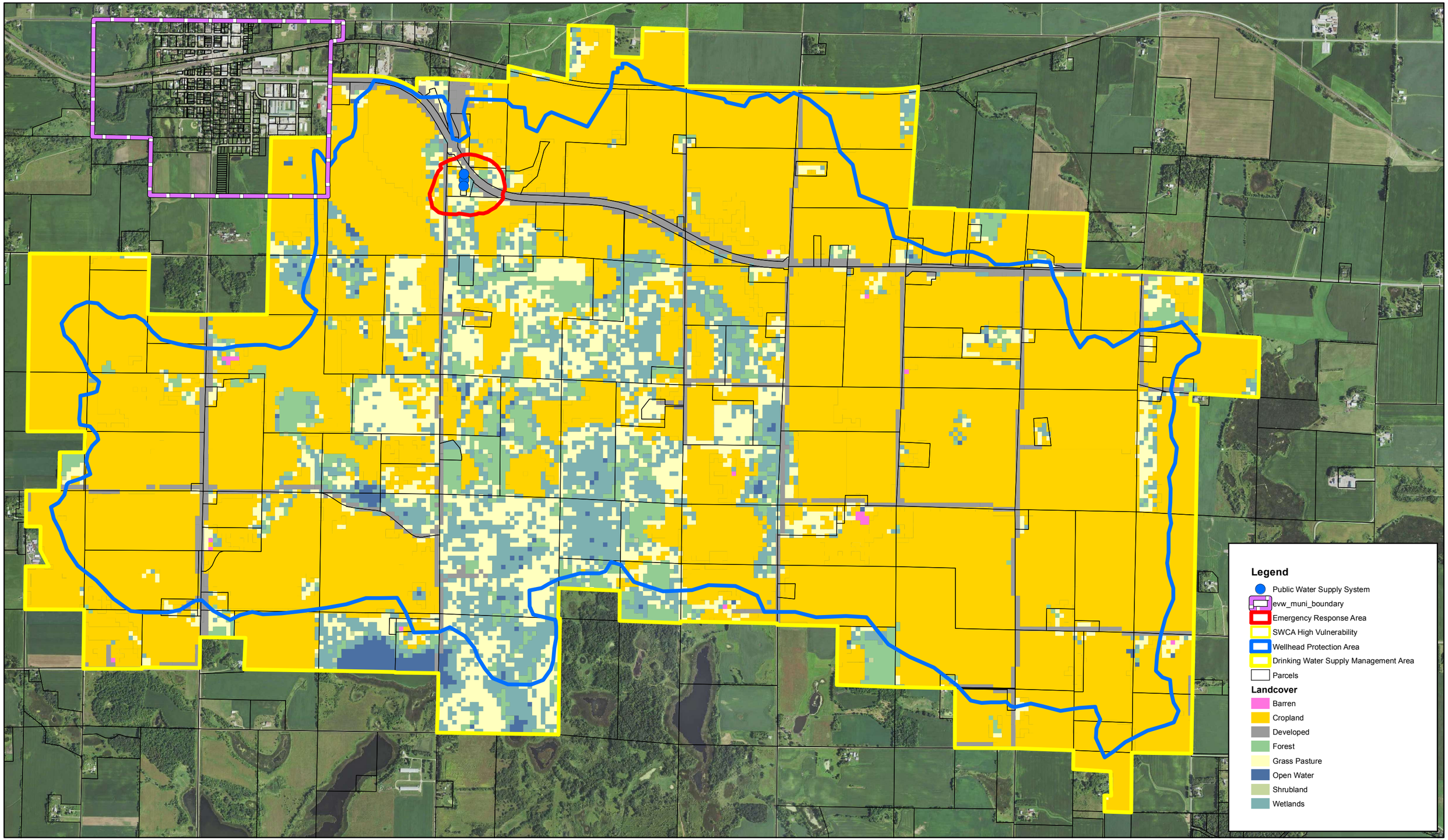

Figure Ten

EDEN VALLEY - DWSMA

Zoning

DEPARTMENT OF HEALTH

0 900 1,800 3,600 Feet

Data sources accessed August, 2019
Map produced by Rick Moore, Moore GIS

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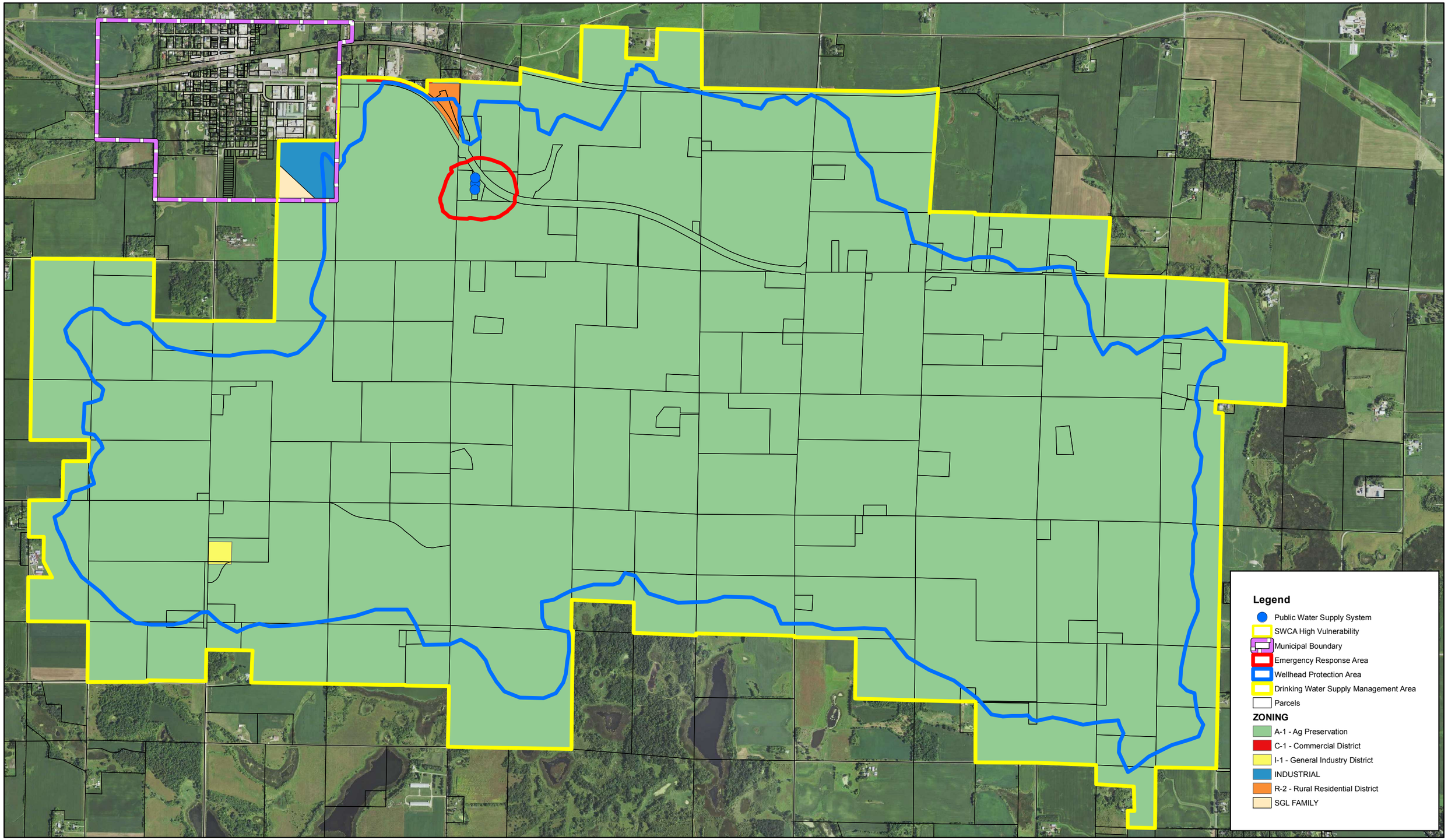
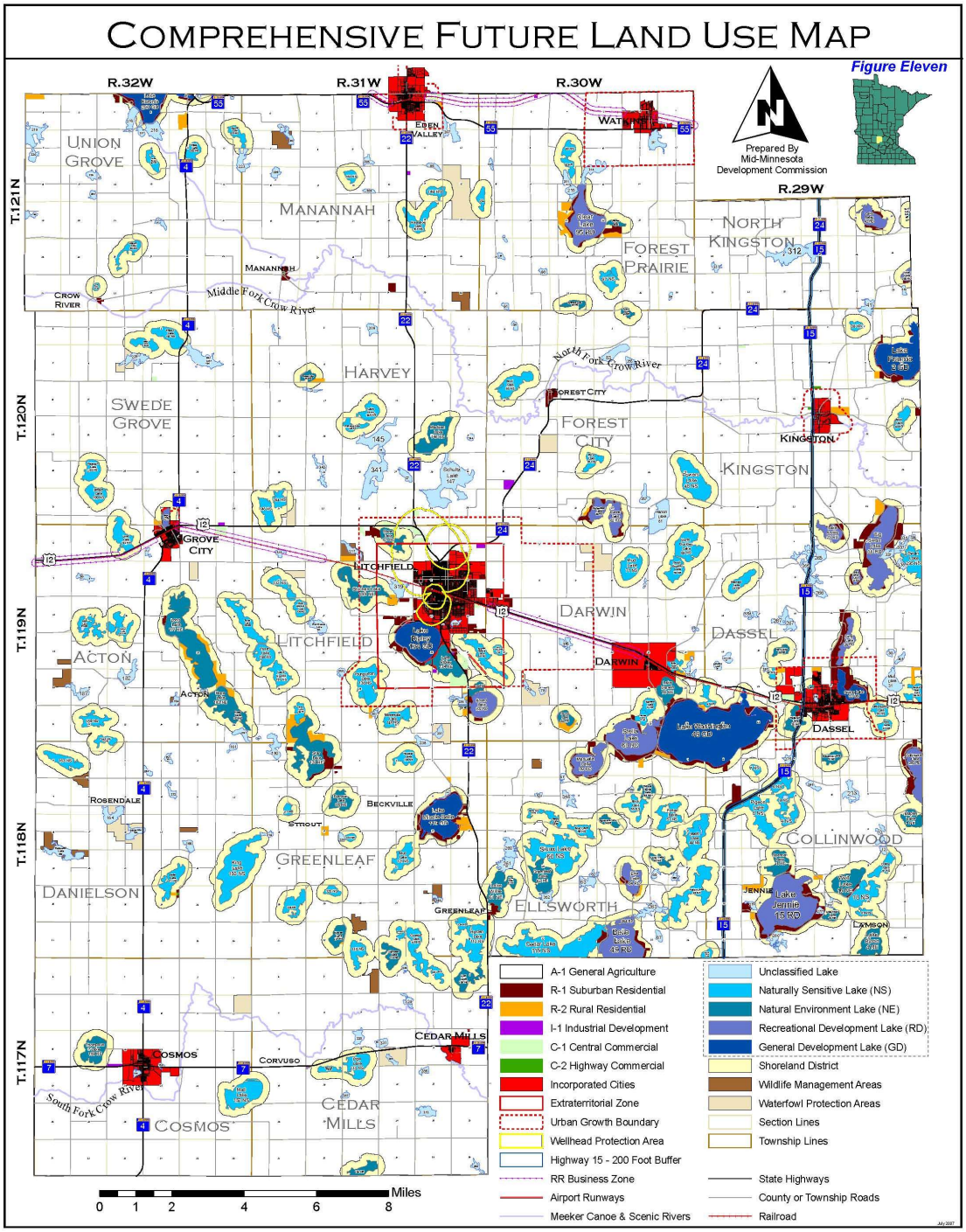


3. Future Land Use / Zoning

The City of Eden Valley is in the process of updating their Comprehensive Plan. They will explore the feasibility of either changing the Industrial Zoning area within the DWSMA or adding protections to ensure no runoff leaves the site either during construction or from the uses on the site.

The Meeker County Comprehensive Future Land Use Map, created by Mid-Minnesota Development Commission and dated July 2007, is located on the County website at: https://www.co.meeker.mn.us/199/Planning-Zoning. This map, as shown in ***Figure Eleven*** perceives outward growth to the south and east of the Eden Valley City Limits. The City will investigate the feasibility of annexation as part of their update process.



4. Potential Contaminant Source Inventory

Existing land uses and potential sources of contamination located within the DWSMA were reviewed by the WHP Team. The Potential Contaminant Source Inventory (PCSI), utilizing State databases combined with local knowledge, was used to identify most of the contaminant sources. ***Table 5*** lists and ***Figure Twelve*** shows the location of identified Potential Contaminant Sources. Priority for implementation will be the groundwater capture area (Priority A). A listing of parcels identified as having potential contaminant sources is shown in ***Appendix III***.

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, storm water 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. The risk a Class V well may present depends on factors such as: the type of fluid(s) it receives, its location in relation to water supply sources, its construction, maintenance and local geology. There are no known Class V wells located in the DWSMA. Identification of Class V injection wells will be addressed in the management strategies found in Chapter Five.

According to the Part I recommendations, monitoring of the city's water supply wells indicated elevated chlorides and bromide concentrations. These results suggest a connection between the wells and land use activities. The source of the chlorides has been identified as likely from road salt application. Strategies to work with the MNDOT and townships on road salt applications and a program for additional monitoring of isotope and chloride-bromide levels are recommended by MDH Hydrologist and will be considered in the strategies.

Ten active animal feedlots are located within the DWSMA. None of these are located within the groundwater capture zone. The city will work with Meeker SWCD to determine land application sites and offer programs to ensure these feedlots have minimized runoff to the waterway. The city can supplement grant dollars with MDH SWP funds for land practices to prevent runoff.

