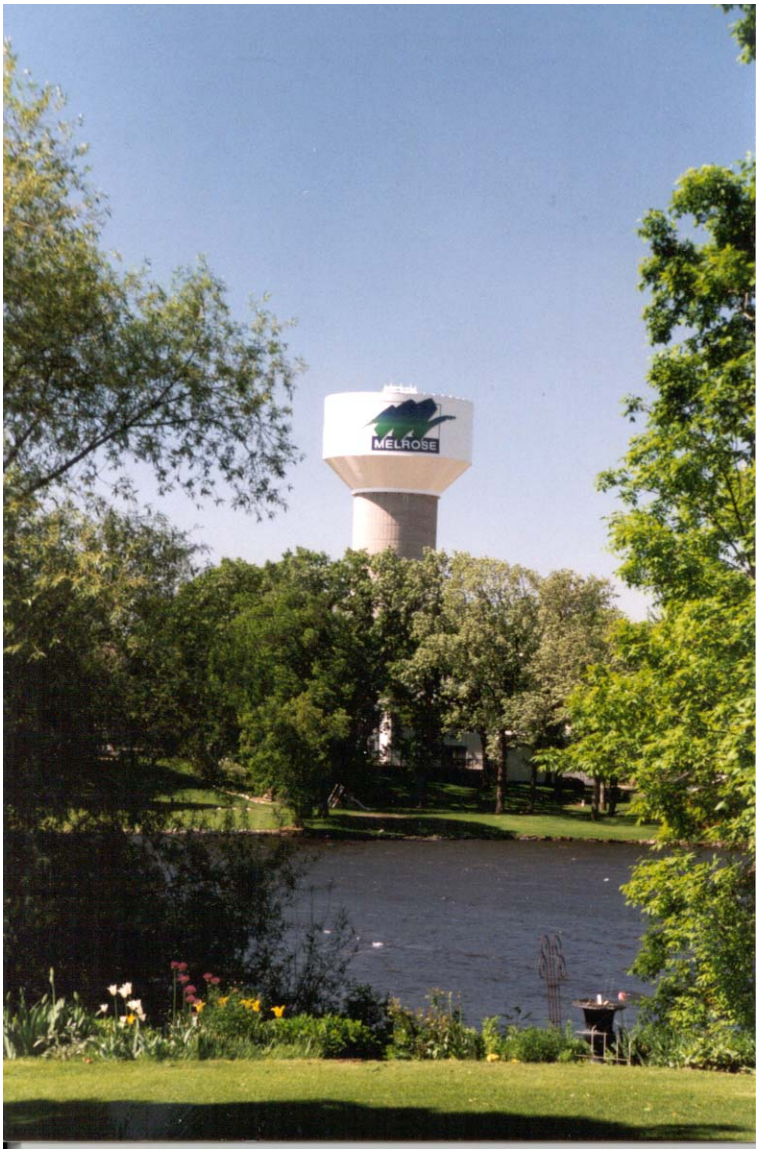
WELLHEAD PROTECTION PLAN - PART II



POTENTIAL CONTAMINANT SOURCE MANAGEMENT STRATEGY

JULY 2015

TO

JULY 2025

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PUBLIC WATER SUPPLY PROFILE

PUBLIC WATER SUPPLY	
NAME	City of Melrose
ADDRESS	225 First Street NE
	Melrose, MN 56352
TELEPHONE NUMBER	320-256-4278
E-MAIL	admin@cityofmelrose.com

WELLHEAD PROTECTION MANAGER	
NAME	Tim Vogel
	Melrose Water/Wastewater Coordinator
ADDRESS	225 First Street NE
	Melrose, MN 56352
TELEPHONE NUMBER	320-256-4278
E-MAIL	mbrethorst@cityofmelrose.com

CONSULTANT	
NAME	Marilyn Bayerl
	Bayerl Water Resources
ADDRESS	9083 State Hwy 114 SW
	Alexandria, MN 56308
TELEPHONE NUMBER	320-766-6126
E-MAIL	bayerl@runestone.net

GENERAL INFORMATION	
UNIQUE WELL NUMBERS	215113 (Well Number 4), 180122 (Well Number 5), 486430 (Well Number 7), 608438 (Well Number 8) 608434 (Well Number 9)
POPULATION SERVED:	3,622
	- 987 Residential
	- 143 Commercial
	- 5 Industrial
CONNECTIONS:	1,148
COUNTY:	Stearns

DOCUMENTATION LIST

STEP	DATE PERFORMED
Scoping Meeting 2 Held (4720.5340, subp. 1)	February 24, 2014
Scoping 2 Letter Received (4720.5340, subp. 2)	March 20, 2014
Remaining Portion of Plan Submitted to Local Units of Government (LGUs) (4720.5350)	January 23, 2015
Review Received From Local Units of Government (4720.5350, subp. 2)	March 29, 2015
Review Comments Considered (4720.5350, subp. 3)	April 1, 2015
Public Hearing Conducted (4720.5350, subp.4)	April 16, 2015
Remaining Portion WHP Plan Submitted (4720.5360, subp. 1)	April 2015
Final WHP Plan Review Received (4720.5360, subp. 4)	July 2015

Members of the Wellhead Protection Team

NAME	REPRESENTING
Michael Brethorst	City of Melrose Administrator
Tim Vogel	City of Melrose Mayor - Water/Wastewater Coordinator
Jamie Wieling	Wheels Water Service (local well driller)
Shawn Mayers	Contractor / Gravel Pit Operator
Tracy Ekola	Resident
Sharon and Roger Meyer	Local Farmer
Marvin and Judy Thielen	Local Farmer
Gerald Sonnen	Local Farmer
Dave Theiler	Local Farmer
Jason Bauer	Local Ag Property Owner
Richard Thull	Clerk – Grove Township
George Traeger	Melrose Lake Association
Susan McGuire	Stearns County Environmental Services
Lynn Nelson	Sauk River Watershed District
Carrie Raber	Stearns County SWCD - CMWEA
Dan Langseth	MN Department of Agriculture – Soil Scientist
Steve Holste	MN Department of Transportation
Nicola Blake-Bradley	MN Department of Natural Resources
Aaron Meyer	MN Rural Water Association
Karen Voz	MN Department of Health

Abbreviations

BMP Best Management Practices
CRP Conservation Reserve Program
CMWEA Central MN Water Education Alliance
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
Mg/Y 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 Services
NWI National Wetlands Inventory
OBWEL Observation Well
PCSI Potential Contaminant Source Inventory
PWS Public Water Supply
RST Registered Storage Tank
SCES Stearns County Environmental Services
SRWD Sauk River Watershed District
SSTS Sub-surface Sewage Treatment Systems
SWCD Stearns Soil & Water Conservation District
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 Melrose 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 the ***Appendix*** 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.

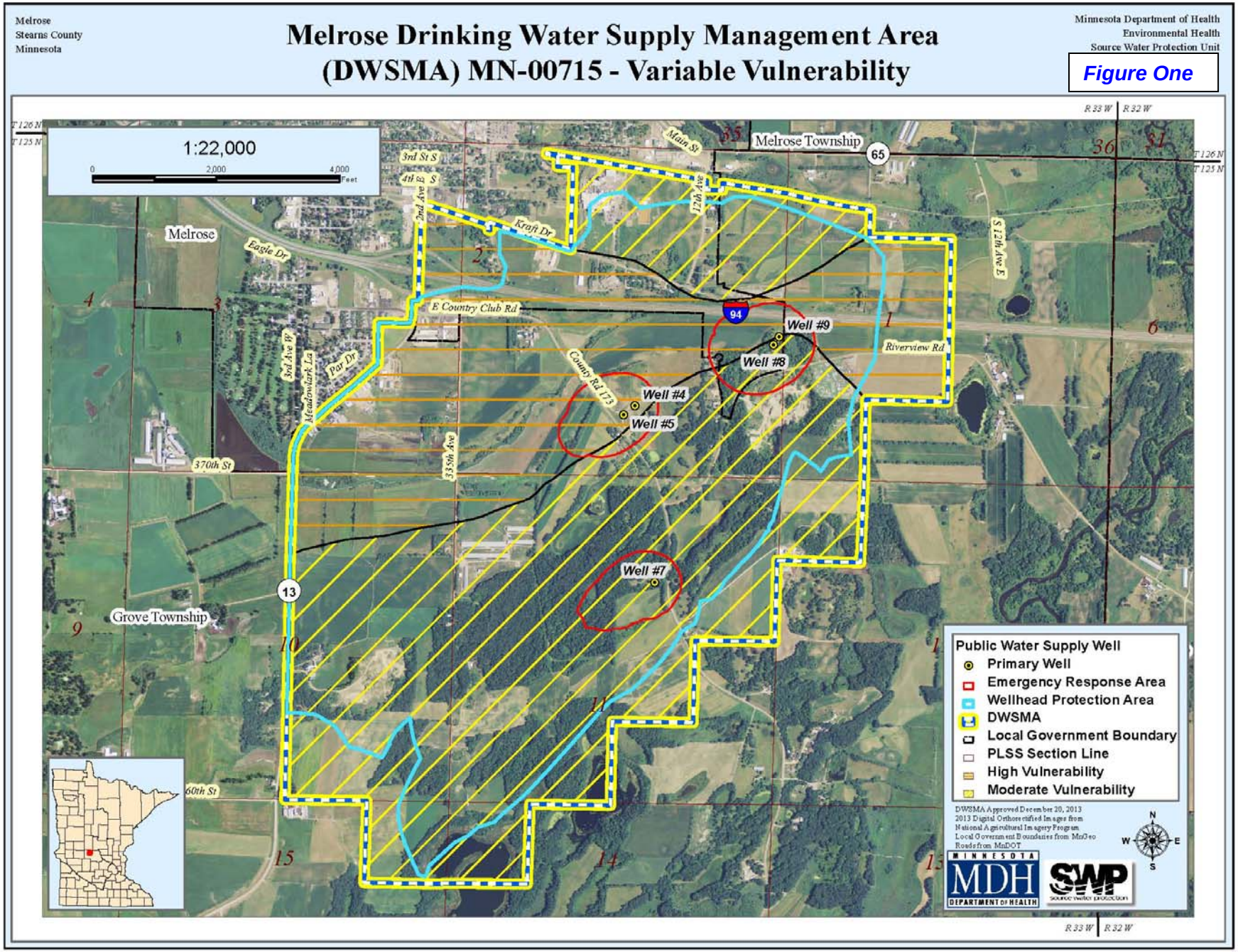
In Part One of the Plan Amendment, the delineation of the Wellhead Protection Area (WHPA), the Drinking Water Supply Management Area (DWSMA), vulnerability of the wells, and vulnerability status of the aquifer in which the city's wells are located were completed and approved by the Minnesota Department 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. ***Figure One*** maps the area of vulnerability for the city's wells. The DWSMA has both high and moderate vulnerability. It is comprised of 1,877 acres – 661 acres are considered high vulnerability and 1,216 acres medium vulnerability. This plan will differentiate between the two areas based on required potential contaminant considerations required for each.