There are seventy-three Sub-surface Sewage Treatment Systems (SSTS) within the DWSMA, which presents a risk to the drinking water supply if they are not functioning correctly. Fifty-five are known and permitted by Meeker County, the remaining eighteen are located on a parcel with a dwelling, indicating likely presence. Of these, two of the unknown status are within the GWCA. Education will be provided to these property owners to help them understand the importance of proper SSTS maintenance. A management strategy to verify the initial inventory and assess contamination potential will be considered.

Transportation corridors that run through high vulnerability and surface water contribution areas can pose a threat if spills occur. Strategies to address MN State Hwy 55 will be addressed by a letter to MNDOT identifying the area of concern. The highway crosses into the IWMZ for city well #2 and the ERA of all three city wells. The City of Eden Valley will continue to train the fire department on spill response and Haz Mat. The MN Duty Officer will be notified of spills within the right-of-way.

A pipeline carrying crude oil traverses the western border of the DWSMA from north to south. Notification of the owner of location within DWSMA will be considered.

Table 5 - Potential contaminant sources and assigned risk

Potential Source Type *A=Active, I=Inactive, U=Unknown, R=Level of Risk (H=High, M=Medium, L=Low)	Total No.	Groundwater Capture Zone with Surface Water Priority Area A				Surface Water Vulnerability Area Priority Area B			
		A	I	U	R	A	I	U	R
AFL – Animal Feedlots	**10**					10			
LAPP – Land Application Site IsoNova	**6**					6			
SROUT – Stormwater Outlet	**2**					1	1		
SWMS – Solid Waste	**1**					1			
WWTD – Wastewater Treatment	**1**					1			
Transportation – MN State Hwy 55		X				X			
PIPEX – Pipeline	**1**					1			
Public Water Supply Wells	**3**	3							
Domestic Wells	**12**	6		6					
Irrigation Wells	**1**	1							
USGS Test Wells	**4**			4					
Sub-surface Sewage Treatment Systems	**73**	10		2		45		16	
Total	**114**	**20**		**12**		**65**	**1**	**16**	

IsoNova Technologies, a general industrial byproduct manufacturing plant, is permitted as a stormwater, solid waste, and wastewater treatment facility. It is located outside the groundwater capture zone. Land application sites are permitted by the MPCA. There are six sites within the DWSMA. The team will consider working with the owner to determine existing sites they use and management practices to prevent runoff. Land application sites for septage known by the County are located outside the DWSMA. Education of licensed septage pumpers will be a priority.

There are six known domestic wells located within the wellhead area. The city will explore opportunities to seal any unknown/unused wells identified within the DWSMA. There are six parcels that likely have a well located on the property. The city will verify well locations and try to match with existing unlocated well logs. USGS test wells drilled in the early 1950s remain unlocated and unverified. The city will work with USGS and/or MDH to attempt to locate and seal these wells. One irrigation well is located on the southwest border of the groundwater capture zone. Discussion with the property owner to educate on the vulnerability of this well is the strategy considered. Funding for sealing of this well will be offered via MDH SWP grants.

Education strategies to address residential and agricultural stormwater management practices for property owners will be developed utilizing existing opportunities presented by the MPCA and SRWD. Incentive cost-share programs are available through the Meeker SWCD, the SRWD and MDH implementation and competitive grants.

There are no storage tanks, hazardous waste generators, leak or spill sites located within the DWSMA.

Strategies will be developed to manage the industrial stormwater and the overland stormwater to the ditch system. The city will work with the Meeker SWCD to provide education and mitigation as appropriate to these sites.

EDEN VALLEY - DWSMA

Potential Contaminant Source Inventory

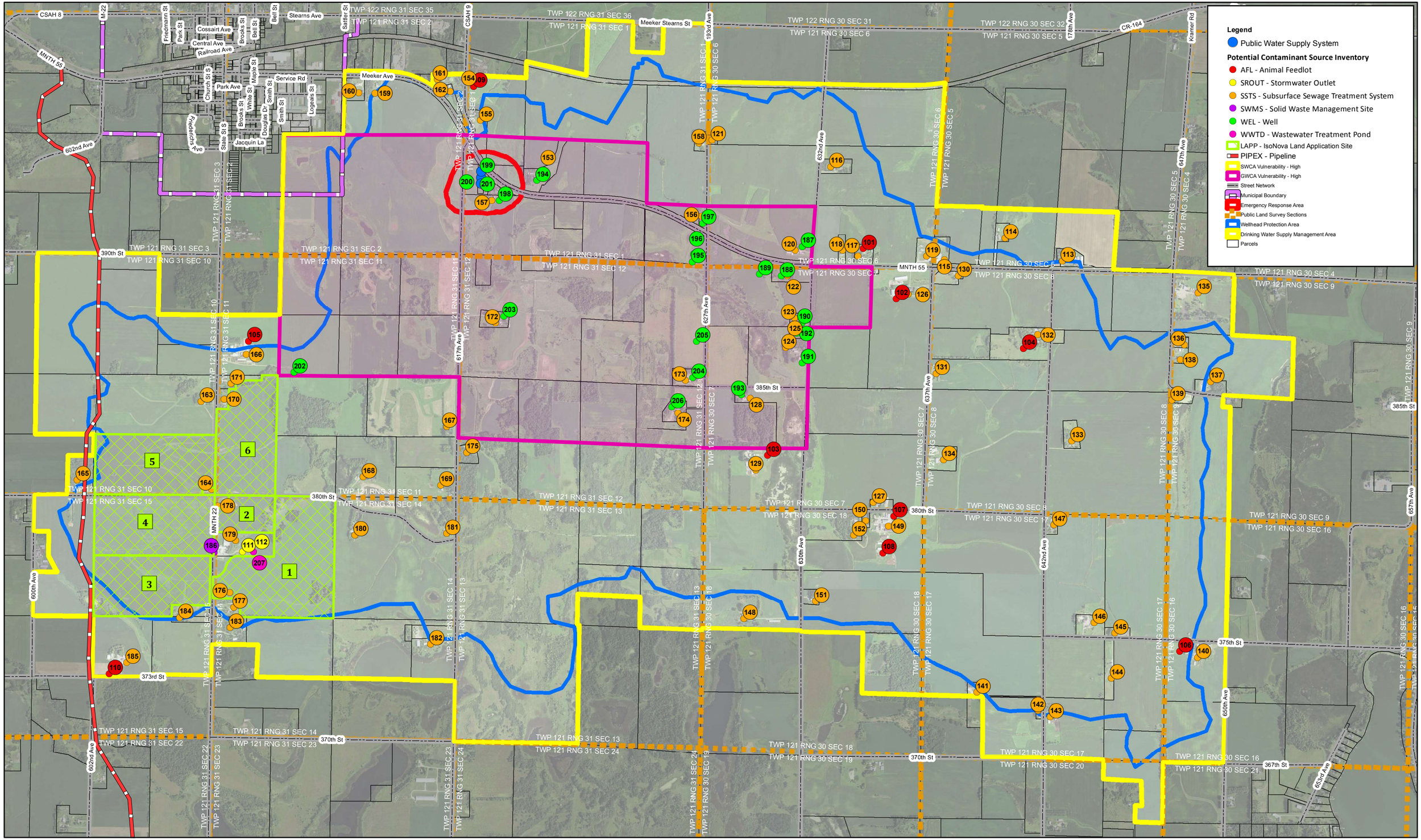
Figure Twelve

DEPARTMENT OF HEALTH

0 800 1,600 3,200 Feet

Data sources accessed August, 2019
Map produced by Rick Moore, Moore GIS

N W E S



5. Inner Wellhead Management Zone

Existing land uses, management and local land use controls within the Inner Well Management Zone (IWMZ or 200' radius around the public water supply wells) and the immediate one year time of travel area as shown in ***Table 6*** and was reviewed and considered by the WHP team during the development of this plan. This is done to identify land use issues and related potential contaminants which may have the most immediate impact upon the public water supply wells. State Highway 55 crosses the IWMZ of PWS Well #4, 100-feet from the well. Spill response training and working with the Minnesota Department of Transportation (MNDOT) will be considered in the strategies.

Table 6 **- Potential Contamination Sources and Assigned Risk for the IWMZ**

Source Type	Well 2	Well 3	Well 4	Assigned Risk
PC1 – Pollutant or contaminant that may drain into the soil.	1			H
WEL – Operating Well (Eden Valley public water supply well)	1	1	2	L

A copy of the IWMZ forms and measures that have been identified are included in ***Appendix IV*** of this plan. The WHP team discussed the importance of on-going monitoring for land use changes and potential contaminants near the public water supply wells and awareness of State Well Code isolation distances and need to maintain these setback requirements.

Public Utility Services

Ground transportation corridors provide a potential source of contamination due to accidental spills and discharges. Transportation corridors located within the DWSMA include Minnesota Highway 55 which traverses the top third of the DWSMA in an east/west direction. Water from the Highway flows overland and infiltrates into the soil and/or runs off into the ditch system. MNDOT has developed a protocol to address spills within the right of way, including notification of a duty officer who assigns clean up. An 800-report number is on file at the Water Treatment Plant and at City Hall. The DNR Water Emergency and Conservation Plan, found in ***Appendix V,*** addresses options for back up water supplies and emergency preparedness in the event of a catastrophic event such as a hazardous release that may impact the public water supply.

Stormwater from the City of Eden Valley DWSMA drains toward the public ditch. The city's utility and public drainage system map is on file at the City Public Works Department and is mainly located outside the DWSMA. Water lines run from the PWS wells along the south side of Highway 55 to the city limits of Watkins. They run due west to the city limits of Eden Valley. All other public utility services are located outside the DWSMA. Strategies to manage stormwater will be considered. There are no public drainage systems, however a ditch system runs from south to north through the DWSMA. It has numerous lateral branches dumping into it and it passes through the ERA of the PWS wells. An oil pipeline runs along the western edge of the DWSMA.

Unused municipal or other high capacity wells located within the DWSMA must be investigated to determine sealing protocol. A copy of the municipal well index, compiled by the MDH, is in ***Appendix VI*** of this plan.

C. WATER QUANTITY DATA ELEMENTS

1. Surface Water Quantity

There is no flood plain located within the DWSMA and no known surface water conflicts to the City public drinking water supply.

2. Groundwater Quantity

Adequacy of volume during drought periods has been addressed in Part One of The Plan. Any new proposed high-capacity wells will be evaluated by the City and MDH to determine impact to the public water supply. If a new well is needed by the City, they will work with the MDH to determine placement. There are no known well interference conflicts.

While permitted withdrawal from each of the city wells is allowed at 80-million gallons per year, actual historic well use is considerably less as shown in ***Table 7***. Water use is expected to remain stable.

ANNUAL WELL PUMPING AMOUNTS ***Table 7***
(IN MILLIONS OF GALLONS)

YEAR	Well 2	Well 3	Well 4	TOTAL
2014	22.9	6.9	24.1	53.9
2015	24.1	4.2	19.2	47.5
2016	16.3	7.5	24.7	48.5
2017	16.5	15.8	17.2	49.5
2018	17.1	16.6	16.7	50.4

There are no known environmental bore holes in the DWSMA. Environmental bore holes are used to measure static water levels and can be used for monitoring other parameters as well.

D. WATER QUALITY DATA ELEMENTS

1. Surface Water Quality

There are no lakes located within the DWSMA. Water generally flows from the watershed area toward the public ditch system. It is then conveyed via the ditch northward to Vails Lake outside the DWSMA to the north. In 1983, a rapid rainfall event caused the waterway to overtop its banks and flood the city's wellfield. This could impact the city's public water supply wells if it happens again. The city will consider strategies to mitigate this possibility. Isotopic data, completed by MDH, shows a direct correlation between the water in the ditch and the PWS wells. This information can be found in ***Appendix VII*** of this plan. Although sampling of the ditch is limited to MDH Hydrology studies, numerous studies have been completed on the Sauk River Watershed and they are currently in the process of completing a One Watershed One Plan (1W1P). Information is available on completed studies and 1W1P process at the Minnesota Pollution Control Agency (MPCA) site: https://www.pca.state.mn.us/water/watersheds/sauk-river. The Sauk River Watershed District (SRWD) has information regarding current projects and is available at: http://www.srwdmn.org/index.html.

2. Groundwater Quality

Elevated chloride and chloride/bromide ratios were found in the PWS wells #s 3 and 4. This, and other testing indicates a potential influence from the ditch system.

Tritium is a radioactive isotope of hydrogen that was released into the atmosphere during testing of hydrogen bombs. When Tritium is found in groundwater in amounts greater than one tritium unit, it is an indicator that recharge due to rainfall has occurred in the United States. Results of the Tritium testing for the PWS wells shows water in the aquifer is "young" in these wells. It has leached from the surface since 1953. Further testing including these wells will be considered in the implementation strategies.

Naturally occurring Arsenic levels have been elevated in Well #3 but are within MDH standards and reduced significantly with treatment. Nitrate is not detected in the PWS wells. The City of Eden Valley will work to maintain their good water quality the community has come to expect.