The City of Melrose actively uses five wells. All five of these wells are considered vulnerable to contamination due to a missing or non-contiguous layer of clay-rich geologic materials over the aquifer that is sufficient to retard or prevent the vertical movement of contaminants. Water sampling showed indications of well vulnerability and Tritium was found in two of the wells.

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, feedlots, sub-surface sewage treatment systems, hazardous waste permits, and underground storage tanks in the high vulnerability area only. Transportation corridors, surface water discharges, above ground Tanks, unused, unsealed wells and Class V Wells will be considered in the entire DWSMA.

The Wellhead Protection Team intends to work with the City of Melrose, Stearns County, Sauk River Watershed District, Stearns Soil and Water Conservation District, Grove Township, the Central Minnesota Water Education and Alliance, and state and local agencies to educate and help 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.


Melrose
Stearns County
Minnesota
Melrose Drinking Water Supply Management Area
(DWSMA) MN-00715 - Variable Vulnerability
Minnesota Department of Health
Environmental Health
Source Water Protection Unit
Figure One
1:22,000
0
2,000
4,000
Feet
Melrose Township
Melrose
Grove Township
Main St
3rd St S
4th St S
2nd Ave S
12th Ave
Kraft Dr
Eagle Dr
E Country Club Rd
Riverview Rd
S 12th Ave E
3rd Ave W
Meadowlark Ln
Par Dr
County Rd 173
370th St
335th Ave
60th St
Well #9
Well #8
Well #4
Well #5
Well #7
Public Water Supply Well
Primary Well
Emergency Response Area
Wellhead Protection Area
DWSMA
Local Government Boundary
PLSS Section Line
High Vulnerability
Moderate Vulnerability
DWSMA Approved December 20, 2013
2013 Digital Orthorectified Images from
National Agricultural Imagery Program
Local Government Boundaries from MnGeo
Roads from MnDOT
MINNESOTA
MDH
DEPARTMENT of HEALTH
SWP
Source Water Protection
N
W
E
S
R 33 W
R 32 W
T 126 N
T 125 N

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 in the City of Melrose is 28.6 inches, with variation between 24 and almost 35 inches, as shown in ***Table 1***. Rain falling on the ground can filter through the layers of sediment and enter the aquifer containing the city's vulnerable wells. All five of the city wells are vulnerable to contamination. It is important to address areas where rainfall could cause infiltration of contaminants.

Precipitation Data for the City of Melrose — ***Table 1***

Based on DNR Climatology Data

Measured in inches — County Average

	2009	2010	2011	2012	2013
January	.52	.68	.85	.14	.32
February	.81	.70	.84	1.04	1.42
March	4.40	.89	1.69	1.10	2.14
April	1.52	1.58	2.13	2.62	1.88
May	.64	2.48	4.86	7.67	4.99
June	3.00	4.10	2.86	3.55	6.87
July	2.98	4.51	8.93	2.78	2.04
August	5.24	9.31	2.48	1.74	.88
September	1.05	4.32	.43	.08	2.87
October	6.99	3.54	.73	1.08	4.36
November	.49	.67	.25	1.11	.15
December	1.33	2.05	.17	1.62	1.08
Total	**28.97**	**34.83**	**26.22**	**24.03**	**29.00**

2. Geology

Geologic data elements pertinent to the Wellhead Protection Area (WHPA) delineation and vulnerability status are included in Part One in the ***Appendix*** of this WHP Plan, summarized below and are on file with the Minnesota Department of Health (MDH) and the City of Melrose.

Stearns County, with assistance from the Department of Natural Resources (DNR) and the Minnesota Geologic Survey (MGS), completed a Geologic Atlas in 2005. This data, along with stratification data from existing well records and transmissivity testing were utilized to determine the vulnerable status of the aquifer to land uses.

A connection between land use practices and the quality of the water in the aquifer has been determined. Management strategies to address land use practices will be discussed in Chapter Five.

3. Soils

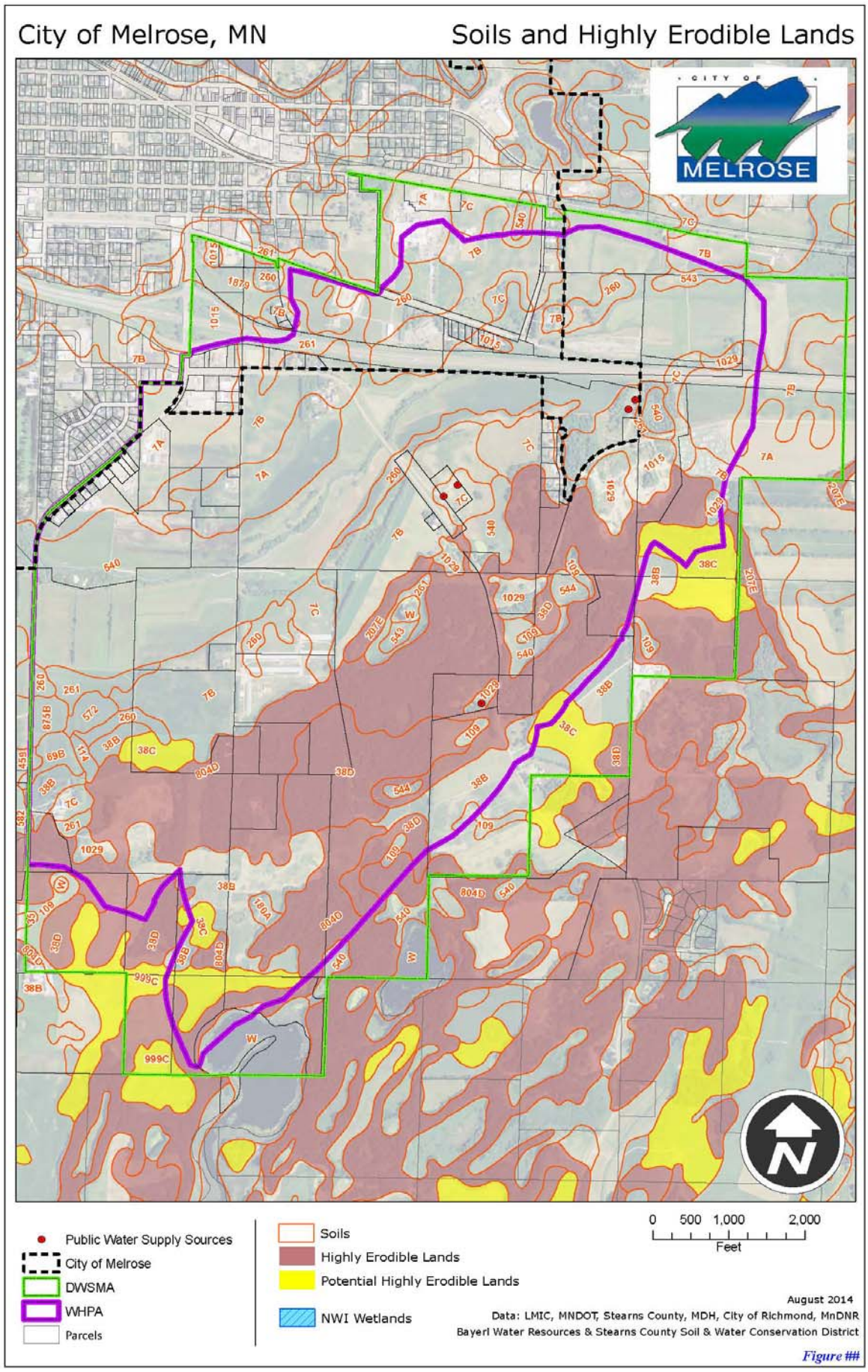
A map of the soils, ***Figure Two*** shows the major soil types and erodibility of soils located within the DWSMA.