II. ASSESSMENT OF DATA ELEMENTS

A. USE OF THE WELL

The City of Eden Valley utilizes three wells ranging in depth from 72 to 78 feet, as shown in ***Table 8.*** An average of 50 million gallons per year is pumped from these wells. Usage has varied between 47.5 million gallons per year in 2015 and 53.9 million gallons per year in 2014. The 2022 projection, according to Part One, is shown in ***Table 8.***

Table 8

Well Number	Unique well #	Casing Depth (ft)	Well Depth (ft)	2022 Projection (Mg/Y)
2	211666	52	72	24.1
3	211662	57	78	15.8
4	649153	48	73	28.4

The city pumps an average of 135,000 gallons per day and has one elevated storage tank in Eden Valley that holds 60,000 gallons and one in Watkins that holds 40,000 gallons. They also utilize one underground tank at the treatment plant in Eden Valley that holds 170,000 gallons and one underground tank in Watkins that holds 235,000 gallons, with a total capacity of 505,000 gallons. The city water system provides drinking water to 438 metered service connections in Eden Valley and 381 in Watkins through appurtenant distribution mains, lines and services. Historic water usage over the past five years has averaged approximately 50 million gallons annually. Water use is expected to remain stable. A State licensed operator currently manages the water system.

B. WELLHEAD PROTECTION AREA DELINEATION CRITERIA

The following data inputs were used in determination of the boundaries of the wellhead protection area.

1. **Time of Travel - 10 year**
2. **Flow Boundaries**
3. **Daily Volume**
4. **Ground Water Flow Field**
5. **Aquifer Transmissivity**

A detailed discussion of the delineation is found in Part One of the Plan. Part One of the City's plan was completed by John Woodside, Hydrologist from the MDH Source Water Protection Unit. Part One is in ***Appendix I*** of this plan.

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

Eden Valley's wells pumped about 50 million gallons in 2018. Results of routine sampling conducted by the MDH in 2019 discovered no violations of any parameters monitored under the Federal Safe Drinking Water Act.

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

The area surrounding the ditch is almost entirely agriculture with one manufacturing plant and some commercial along State Highway 55. Overland runoff is the main contributor to the ditch system.

Education and incentives to landowners about the importance of proper management of septic systems, wells, and stormwater from agriculture and industry uses that contribute to overland runoff will be the focus of the strategies.

The intent of this WHPP is to heighten awareness regarding the impact of land use activities on groundwater quality. Through awareness, it is hoped that citizens will voluntarily take the necessary steps, which will maintain the quality of groundwater and drinking water produced by the city.

CHAPTER TWO

IMPACT OF CHANGES ON PUBLIC WATER SUPPLY WELL

Minnesota Rules 4720.5220

I. CHANGES IDENTIFIED IN:

A. Physical Environment

There is no anticipated change to the current physical environment within the DWSMA.

B. Land Use

There are no substantial changes anticipated in the City's Zoning designations.

Annexation is petition driven and the City expects minimal growth. Newly annexed areas will be evaluated as they are brought into the city limits. Sewer and water hook-ups are mandated within city limits.

C. Surface Water

The city hopes to improve surface water inputs to the ditch.

D. Groundwater

Additional high-capacity wells within the area of the 10-year time-of-travel could influence the groundwater resource.

II. IMPACT OF CHANGES

A. EXPECTED CHANGES IN WATER USE

The City does not expect significant changes to water use or anticipate the need to drill a new well within the next ten years.

B. INFLUENCE OF EXISTING WATER AND LAND GOVERNMENT PROGRAMS AND REGULATION

The City of Eden Valley has regulatory jurisdiction over the area located within their own limits. Mannanah and Forest Prairie Townships are regulated by Meeker County. The Wetland Conservation Act is administered by the Meeker SWCD. The Meeker County Local Water Management Plan has identified priorities supportive of groundwater protection in its 2013 update of the plan.

The DWSMA is located entirely within the Sauk River Watershed, a part of the Upper Mississippi River Basin. The Sauk River Watershed District has regulatory authority over permitting when management of stormwater is involved. Permit information is on their website at: http://www.srwdmn.org/permits.html.

C. ADMINISTRATIVE, TECHNICAL, AND FINANCIAL CONSIDERATIONS

The Cities of Eden Valley and Watkins, Stearns and Meeker SWCDs, Sauk River Watershed District and Meeker County Department of Planning and Zoning have been supportive of Wellhead Protection efforts. A wellhead committee had been formed and has been actively involved in the planning process. A budget will be established for implementation of priority strategies identified in this Plan.

The WHP Manager will be the designated contact person for implementation of this Plan. The committee will continue to meet at least every two years, with intent to try to meet annually to review and discuss implementation programs.

The city will work with the Meeker Soil and Water Conservation District providing surface and groundwater education opportunities as they arise, along with mitigation to inlets to the ditch. Meeker County GIS, Local Water Management, Soil and Water Conservation District and County Department of Planning and Zoning have provided and will continue to provide technical assistance for this plan.

CHAPTER THREE

ISSUES, PROBLEMS, AND OPPORTUNITES

Minnesota Rules 4720.5230

I. LAND USE ISSUES, PROBLEMS, AND OPPORTUNITIES RELATED TO:

A. THE AQUIFER

The aquifer providing the City's public water supply has been determined to be influenced by land use based on the existence of Tritium in city wells, Chloride levels (Chloride/Bromide ratios), and isotope monitoring in the city wells and the ditch. A portion of the DWSMA is considered high vulnerability for groundwater, and the entire DWSMA is high vulnerability for surface water.

B. THE WELL WATER

The City of Eden Valley has adequate water for the projected use in the next ten years. Adding any high capacity well by the city may affect the WHPA and DWSMA

and would require a new delineation. They will work with the MDH and DNR to assist with location and construction of any proposed new high capacity wells. Education is one of the main strategies in protection of drinking water supplies.

C. The Drinking Water Supply Management Area

Land use within the DWSMA of these aquifers has been relatively stable for years.

II. IDENTIFICATION OF:

A. Problems and Opportunities Disclosed at Public Meeting and in Written Comment

While no public comments were presented at any of the public meetings held in conjunction with this plan, the following ***Table 9*** depicts problems and opportunities identified by the wellhead team.

Issue Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	***Table 9*** Adequacy of Existing Controls to Address the Issue
There may be unused and unsealed wells on both municipal and residential properties.	Aquifer Well water quality DWSMA	The city needs to assess which wells present a threat to the aquifer based upon their depth, construction, and state of repair.	The city can apply for MDH SWP funding to contact property owners and assist with well sealing.	The city does not have authority to require that unused wells be properly sealed. The MDH has authority to require well sealing.
Land Use – Feedlots and Stormwater management	Aquifer Well water quality	The city needs to inform landowners of proper management practices.	The city can work with the Meeker SWCD and the SRWD to offer programs for ag management practices.	The city does not have authority to regulate land use outside city limits. Meeker County Planning and Zoning controls land use regulation.
Transportation Corridors / Spill Response IWMZ wells.	Aquifer Well water quality	Potential spills within Hwy 55 right-of-way are a threat to the aquifer.	The city can partner with MNDOT and MDH to inform and train city first responders.	MNDOT has spill response protocol.
Lack of adequate information – Rainfall and Monitoring	Aquifer Well water quality DWSMA	The city can measure rainfall at their well sites and work with the MDH to establish and implement a monitoring plan.	The city can partner with the MDH and apply for MDH Implementation funds to help with costs.	The city can complete the collection of samples for testing. The MDH can complete the tests.
SSTS	Aquifer Well water quality DWSMA	The city does not have information on the status of all existing SSTS.	The city can work with Meeker Planning and Zoning to determine status of SSTS.	The city does not have regulatory authority beyond its city limits. Meeker County permits SSTS.

Issue Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	*Table 9 (cont.)* Adequacy of Existing Controls to Address the Issue
Food manufacturing plant	Aquifer Well water quality DWSMA	Land application of bio solids have potential impact to the PWS wells if allowed to run into the ditch.	The city can work with the SWCD to inventory current sites. Education and incentive to incorporate bi-product immediately.	The city does not have regulatory authority beyond its city limits. Meeker County permits land use and zoning in this area.
Potential for flooding of PWS wells	Aquifer Well water quality	Floodwaters overtopped the waterway in 1983, flooding the city's wellfield	The city can work with MDH to determine appropriate mitigation practices.	The city owns the land the PWS wells are located on.
The high surface water contribution area of the DWSMA encompasses 6,890 acres and over 170 parcels.	Aquifer Well water quality DWSMA	The city needs to provide education and/or incentives to a large area and population.	The city can partner with the Meeker SWCD and SRWD. The city can apply for MDH Grant funding to help with education incentive costs.	The city does not have regulatory authority over the majority of the DWMA. Meeker County has regulatory authority.
There are 639 acres of restorable wetlands within the DWSMA.	Aquifer Well water quality	Wetlands that have been filled or drained do not pond or filter stormwater.	The city can work with the Meeker SWCD and the SRWD to offer programs to restore wetlands.	The city does not have regulatory authority beyond its city limits. Meeker SWCD administers the WCA.
Ag Management Practices	Aquifer Well water quality	Surface water runoff affects the groundwater within the GWSA.	The city can work with the Meeker SWCD and the SRWD to offer programs for ag management practices.	The city does not have regulatory authority beyond its city limits
Pipeline along western edge of DWSMA containing crude oil.	Aquifer Well water quality	If a spill occurred and entered the waterway, the PWS well will be vulnerable.	The city can contact the owners of the pipeline, notifying them that they are located within a highly vulnerable SWCA and GWCZ.	The city does not have regulatory authority over pipelines.
Future Planning	Well water quality	The city is in the process of completing an updated Comprehensive Plan. The SRWD is in process of completing a 1W1P.	The wellhead protection manager can participate in the city meetings and the city can participate in 1W1P meetings to ensure drinking water priorities are considered.	The city has authority within their city limits. The SRWD has regulatory authority over the 1W1P process and implementation.

Issue Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	*Table 9 (cont.)* Adequacy of Existing Controls to Address the Issue
Elevated Chlorides in PWS wells and ditch	Aquifer Well water quality DWSMA	The elevated Chlorides and the Chloride/Bromide ratio suggests road salt is the cause.	The city can work with MNDOT and Meeker County to ensure road salt is utilized properly on State Hwy 55 and county roads.	The city does not regulate road salt use outside city limits.
There may be unknown Class V Wells located in the DWSMA.	Aquifer Well water quality DWSMA	The city needs to inform property owners of what a Class V Well is and how to report.	The city can apply for MDH grant funding to inform the property owners within the DWSMA.	The EPA has authority over Class V Wells in Minnesota.

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 of Eden Valley's WHPA and DWSMA and to determine vulnerability of the aquifer to possible contamination comes from regional sources on a large scale. While much regional information and data is being used as supplied by MDH, the City has initiated verification of many of the contaminant sites to further protect public drinking water supplies.

The City will continue to compile data collected by all entities regarding groundwater and surface water to track potential changes in the quality of water. This plan will be updated on ten-year intervals as required by the State of Minnesota. Updated data will be utilized at that time.

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

The WHP committee feels adequate protection of the DWSMA is available through existing land use ordinances in the City of Eden Valley, Meeker County, and the SRWD along with state well and groundwater appropriation permits.

Existing education programs promoting Best Management Practices (BMPs) and working with local landowners on issues is the approach proposed by the City.

The MDH and Minnesota Rural Water Association (MRWA) will continue to provide technical assistance towards the successful implementation of this Plan. Other State agencies including the DNR, MDA, MPCA, and BWSR are available to provide assistance as needed.

CHAPTER FOUR

WELLHEAD PROTECTION GOALS

Minnesota Rules 4720.5240

Goals define the overall purpose for the WHP plan, as well as the end points for implementing objectives and their corresponding actions. 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:

- Maintain a safe and adequate drinking water supply for community residents.
- Prevent contaminants from reaching levels that present a risk to people's health.
- Provide the citizens with educational materials and other resources to assist landowners with drinking water protection issues such as private well use, maintenance and sealing assistance and Class V wells.
- Continue to partner with state and local agencies to minimize impacts to the source of drinking water for the cities of Eden Valley and Watkins.

CHAPTER FIVE

OBJECTIVES AND PLANS OF ACTION

Minnesota Rules 4720.5252

Objectives provide the focus for ensuring that the goals of the WHP plan 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 1) the data elements, 2) the potential contaminant source inventory, 3) the impacts that changes in land and water use present and 4) issues, problems, and opportunities referenced to administrative, financial, and technical considerations.

OBJECTIVES

The following objectives have been identified to support the goals of the WHP plan for the City of Eden Valley:

A. Create public awareness and general knowledge about the importance of WHP for maintaining an adequate and safe drinking water supply.

B. Increase the knowledge base regarding quantity of water available – maintain adequate drinking water supply.

C. Gather new information on potential contaminants.

D. Manage potential contaminants.

E. Ensure emergency preparedness of local agencies.

F. Create awareness among LGUs about the importance of protection of the drinking water supply aquifer.

G. Maintain communications with the MDH and other agencies able to assist with implementation of this plan.

H. Collect additional data to substantiate information contained within this Plan, and to provide more detail for future amendments.

I. Conduct regular evaluations of Plan implementation and effectiveness.

WHP Measures and Action Plan

Based upon this information, the WHP team has identified WHP measures that will be implemented by the city over the 10-year period that its WHP plan is in effect. The objective that each measure supports is noted as well as 1) the lead party and any cooperators, 2) the anticipated cost for implementing the measure and 3) the year or years in which it will be implemented.

The following categories are used to further clarify the focus that each WHP measure provides, in addition to helping organize the measures listed in the action plan:

- Data Collection
- IWMZ Management
- Land Use Management
- Potential Contamination Source Management
- Public Education and Outreach
- Reporting and Evaluation
- Water Use and Contingency Strategy

Establishing Priorities

WHP measures reflect the administrative, financial, and technical requirements needed to address the risk to water quality or quantity presented by each type of potential contamination source. Not all of these measures can be implemented at the same time, so the WHP team assigned a priority to each. A number of 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 of potential contaminant sources relative to the wells.
- The number of each potential contaminant source identified and the nature of the potential contaminant associated with each source.
- The capability of the geologic material to absorb a contaminant.
- The effectiveness of existing controls.
- The time needed to acquire cooperation from other agencies and cooperators.
- The resources needed, i.e., staff, money, time, legal, and technical resources.