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 "A" infiltrates greater than .30 inches per hour – this soil constitutes greater than 50 percent of the land within the DWSMA. This is why land use is important to the protection of the aquifer. Strategies to address land use will be discussed in Chapter Five.

Soil Permeability			***Table 2***
Map Unit	**Map Unit Name**	**HSG ***	**Acres**
35	Blue Earth mucky silt loam	B/D	0.52
109	Cordova loam	C/D	17.97
114	Glencoe loam	B/D	2.48
260	Duelm loamy sand	A	59.30
261	Isan loamy sand	A/D	40.06
459	Corunna loam	B/D	0.81
540	Seelyeville muck	A/D	368.68
543	Markey muck	A/D	7.61
544	Cathro muck	A/D	5.51
572	Lowlein sandy loam	B	5.75
582	Roliss loam	B/D	0.31
1015	Psamments, sloping	A	38.94
1029	Pits, gravel		30.82
1879	Seelyeville muck, calcareous	A/D	22.86
180A	Gonvick loam, 1 to 2 percent slopes	C	2.79
207E	Nymore loamy sand, 15 to 25 percent slopes	A	10.14
38B/C/D	Waukon loam, 2 to 18 percent slopes	B	295.04
69B	Fedji loamy sand, 2 to 6 percent slopes	B	5.49
7A/B/C	Hubbard loamy sand, 0 to 2 percent slopes	A	499.33
804D	Koronis-Estherville complex, 12 to 25 percent slopes	A	388.72
875B	Estherville-Hawick complex, 2 to 6 percent slopes	A	5.59
999C	Ves-Estherville complex, 6 to 12 percent slopes	B	31.76
W	Water		36.94

* 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

The soil types within the DWSMA consist of about 504 acres of highly erodible soil, 87 acres of partially erodible, and 1,286 acres of non-erodible soil. The highly vulnerable areas of the DWSMA are not vulnerable to erosion; therefore erosion and sedimentation have been determined not to have impact in the high vulnerability area surrounding the city wells and does not need to be considered in the implementation of this Plan.


City of Melrose, MN
Soils and Highly Erodible Lands
CITY OF
MELROSE
Public Water Supply Sources
City of Melrose
DWSMA
WHPA
Parcels
Soils
Highly Erodible Lands
Potential Highly Erodible Lands
NWI Wetlands
0 500 1,000 2,000
Feet
August 2014
Data: LMIC, MNDOT, Stearns County, MDH, City of Richmond, MnDNR
Bayerl Water Resources & Stearns County Soil & Water Conservation District
Figure ##

4. Water Resources

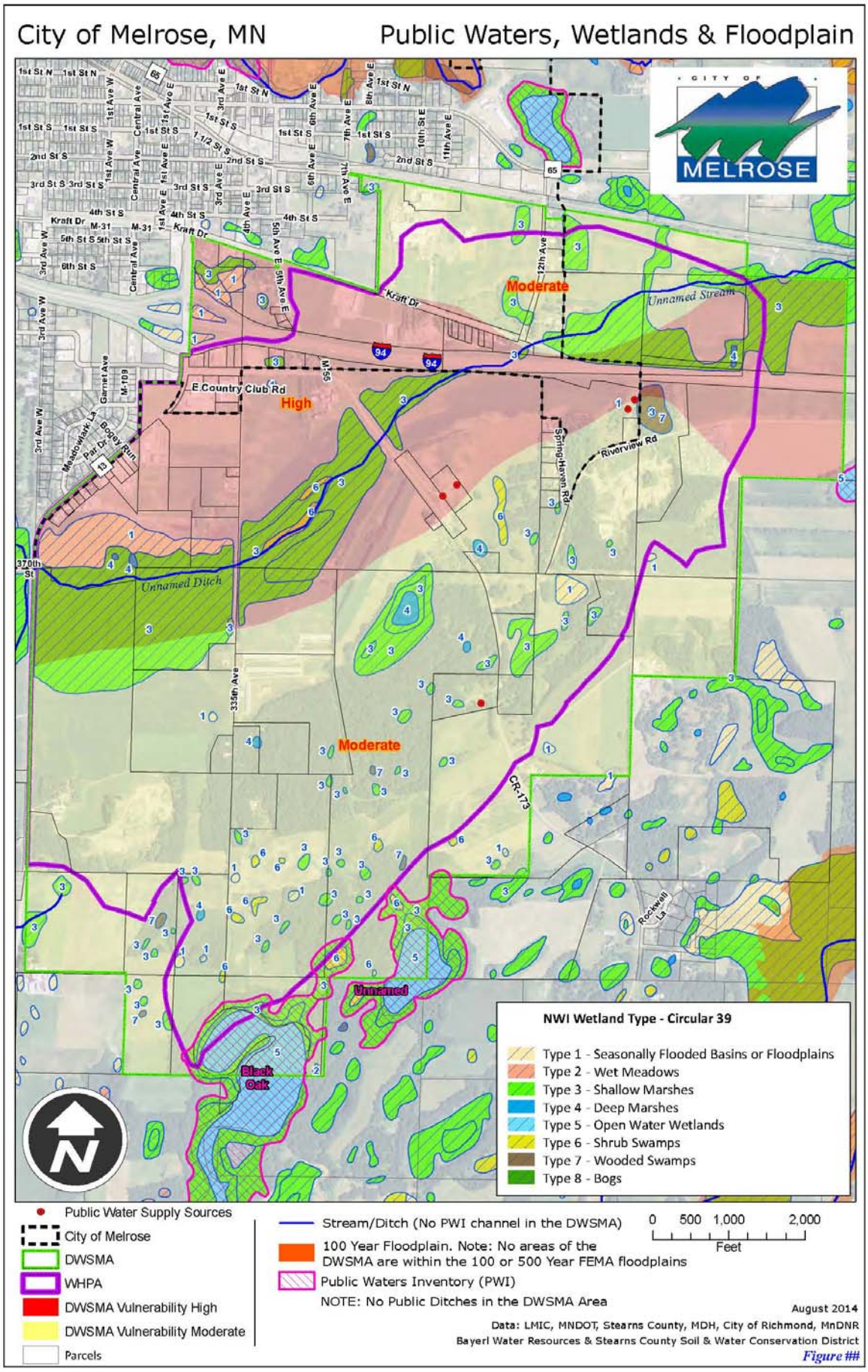
Rivers/Lakes: The Melrose City DWSMA is located entirely within the Sauk River Watershed. There is an unnamed stream/ditch that runs from the southwest to the northeast and drains into the Sauk River. Black Oak Lake is a small, shallow Natural Environment Lake (Identification Number 73024100) with a maximum depth of 19 feet and water clarity of about 3.5 feet. Water flows toward Black Oak Lake on the southern tip of the DWSMA and toward the stream/ditch in the northern area.

Floodplain: There is no floodplain located within the DWSMA and no legal drainage ditches.

Wetlands: A map of the wetlands located in the City of Melrose DWSMA is shown in ***Figure Three***. 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***. There 368 acres of wetlands located in the DWSMA. A small portion of Black Oak Lake is located in the far southern tip of the DWSMA.

NWI Wetland Type		***Table 3*** **Acres**
1	Seasonally Flooded Basins or Floodplains	33.2
2	Wet Meadows	0.2
3	Shallow Marshes	290.4
4	Deep Marshes	4.9
5	Open Water Wetlands	24.3
6	Shrub Swamps	9.7
7	Wooded Swamps	5.7
	TOTAL	**368.4**

The above Wetland Types have been designated by the Circular 39 system – developed by the U.S. Fish and Wildlife Service in 1956. This system 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. Types 3, 4, and 5 have open water and compose over 300 acres within the DWSMA. The wetlands located within the high vulnerability area will be addressed in the implementation section. These areas provide a sink for water draining from surrounding land uses. They are generally located over the mucky soils and do not readily infiltrate into the drinking water aquifer. It is important to preserve these areas.


City of Melrose, MN
Public Waters, Wetlands & Floodplain
MELROSE
Moderate
High
Moderate
Unnamed Stream
Unnamed Ditch
Unnamed
Black Oak
E Country Club Rd
Kraft Dr
Riverview Rd
Spring Haven Rd
CR-173
Rockwell La
370th St
335th Ave
NWI Wetland Type - Circular 39
Type 1 - Seasonally Flooded Basins or Floodplains
Type 2 - Wet Meadows
Type 3 - Shallow Marshes
Type 4 - Deep Marshes
Type 5 - Open Water Wetlands
Type 6 - Shrub Swamps
Type 7 - Wooded Swamps
Type 8 - Bogs
Public Water Supply Sources
City of Melrose
DWSMA
WHPA
DWSMA Vulnerability High
DWSMA Vulnerability Moderate
Parcels
Stream/Ditch (No PWI channel in the DWSMA)
100 Year Floodplain. Note: No areas of the DWSMA are within the 100 or 500 Year FEMA floodplains
Public Waters Inventory (PWI)
NOTE: No Public Ditches in the DWSMA Area
0 500 1,000 2,000
Feet
August 2014
Data: LMIC, MNDOT, Stearns County, MDH, City of Richmond, MnDNR
Bayerl Water Resources & Stearns County Soil & Water Conservation District
Figure ##

B. Land Use Data Elements

Land Use

The City of Melrose is located in Stearns County. A map and database of land parcels within the WHPA/DWSMA, and the property identification number for each parcel as assigned by the County, is included in the ***Appendix*** of this Plan. Land use, noted in ***Table 4 and Figure Four,*** in the DWSMA is primarily cultivated land – over 50%. The next highest use is grassland and deciduous forest.

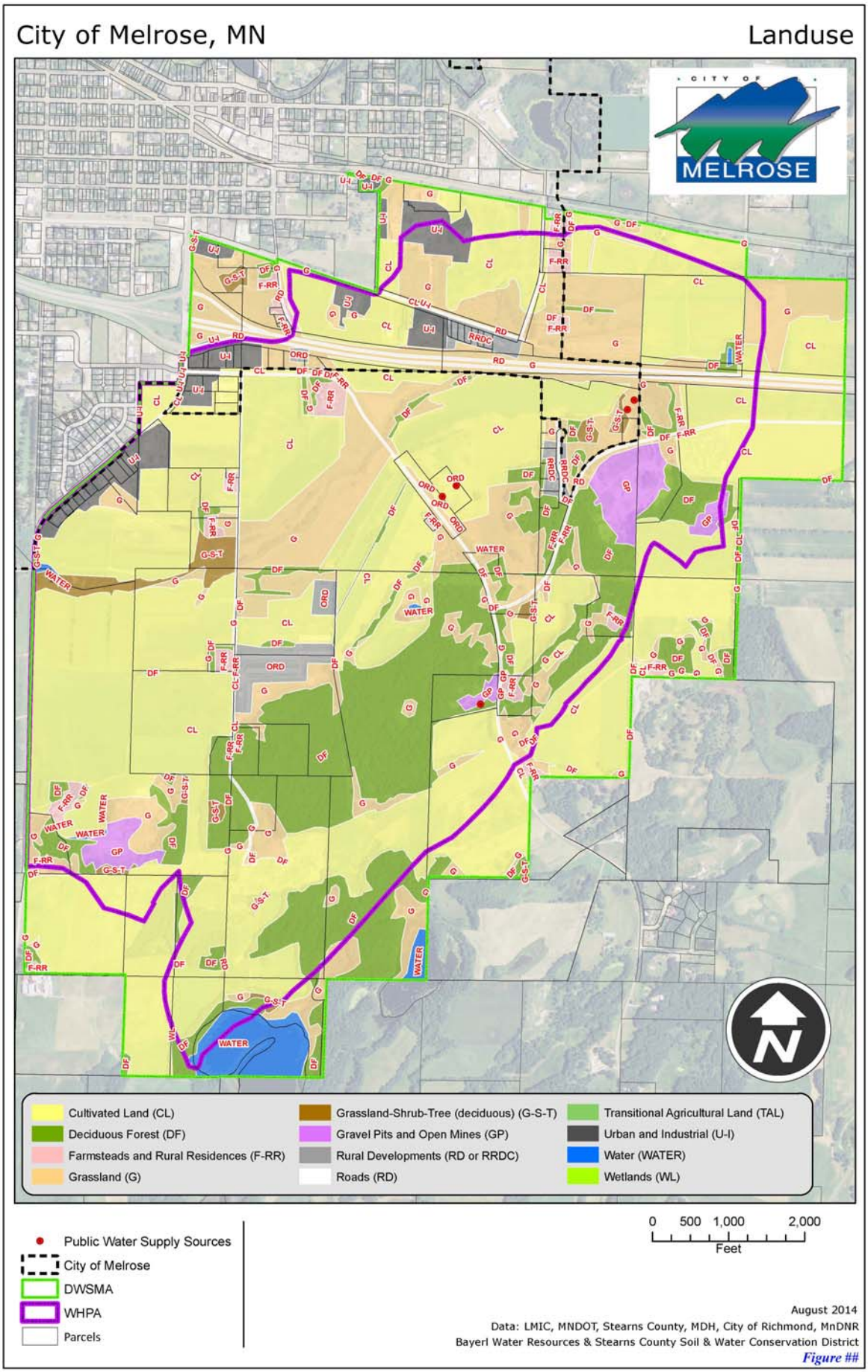
Landuse in Melrose DWSMA	*Acres*	*Table 4* *Percent of DWSMA*
Cultivated Land	965.0	51.4
Deciduous Forest	316.3	16.8
Farmsteads and Rural Residences	26.8	1.4
Grassland	353.4	18.8
Grassland-Shrub-Tree (deciduous)	26.7	1.4
Gravel Pits and Open Mines	34.4	1.8
Other Rural Developments	19.4	1.0
Roads	36.2	1.9
Rural Residential Development Complex	10.9	0.6
Transitional Agricultural Land	0.0	0.0
Urban and Industrial	56.5	3.0
Water	31.9	1.7
Wetlands	0.0	0.0
	1,877.4	**100.0**

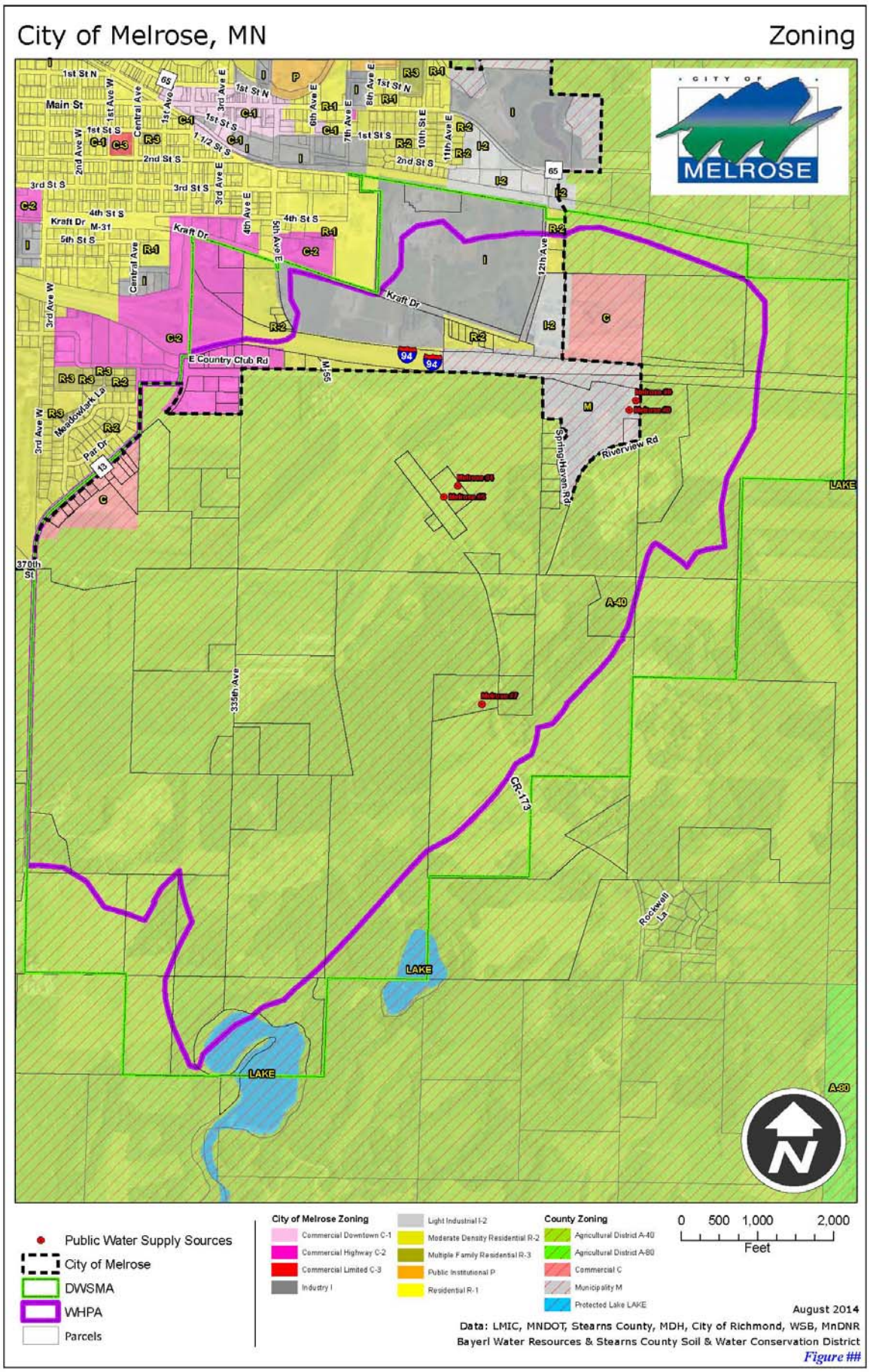
*LMIC via DNR data deli, 1995

Zoning

Official zoning within the DWSMA are shown in ***Table 5 and Figure Five***.