The City of Eden Valley defines a priority for implementing a WHP measure as maintaining the quantity and high-quality drinking water they have come to expect. The following ***Table 10*** lists each measure that will be implemented over the 10-year period that the City's WHP plan is in effect, including the priority assigned to each measure. It is difficult to foresee and plan for the future. The City will use its planning and management capabilities within this plan to respond to any new/unknown source water protection issues that may impact the quality or quantity of its drinking water in the future.

MONITORING, DATA COLLECTION, AND ASSESSMENT:

Table 10 - WHP Plan of Action

Description	Objective	Priority	Responsible Party & Cooperators	Implementation Time Frame									
				2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1. Groundwater Quality Monitoring **WHP Measure #1:** Contact MDH Hydrologist to set up a monitoring plan to: Sample Wells 2, 3 and 4 (or whatever primary wells exist at that time) for vulnerability parameters in year six of plan development, determined in consultation with MDH (likely tritium, chloride, bromide, nitrate and ammonia) and dependent on available funding. 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.	**G/H**	**H**	Eden Valley MDH Hydro						X				
WHP Measure #2: Contact MDH Hydrologist to set up a monitoring plan to include: Future monitoring of surface water from the nearby ditches (east and west), and Wells 2, 3, and 4 (211666, 211662, 649153, respectively) should be conducted to help to confirm initial results. The details of the monitoring program should be worked out in consultation with MDH hydrologist, but may incorporate temperature logging to further assess the connection between the wells and nearby surface water features and/or evaluations of gain or loss of ditch flow in proximity to the city wells.	**H**	**H**	Eden Valley MDH Hydro						X	X			
WHP Measure #3: The city will pursue MDH grant funding to procure rainfall data measurement equipment for use near the city wells.	**H**	**H**	Eden Valley MDH	X									
2. Well Inventory and Prioritization **WHP Measure #4:** Annually update the PCSI. Identify new and review the status of existing potential contaminants within the DWSMA.	**C**	**M**	Eden Valley MDH	←----------On-Going----------→									
WHP Measure #5: Work with MDH to review old municipal well and boring information to help locate and determine efforts needed to address former city wells. Locate well sealing records for test wells and submit to MDH.	**G/D**	**M**	Eden Valley MDH USGS			X							

WELL AND CONTAMINANT SOURCE MANAGEMENT:

Description	Objective	Priority	Responsible Party & Cooperators	Implementation Time Frame									
				2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1. Municipal Well Management Practices **WHP Measure #6:** Contact MDH to update the IWMZ survey form for all wells in the system in year 6 working in coordination with the MDH.	**D**	**H**	Eden Valley Watkins MDH MRWA						X				
WHP Measure #7: Monitor setbacks for all new potential contaminant sources within the IWMZ.	**D**	**H**	Eden Valley Watkins-MDH	←----------As Needed----------→									
WHP Measure #8: Develop a spill response plan to provide emergency response in the event of a spill or release.	**E/G**	**H**	Eden Valley Watkins MNDOT Meeker Cnty Consultant Townships IsoNova		X								
WHP Measure #9: Provide a letter, along with a map of the DWSMA to the local Fire Department, City Street Department, Meeker County Emergency Management, Meeker County Highway Department, Manannah Township, Flint Hills Resource Pipeline, and MNDOT. Request their awareness and prompt response to accidents, spills and clean-up efforts within DWSMA especially along MN State Hwy 55 near wells. Work with MNDOT to assess mitigation options on road salt application along Hwy 55 within the IWMZ.	**E/F**	**H**	Eden Valley Watkins Meeker County Manannah Township MNDOT MPCA	X	X								
WHP Measure #10: Work with MDH to assess mitigation options for potential flooding of the city's wellfields.	**E/F**	**H**	Eden Valley Watkins MDH			X							
2. Private Well Management **WHP Measure #11:** Reach out to DWSMA residents to gather information on all wells that do not have an existing well log. Report results to MDH. Priority A Strategy	**C**	**M**	Eden Valley Watkins MDH	X	X	X							

WELL AND CONTAMINANT SOURCE MANAGEMENT (CONT):

Description	Objective	Priority	Responsible Party & Cooperators	Implementation Time Frame									
				2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
WHP Measure #12: Apply for MDH SWP Grant to seal abandoned and unused unsealed wells identified in the DWSMA in Priority A area.	**D**	**H**	Eden Valley Watkins MDH	←----------As Needed----------→									
WHP Measure #13: Notify MDH Hydrologist of any known new wells drilled within the Eden Valley area to assist in future delineations.	**B/G/H**	**H**	Eden Valley Watkins MDH	←----------As Needed----------→									
WHP Measure #14: Provide well maintenance and well sealing information to Priority A DWSMA landowners. Place information on City website and utilize social media.	**A**	**H**	Eden Valley Watkins MDH MRWA SWCD Forest Prairie & Manannah Twp	X	X								
3. <u>Sub-Surface Sewage Treatment Systems (SSTS)</u> **WHP Measure #15:** City to send letter to Meeker County requesting compliance information updates of the SSTS located within the DWSMA annually.	**A/D**	**H**	Eden Valley Watkins MDH	X	X	X	X	X	X	X	X	X	X
WHP Measure #16: Apply for funding to mitigate failing septic systems within the Priority A Area.	**D**	**H**	Eden Valley Watkins MDH	←----------As Needed----------→									
WHP Measure #17: Provide DWSMA map and letter to Licensed Maintainers (pumpers) within Meeker (2) and Stearns (7) Counties. Request that they land apply septage outside the DWSMA, and request location of any approved sites within the DWSMA.	**A/C**	**H**	Eden Valley Watkins SWCD MPCA		X								
4. <u>Urban Storm Water and Surface Water Management</u> **WHP Measure #18:** Work with Meeker/Stearns SWCD to promote BMPS on priority inlets and outfalls in the DWSMA. Apply for MDH SWP or Clean Water funding to assist with costs.	**D/G**	**H**	Eden Valley Watkins MDH SWCD		X			X					

WELL AND CONTAMINANT SOURCE MANAGEMENT (CONT):