Melrose DWSMA Zoning	*Acres*	*Table 5* *Percent of DWSMA*
CITY ZONING		
Commercial Highway	41.6	2.2
Industry	115.1	6.1
Light Industrial	10.3	0.5
Residential	1.0	0.1
Moderate Density Residential	42.5	2.3
COUNTY ZONING		
Agricultural District A-40	1,548.8	82.5
Commercial	44.7	2.4
Municipality	50.5	2.7
Protected Lake	23.8	1.3
TOTAL	**1,878.3**	**100.0**


City of Melrose, MN
Landuse
CITY OF
MELROSE
Cultivated Land (CL)
Deciduous Forest (DF)
Farmsteads and Rural Residences (F-RR)
Grassland (G)
Grassland-Shrub-Tree (deciduous) (G-S-T)
Gravel Pits and Open Mines (GP)
Rural Developments (RD or RRDC)
Roads (RD)
Transitional Agricultural Land (TAL)
Urban and Industrial (U-I)
Water (WATER)
Wetlands (WL)
Public Water Supply Sources
City of Melrose
DWSMA
WHPA
Parcels
0 500 1,000 2,000
Feet
August 2014
Data: LMIC, MNDOT, Stearns County, MDH, City of Richmond, MnDNR
Bayerl Water Resources & Stearns County Soil & Water Conservation District
Figure ##


City of Melrose, MN
Zoning
MELROSE
Public Water Supply Sources
City of Melrose
DWSMA
WHPA
Parcels
City of Melrose Zoning
Commercial Downtown C-1
Commercial Highway C-2
Commercial Limited C-3
Industry I
Light Industrial I-2
Moderate Density Residential R-2
Multiple Family Residential R-3
Public Institutional P
Residential R-1
County Zoning
Agricultural District A-40
Agricultural District A-80
Commercial C
Municipality M
Protected Lake LAKE
0 500 1,000 2,000
Feet
August 2014
Data: LMIC, MNDOT, Stearns County, MDH, City of Richmond, WSB, MnDNR
Bayerl Water Resources & Stearns County Soil & Water Conservation District
Figure ##

Over 82 percent of the land within the City of Melrose DWSMA is zoned agricultural and close to 90 percent is located outside the city limits in Grove Township. In the area designated as high vulnerability, the majority of the zoning is agricultural with some industrial, commercial and light commercial.

Within the City of Melrose, land use controls are administered locally. Grove Township does not have permitting regulations. The DNR is responsible for regulation of public waters in the state. This includes Black Oak Lake located in the southern DWSMA area. Stearns County Environmental Services is responsible for all other permits, including Conditional Use, Variances, SSTS, feedlots and shoreland in the areas located outside the city limits of Melrose. They also enforce the Wetland Conservation Act. The entire DWSMA is located within the Sauk River Watershed District (SRWD). The SRWD regulates drainage and excavation on projects based on the size of the project and may require a permit for land use activities. A worksheet on their website at http://srwdmn.org/pdf/PermitApplication.pdf informs the applicant if a permit is required.

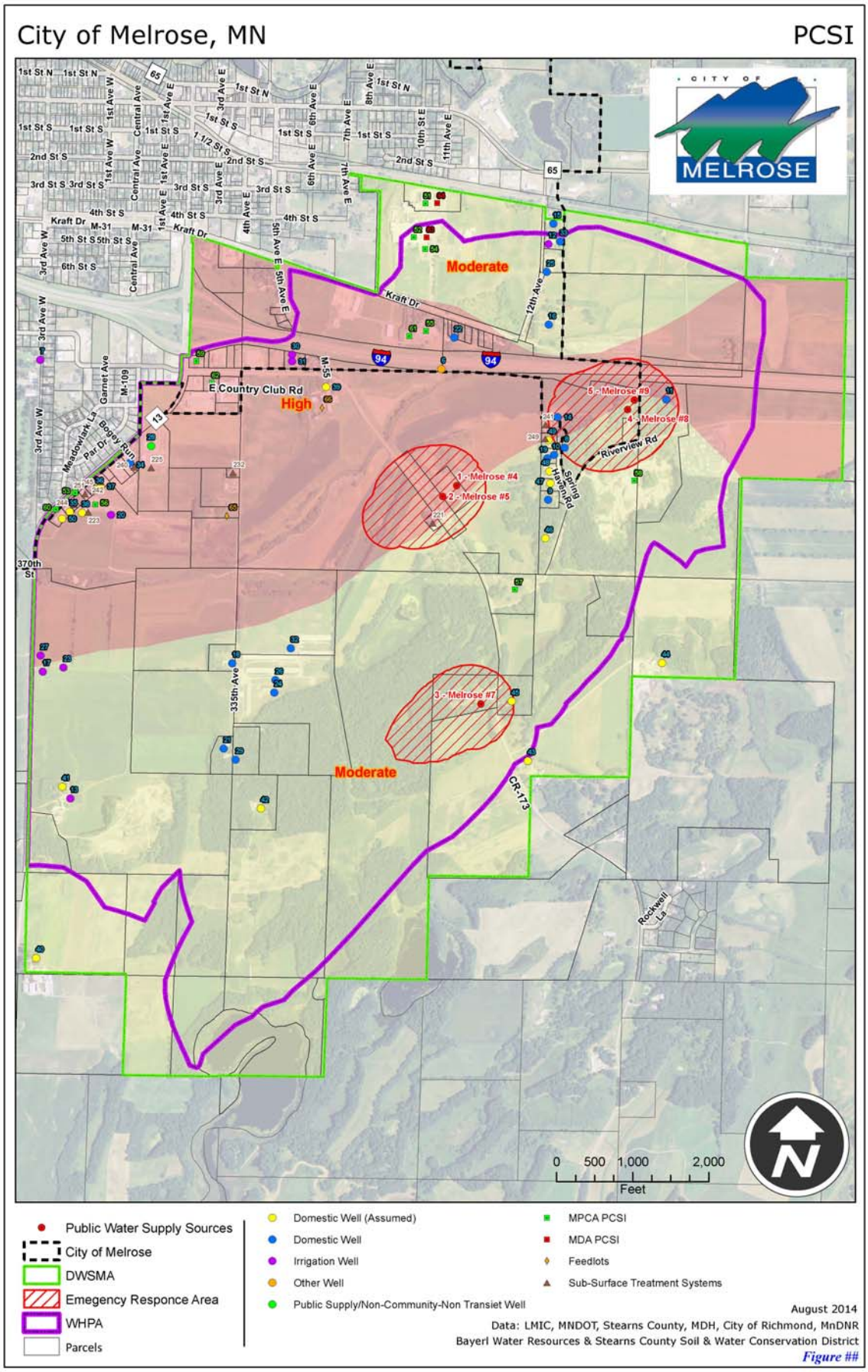
Education, incentives and management practices to protect the aquifer will be addressed in the implementation section of this plan.

Potential Contaminant Source Inventory

Existing land uses and potential sources of contamination located within the DWSMA were reviewed by the WHP Team. The PCSI, utilizing State databases combined with local knowledge, was used to identify most of the contaminant sources. ***Table 6 and Figure Six*** show the location of identified Potential Contaminants. A listing of parcels identified as having potential contaminant sources is shown in the ***Appendix***, along with a list of property owners, addresses, parcel identification numbers, and current classification.

Table 6

Potential Source Type	High Vulnerability			Moderate Vulnerability		
	Active	Inactive	Level of Risk	Active	Inactive	Level of Risk
Leak Site		3	M		1	L
Gravel Pit	3		H			
Above Ground Tanks	2		M	16		M
Underground Storage Tanks	4		H			
Hazardous Waste (Small to Minimal)	5	1	L			
Transportation – I-94	1		H			
Public Water Supply Wells	2		L	3		L
Domestic Wells	12		H	23		M
Irrigation Wells	4		H	4		M
Public/Non Community, Non Transient	1		H			
Other Well (OT)	1		H			
Solid Waste – Permit by Rule	1		M	1		L
Feedlots	2		H			
Sub-Surface Sewage Treatment Systems	11		M			
Class V Wells	0		L			
Bio Solids application site	1		L			


City of Melrose, MN
PCSI
CITY OF
MELROSE
Moderate
High
Moderate
1 - Melrose #4
2 - Melrose #5
3 - Melrose #7
4 - Melrose #8
5 - Melrose #9
Kraft Dr
E Country Club Rd
Riverview Rd
Spring Haven Rd
CR-173
Rockwell Ln
370th St
335th Ave
0 500 1,000 2,000
Feet
Public Water Supply Sources
City of Melrose
DWSMA
Emegency Responce Area
WHPA
Parcels
Domestic Well (Assumed)
Domestic Well
Irrigation Well
Other Well
Public Supply/Non-Community-Non Transiet Well
MPCA PCSI
MDA PCSI
Feedlots
Sub-Surface Treatment Systems
August 2014
Data: LMIC, MNDOT, Stearns County, MDH, City of Richmond, MnDNR
Bayerl Water Resources & Stearns County Soil & Water Conservation District
Figure ##

The level of risk noted on ***Table 6*** is determined by proximity to the City wells, regulation by local and state authorities and perceived potential to affect the aquifer by the wellhead team.

The City applies treated bio solids to 24 acres in the high vulnerability area as shown in ***Figure Six***. It is knifed in per standard protocol and runoff risk is minimal.

Gravel mining often opens a direct conduit to the water table and water percolates rapidly into the lower aquifers. There are three actively mined pits within the Melrose DWSMA. It is important to manage gravel mining as high vulnerability to the aquifer.

Transportation corridors that run through high vulnerability areas can pose a threat if spills occur. Strategies for Interstate Highway 94 will be addressed by a letter to MNDOT and Melrose area first responders, identifying the area of concern. MNDOT has developed a "Vehicle and Fluid Spill Response" memo that is located in the ***Appendix*** of this document. The City of Melrose will explore feasibility of developing a spill response plan and utilize MDH SWP funding to procure necessary equipment for spill abatement. The City will consider signage near wells eight and nine if appropriate.

There are eleven Sub-surface Sewage Treatment Systems (SSTS) within the high vulnerability area of the DWSMA. The University of Minnesota *Septic System Owner's Guide* 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.