Description	Objective	Priority	Responsible Party & Cooperators	Implementation Time Frame									
				2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
WHP Measure #19: Request Meeker County and SRWD to utilize the MDH Stormwater Guidance Document to determine areas where infiltration is not allowed and work with developers to ensure compliance.	**D**	**H**	Eden Valley Watkins Meeker Co SRWD MDH Consultant		X								
WHP Measure #20: Send a letter to SRWD requesting monitoring in the DWSMA ditch system at several junctions for Chlorides.	**G/H**	**M**	Eden Valley Watkins SRWD	X									
5. Waste Management **WHP Measure #21:** Notify solid waste management site that they are located within the DWSMA. Encourage use of Best Management Practices with land applications.	**A/D**	**M**	Eden Valley Watkins MPCA SWCD		X								
6. Agricultural Management Practices **WHP Measure #22:** Contact the Meeker SWCD to request an inventory and assessment of animal feedlots land application sites within the DWSMA.	**D/G**	**M**	Eden Valley Watkins SWCD MDH	X									
WHP Measure #23: Work with partners to provide information and incentives to property owners/operators for programs (CRP, CREP, EQIP, etc.), nutrient management, cover crops, wetland restoration, and other BMP's in the DWSMA.	**G/D**	**H**	Eden Valley Watkins SWCD MDH NRCS SRWD				X						

EDUCATION AND OUTREACH:

Description	Objective	Priority	Responsible Party & Cooperators	Implementation Time Frame									
				2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1. Education and Outreach **WHP Measure #24:** Select WHP education items from the MDH and/or MN Rural Water Association source water protection website to inform the public about WHP and unsealed wells, septic systems, buffers, and nutrient management. Assist with upgrades and post and highlight WHP education information on the city websites of Eden Valley and Watkins.	**A**	**H**	Eden Valley Watkins MRWA MDH Watkins	X	X			X					
WHP Measure #25: The City will participate in the One Watershed, One Plan when it is developed.	**F**	**M**	Eden Valley BWSR SRWD	←----------On-Going----------→									
WHP Measure #26: Continue to support financially and via involvement in the area wide Community Youth Water Festival. Encourage use of groundwater flow model to educate on wells and drinking water.	**A**	**M**	Eden Valley Watkins Stearns County	X	X	X	X	X	X	X	X	X	X
WHP Measure #27: Provide leak detection audit assistance to homeowners that show high water usage.	**A**	**M**	Eden Valley Watkins	←----------As Needed----------→									

LAND USE AND PLANNING:

Description	Objective	Priority	Responsible Party & Cooperators	Implementation Time Frame									
				2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1. Comprehensive Land Use Planning **WHP Measure #28:** Work with local planning & zoning staff to update their comprehensive plan to reflect existing WHP issues and identify changes to local controls that can be made to help protect the community water supply wells and the aquifer. Incorporate WHP plan by reference.	**F**	**M**	Eden Valley	X									
2. General Land Use & Water Resource Planning **WHP Measure #29:** Send letter to the SRWD and Meeker County requesting notification of any re-zoning and/or permits within the DWSMA.	**F**	**M**	Eden Valley Meeker County SRWD	X									

WHP COORDINATION, REPORTING, AND EVALUATION:

Description	Objective	Priority	Responsible Party & Cooperators	Implementation Time Frame									
				2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1. WHP Coordination **WHP Measure #30:** Coordinate a meeting with the WHP team every 2 years. Discuss funding needs and pursuit of SWP Grant funds to help implement activities identified in the WHP Plan.	**I**	**H**	Eden Valley Watkins WHP Team MDH	X		X		X		X		X	
2. Implementation Tracking and Reporting Activities **WHP Measure #31:** Maintain a "WHP folder" that contains documentation of WHP activities you have completed and a date that it was done. Identify each activity with the number of the measure contained in this table.	**I**	**H**	Eden Valley Watkins	X	X	X	X	X	X	X	X	X	X
WHP Measure #32: Develop a spreadsheet that coincides with measures found in your plan to track and monitor plan implementation activities and completion dates.	**F/H**	**H**	Eden Valley Watkins	X									
3. WHP Program Evaluation Plan Reporting **WHP Measure #33:** Complete an Evaluation Report every 2.5 years that evaluates the "progress of plan of action and the impact of any contaminant release on the aquifer supplying the public water supply well" MN WHP Rule 4720.5270. Submit copy to MDH during year 8.	**I/G**	**H**	Eden Valley Watkins MDH			X			X			X	

CHAPTER SIX

EVALUATION PROGRAM

Minnesota Rules 4720.5270

The success of the Potential Contaminant Source Management Strategy must be measured regularly to ensure the Plan is meeting the community needs on Wellhead understanding and compliance.

The City of Eden Valley's WHPA has been designated as having multiple vulnerabilities to contamination. The designation of high groundwater vulnerability requires monitoring of the following potential contaminant sources within the DWSMA:

a. Above Ground Storage Tanks greater than 1,100 gallons
b. Potential Class V Wells
c. Leaking Underground Storage Tanks
d. Potential Contamination Sites
e. Solid Waste Management Sites
f. Spills
g. Storage or Preparation Areas (Chemicals, Fertilizers, Fuels, Gasses, Oils, Hazardous substances, Solvents and Coatings and Waste
h. Suspected Contaminants of Concern
i. Underground Storage Tanks
j. Wells
k. Animal Feedlot
l. Graves
m. Hazardous Waste Generator
n. Hazardous Waste Handler
o. Sub-surface sewage treatment systems
p. LUST sites
q. Gravel Pit
r. Storage Sites (above plus Ag Chemicals, Road Salt, Waste (Solid, animal, oils tires))

The surface water contribution area (which encompasses the entire DWSMA) has these additional requirements:

s. Run-off Related Sources
    1. Spills
    2. Road Salt storage prep areas
    3. Above ground storage tanks
    4. Animal feedlots
    5. Aggregate mining off-site discharges
t. Stormwater – basins, unlined conveyance features, outlets that discharge to the ditch.
u. Wastewater Treatment Ponds or Disposal sites (Eden Valley's are outside the DWSMA).

A program to ensure this is completed has been documented in Chapters One through Five. In addition to this, to ensure compliance, the City will:

- Track the implementation efforts completed;
- determine the effectiveness of these efforts; and
- identify any implementation changes needed to accomplish the goal of the plan.

To accomplish the above, the following activities will be completed:

1. Changes in land use and other development within the DWSMA will be monitored.
2. It is recommended that the WHP team meets annually, although at a minimum they will meet every two-and-one-half years and develop a report which assesses the status of plan implementation and to identify issues that impact the implementation of action steps throughout the DWSMA.
3. A written report will be completed every 2.5 years and presented to the Eden Valley City Council stating progress in implementation of objectives. This report will be sent to the Minnesota Department of Health and be placed on file at the Eden Valley and Watkins City offices.

CHAPTER SEVEN

ALTERNATIVE WATER SUPPLY / CONTINGENCY STRATEGY

Minnesota Rules 4720.5280

PURPOSE

The DNR *Water Emergency and Conservation Plan* approval letter can be found in ***Appendix V*** of this Plan. The purpose of this plan is to establish, provide and keep updated, certain emergency response procedures and information for the City of Eden Valley which may become vital in the event of a partial or total loss of public water supply services as a result of natural disaster, chemical contamination, or civil disorder of human-caused disruptions.

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