Education strategies to address residential turf and agriculture management practices located within the high vulnerability area will be developed. Incentive programs are available through the Stearns County SWCD, the SRWD and the MN Department of Agriculture to help ensure the best use of agriculture land while protecting the groundwater aquifer. There are two feedlots and numerous residential properties in this area.

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 further in the management strategies found in Chapter Five.

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 are shown in ***Table 7*** and were 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.

Potential Contamination Sources for the IWMZ	Well 4	Well 5	Well 7	Well 8	Well 9	*Table 7* Assigned Risk
Unused, unsealed well or boring	1					H
Monitoring well			2	2	2	L
Operating Well				1	3	L

A copy of the IWMZ forms and measures that have been identified are included in the ***Appendix*** 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.

Existing land uses, potential contaminants and future land use changes were also considered within the one year time of travel. Based on the land uses and potential contaminants identified in the IWMZ and one year time of travel area described, the city will consider the potential contaminants and land uses a high priority during the implementation of management strategies found in Chapter Five of this plan.

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 Interstate Highway 94. Water from the Highway flows overland and infiltrates into the soil. The Minnesota Department of Transportation (MNDOT) has developed a protocol to address spills within the right of way as shown in the ***Appendix***, including notification of a duty officer who assigns clean up. An 800 report number is on file with the city.

The Department of Natural Resources Water Supply Plan can be found in the ***Appendix*** and 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.

The city's utility and public drainage system map is shown in the ***Appendix*** and is on file at the City of Melrose Public Works Department. Water and wastewater lines should have negligible impact on groundwater quality. There are no public drainage systems or gas/oil pipelines located within the Melrose DWSMA.

Unused, unsealed municipal or other high capacity wells located within the DWSMA need to be explored to determine if they have been properly sealed. A list of old municipal wells has been provided by the MDH as a starting point for location and verification of sealing of these wells. The City will utilize this list, found in the ***Appendix*** to verify these wells. Municipal wells are eligible for 100% sealing assistance through the MDH. Programs for sealing wells are available at up to fifty percent reimbursement at Stearns Soil and Water Conservation District (SWCD) and the Sauk River Watershed District (SRWD) for landowners with unused, unsealed wells. The MDH SWP implementation grant program can cover well sealing among other strategies identified in this plan. Strategies for providing information to property owners, such as newsletters will be identified in Chapter Five.

C. WATER QUANTITY DATA ELEMENTS

Surface Water Quantity

There are no known surface water withdrawals.

Groundwater Quantity

Adequacy of volume during drought periods has been addressed in Part One of The Plan Amendment. While there are seven other high capacity wells noted in Part One located within a two-mile radius of the city wells, there are no known well interference problems or water use conflicts. While permitted withdrawal from each of the city wells is allowed at 800 million gallons per year, actual historic well use is considerably less and is shown in ***Table 8***.

ANNUAL WELL PUMPING AMOUNTS ***Table 8***
(IN MILLIONS OF GALLONS)

YEAR	Well 4 215113	Well 5 180122	Well 7 486430	Well 8 608438	Well 9 608424	TOTAL
2008	131.1	89.8	189.1	171.9	134.9	716.8
2009	142.1	101.6	105.9	187.1	115.9	652.5
2010	117.1	135.6	125.5	170.7	111.7	660.6
2011	116.5	126.0	102.4	181.7	106.9	633.4
2012	143.1	132.0	98.8	156.0	107.0	636.9

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

Surface Water Quality

The unnamed stream/ditch that runs through the high vulnerability area has no monitoring data. There is a question as to the effect this stream has on the DWSMA aquifer. Monitoring of this stream along with the wells will be part of the implementation strategies of this plan.

Groundwater Quality

Tritium analysis was conducted on the PWS wells number five and seven. 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 at 10.7 and 7.5 tritium units, respectively, shows water in the aquifer is "young" in these wells, meaning it has leached from the surface since 1953. Tritium has not been tested in wells eight and nine, but further testing including these wells will be considered in the implementation strategies.

While Nitrate levels in all wells are within MDH standards on a monthly basis, levels have been detected on occasion that would indicate influence from surface activities. Nitrates on city well number five have been tested infrequently but results run from 10.0ppm in 2012 and have gradually dropped to 7.6ppm when sampled in January of 2014. Further nitrate monitoring of the city wells and land activities in the high vulnerability areas must be considered in the implementation strategies. The ***Appendix*** contains the 2013 Consumer Confidence report, along with nitrate graphs.

II. ASSESSMENT OF DATA ELEMENTS

A. USE OF THE WELL

The City of Melrose utilizes five wells ranging in depth from 85 to 128 feet, as shown in ***Table 9.*** An average of 660 million gallons per year is pumped from these wells. Usage has varied between 633 million gallons per year in 2011 and 717 million gallons per year in 2008.

Table 9

Well Number	Unique well #	Casing Depth (ft)	Depth (ft)	Average pumped (Mg/Y)
4	215113	98	128	130.0
5	180122	62	87	117.0
7	486430	83	105	124.3
8	608438	75	100	173.5
9	608424	67	85	115.3

The city pumps an average of 1.8 million gallons per day and has two elevated storage tank with a total capacity of 2 million gallons. The city water system provides drinking water to 1149 metered service connections through appurtenant distribution mains, lines and services. Historic water usage over the past five years has averaged approximately 660 million gallons annually. Water use is expected to increase slightly by 2024. 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 Amendment. Part One of The City of Melrose plan amendment was completed by Amal M Djerrari, P.E., Hydrologist and Joy Loughry, P.G., Hydrologist with the MDH. Part One is located in the ***Appendix*** of this plan.

C. QUALITY AND QUANTITY OF WATER SUPPLYING THE PUBLIC WATER SUPPLY WELL

The City wells pump about 660 million gallons per year. Results of routine sampling conducted by the MDH in 2013 discovered no violations of any parameters monitored under the Federal Safe Drinking Water Act. A copy of the 2013 Consumer Confidence Report is located in the ***Appendix*** of this plan.

D. THE LAND AND GROUNDWATER USES IN THE DRINKING WATER SUPPLY MANAGEMENT AREA

The area of the DWSMA located within the city limits of Melrose consists mainly of agriculture with some commercial / industrial along the highway corridor. This agricultural area is zoned industrial by the City. Education of landowners about the importance of proper management of hazardous wastes, agricultural chemicals and fertilizers, proper turf management, tank management and monitoring for nitrates in the city wells are issues of concern and will be the focus of management strategies in the high and medium vulnerability areas of the DWSMA.

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 expected expansion to the three gravel mining operations within the DWSMA

B. LAND USE

Any annexation to the City of Melrose is petition driven. There is no expected annexation in the near future.

It is expected that light commercial development will continue and expand east of Highway 13. West of Highway 13 will continue to be of residential use.

C. SURFACE WATER

The stream/ditch that runs through the vulnerable area of the DWSMA is currently zoned almost entirely agriculture with a small area of light industrial use near the City wells. There are no expected changes in the stream.

D. GROUNDWATER

No changes in the groundwater are anticipated.

II. IMPACT OF CHANGES

A. EXPECTED CHANGES IN WATER USE

There are no expected changes in the water use within the DWSMA. No new expected irrigation wells in the area.

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

The City has replaced and repaired all cross-connections within city limits and developed an ordinance to prevent further cross-connections.

The Stearns County Local Water Management Plan has identified priorities supportive of groundwater protection in its current plan.

The Melrose DWSMA is located within the Sauk River Watershed and is part of the Upper Mississippi River Basin. More information about the Sauk River Watershed can be found at: http://www.srwdmn.org/.

The following ***Table 10*** shows the departments or programs that may be able to assist the City with issues relating to potential contamination sources that have been inventoried or may result from changes in land and water use within the DWSMA.

Government Unit	Name of Control/Program	Table 10 Program Description
City of Melrose	Comprehensive Land Use Plan Planning and Zoning	Land Use Permitting Cross Connection Ordinance
Soil and Water Conservation District	Local Water Management Plan	Well Sealing Cost-share Assist with Farm Bill implementation
Stearns County Environmental Services	Comprehensive Land Use Plan Local Water Management Plan	Zoning and Land Use Ordinance Feedlots, SSTS Wetland Conservation Act
Stearns County Emergency Services	Emergency Response	Spill Response
Sauk River Watershed District	Comprehensive Plan Water Management Plan	SSTS Stormwater Permitting Ditch Authority

The following ***Table 11*** indicates the state and federal agencies and programs available to implement this WHP plan.

Government Unit	Type of Program	Table 11 Program Description
MDH	State Well Code (Minnesota Rules, Chapter 4725)	MDH has authority over the construction of new wells and the sealing of 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	Wellhead Protection	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. MDH can assist with implementation through MDH & SWP Implementation Grants.
DNR	Water appropriation permitting Shoreland permitting	DNR 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 concerns are included in a WHP plan. DNR has permitting authority within the protected waters of the State.
EPA	Class V Wells	The EPA has authority over Class V wells. Owners are required to notify the EPA.

MPCA	Environmental Permits Potentially Contaminated Sites	The MPCA has authority over potential contaminant sources such as tanks, hazardous waste generators, and dumpsites.
MNDOT	Interstate transportation	The MNDOT has authority over right-of-way and signage along interstate corridors.
USDA NRCS	Farm Bill Conservation Programs	NRCS provides incentives through cost-share for agriculture related land uses.

C. ADMINISTRATIVE, TECHNICAL, AND FINANCIAL CONSIDERATIONS

The City of Melrose, Stearns SWCD and the Stearns County Environmental Services Office have been supportive of Wellhead Protection efforts. A wellhead committee had been formed and has been actively involved in the planning process. A budget has been established for implementation of priority strategies identified in this Plan.

The WHP Manager will be responsible for implementation of this Plan. The committee will continue to meet at least annually to review and discuss implementation programs.

The city will work with the Stearns SWCD, MDH, MRWA and the Central Minnesota Water Education Alliance (CMWEA) providing groundwater education opportunities as they arise. Stearns County Local Water Management, SWCD, DNR, SRWD, MDA and County Environmental Services 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 used by the City PWS wells is located in a buried sand channel deposit, which has up to 30 feet of clayey material. According to the Part One Plan Amendment, the glacial outwash aquifer within the eroded channel near Melrose is highly vulnerable to potential sources of contamination that are located directly over the aquifer or may introduce contaminants to surface water runoff that may recharge the aquifer from higher topographic elevations. The areas outside this channel present moderate vulnerability.

B. THE WELL WATER

There is uncertainty as to the connection between the stream and the aquifer.

The results of routine chemical monitoring of water samples from the water treatment plant and city wells conducted by MDH over the ten-year period of the previous plan showed indications of well vulnerability. No violations of any parameters monitored under the Safe Drinking Water Act were noted; however Nitrate–nitrogen has been detected at moderate levels. A graph, provided by the MDH, is shown in the ***Appendix*** of this plan. Nitrate monitoring data shows City well number five had high levels of Nitrate + Nitrite Nitrogen in the 1990s. This well exceeded the 10 mg/L federal drinking water standard several times during this time. Recent monitoring shows a downward trend in amount of nitrates in this well. This is the only well of the five City wells that contains appreciable levels of nitrates and is blended with other wells, providing safe drinking water to the residents of Melrose. Pesticides and volatile organic compounds have not been detected in the water.

C. THE DRINKING WATER SUPPLY MANAGEMENT AREA

Land use within the DWSMA of this aquifer 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 hearings held in conjunction with this plan, the following ***Table 12*** 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 12*** Adequacy of Existing Controls to Address the Issue
There are 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 partner with Stearns SWCD and/or apply for MDH Implementation funds to help pay for the costs of properly sealing unused wells.	The city does not have authority to require that unused wells be properly sealed. The MDH has authority to require well sealing.
Land Use (SSTS, Agriculture, Manure Management) – Most of DWSMA outside city limits.	Aquifer Well water quality	The city needs to inform land owners of proper management practices.	The city can work with SCES, USDA, MDA, MRWA and SWCD to provide education and incentives.	The city does not have authority to regulate land use in the DWSMA outside city limits. SCES and SRWD control land use regulation.
Transportation Corridors / Spill Response	Aquifer Well water quality	Potential spills within the highway right-of-way are a threat to the aquifer.	The city can partner with MNDOT, SCES and MDH to produce a spill response/abatement plan.	The city has an emergency management team. MNDOT has spill response protocol.
Lack of adequate information – Monitoring of Surface/ Groundwater connection	Aquifer Well water quality DWSMA	The city needs to 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.
Gravel Mining	Aquifer Well water quality	The city needs to inform gravel mining owners and operators of potential risk to the aquifer.	The city can work with SCES on adequate controls to protect the aquifer.	The city does not have authority to regulate the gravel mining in the DWSMA. SCES controls land use regulation.
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.

The City has a history of nitrates in well #5 from an unknown source.	Aquifer Well water quality DWSMA	The City has limited funding to explore possible causes.	The City can apply for MDH grant funding to monitor for changes in nitrates in the well.	The City blends the water from multiple wells. The City can remove Well #5 from production if necessary.

B. DATA ELEMENTS

The State's Wellhead Protection Rule requires that existing information be utilized in developing the Wellhead Protection Plan. Much of the data collected and utilized to delineate the City of Melrose 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 verified of many of the contaminant sites to further protect public drinking water supplies.

The city will work with the MDH to develop and implement a monitoring plan to include the stream and the PWS wells to determine if there is any impact to the drinking water supply from the stream. 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 are available through existing land use ordinances in the City of Melrose, Stearns County, and 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 city will work with Stearns County LWMP, SWCD, CMWEA, and the SRWD to provide education and incentives.

The Stearns County LWMP, administered by Stearns County Environmental Services, addresses ground and surface water protection. Potential funding for well sealing or other BMPs may be available through Local Water Planning or the Soil and Water Conservation District in Stearns County, or through MDH Source Water Protection Implementation Grants (available as part of the Clean Water Legacy). 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; and
- 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.

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.

A. OBJECTIVES

The following objectives have been identified to support the goals of the WHP plan for the City of Melrose and will be utilized in ***Table 13***:

1. Create public awareness and general knowledge about the importance of WHP for maintaining an adequate and safe drinking water supply;
2. Gather new information on potential contaminants.
3. Manage potential contaminants.
4. Ensure emergency preparedness of local agencies.
5. Create awareness among LGUs about the importance of protection of the drinking water supply aquifer.
6. Maintain communications with the MDH and other agencies able to assist with implementation of this plan.
7. Collect additional data to substantiate information contained within this Plan, and to provide more detail for future Plan amendments.
8. Conduct regular evaluations of Plan implementation and effectiveness.

B. 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

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 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 Melrose 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 13*** lists each measure that will be implemented over the 10-year period that the City's WHP plan is in effect, including the above-listed objectives and 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 have an impact on the quality or quantity of its drinking water in the future.

Table 13 - WHP Plan of Action

MONITORING, DATA COLLECTION, AND ASSESSMENT:

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame									
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1. Groundwater Quality & Quantity Monitoring **WHP Measure #1:** Work with MDH to have stable isotopes collected from Wells 8 & 9 and the surface water from the unnamed stream to determine if there is a surface to groundwater connection.	**7**	H	Melrose MDH	MDH will cover lab fees	X	X								
WHP Measure #2: Work with MDH to develop a sampling schedule to collect raw water samples (source samples) for nitrate/nitrite analysis.	**7**	H	Melrose MDH	MDH will cover lab fees	X	X	X	X	X	X	X	X	X	X
WHP Measure #3: Work with MDH to have isotope (Tritium) samples collected for Wells 8 and 9.	**7**	H	Melrose MDH	MDH lab fees							X			
2. Data Collection **WHP Measure #4:** Apply for MDH SWP grant to conduct a down-hole camera viewing of Well #5 to verify the integrity of well casing. Obtain contractor estimates to ascertain costs.	**7**	H	Melrose Contractor MRWA MDH	$10,000	X	X								
3. Well Inventory and Prioritization **WHP Measure #5:** Use the County Well Index to update the private well inventory years 4 & 7. Review status of existing wells and add new wells identified within the DWSMA.	**2**	H	Melrose SWCD	Staff Time				X			X			
WHP Measure #6: The city will send a survey to all landowners within the DWSMA in an effort to identify unknown wells and unused, unsealed wells. Property owners will be offered grant funding to seal unused, unsealed wells.	**2/3**	H	Melrose CMWEA SWCD MDH MRWA	$500			X							
WHP Measure #7: Work with MDH to review old municipal well inventory to help locate, seal and determine the status of former municipal wells. Submit well records to MDH.	**2**	H	Melrose Well Drillers MDH MRWA	$10,000		X								

WELL AND CONTAMINANT SOURCE MANAGEMENT:

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame									
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1. Municipal Well Management Practices **WHP Measure #8:** Review and update the IWMZ survey form for all wells in the system every 5 years working in coordination with the MDH.	**2**	H	Melrose MDH, MRWA	Staff Time					X					X
WHP Measure #9: Monitor setbacks for all new potential contaminant sources within the IWMZ.	**3**	H	Melrose MDH	Staff Time	←----------On-Going----------→									
WHP Measure #10: Implement WHP measures identified on the IWMZ Inventory forms.	**3**	H	Melrose MDH	Staff Time		X								
WHP Measure #11: Identify and mark a 50-foot permanent vegetative buffer around PWS wells.	**3**	L	Melrose MDH	Staff Time	X									
WHP Measure #12: Provide a map of the DWSMA to the local Fire Department, City Street Department, Stearns County Emergency Management, and MNDOT. Request their awareness and prompt response to accidents, spills and clean-up efforts near the PWS wells.	**4/5**	H	Melrose Stearns County MNDOT	Staff Time	X				X					
2. Private Well Management **WHP Measure #13:** Provide information on the Melrose website about proper management of active wells and sealing of unused wells located in the DWSMA and why this is important.	**1**	H	Melrose MDH MRWA	$1,200			X							
WHP Measure #14: Apply for a MDH SWP Grant, SRWD and SWCD funding to seal the high priority unused unsealed wells identified in the DWSMA if funding is available.	**5**	H	Melrose MDH SRWD SWCD	Approx. $600-$1,000 per well	←---------- As Needed ----------→									

WELL AND CONTAMINANT SOURCE MANAGEMENT (CONT.):

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame									
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
3. Class V Wells **WHP Measure #15:** The City will update and identify any new known potential Class V Wells in the DWSMA. Contact MDH Planner for assistance working with a suspected owner of a Class V well.	**3/6**	M	Melrose MDH EPA	Staff Time	←---------- As Needed ----------→									
WHP Measure #16: The City will notify MDH of any Class V wells identified, and provide educational materials to the property owners within the DWSMA about impacts of Class V wells to groundwater.	**1/3/6**	H	Melrose MDH	Staff Time	←---------- As Needed ----------→									
4. High Capacity Wells **WHP Measure #17:** If the City receives High Capacity Well notification from the DNR during the review process; they will contact the MDH SWP Planner or Hydrologist.	**6**	H	Melrose MDH DNR	Staff Time	←---------- As Needed ----------→									
5. Tank Management **WHP Measure #18:** Contact the owners of above and below ground storage tanks identified in the PCSI to determine the status of their tanks. If any corrective measures are needed, assist them by applying for a grant via MDH SWP grant to perform any corrective actions and/or secondary containment or tank removal.	**1/3**	H	Melrose MDH MPCA	TBD				X						
6. Gravel and Mining **WHP Measure #19:** The City will work with SCESD to notify owners of gravel mining sites that they are located within the DWSMA and distribute MDH Guidelines for Operation and Management.	**1/3**	H	Melrose SCESD MDH	Staff Time	X									

WELL AND CONTAMINANT SOURCE MANAGEMENT (CONT.):

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame									
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
WHP Measure #20: Apply for MDH SWP grants to assist with costs associated with the reclamation of abandoned gravel pits within the city's DWSMA.	**3**	H	Melrose MDH	Up to $10,000	←---------- As Needed ----------→									
7. Sub Surface Sewage Treatment Systems **WHP Measure #21:** The City will provide Septic System Owner's Guide to property owners within the high vulnerability area with a septic system.	**1**	M	Melrose SCES SRWD SWCD	$1200 plus Staff Time		X								
WHP Measure #22: Request that SCESD provide SSTS compliance information of SSTS located within the high vulnerable area of the city's DWSMA.	**2**	M	Melrose SCESD SRWD MDH	Staff Time			X	X						
WHP Measure #23: Fund city sewer hook-ups or SSTS upgrade of non-compliant SSTS located within the high vulnerability area of the DWSMA if grant funding is available.	**3**	H	Melrose SCES SRWD MDH	$6,000-10,000/ system				X	X					
8. Tank and Leak Site Management **WHP Measure #24:** The City will send DWSMA map with tanks and leak sited identified to the MPCA requesting notification of any activities such as new or removal of existing tanks and re-activation by state agencies regarding known LUST sites.	**2/3/6**	M	Melrose MPCA	Staff Time	X									
9. Nutrient Management **WHP Measure #25:** The City will convene a meeting with resource professionals to develop a plan for implementing nutrient management measures with land owners in high vulnerability areas of the DWSMA. The City will work cooperatively with MRWA and SWCD in the development of the nutrient management plan. External partners such as the MDA, NRCS and MDH will be asked to help develop this plan.	**3**	H	Melrose SWCD MDA SRWD SCESD NRCS MRWA	Staff Time			X	X				X	X	

WELL AND CONTAMINANT SOURCE MANAGEMENT (CONT.):

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame									
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
WHP Measure #26: The City will solicit external funding and technical expertise that are needed to support implementation of the DWSMA nutrient management plan within the city's DWSMA**.**	**3**	H	Melrose MDH MRWA	$3,000-10,000				X	X				X	X
10. Hazardous Waste **WHP Measure #27:** The City will send hazardous waste generators within the high vulnerability area of the DWSMA educational information about wellhead protection and waste disposal.	**1**	M	Melrose MPCA	Staff Time	X									
WHP Measure #28: The City will post dates and location of the household hazardous waste collection on their website.	**1**	L	Melrose	Staff Time	X	X	X	X	X	X	X	X	X	X
11. Stormwater **WHP Measure #29:** The City will provide stormwater management information on the Melrose website.	**1**	M	Melrose CMWEA MRWA	Staff Time		X								
WHP Measure #30: The City will consider MDH guidance when designing stormwater management for future growth in the Emergency Response Area.	**3**	M	Melrose	Staff Time	←---------- As Needed ----------→									
WHP Measure #31: The City will provide a letter and DWSMA map to state and local regulatory authorities requesting that they follow MDH stormwater guidance when considering stormwater treatment within the high vulnerability area of the DWSMA.	**3**	H	Melrose SRWD MNDOT MDH MPCA	Staff Time	X									

WELL AND CONTAMINANT SOURCE MANAGEMENT (CONT.):

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame									
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
12. Transportation Corridors **WHP Measure #32:** Work with local fire department, MNDOT, Stearns County Emergency Management, Stearns County Highway Department and Melrose Emergency Management to develop and implement a spill response plan. Utilize MDH Implementation funding as appropriate to purchase abatement equipment.	**4**	H	Melrose MNDOT Stearns County SCEM	TBD Staff Time			X							
13. Implementation Assistance: **WHP Measure #33:** The City will explore the option of working together with neighboring public water suppliers to help fund implementation assistance of wellhead protection plans if grant funding is available.	**1/3**	M	Melrose MDH Other PWS	$10,000	←----------X Then As Needed ---→									

EDUCATION AND OUTREACH:

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame									
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1. Education and Outreach **WHP Measure #34**: Select wellhead protection education items from the MRWA and MDH source water protection websites to use to educate the public about identified potential contaminant sources. Place brochures at City Hall, local newspaper and/or other media, and the public library. Apply for MDH SWP funds for printing costs.	**1**	H	Melrose MRWA CMWEA MDH	$5000			X						X	
WHP Measure #35: Post and highlight WHP education information on the city website.	**1**	M	Melrose MDH MRWA CMWEA	Staff Time	←-------2015 and As Needed--------→									
WHP Measure #36: Assess interest and annually provide the MRWA Water Week educational materials to the local 4th grade school teacher if willing to participate.	**1**	M	Melrose MRWA MDH	Staff Time	X	X	X	X	X	X	X	X	X	X
WHP Measure #37: The city will support and sponsor the Middle SRWD Children's Water Festival in the area of groundwater protection.	**1**	M	Melrose CMWEA MDH SRWD	Staff Time plus in-kind $500			X				X			
WHP Measure #38: The City may apply for grant funds to help offset costs for participation in the Central MN Water Education Alliance, an organization that provides education outreach to promote water quality stewardship.	**1/3**	M	Melrose CMWEA MDH	$235 per year	←---------- As Needed ----------→									
WHP Measure #39: The City will participate with the Melrose School District in their Best Management Practices education curriculum.	**1**	M	Melrose School District	Staff Time	←---------- As Needed ----------→									

LAND USE AND PLANNING:

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame									
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1. Water Use Management **WHP Measure #40:** The City will implement DNR approved Water Supply Plan and update as required.	**4**	H	Melrose	Staff Time	X	X	X	X	X	X	X	X	X	X
WHP Measure #41: The city will enforce the existing policy that requires businesses located on all properties within the municipality to hook up to the municipal water supply when feasible.	**3**	H	Melrose	Staff Time	←---------- As Needed ----------→									
WHP Measure #42: The City will implement their conservation rate schedule and educate the public on water conservation practices they can implement to reduce water use via the City website.	**1**	M	Melrose MDH DNR	Staff Time	←---------- As Needed ----------→									
2. General Land Use & Water Resource Planning **WHP Measure #43:** The city will send a letter to SCESD requesting notification of any permit requests or land use changes within the city of Melrose DWSMA.	**5**	H	Melrose	Staff Time	X									
3. Comprehensive Land Use Planning **WHP Measure #44:** The city will send a letter requesting inclusion in Stearns LWMP, the SRWD Plan and County Comprehensive Plan. Include in City Comprehensive Plan. Request support for implementation measures as appropriate.	**5**	M	Melrose LWMP SCES	Staff Time	X	X								
4. Zoning Controls **WHP Measure #45:** Require proposed new development located in the DWSMA to hook up to municipal services when feasible.	**3**	H	Melrose	Staff Time	←---------- As Needed ----------→									

WHP COORDINATION, REPORTING, AND EVALUATION:

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame									
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1. WHP Coordination **WHP Measure #46:** Coordinate a meeting with the WHP team every 2.5 years. Discuss funding needs and pursuit of SWP Grant funds to help implement activities identified in the WHP Plan.	**5**	H	Melrose WHP Team MRWA	Staff Time			X			X			X	
2. Implementation Tracking and Reporting Activities **WHP Measure # 47:** 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.	**8**	H	Melrose	Staff Time	X	X	X	X	X	X	X	X	X	X
3. WHP Program Evaluation Plan Reporting **WHP Measure #48:** 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.	**8**	H	Melrose MDH	Staff Time			X			X			X	
WHP Measure #49: 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.	**3**	L	Melrose MDH	$5,000	←---------- As Needed ----------→									

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 Melrose's WHPA has been designated as having high to moderate vulnerability to contamination. The designation of high vulnerability requires monitoring of all potential contaminant sources within 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. The wellhead team will meet as needed but at least annually to review completed objectives and their effectiveness. Necessary modifications to the Plan will be discussed with strategies added as needed.
3. A written report will be completed every 2.5 years and presented to the City Council stating progress in implementation of objectives. This report will be sent to the Minnesota Department of Health, Source Water Protection Planner; Minnesota Rural Water Association, Wellhead Liaison; The County Local Water Manager; and be placed on file at the Melrose City offices.

CHAPTER SEVEN

ALTERNATIVE WATER SUPPLY / CONTINGENCY STRATEGY

Minnesota Rules 4720.5280

PURPOSE

The purpose of having a Contingency Plan is to establish certain emergency response procedures and information for the City of Melrose 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.

The City has an approved DNR Water Supply Plan to address water supply issues. It is contained in the ***Appendix*** of this plan.